

---

# COLORADO PERA SENATE BILL 10-001 REPORT

---



*Prepared by Colorado PERA  
December 2015*





## CONTENTS

---

I.	Introduction and Key Findings .....	1
II.	Executive Summary.....	5
III.	Colorado PERA and General Assembly Address Post-2008 Sustainability Concerns .....	17
IV.	Overview of Senate Bill 10-001 Reforms Designed to Restore Sustainability for Colorado PERA.....	21
V.	Senate Bill 10-001 Reforms Ensure Colorado PERA Sustainable for Foreseeable Future.....	27
VI.	Colorado PERA Retirees Keeping Pace With Inflation .....	45
VII.	Legal Rulings Allow for Continued Application of Senate Bill 10-001 Reform.....	49
VIII.	Senate Bill 14-214 Studies Highlight Efficient, Low-Cost Plan Design and Deliver Useful Analytic Tools .....	53
IX.	Economic Impact Studies Show Colorado PERA is One of Colorado’s Best Investments .....	61
X.	Revised Pension Funding Policy Yields Greater Transparency and Stability .....	69
	APPENDIX A – Senate Bill 10-001 Legislative Act .....	75
	APPENDIX B – Complete List of Original Board Recommendations and Resulting Senate Bill 10-001 Reforms and January 15, 2010, Letter from the Three Governor-Appointed Colorado PERA Trustees to Senate President Brandon C. Shaffer .....	119
	APPENDIX C – Summary of Details Regarding Projection Scenarios and Projection Graphs for Each Division .....	125
	APPENDIX D – Summary of Gain/Loss Information .....	139
	APPENDIX E – Estimated Impact of Major Senate Bill 10-001 Reforms .....	145
	APPENDIX F – Analysis of Member Experience Related to Senate Bill 10-001 Reforms.....	151
	APPENDIX G – CPI-W Data and Annual Increase Comparative Analysis .....	155
	APPENDIX H – Colorado PERA Public Pension Plan Contribution Rate Analysis .....	161
	APPENDIX I – What if Colorado Public Employees Had Been in a Defined Contribution Plan? Additional Data From Pacey Economics, Inc., September 2015 .....	167
	APPENDIX J – Colorado PERA Pension Funding Policy and Projection Graphs Reflecting Payment of the Actuarially Determined Contribution (ADC) .....	181



---

## **SECTION I**

### **Introduction and Key Findings**

---



**Introduction**

Colorado was among the first states in the nation to enact meaningful pension reform as a result of the 2008 Great Recession. Senate Bill 10-001 (SB 1), the legislative package in response to the 2008 financial crisis, put the Colorado Public Employees’ Retirement Association (PERA) back on track to being fully funded. This report reviews the impact of SB 1 since enactment.

As part of the changes implemented in SB 1, PERA is required to report to the General Assembly on the effectiveness of SB 1, pursuant to Colorado Revised Statutes § 24-51-220.

*“The association shall provide a report to the general assembly on January 1, 2016, and every five years thereafter, regarding the economic impact of the 2010 legislative changes to the annual increase provisions on the retirees and benefit recipients as compared to the actual rate of inflation and the progress made toward eliminating the unfunded liabilities of each division of the association”.*

**As a result of the innovative shared sacrifices and reforms made to PERA by SB 1, PERA is once again sustainable for the long term. The expectation is PERA will continue to pay all benefits promised to all benefit recipients as well as current and future members, indefinitely, just as it has since PERA began in 1931.**

**Key Findings**

- 1 As a result of the SB 1 reforms, PERA is sustainable into the foreseeable future. (See Section V, pages 27–35)
- 2 The SB 1 reforms significantly reversed PERA’s predicted course from running out of money within 20 to 25 years to projections of full funding in approximately 30 to 36 years.<sup>1</sup> (See Section V, pages 30–31)

**EXHIBIT 1**

Division	Post-SB 1 Projected Funding Levels to December 31, 2014		Actual Funding Levels as of December 31, 2014	
	Funded Ratio (AVA Basis)*	Projected Length of Time to Reach Full Funding	Funded Ratio (AVA Basis)	Projected Length of Time to Reach Full Funding
State	57.6%	36	57.8%	37
School	60.7%	33	60.9%	38

\* Funded ratios are typically presented with regard to the Actuarial Value of Assets (AVA) or “smoothed” asset values, as shown here, unless otherwise indicated. Other areas of this report reference funded ratios based on the Market Value of Assets to help illustrate the full magnitude of asset losses that have occurred in the last 15-year period.

<sup>1</sup> In 2010, projections were based upon the 8.0 percent expected long-term rate of return and discount rate in place at the time. In 2013, the PERA Board of Trustees adopted a more conservative expected long-term rate of return and discount rate of 7.5 percent per year. This shift extended the projected period for PERA’s trust funds to reach 100 percent funding.

- 3 SB 1 reforms reduced benefits for all active and retired members. Consequently, PERA employers and taxpayers are saving money by providing a more affordable benefit. PERA members with membership dates of January 1, 2007, or later, fund approximately 80 percent of the cost of their retirement benefits through salary deductions. (See Section V, page 28)
- 4 Over the past five years, SB 1 reforms saved PERA approximately \$15 billion in unfunded actuarial accrued liability (UAAL). (See Section V, page 39)
- 5 The SB 1 reform with the most significant impact over the last five years is the reduction in Annual Increase provisions which accounts for over 90 percent of the \$15 billion in savings to date. (See Section V, page 39)
- 6 As a result of the contribution reforms made to the Local Government and Judicial Divisions, PERA employers, members, and taxpayers saved approximately \$55 million, to date, in reduced contributions. (See Section V, page 39)
- 7 Even recognizing the SB 1 reforms which changed the Annual Increase provisions, PERA benefit recipients kept up with U.S. inflation over the last five-year period. (See Section VI, page 45)
- 8 All divisions benefited from the annualized 9.9 percent investment rate of return experienced over the five-year study period. This better than expected investment performance had a positive impact on the amortization period (estimated time to reach 100 percent funded). (See Section V, page 38)
- 9 The State and School Divisions did not realize the level of employment growth projected in 2010. This lower than expected growth rate in the active population had a negative impact on the amortization period for these divisions. (See Section V, page 38)
- 10 Assuming all future assumptions are met, the funded ratios are projected to do the following:
  - Continue to slightly decline or hold steady over the next 17 to 20 years for the State and School Divisions. The funded ratios will then increase and eventually attain 100 percent funded in approximately 37 to 38 years. (See Appendix C, page 134)
  - Continue increasing and reach 100 percent funded ratio in approximately 25 years by 2040 for the Local Government Division. (See Appendix C, page 135)

## I. INTRODUCTION AND KEY FINDINGS

- Continue to slightly decline or hold steady over the next 30 years for the Judicial Division. The funded ratio will then gradually increase and eventually attain 100 percent funding by 2063. (See Appendix C, page 135)
  - Continue to slightly decline or hold steady over the next 25 years for the DPS Division. The funded ratio will then gradually increase and eventually attain 100 percent funding by 2048. (See Appendix C, page 136)
- 11** Considering all divisions of PERA, employers' contributions to PERA on behalf of their employees represent approximately 2.9 percent of their total budget. (See Section VIII, page 56)
- 12** Exhibit 2 below provides a summary of the aggregate impacts of the major SB 1 reforms and cumulative plan experience on PERA's funded status reflecting the five-year study period (2010–2014, inclusive).
- 13** Sacrifice by PERA members was realized in many forms: (See Section V, page 42)
- Over a 25-year retirement period a typical retiree receiving a \$3,000 monthly benefit as of January 1, 2010, will sacrifice the equivalent of approximately seven years of base retirement payments.
  - Over a 25-year retirement period, a typical member who eventually accumulates 25 years of service and retires early at age 55, could sacrifice as much as the equivalent of 10 to 15 years of base retirement payments.
  - A typical State Division new-hire as of January 1, 2017, will be required to have at least 30 years of service and be at least age 60 to retire with an unreduced benefit.
  - Reduced Annual Increases for all PERA members who currently receive, or one day will receive a PERA benefit.

### EXHIBIT 2

Impacts of SB 1 Reforms and Plan Experience on Funded Status 2010–2014

Item	Isolated Impact Amount (to UAAL)*	Direction of Impact
<b>SB 1 Reform</b>		
Reduced Annual Increase Provisions	\$14.6 billion	
Vesting Requirement for Match on Refunds	\$172 million	
Use of Actuarially Equivalent Early Retirement Reductions	\$143 million	
Additional Employer and Employee Contributions (AED/SAED) <i>State, School, DPS</i>	\$125 million	
Freezing Employer and Employee Contributions (AED/SAED) <i>Local Government, Judicial</i>	(\$55 million)	
Implementation of Rule of 85 (Existing members with less than five years of service as of January 1, 2011, minimum age of 55)	\$51 million	
Implementation of Rule of 88 (New members between January 1, 2011, and January 1, 2017, minimum age of 58)	\$16 million	
<b>Plan Experience (5-Year Cumulative Gain/Loss)</b>		
Market Value Asset Gain (Annualized 9.9 percent investment return 2010–2014)	\$4.2 billion	
Actuarial Accrued Liability Loss (Includes reduced assumed investment rate of return from 8.0 percent to 7.5 percent)	(\$816 million)	
Population Growth Loss (Lower population growth than expected)	(\$145 million)	

\*Each individual UAAL impact amount shown reflects the major reform if valued independently from the other reforms and are shown only for purposes of illustrating magnitude. Since some of these items are interdependent, it is not appropriate to sum the items to determine a total impact amount.



---

## **SECTION II**

### **Executive Summary**

---



## Overview and Background

Colorado was among the first states in the nation to enact meaningful pension reform as a result of the 2008 Great Recession. Senate Bill 10-001 (SB 1), the legislative package in response to the 2008 financial crisis, put the Colorado Public Employees' Retirement Association (PERA) back on track to being fully funded. This report reviews the impact of SB 1 since enactment.

As part of the changes implemented in SB 1, PERA is required to report to the General Assembly on the effectiveness of SB 1, pursuant to Colorado Revised Statute § 24-51-220.

*"The association shall provide a report to the general assembly on January 1, 2016, and every five years thereafter, regarding the economic impact of the 2010 legislative changes to the annual increase provisions on the retirees and benefit recipients as compared to the actual rate of inflation and the progress made toward eliminating the unfunded liabilities of each division of the association".*

The groundwork for this historic, bipartisan legislation began after the 2008 economic decline when PERA's annual actuarial projections showed PERA's largest divisions (State and School) were not sustainable and projected to run out of money. In 2009, in response to education and notification by the PERA Board of Trustees (the Board), the Colorado General Assembly passed legislation requiring PERA to submit a proposal with specific, comprehensive recommendations to ensure PERA would become and remain fully funded.

At the onset of the Board's work, the following guiding principles were established by the Board for developing a comprehensive package to provide long-term sustainability:

- Shared responsibility among members, retirees, and employers.
- Intergenerational equity.
- Preservation of the defined benefit plan.
- Preservation of portability for members who move between different divisions of PERA, by maintaining common benefit structures.
- Development of recommendations that would have little to no short-term impact on member behavior.

The guiding principles were reflected and adhered to in the formation of the Board's recommended proposal. The Board was committed to the preservation of the defined benefit plan, as well as the preservation of the significant portability afforded members through the maintenance of existing benefit structures for the different divisions. While maintaining the maximum amount of intergenerational equity, the Board

developed a plan with a notable level of shared sacrifice by all interested parties, designing these sacrifices with as minimal an impact on member behavior as possible.

After more than a year of research and outreach, PERA worked with bipartisan leaders in the Colorado House of Representatives and Senate to craft SB 1 which included the necessary provisions to ensure PERA is able to provide retirement security for current and future retirees. SB 1 was not intended to bring PERA trust funds to 100 percent funded immediately, but rather to put in place a systematic plan of paying down unfunded liabilities while supporting PERA's principles of fairness and intergenerational equity. These basic principles ensuring retirement security are particularly important for PERA members as few of them also contribute to Social Security.

### Key Reforms Adopted Prior to SB 1 and Timeline

In 2000, PERA was over 100 percent funded. Because of solid funding levels, prosperous economic times, and other state policy and personnel considerations, the General Assembly and Governor took steps from 1998 through 2000 to implement changes to PERA that boosted annual increase adjustments for retirees, allowed members to purchase service credit at a lower rate, encouraged early retirement, and reduced employer contribution rates.

The changes meant higher costs and fewer dollars flowing into PERA leading up to the unexpected dot-com economic downturn of 2000-2002. By the end of 2002, PERA's aggregate funded ratio across all divisions dropped to 88.3 percent (68.1 percent based on a market value of assets). As of 2003 (2004 for the Judicial Division), the statutory employer contribution levels were no longer sufficient to meet the annual required contribution (ARC) rates as determined by PERA's actuaries. Over the five-year study period, the ARC contribution deficiency accumulated to approximately a \$1.4 billion loss. The gain/loss attributable to the ARC contribution deficiency for each year is shown, by division, in Appendix D.

Beginning in 2003 with limitations on service credit purchases, and continuing through 2006 with other benefit and contribution changes, the General Assembly, with education and resources provided by PERA, began a series of reforms aimed to ensure PERA reached fully funded status within approximately 60 years.

The two reforms that impacted the amount of contributions to the plan included adoption of the Amortization Equalization Disbursement (AED), which was legislated in 2004 with a January 1, 2006, effective date, and the Supplemental Amortization Equalization Disbursement (SAED), legislated in 2006 with a January 1, 2008, effective date. The AED is an

## II. EXECUTIVE SUMMARY

additional amount contributed by PERA employers specifically allocated toward paying for the unfunded liability. The AED was set to gradually increase up to 3.0 percent between 2006 and 2012.

The SAED is also an additional amount contributed by employers to be allocated toward paying for the unfunded liability. However, this additional contribution is funded by moneys otherwise available for employee compensation increases. The SAED was set to gradually increase up to 3.0 percent between 2008 and 2013.

Other impactful reforms that took place in 2004 and 2006 were those affecting the Annual Increase (AI) provisions. Effective for individuals with a membership date on or after July 1, 2005<sup>2</sup>, the AI was more closely tied to the Consumer Price Index for Urban Wage Earners and Clerical Workers or CPI-W, by annually granting the lesser of 3.0 percent or the average increase in CPI-W. Again in 2006, the AI for individuals with membership dates on or after January 1, 2007<sup>3</sup>, was altered. This structure includes an AI reserve, funded by accumulating 1.0 percent of covered compensation. The AI to be granted to

this group, as initially adopted, was the lesser of 3.0 percent or the increase in CPI-W, not to exceed 10.0 percent of available dollars in each of the AI reserves to fund the increase.

In addition to incremental employer contributions (AED), both the adoption of the SAED, with resources stemming from foregone compensation increases, and changes to the AI provisions to allow for indexed increases when annual average CPI-W fell below 3.0 percent, were enacted. Considering these three major reforms, the beginning of shared sacrifice of the membership toward the solvency of its retirement plan was evident. The adoption of reforms included in SB 1 simply extended and expanded the practice of shared sacrifice.

Although a number of reforms had just been put into place, with the Great Recession of 2008 following so closely after the 2000-2002 market decline, it was clear to the General Assembly and the PERA Board, there would need to be another round of reforms, more significant than the prior.

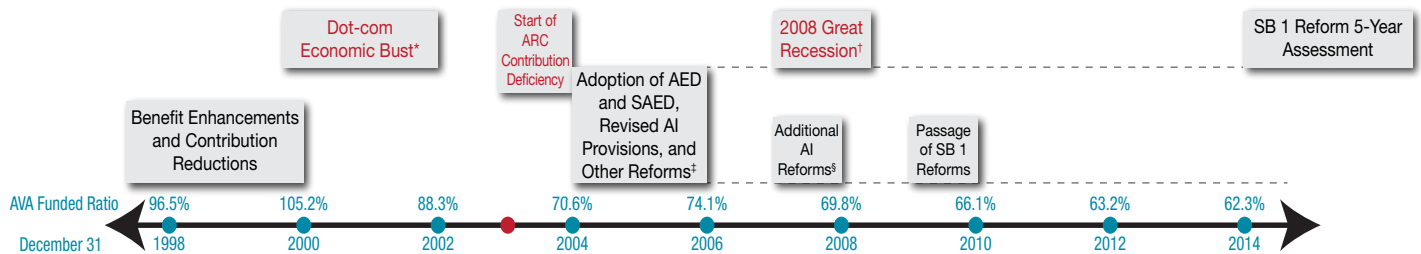
The diagram below shows a timeline of the prior reforms implemented and funded ratios based on the actuarial value of assets leading up to 2010 and the adoption of SB 1.

<sup>2</sup> Individuals with a membership date prior to July 1, 2005, are referred to as PERA Tier 1 members. Individuals with a membership date on or after July 1, 2005, but prior to January 1, 2007, are referred to as PERA Tier 1A members.

<sup>3</sup> Individuals with a membership date on or after January 1, 2007, are referred to as PERA Tier 2 members.

### EXHIBIT 3

#### Events Leading to SB 1



\* During this time, PERA experienced three consecutive years of less than expected investment returns of 0.2 percent, -7.7 percent, and -11.8 percent for 2000 through 2002, respectively.

<sup>†</sup> PERA's investment rate of return for 2008 was -26.0 percent.

<sup>‡</sup> Other reforms include: a reduction in the amount of interest earned on member accounts, an additional increase to the School Division's base contribution rate, increases to age and service requirements for service retirement, and implementation of required employer contributions on the payroll of retired members who return to work.

<sup>§</sup> Additional reforms to the AI became effective as of January 1, 2007, implementing an AI reserve to fund the lesser of the AI cap (currently 2.0 percent) and CPI-W, not to exceed 10.0 percent of the AI reserve.

**Overview of SB 1 Reforms Designed to Restore Sustainability for Colorado PERA**

SB 1, the legislative package in response to the 2008 financial crisis, put Colorado PERA back on track to being fully funded.

Retirees, active and inactive members, and employers were all impacted in the comprehensive program of shared sacrifice. PERA’s unfunded liabilities were immediately reduced by approximately \$9 billion, and the costs to provide future pension benefits were substantially reduced.

**Key Reforms Adopted in SB 1**

**Annual Increase (AI)**

Reduce the AI to an amount equal to 2.0 percent, unless PERA experiences a negative investment year. If a negative investment year, then the next three years’ AI will equal the lesser of the CPI-W or 2.0 percent.

Allows the AI cap to be adjusted based on PERA’s overall year-end funded status, with increases when PERA’s funded status is over 103 percent and decreases when PERA’s funded status subsequently falls below 90 percent.

**Highest Average Salary (HAS)**

Retained a 3-year HAS with a base year, but implemented an 8.0 percent spike cap applicable to new hires and all members not eligible to retire on January 1, 2011.

**Service Retirement Eligibility**

SB 1 implemented the following changes for age and service requirements for retirement eligibility

- A modified Rule of 85 (total years of age plus service credit required for full service retirement), with a minimum age of 55, for all existing members with less than five years of service credit as of January 1, 2011.
- A modified Rule of 88, with a minimum age of 58, for all new hires between January 1, 2011, and January 1, 2017.
- A modified Rule of 90, with a minimum age of 60, for all new hires on or after January 1, 2017 (with some exceptions).

**Contribution Rates**

SB 1 made many changes to enhance funding to the plan through additional gradual employer and employee contribution increases known as AED and the SAED. The AED/SAED contribution structure for the four PERA divisions was in place prior to the 2008 market decline.<sup>4</sup> The AED and SAED contribution rates were scheduled to reach their 3.0 percent maximums as of 2012 and 2013, respectively.

The SB 1 reforms expanded and gradually increased the

incremental contribution schedule to higher maximum values in later years.<sup>5</sup>

**State Division:**

- AED is increased by 0.4 percent per year in 2013 through 2017 (from a maximum rate of 3.0 percent to 5.0 percent).
- SAED is increased by 0.5 percent per year in 2014 through 2017 (from a maximum rate of 3.0 percent to 5.0 percent).

**School and DPS Divisions:**

- AED is increased by 0.4 percent per year in 2013 through 2015, and by 0.3 percent in 2016 (from a maximum rate of 3.0 percent to 4.5 percent).
- SAED is increased by 0.5 percent in 2014 through 2018 (from a maximum rate of 3.0 percent to 5.5 percent).

When fully phased-in by 2018, the AED/SAED increments for the State and School Divisions will continue to grow in significance over time as the UAAL is paid off.

The General Assembly chose to phase-in these increases over time in order to minimize the strain on employers’ budgets during the recovery from the Great Recession.

**SB 1 Reforms Ensure PERA Sustainable for Foreseeable Future**

One of the most important objectives of the legislation requiring this five-year progress report is to gauge the “...progress made toward eliminating the unfunded liabilities of each division of the association.” To accomplish this objective, this report assesses the impact of the SB 1 reforms on the projected sustainability, the key valuation metrics, and the members of the plan.

PERA monitors the amount and degree of changes affecting the sustainability of the plan in a number of ways. Annually PERA receives actuarial valuation results generated by PERA’s actuaries. This report contains information pertaining to each of PERA’s five divisions, including funded ratios, amortization periods (funding periods), and plan assets and liabilities. In addition to this analysis, the actuaries and other industry experts assist with periodic economic actuarial assumption reviews to ensure PERA applies an appropriate assumed long-term rate of return (LTROR) and discount rate,<sup>6</sup> considering risk tolerance and economic outlook.

<sup>4</sup>The AED/SAED contribution impact analysis was not performed for the DPS Division due to the timing of the merger of the Denver Public Schools Retirement System (DPSRS) into Colorado PERA, effective January 1, 2010, and the reflection of AED/SAED reforms in the December 31, 2009, actuarial valuation. The AED/SAED contribution schedules in place prior to SB 1 were not modeled for the DPS Division.

<sup>5</sup>Please see Section III for further details regarding the changes made to the AED/SAED schedule as well as the other SB 1 reforms referred to in this section.

<sup>6</sup>Unless otherwise noted, it should be understood that all references to an assumed or expected long-term rate of return also implies the same assumption is used for purposes of discounting the pension liabilities.

## II. EXECUTIVE SUMMARY

### Projections Under Various Scenarios

To fully gauge the effect of the plan design changes enacted in SB 1, PERA annually requests projections over a 40-50 year period, of the membership demographics, the funded ratio, and the funding period for each division. Unlike the actuarial valuation, which is a one-day “snapshot” view of the plan’s actuarial measurements taken on December 31, the projections incorporate an additional assumption regarding active population growth which allows for projection of the actuarial metrics into the future.

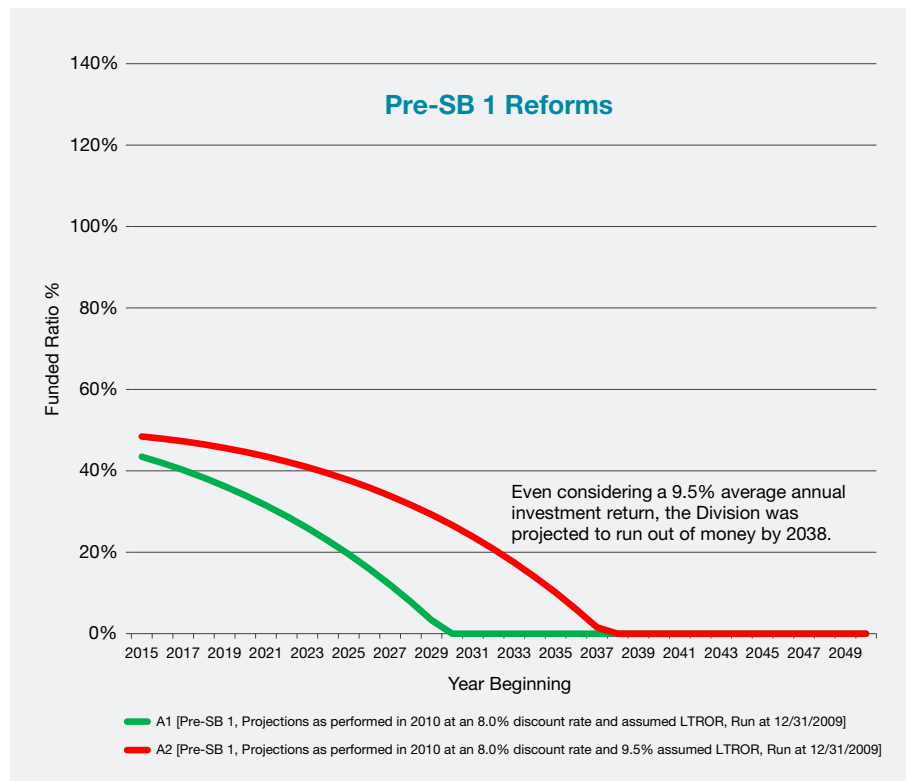
It is important to keep in mind these types of projections encompass a significant number of economic and actuarial assumptions and are projected over a long time-horizon in order to provide information on trends in actuarial

measurements. The assumptions are long-term in nature and thus, the projections are simply an indication of what may occur and do not provide absolute results.

***The Original Outlook – Unsustainable Without Change***  
The first set of funded ratio projection graphs provides PERA’s outlook following 2008.<sup>7</sup> The State Division funded ratio projection graph below **illustrates that PERA’s sustainability issues could not be addressed simply by relying on investment performance.** This was evident, particularly for the two largest divisions, the State and the School Divisions, which make up approximately 86 percent of PERA’s total population and represent approximately 84 percent of PERA’s pension asset base.

<sup>7</sup>The DPSRS was merged into Colorado PERA as of January 1, 2010, so graphs described under this first scenario were not produced for the DPS Division since PERA’s actuaries had not originally performed the analysis. However, prior to merger, DPSRS had performed projections following the 2008 market decline, confirming that DPSRS also was on an unsustainable path.

Colorado PERA–State Division  
35-Year Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines A



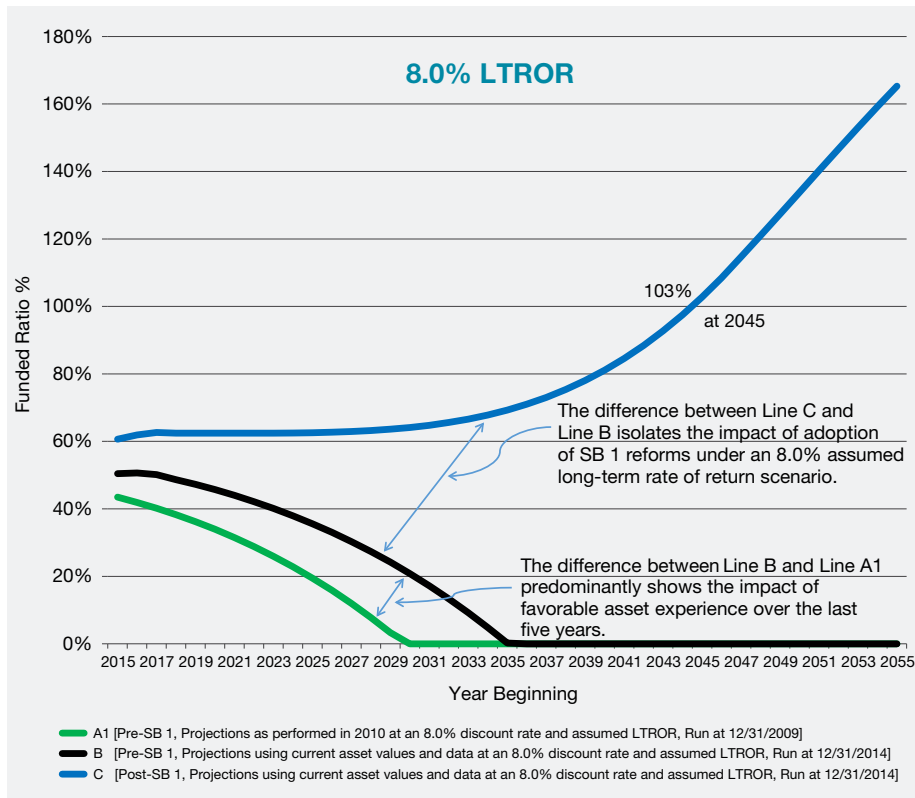
**Impact of Plan Experience and SB 1 Reforms**

The second set of funded ratio projection graphs shows the impact of member experience and the favorable asset returns experienced over the last five years (2010 through 2014, inclusive), during which time PERA’s assets produced a 9.9 percent annualized rate of return.

Had the SB 1 reforms not been adopted, the favorable asset performance would have “bought” an additional six years of solvency for the State Division and four years for the School Division.

The State Division funded ratio projection graph below illustrates the significant economic impact of the SB 1 reforms reversing PERA’s projected path from insolvency by 2030 to full funding by 2045.

**Colorado PERA–State Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines A1, B, and C**



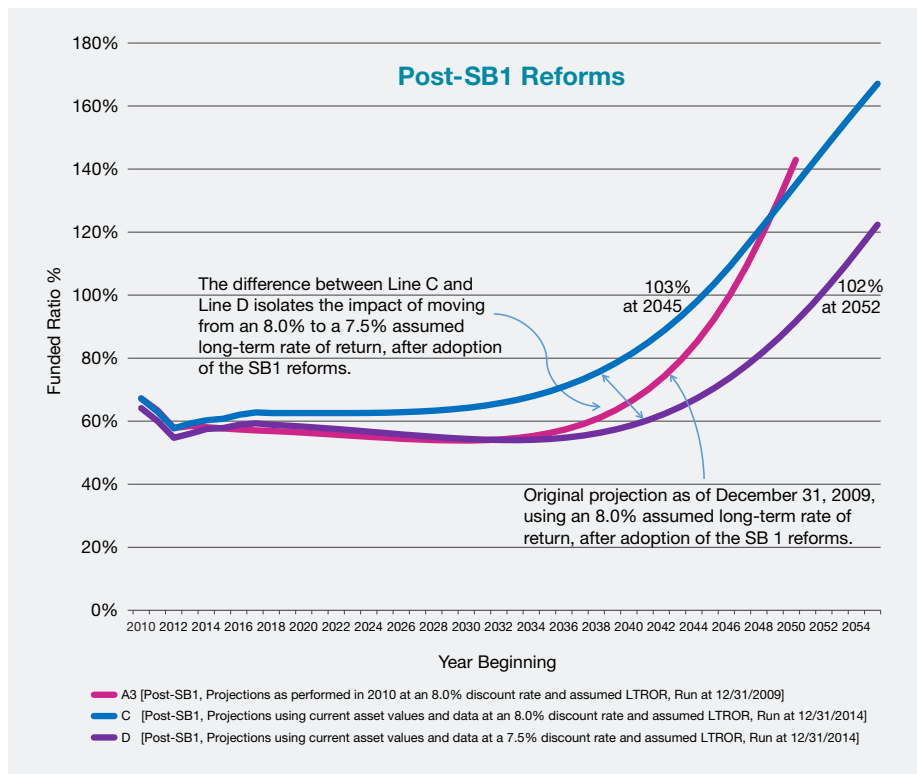
## II. EXECUTIVE SUMMARY

### *Impact of Adopting a 7.5 Percent Assumed Long-Term Rate of Return*

Regarding the change in the assumed LTROR, the third set of funded ratio projection graphs illustrates an important element of the progress made in reducing the unfunded liability since the adoption of the SB 1 reforms.

By adopting a more conservative assumed LTROR, the Board recognized lowered economic expectations and sensitivity to risk. **Due to moving from an 8.0 percent to a 7.5 percent LTROR, the time frame for bringing the plan to the desired 100 percent or better funded ratio was extended, as illustrated by the State Division funded ratio projection graph shown below.**

**Colorado PERA—State Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines A3, C, and D**



### *Initial SB 1 Projections—Updated*

Although active member growth was less than expected, the favorable asset performance over the last five-year period helped counteract the impact of the actual membership growth. If continuing under an 8.0 percent LTROR assumption in effect at the time of SB 1’s enactment, PERA generally would be “on course” regarding the original path established in 2010,

as indicated by comparing the blue and magenta lines, in the State Division funded ratio projection graph shown above.

**These projections indicate that the SB 1 package of reforms will continue to be sufficient to allow PERA to reach full funding over time while continuing to pay all the benefits earned by PERA’s members.**



**Estimated Impact of Major SB 1 Reforms**

Over the past five years, SB 1 reforms saved PERA approximately \$15 billion in unfunded actuarial accrued liability (UAAL) of which over \$13 billion is attributable to the State and School Divisions as shown in Exhibit 4 below.

**The reforms to the AI provisions had the most significant impact in ensuring the sustainability of PERA.**

**The impact of the AED/SAED reforms for each of the State and School Divisions is relatively small,** since the impact of the AED increments due to SB 1 only reflect two years of application and the impact of the SAED increments reflect one year of application.

The impacts of these two items and the other major SB 1 reforms are detailed by division in Exhibit 12 on page 39. Of the \$15 billion impact in UAAL, a total of approximately \$1.3 billion has been recognized in the trust funds as of December 31, 2014. The impacts of the reforms to both the UAAL and market value of assets will continue to grow in magnitude as of each scheduled five-year assessment required in legislation.

**EXHIBIT 4**

**Summary of Estimated Impact of Major SB 1 Reforms  
(Benefit Provisions and Contribution Schedules)**

Summary of Estimated Impact of Major SB 1 Reforms* on Actuarial Metrics <sup>†</sup> Regarding UAAL (in Millions of Dollars), Funded Ratio, and Actuarially Determined Contribution (ADC, as a Percent of Pay)		
Actuarial Metric	Valuation as of December 31, 2014	Results if the Reforms Had Not Been Adopted
		Total
<b>State Division</b>		
UAAL	\$9,885	\$15,194
Additional UAAL		\$5,309
Funded Ratio	57.8%	46.0%
ADC less AED/SAED	12.41%	28.13%
Incr/(Decr) in Net ADC		15.72%
<b>School Division</b>		
UAAL	\$14,243	\$22,245
Additional UAAL		\$8,002
Funded Ratio	60.9%	49.2%
ADC less AED/SAED	12.49%	27.89%
Incr/(Decr) in Net ADC		15.40%

\* The results shown were provided by Cavanaugh Macdonald Consulting, LLC, and reflect actual plan experience related to each SB 1 reform over the last four years except for the AI/COLA reform which reflects five years of experience.

† The UAAL is the difference between the actuarial accrued liability and the actuarial value of assets and the funded ratio is the actuarial value of assets as a percentage of the actuarial accrued liability. An ADC is an actuarially determined contribution, or the recommended employer contribution developed in the annual actuarial valuation determined to be sufficient to pay the normal cost of the plan and an amortization payment (determined over a closed period) on the UAAL, shown as a percentage of pay. The “ADC less AED/SAED” is the ADC rate calculated for the division less the expected AED and SAED rate for that division. Therefore, reference to “Incr/Decr in Net ADC” means the additional (or reduced) amount, also shown as a percentage of pay, necessary if the reform had not been adopted.

The impact of each major reform in actual dollars is detailed in Exhibit 13 on page 40.

**Impact to Members and Member Behavior**

As SB 1 provides PERA long-term stability and sustainability, this solution requires a shared sacrifice from retirees, public employees, and public employers. Below are some examples of the impacts to members and on member behavior:

*Impact to Members*

- An individual, retired January 1, 2008, who is receiving a \$3,000 monthly benefit as of January 1, 2010, over the next 25 years will receive
  - At least \$249,000 fewer dollars in annual increases.
  - A total reduction in retirement income equating to approximately seven fewer years of base retirement payments from what she would have received without consideration of SB 1 reforms.
- An individual who began PERA membership after January 1, 2007, who retires under an early reduced retirement eligibility at age 55 with 20 years of service credit, and a monthly HAS of \$4,167, with a monthly benefit of \$1,458 will receive:
  - Approximately \$313 per month less in retirement income (or an 18 percent reduction) as of the date of retirement.
  - Over a 25-year period, \$93,900 less in base retirement benefits and at least \$173,500 less in annual increases due to the combination of lower benefits and lower assumed rate of annual increases.
  - Over a 25-year period, a total reduction in retirement income equating to approximately 13 fewer years of base retirement payments, from what he would have received without consideration of SB 1 reforms.
- Reduced AI for the all PERA members who currently receive, or one day will receive a PERA benefit.

## II. EXECUTIVE SUMMARY

### Impact on Member Behavior

Comparing member behavior and experience in the five years leading up to the enactment of SB 1 and the five years following enactment, the following was noted:

- Member contribution account refunds for terminated members with a membership date on or after January 1, 2011, and with less than five years of service are 33 percent lower than refunds leading up to the effective date of SB 1.
- Monthly retirement benefits for terminated vested members with 25 or more years of service credit received an average \$244 fewer dollars per month at benefit commencement.
- There were 12.9 percent fewer early reduced retirements and they experienced between a 24 percent and 52 percent increase in the reductions applied to their benefits.
- Regarding members who had retired and returned to work, there were:
  - 14.2 percent fewer retirees returning to work in a non-suspended status, but their contributions at the member rate delivered an approximate \$49.8 million to the total PERA trust fund.

- 88.3 percent fewer retirees returning to work in a suspended status and at subsequent retirement, received an average \$615 less in monthly benefits under the “second segment” benefit structure.

### PERA Retirees Keeping Pace with Inflation

**For the majority of PERA retirees and benefit recipients their annual increases tracked closely to inflation and buying power was retained over the five-year period since the adoption of the SB 1 annual increase reforms.**

The AI provisions, in place prior to the enactment of SB 1, would have provided increases that were equal to or above the rate of inflation reflecting the five-year study period. After the SB 1 reforms, the actual PERA-provided annual increases more closely align with the rate of inflation for the majority of the retirees.

#### EXHIBIT 5

Summary of AI Provision Increases Compared to National Inflation

	Increase for 2010		Increase for 2011		Increase for 2012		Increase for 2013		Increase for 2014	
	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W
Applicable Annual Increase	0.0%	-0.7%	2.0%	2.1%	2.0%	3.6%	2.0%	2.1%	2.0%	1.4%
Cumulative Increase	0.0%	-0.7%	2.0%	1.4%	4.0%	5.0%	6.1%	7.2%	8.2%	8.7%
Average Increase	0.0%	-0.7%	1.0%	0.7%	1.3%	1.7%	1.5%	1.8%	1.6%	1.7%

All legal issues concerning any modifications to the annual increase in SB 1 were resolved with the Colorado Supreme Court’s Ruling in *Justus, et al. v. State of Colorado et al.* On October 20, 2014, the Colorado Supreme Court issued its decision, finding the changes constitutional to the annual increase provisions in SB 1. Please see Section VII of this report for more detail regarding a summary of the courts’ rulings.

### Senate Bill 14-214 Studies Highlight Efficient, Low Cost Plan Design and Deliver Useful Analytic Tools

In 2014, the Colorado General Assembly commissioned three independent studies to further the General Assembly’s understanding of how well the Colorado PERA Hybrid Defined Benefit Plan is working for the State of Colorado.

### Total Compensation Study with Retirement Benefits

The Colorado Department of Personnel and Administration prepared a compensation study inclusive of retirement benefits for the workforce of the State of Colorado. This analysis compared the value of the retirement benefits provided to PERA-covered state employees to the value of retirement benefits offered to employees in similar workforce structures, including private companies and other states.

The report, produced by Milliman, Inc., concluded the State’s **total compensation package is on par with the market median considering retirement benefits.**

**Plan Design Study**

The Office of the State Auditor oversaw and commissioned an independent actuarial firm, Gabriel Roeder Smith & Company (GRS), to conduct a comprehensive study comparing the cost and effectiveness of the design of the current Colorado PERA Hybrid Defined Benefit Plan to alternative plan designs currently in use in the public and private sector.

The results of this independent study show the reforms to **the benefit provisions of PERA, modified by SB 1, created a plan design that “is more efficient and uses dollars more effectively than the other types of plans in use today.”**<sup>8</sup>

**Sensitivity Analysis of PERA’s Actuarial Assumptions**

The Office of the State Auditor oversaw and commissioned a separate independent actuarial firm, Pension Trustee Advisors (PTA), to perform a sensitivity analysis and to develop an early warning mechanism to determine whether model actuarial assumptions used by PERA are meeting targets and achieving sustainability.

PTA developed a new signal light methodology in evaluating PERA, awarding “green lights” (meaning sustainable and on a path to full funding in a reasonable amount of time) to four of PERA’s five division trust funds and a “yellow light” to the 700-member Judicial Division.

This independent study shows PERA is sustainable into the future under reforms enacted in 2010, stating, **“the PERA Hybrid Defined Benefit Plan is currently on track to be fully funded...Prior to the changes in Senate Bill 10-001, the PERA Plan was projected to become insolvent.”**

In addition, during their analysis, PTA was able to replicate the funded ratio projections performed by Cavanaugh Macdonald Consulting, LLC, (CMC) PERA’s actuaries, and confirm the reasonableness of PERA’s actuarial assumptions.

**Economic Impact Studies Show PERA is One of Colorado’s Best Investments**

With the passage of SB 1 in 2010, the General Assembly showed support for PERA’s Hybrid Defined Benefit Plan by implementing a reduced defined benefit structure and a systematic approach to paying for promised retirement obligations, the combination of which reduced the funding shortfall predominantly resulting from the 2008 economic crisis.

**Current Perspective: Statewide Economic Impact**

A recent economic impact study by Pacey Economics, Inc., shows that the economic impact of PERA benefit distributions is one of Colorado’s best investments.

- In 2014, PERA distributed over \$3.5 billion in benefits to Colorado residents representing 3.5 percent of state payroll (U.S. Census Bureau) or 1.15 percent of state Gross Domestic Product (GDP).
  - Creating \$5.2 billion in economic output.
  - Sustaining an additional 29,357 jobs or 1.2 percent of total non-farm payroll employment.
  - Producing \$2.52 billion in value-added to state GDP beyond the \$3.5 billion in benefit distributions.
  - Generating \$267 million in state and local tax revenue which equals 22 percent of employer pension contributions.

<sup>8</sup>The GRS Plan Design Study report, June 2015, page 2.

## II. EXECUTIVE SUMMARY

### Historical Perspective: PERA Hybrid DB Plan vs. Ideal and Self-Directed DC Plans

In 1984, PERA had a balance (assets for active members and retirees) of approximately \$3.9 billion with 99,000 active members and 27,700 benefit recipients.

Thirty years later the fund has grown to \$44.2 billion for approximately 202,700 members, 218,800 inactive members, and 107,600 benefit recipients, representing over 10 percent of the adult population of Colorado.

With the same historical contributions by PERA members and employers and the same withdrawals (as a percent of available funds) over this 30 year period, the assets available to active members and retirees:

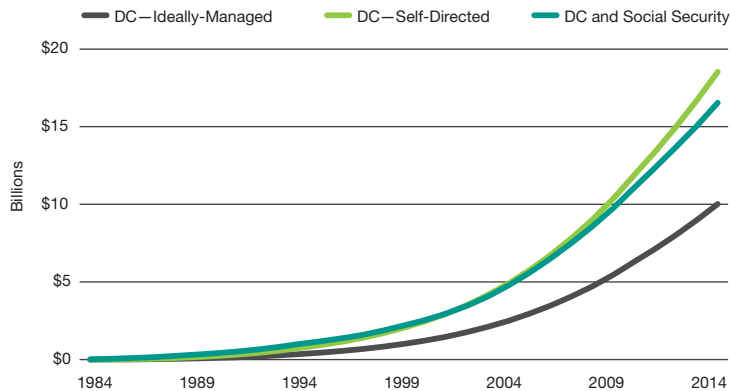
- Even an “ideally managed” (same low fees as a DB plan) DC plan, would result in an approximate fund balance of \$32.4 billion. Under the same scenario, but assuming a self-directed DC plan had been adopted, the fund balance would be approximately \$23.3 billion.

- The reductions in the standard of living for retirees and the flexibility of employers’ workforce structures would have been dramatic. Compared to the PERA Hybrid DB Plan current average of \$36,100 per year:
  - Under ideal DC management, benefits would be significantly lower with an average annual benefit of \$26,500.
  - Under typical DC self-directed management, the results show an even greater difference with an expected average annual benefit of only \$19,100 per year.
  - Adding Social Security to an ideally managed DC plan only marginally improves the average annual benefit to \$24,700 per year.

Adopting these alternative retirement plans would not only be adverse for public employees and their standard of living, but after 30 years the State of Colorado would be measurably worse off with less total wealth and less annual income as is shown in Exhibit 6 below.

### EXHIBIT 6

Cumulative Loss to State GDP if Colorado had been in a DC Plan by Year



Ultimately, because of the 80-year long-term investment in PERA by the State, PERA provides significantly more in economic output annually to Colorado than the total contribution cost to employees, employers, and taxpayers. In addition, the contribution changes and benefit reforms contained in SB 1 keep the total cost of the benefits as a percentage of the economy and employer budgets, stable.

---

**SECTION III**  
**Colorado PERA and General Assembly Address**  
**Post-2008 Sustainability Concerns**

---



#### Colorado PERA Sustainability After 2008

The dramatic investment market decline in 2008 significantly impacted the financial condition of Colorado PERA, as it did most public, private, and individual retirement plans. The investment return for PERA trust fund assets in 2008 was a negative 26 percent. Although a stronger performance than either PERA's Total Fund Policy Benchmark, (-27.7 percent), or the BNY Mellon Performance and Risk Analytics' Median Public Fund Universe, (-26.8 percent), the loss of over a quarter of PERA's plan assets threatened the sustainability of the plan. The market value of assets in PERA's defined benefit pension plans fell from \$41.1 billion at the end of 2007, to \$29.3 billion at the end of 2008. The market value funded ratio fell from 78.4 percent in 2007, to 52.7 percent at the end of 2008.<sup>9</sup>

In 2007, PERA was projected to maintain and slowly improve its funding position from 78.4 percent, and gradually reach 100 percent funding in about 60 years. A number of prior statutory reforms to reduce benefit provisions and incrementally increase contributions left PERA in a financially sound and sustainable position. The expectation was PERA would be able to continue to pay all benefits promised to all benefit recipients as well as current and future active members, indefinitely, just as it had since PERA began in 1931.

But the Great Recession and 2008 financial market collapse sharply affected capital markets, and it was clear to PERA that recent changes to PERA were not enough to ensure long-term sustainability. Following the 2008 economic decline, PERA's annual actuarial projections confirmed this and showed three out of the four division trust funds were not on a sustainable path. If the projected growth in promised benefits was not reduced, and/or contribution rates were not increased, the State Division and School Division trust funds were projected to run out of money by 2029 and 2033, respectively. Significant changes were needed to make PERA's trust funds sustainable for the long-term.

#### General Assembly and PERA Board Plan of Action

The Colorado General Assembly is responsible for setting the benefit provisions and contribution levels for PERA. Based on results of annual investigations following 2008, the Board told the legislature that PERA would become unsustainable without statutory changes to benefits and contribution rates. The General Assembly responded enacting C.R.S. § 24-51-211(2). This legislation directed PERA to submit specific, comprehensive recommendations to ensure PERA would become and remain fully funded. The statute called for the recommendations to be submitted to the General Assembly by November 1, 2009.

In response to the legislation, PERA methodically and comprehensively analyzed every aspect of the plan using external actuarial and investment consulting firms. These third-party expert studies included an actuarial experience study, an actuarial audit, and an asset/liability study. These studies typically are performed by PERA on a periodic basis, but in response to the economic crisis, PERA accelerated and aligned all the studies to be performed during 2009 to confirm the current financial and actuarial conditions.

The experience analysis evaluated the current actuarial assumptions and gave PERA the opportunity to adjust long-term assumptions, as necessary, reflecting the most recent plan experience and the anticipated economic environment. The actuarial audit was performed by a separate actuarial firm to ensure the reasonableness and accuracy of PERA's current actuarial firm's computations. The asset/liability modeling study allowed PERA to review, confirm, and/or adjust the current investment asset allocation being applied to the trusts. In addition, PERA requested an actuarial and legal analysis of the impact of possible benefit and contribution changes to consider for legislation in 2010.

The studies clearly showed that a recovery in the investment markets would not be enough to solve the funding problem, even if returns were 9.5 percent per year in the future. Increases in contributions alone would not lead to sustainability, as that scenario would require an increase of over 20 percent of payroll. Therefore, it was clear a comprehensive package of benefit and contribution changes was needed which would necessarily impact all PERA members, retirees, and employers.

The Board set the following guiding principles and objectives for developing a comprehensive package to ensure long-term sustainability:

- Shared responsibility among members, retirees, and employers.
- Intergenerational equity.
- Preservation of the defined benefit plan.
- Preservation of portability for members who move between different divisions of PERA, by maintaining common benefit structures.
- Development of recommendations that would have little-to-no short-term impact on member behavior.

<sup>9</sup>The market value of assets is the fair market value of each individual division trust fund as of the annual actuarial valuation date. The actuarial value of assets, also as of the actuarial valuation date, is the four-year smoothed value of assets in each division trust fund. Although assets attributable to one division trust fund cannot be used to pay benefits of another division, often the asset values are aggregated for general communication purposes.

### III. COLORADO PERA AND GENERAL ASSEMBLY ADDRESS POST-2008 SUSTAINABILITY CONCERNS

---

Outreach to all stakeholders and transparency were key elements of PERA's plan. The process for gathering input and developing proposed reforms would need to be communicated to members, employee groups, employers, legislators, and taxpayers. PERA held eight "listening tour" meetings throughout Colorado in August 2009. The meetings were open to everyone; the public and media as well as PERA members and retirees. These meetings allowed the Board hear from all stakeholders and gain input on possible changes. Members, retirees, and the public were encouraged to supply their views through active discussion, PERA's website, and direct surveys.

In September and October 2009, the Board reviewed the feedback from the membership and received input from PERA's actuaries and other experts. PERA ultimately reduced the long-term assumed investment return from 8.5 percent to 8.0 percent per year, received input from investment advisors regarding the Asset/Liability Modeling Study, and discussed possible benefit and contribution reforms. PERA then finalized and submitted recommendations for benefit and contribution reforms to the General Assembly.<sup>10</sup>

Pursuant to their fiduciary duty to act in the best interest of PERA members and retirees, the defined benefit plan was preserved, as well as the significant portability members have by maintaining similar benefit structures for the different divisions. The Board developed a plan based on shared sacrifice where all parties were impacted by the reforms. The benefit changes were designed so members would not alter their behavior, for example, by retiring before the effective date of the new law in order to get a higher benefit. Most of the recommended changes were supported by over 4,000 members and retirees who responded to the "listening tour" survey.

#### SB 1 Objectives

The goal for SB 1 was to ensure PERA did not run out of money in the near-term and to be back on the path to sustainability, in the long-term. The recommended benefit and contribution changes would provide an adequate and sustainable benefit for all PERA members. The bill included the necessary provisions to ensure PERA provides retirement security for existing retirees, as well as for current and future public employees.

**SB 1 was not intended to bring PERA trust funds to 100 percent funded immediately, but rather to put in place a systematic plan of paying down unfunded liabilities at a reasonable cost to members, employers, and taxpayers, while supporting principles of fairness and intergenerational equity.**

In developing the comprehensive reform package, the Board attempted to meet the 100 percent funding objective, as stated in the funding policy in place at the time (adopted November 2007), and to do so within a 30-year time frame as defined within C.R.S. § 24-51-211(1). The comprehensive package of benefit reductions and contribution increases in SB 1 was designed to include the measures projected to be necessary to reduce the amortization period from infinite to approximately 30 years, in each division and not beyond that objective.

Retirees and current and future members bore approximately 90 percent of the burden through changes in the structure to annual increases, benefit provision reforms, and foregone compensation increases.

PERA's initial recommended package was revised in a few areas by the General Assembly.<sup>11</sup> Senators Brandon Shaffer (President), Joshua Penry (Minority Leader), and Representative Andrew Kerr, in a truly bipartisan effort, introduced the legislation on January 13, 2010. SB 1 eventually was signed into law by Governor Bill Ritter on February 23, 2010. See Section IV for a comprehensive discussion of all the major changes implemented through SB 1.

As discussed in greater detail in Section V of this report, PERA annually gauges progress of the plan, considering all SB 1 reforms through information provided by PERA's actuaries. The gain/loss analysis provided in the annual actuarial valuation report compares actuarial assumptions against actual plan experience and member behavior. In addition, the annual projections give PERA and the General Assembly an update each year on the projected number of years (or the funding period) until full funding will be achieved in each division.

A copy of the complete text of the SB 1 Act is available in Appendix A.

---

<sup>10</sup> A complicating factor was the pending merger of the Denver Public Schools Retirement System (DPSRS) into Colorado PERA (pursuant to SB 09-282), scheduled to take place as of January 1, 2010, two months after the due date of the Board's recommended proposal to the General Assembly. To the extent possible, all reforms applied for the members of the School Division also would be applied for the existing and new members of the future Denver Public Schools (DPS) Division Trust Fund, as DPSRS had performed projections following the 2008 market decline, confirming that DPSRS also was on an unsustainable path.

<sup>11</sup> See Appendix B for a complete list of "Original Board Recommendations" and "Resulting SB 1 Reforms" and a copy of the January 15, 2010, letter from the three Governor-appointed PERA Board members to Senate President Brandon C. Shaffer.



---

**SECTION IV**  
**Overview of Senate Bill 10-001 Reforms Designed to**  
**Restore Sustainability for Colorado PERA**

---



## IV. OVERVIEW OF SENATE BILL 10-001 REFORMS DESIGNED TO RESTORE SUSTAINABILITY FOR COLORADO PERA

As outlined in Section III, the 2008 financial crisis resulted in a 26 percent reduction in PERA’s investment portfolio, which threatened the long-term sustainability of the plan. Colorado PERA’s projections showed the plan would run out of money if no changes were implemented.

The SB 1 legislation was among the first public pension reform packages enacted in the nation in response to the financial crisis of 2008, and was a model used by other systems.

SB 1 made many changes to lower the cost of the benefits and to enhance funding to the system through additional gradual employer and employee contribution increases known as the Amortization Equalization Disbursement (AED) and the Supplemental Amortization Equalization Disbursement (SAED). These contribution structures were initially adopted in 2004 and 2006, respectively. The AED is an additional amount contributed by PERA employers based on each employer’s total payroll. The SAED is also an amount contributed by employers, but, to the extent permitted by law, is funded by moneys otherwise available for employee compensation increases.

Retirees, active and inactive members, and employers were all impacted in the comprehensive program of shared sacrifice. PERA’s unfunded liabilities were immediately reduced by approximately \$9 billion, and the costs to provide future pension benefits were substantially reduced.

After SB 1 was passed, PERA was projected to be fully funded in approximately 30 to 36 years, assuming an annual 8.0 percent expected long-term rate of return and discount rate. In 2013, the Board adopted a more conservative expected long-term rate of return and discount rate of 7.5 percent, per year. As a result, the projected funding period of each division

was extended. Current projections indicate a funding period between 37 to 38 years for PERA’s two largest trust funds—the State Division and the School Division.

Listed below are the SB 1 reforms with the most significant impact toward the General Assembly’s goal of achieving and ensuring the long-term sustainability of PERA.

### Changes to Benefit Provisions in SB 1 Annual Increase (AI) or Cost-of-Living Adjustment (COLA)

Exhibit 7, below, compares the AI provisions prior to the adoption of SB 1 reforms with the AI provisions after adoption of SB 1 reforms.

#### How the AI Works

The AI cap of 2.0 percent, applicable to all groups, will adjust based on PERA’s overall funded ratio. There will be increases when the funded status reaches 103 percent and decreases when the funded status subsequently falls below 90 percent. The AI cap cannot fall below 2.0 percent.

In addition, pursuant to SB 1, no AI was paid to retirees in 2010, reflecting negative CPI for 2009. Furthermore, SB 1 delayed the AI payment for some based upon length of time retired and eligibility for a service benefit at time of retirement.

For members in the PERA benefit structure who began membership before January 1, 2007, and members in the DPS benefit structure, the AI is funded through the general trust assets and contribution structure. In 2006 an AI reserve was established for each division trust fund to provide annual increases, to the extent that not more than 10 percent of the fund can be expended for any single year AI, for members in the PERA benefit structure who began membership on or after January 1, 2007. From the employer statutory contributions

#### EXHIBIT 7

Description of Membership Group Affected	Annual Increase (AI) Prior to SB 1	Annual Increase Pursuant to SB 1
<b>PERA Tier 1 and DPS Tier 1</b>		
For members who began membership on or before June 30, 2005	The AI was 3.50 percent for the PERA benefit structure and 3.25 percent for the DPS benefit structure.	The AI was reduced to a fixed AI cap of 2.0 percent per year, unless PERA has a negative investment year. If PERA has a negative investment year, then for the next three years the AI becomes the lesser of 2.0 percent or the change in the CPI-W from the prior calendar year.
<b>PERA Tier 1A and DPS Tier 2</b>		
For members in the PERA benefit structure who began membership between July 1, 2005, and December 31, 2006, or members in the DPS benefit structure who began membership between July 1, 2005 and December 31, 2009	The AI was the lesser of 3.0 percent or the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W).	
<b>PERA Tier 2</b>		
For members in the PERA benefit structure who began membership on or after January 1, 2007	The AI was the lesser of 3.0 percent or the CPI-W and in no case could exceed 10 percent of the AI reserve.	The AI cap was lowered to the lesser of 2.0 percent or the CPI-W, and in no case can it exceed 10 percent of the AI reserve.

## IV. OVERVIEW OF SENATE BILL 10-001 REFORMS DESIGNED TO RESTORE SUSTAINABILITY FOR COLORADO PERA

an amount equal to one percent of pensionable payroll and a certain percentage of reinstatement of service purchase dollars are transferred into the AI reserve to fund the current and future increases related to these members. The AI funding provisions were not directly impacted by the SB 1 reforms.

### Early Retirement

Members are able to retire early with a reduced retirement benefit. Although the age and service requirements for early retirement eligibility were not altered or affected by SB 1, the reduction applied to early retirement benefits was changed. As a result of SB 1, a member who was not eligible to retire as of the effective date (January 1, 2011) has a greater reduction in his or her benefit if they choose to retire early. The reduction was changed to ensure the member's reduced service retirement benefit is equivalent in value to his/her full service benefit. The member will receive the same approximate amount of dollars over his/her retirement regardless of retirement date.

### Highest Average Salary

Highest Average Salary (HAS) is calculated based on the member's four periods of 12 consecutive months of service credit. The four 12-month periods do not have to be consecutive nor do they have to include the last four years of membership. The lowest of the four periods becomes a base year used as a starting point for an annual salary increase cap applied for the next three periods, which are then used to determine the applicable HAS. Prior to SB 1, the annual salary increase or "spike cap" was 15 percent for those with membership before January 1, 2007. SB 1 lowered the spike cap for all members not eligible to retire on January 1, 2011, to 8 percent. This means any salary increase paid by an employer exceeding 8 percent from one year to another during the HAS period is limited to 8 percent for purposes of calculating a member's HAS.

### Access to Employer Matching Contribution

Members who terminate PERA employment are able to either leave their accounts at PERA, or they can take their accounts as cash or a rollover to another qualified plan. Prior to SB 1, members who were not eligible for retirement received a 50 percent match on all member contributions and accrued interest when they withdrew their PERA accounts. SB 1 established a requirement for members to have five years of earned service credit in order to receive a 50 percent match on a refund. However, terminating members who leave their account at PERA until they are eligible for retirement receive a 100 percent match on all member contributions and accrued interest regardless of the years of service credit. SB 1 did not alter this provision.

### Service Retirement Eligibility

Through SB 1, the age and service requirements for service retirement eligibility were increased as follows:

- A modified Rule of 85 (total years of age plus service credit – required for full service retirement), with a minimum age of 55, for all existing members with less than five years of service credit as of January 1, 2011.
- A modified Rule of 88, with a minimum age of 58, for all new hires between January 1, 2011, and January 1, 2017.
- A modified Rule of 90, with a minimum age of 60, for all new hires on or after January 1, 2017 (with a limited exception of the Modified Rule of 88 applicable to members who retire from the School and DPS Divisions, with their last 10 years of service credit earned in those divisions).

### Working After Retirement

Prior to SB 1, a member who retired and then suspended his/her retirement to return to work would have his/her benefit recalculated upon re-retirement. Under SB 1, a retiree who suspends his/her benefit to return to work earns a separate benefit segment based on the additional service credit, rather than having the initial benefit recalculated considering the new HAS and the additional service credit.

### Indexing of Retirement Benefits

Prior to SB 1, the benefit amount at retirement was indexed for a member who terminated with 25 or more years of service, but who was not retirement eligible upon leaving PERA-covered employment. The member's benefit was indexed by the applicable annual increase for every year the individual was inactive prior to his or her actual retirement date. SB 1 reforms removed the indexing of retirement benefits for all inactive members with 25 or more years of service who were not eligible to retire as of January 1, 2011.

### Changes to Contribution Requirements in SB 1

#### AED and SAED Contributions

The AED is an additional amount contributed by PERA employers based on each employer's total payroll. The SAED is also an amount contributed by employers, but, to the extent permitted by law, is funded by moneys otherwise available for employee compensation increases.

Under SB 1, the scheduled AED and SAED contributions were extended and gradually increased to reach higher maximum rates than originally enacted through prior legislation for the State and School Divisions, as follows:

- **State Division:**
  - AED is increased by 0.4 percent per year in 2013 through 2017 (from a maximum rate of 3.0 percent to 5.0 percent).
  - SAED is increased by 0.5 percent per year in 2014 through 2017 (from a maximum rate of 3.0 percent to 5.0 percent).
- **School and DPS Divisions:**
  - AED is increased by 0.4 percent per year in 2013 through 2015, and by 0.3 percent in 2016 (from a maximum rate of 3.0 percent to 4.5 percent).
  - SAED is increased by 0.5 percent in 2014 through 2018 (from a maximum rate of 3.0 percent to 5.5 percent).

The School Division's AED and SAED structure also was adopted for the DPS Division.

For the Local Government and Judicial Divisions, SB 1 froze the AED and SAED at the 2010 rates. Since this SB 1 reform truncated the originally scheduled increases, it is the only SB 1 reform that saved the employers, and potentially the members, contribution dollars.

Through SB 1, PERA law now contains automatic adjustments of the AED and SAED contribution rates based on the funded status of the division. Decreases to the AED and SAED contribution rates occur when a particular division's funded status reaches 103 percent. Increases occur when the funded status of the State, School, or DPS Division reaches 103 percent, or reaches 90 percent for Local Government or Judicial Divisions, and subsequently falls below 90 percent.

#### Working Retiree Contribution

PERA retirees who return to work for a PERA employer are required to make contributions at the same rate as active members. These contributions are not credited to the member's account, do not accrue a benefit, and are not refundable to the retiree.



---

**SECTION V**  
**Senate Bill 10-001 Reforms Ensure Colorado PERA**  
**Sustainable for Foreseeable Future**

---





## V. SENATE BILL 10-001 REFORMS ENSURE COLORADO PERA SUSTAINABLE FOR FORESEEABLE FUTURE

One of the most important objectives of the legislation requiring this five-year progress report, is to gauge the “...progress made toward eliminating the unfunded liabilities of each division of the association.” To accomplish this objective, this report assesses the impact of the SB 1 reforms on the projected sustainability, the key valuation metrics, and the members of the plan.

Colorado PERA monitors the amount and degree of changes affecting the sustainability of the plan in a number of ways. Annually PERA receives actuarial valuation results generated by PERA’s actuaries, currently Cavanaugh Macdonald Consulting, LLC (CMC). This report contains information pertaining to each of PERA’s five divisions, including funded ratios, amortization periods (funding periods), and plan assets and liabilities. A key component of the actuarial valuation is a gain/loss analysis which gauges member activity and behavior versus PERA’s assumptions. In addition to this analysis, the actuaries and other industry experts assist with periodic economic actuarial assumption reviews, to ensure PERA applies an appropriate assumed long-term rate of return (LTROR) and discount rate<sup>12</sup>, considering risk tolerance and economic outlook. Every three to five years, PERA conducts an actuarial experience study in which all of the actuarial assumptions (economic and demographic) are compared to the actual market experience and membership behavior over the prior three- to five-year period. The analysis allows PERA to modify the assumptions to reflect actual experience.

To fully gauge the effect of the plan design changes enacted in SB 1, PERA annually requests projections over a 40-50 year period, of the membership demographics, the funded ratio, and the funding period for each division. Unlike the actuarial valuation, which is a one-day “snapshot” view of the plan’s actuarial measurements taken on December 31, the projections incorporate an additional assumption regarding active population growth which allows for projection of the actuarial metrics into the future.

It is important to keep in mind these types of projections encompass a significant number of economic and actuarial assumptions and are projected over a long time-horizon in order to provide information on trends in actuarial measurements. The assumptions are long-term in nature and thus, the projections are simply an indication of what may occur and do not provide absolute results.

Below are three different assessments of SB 1’s impact.

- 1 Funded ratio projections under various scenarios**  
These scenarios recognize SB 1 reforms, adoption of various actuarial assumptions, and asset performance and member experience over the last five years.
- 2 Estimated impact of the major SB 1 reforms on key actuarial valuation metrics**  
This assessment illustrates the estimated impact from the SB 1 reforms related to the unfunded actuarial accrued liability (UAAL), funded ratio, and the actuarially determined contribution (ADC) within each PERA division.<sup>13</sup>
- 3 Impact to members and member behavior**  
The third assessment reports the effect, by division, of a number of the SB 1 reforms by comparing activity in the five-year period leading up to the adoption of SB 1 reforms (2006 through 2010, inclusive) to the activity in the five-year period following the adoption of SB 1 reforms (2011 through 2015, inclusive).

The Annual Increase (AI) provision changes resulting from SB 1 are incorporated, as appropriate, in the first two assessments described above. In addition, Section VI is devoted entirely to the analysis of impact of the revised AI provisions on PERA’s membership.

### Projections Under Various Scenarios

At PERA’s request, CMC performed a number of funded ratio projections considering various scenarios regarding benefit provisions, contribution schedules, actuarial assumptions, and plan experience during the last five years.

All the projection graphs are line graphs<sup>14</sup>, where the data points are connected by a line that represents the trend results of the projection of the funded ratio of the division under a certain scenario throughout the period. A color is then assigned to each line to tie a particular color to a particular projection scenario for purposes of easy recognition.

A detailed summary of all the underlying provisions, contributions, and assumptions applied to each projection scenario is available for review in Appendix C.

Unlike the annual actuarial valuation performed each year, the projections reflect the turnover of individuals with earlier membership dates (PERA Tiers 1 and 1A and DPS Tiers 1 and 2) with those who have membership dates on or after January 1, 2007 (PERA Tier 2).

<sup>12</sup>Throughout the remainder of this report, unless otherwise noted, it should be understood that all references to an assumed or expected long-term rate of return also implies the same assumption is used for purposes of discounting the pension liabilities.

<sup>13</sup>The actuarially defined contribution, or ADC, is the PERA Board-defined actuarially based contribution benchmark adopted for purposes of the annual actuarial valuation and replaces the prior GASB-defined funding standard known as the annual required contribution, or ARC.

<sup>14</sup>The graphs display a timeline across the X-axis (the line across the bottom of the page) starting with the year 2010 or 2015 and ending with either 2050 or 2055, depending on the graph. The Y-axis (the vertical line down the left side of the graph), displays the range of possible projected funded ratios (typically ranging from 0 percent to 140 percent or higher on certain graphs). The funded ratio represents the projected actuarial value of assets, as of any point in time on the timeline, divided by the projected actuarial accrued liability, at the same point in time, displayed as a percentage.

## V. SENATE BILL 10-001 REFORMS ENSURE COLORADO PERA SUSTAINABLE FOR FORESEEABLE FUTURE

PERA Tier 2 members have a less valuable benefit structure and are accruing benefits at a lower annual cost to the plan than the members under earlier membership tiers. The annual cost of the benefits being accrued is commonly referred to as normal cost.

Exhibit 8 below shows a comparison of the current employer normal cost rate, as a percentage of covered payroll, to the ultimate employer normal cost rate as a percentage of pay that will be realized once all members with earlier benefits structures have been replaced with Tier 2 members.

### EXHIBIT 8

#### Estimated Ultimate Normal Cost Rates (as a Percent of Covered Payroll)\*

Division	Total Normal Cost Rate	Member Contribution	Employer Normal Cost Rate
<b>2016 Normal Cost Rate from December 31, 2014 Valuation</b>			
State	11.01%	8.05%	2.96%
School	12.33%	8.00%	4.33%
Local Government	10.60%	8.00%	2.60%
Judicial	17.93%	8.00%	9.93%
DPS	12.63%	8.00%	4.63%
<b>Estimated Ultimate Normal Cost Rate</b>			
State	9.77%	8.05%	1.72%
School	10.61%	8.00%	2.61%
Local Government	9.33%	8.00%	1.33%
Judicial	16.38%	8.00%	8.38%
DPS	11.11%	8.00%	3.11%

\* Provided by Cavanaugh Macdonald Consulting, LLC.

PERA's actuary prepared four sets of funded ratio projection graphs, each one illustrating a different aspect of the events or experience since the effective date of the SB 1 reforms.

The first set of funded ratio projection graphs shows the status of the PERA trust funds prior to the implementation of the SB 1 reforms reflecting an 8.0 percent discount rate and two different assumed long-term rates of return. These projections show that the trust funds were unsustainable even assuming a better than expected average investment return over the entire projection period.

The second set of funded ratio projection graphs shows the impact of all member experience and favorable asset experience over the last five years (annualized rate of return of 9.9 percent), prior to the adoption of SB 1 reforms and isolates the impact of the adoption of SB 1 reforms under an 8.0 percent assumed LTROR scenario.

The third set of funded ratio projection graphs isolates the impact of moving from an 8.0 percent to a 7.5 percent assumed LTROR, after adoption of the SB 1 reforms.

The fourth and final set of funded ratio projection graphs shows the current projections assuming both an 8.0 percent and a 7.5 percent assumed LTROR in comparison to the original projections performed as of December 31, 2009, considering the SB 1 reforms. This allows a comparison at this five-year mark between initial predictions and actual experience during the five-year period and also illustrates how the last five years of experience affect future predictions of achieving a 100 percent funded ratio.

## V. SENATE BILL 10-001 REFORMS ENSURE COLORADO PERA SUSTAINABLE FOR FORESEEABLE FUTURE

The same color for a particular projection line is used consistently throughout the graphs. For example, the **green line** will always be the baseline projection (for each division), using December 31, 2009, asset values and data, applying an 8.0 percent assumed LTROR, and considering the benefit provisions and contribution schedules (plan provisions<sup>15</sup>) in place prior to enactment of the SB 1 reforms.

Appendix C has a table describing benefit provisions, assumptions, and contribution structures related to each projection line and a summary of purpose of each funded ratio projection graph set.

### The Original Outlook—Unsustainable Without Change

The first set of funded ratio projection graphs provides PERA’s outlook following 2008,<sup>16</sup> which illustrates that **PERA’s sustainability issues could not be addressed simply by relying on investment performance**. This was evident, particularly for the two largest divisions, the State and the School Divisions, which make up approximately 86 percent of PERA’s total population and represent approximately 84 percent of PERA’s pension asset base.

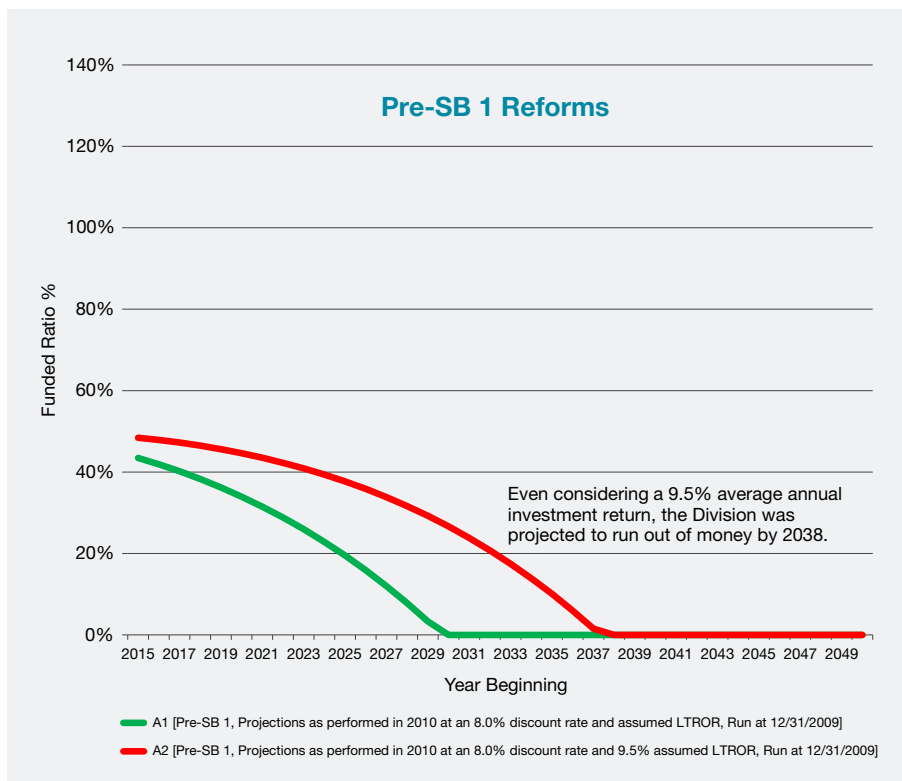
Line A1 and Line A2, shown on each graph (one for each division), are recreations of the funded ratio projections PERA observed following the 2008 market decline. Line A1, the baseline, is described above, and Line A2, is parallel to Line A1 in every aspect, except it reflects a 9.5 percent assumed average rate of return.

Following are the funded ratio projection graphs showing Lines A1 and A2 for the State and Judicial Divisions. Note that assuming an average 9.5 percent return on assets over the projection period only adds eight years of solvency from the baseline (Line A1) projection for the State Division, but projects an approximate 100 percent funded ratio by 2043 for the Judicial Division. It was noted throughout this analysis that the Local Government and Judicial Divisions were much more sensitive to asset returns than the State or School Divisions.

<sup>15</sup> The meaning of the phrase “plan provisions” appearing here and forward in Section V, will encompass both benefit provisions and contribution schedules.

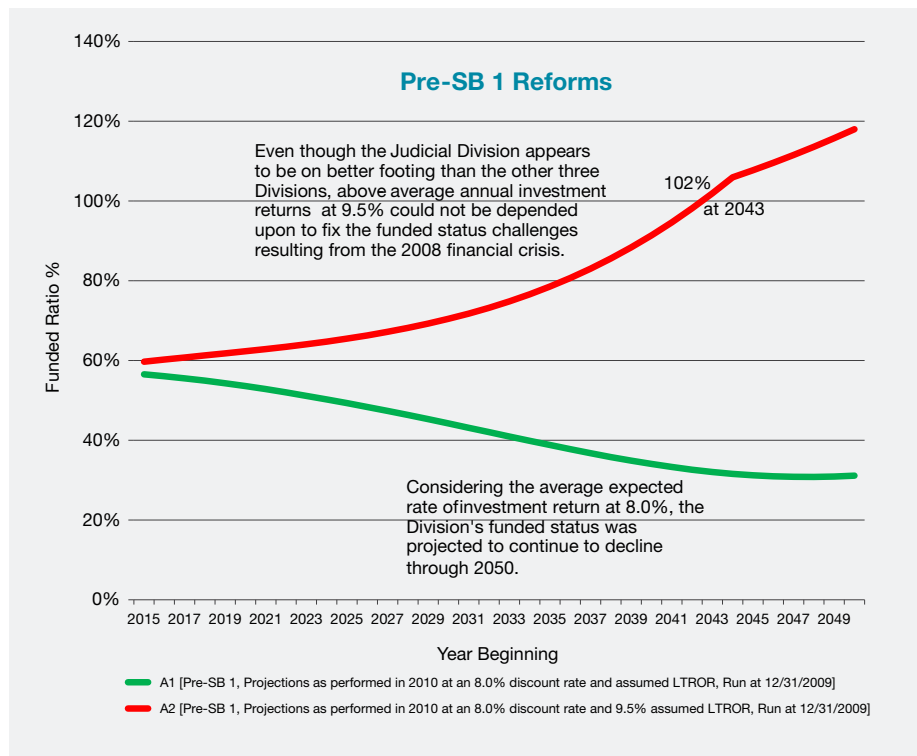
<sup>16</sup> The DPSRS was merged into PERA as of January 1, 2010, so graphs described under this first scenario were not produced for the DPS Division since PERA’s actuaries had not originally performed the analysis. However, prior to merger, DPSRS had performed projections following the 2008 market decline, confirming that DPSRS also was on an unsustainable path.

**Colorado PERA—State Division**  
**35-year Projection of Funded Ratio on Actuarial Asset Value**  
**Projection Lines A**



## V. SENATE BILL 10-001 REFORMS ENSURE COLORADO PERA SUSTAINABLE FOR FORESEEABLE FUTURE

Colorado PERA—Judicial Division  
35-year Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines A



### Impact of Plan Experience and SB 1 Reforms

The second set of funded ratio projection graphs shows the impact of member experience and the favorable asset returns experienced over the last five years (2010 through 2014, inclusive), **during which time PERA's assets produced a 9.9 percent annualized rate of return.**

**Had the SB 1 reforms not been adopted, the favorable asset performance would have "bought" an additional six years of solvency for the State Division and four years for the School Division.**

The impact of the member and asset experience is illustrated by the area between Line B and the baseline Line A1. Both lines were created using an 8.0 percent assumed LTROR and plan provisions without consideration of the adoption of SB 1 reforms, but Line B reflects asset values and data as of December 31, 2014, while Line A1 reflects asset values and data as of December 31, 2009. Since these projection scenarios do not consider the SB 1 reforms, this is purely an analysis of the impact of the member experience and "better than expected" asset performance and substantiates the 9.5 percent return results PERA received in 2010, represented by Line A2 in the first graph set.

More importantly, **the area between Line C and Line B isolates the significant economic impact of adopting the SB 1 reforms.** The Board's plan of action, resulting in the recommendations to the General Assembly, was developed under an 8.0 percent assumed LTROR.

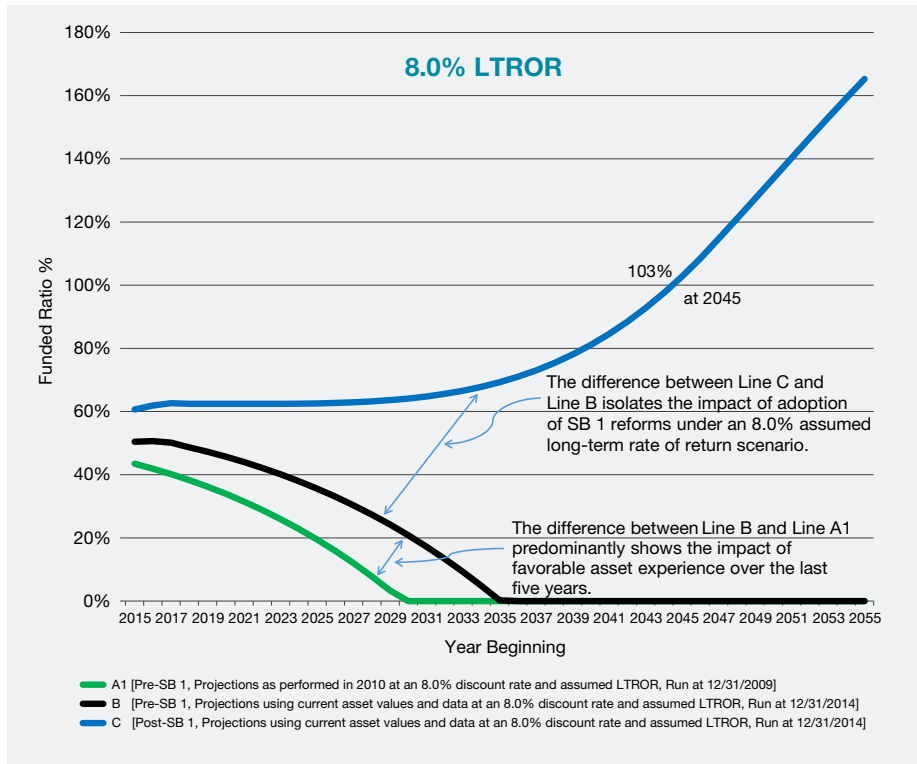
Both Line C and Line B were created using an 8.0 percent assumed LTROR and asset values and data as of December 31, 2014, but Line C reflects the economic effect of plan provisions with consideration of SB 1 reforms while Line B reflects the economic effect of plan provisions without consideration of SB 1 reforms.

This information is relevant as it shows that if the plan of action had not been altered by adopting a 7.5 percent LTROR, PERA generally would be "on course" regarding the original path established in 2010, with the enactment of SB 1. (See further discussion and illustrations of this in fourth funded ratio projection graph set, below.)

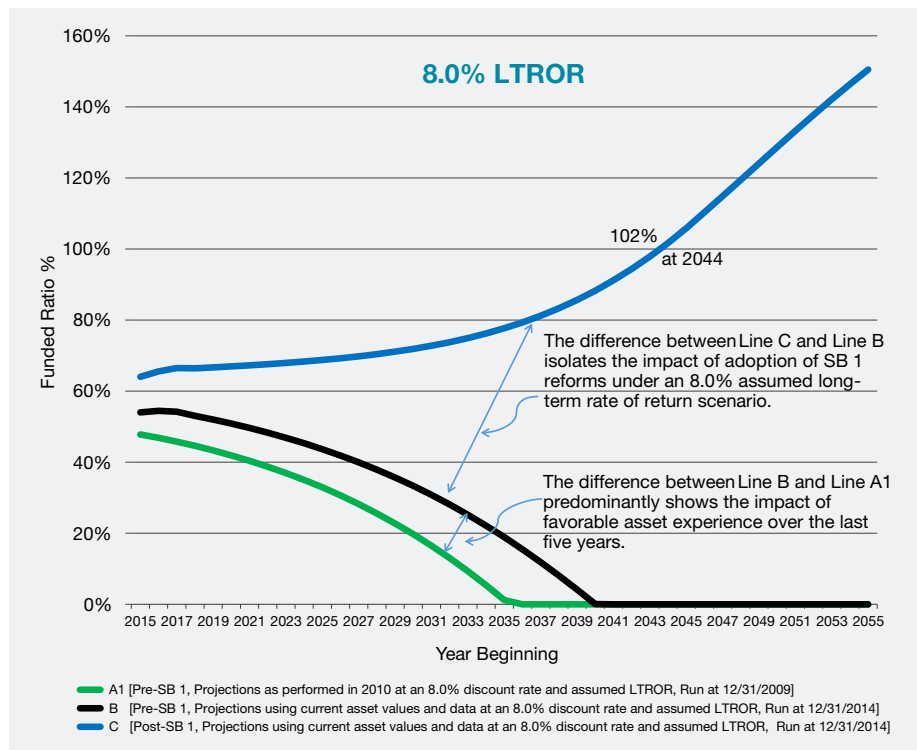
Following are the State and School Division funded ratio projection graphs showing Lines A1, B, and C.

## V. SENATE BILL 10-001 REFORMS ENSURE COLORADO PERA SUSTAINABLE FOR FORESEEABLE FUTURE

**Colorado PERA—State Division**  
**Projection of Funded Ratio on Actuarial Asset Value**  
**Projection Lines A1, B, and C**



**Colorado PERA—School Division**  
**Projection of Funded Ratio on Actuarial Asset Value**  
**Projection Lines A1, B, and C**



## V. SENATE BILL 10-001 REFORMS ENSURE COLORADO PERA SUSTAINABLE FOR FORESEEABLE FUTURE

### Impact of Adopting a 7.5 Percent Assumed Long-Term Rate of Return

Regarding the change in the assumed LTROR, the third set of funded ratio projection graphs illustrates an important element of the progress made in reducing the unfunded liability since the adoption of the SB 1 reforms.

### The area between Line C and Line D isolates the economic impact of moving from an 8.0 percent to a 7.5 percent assumed LTROR.

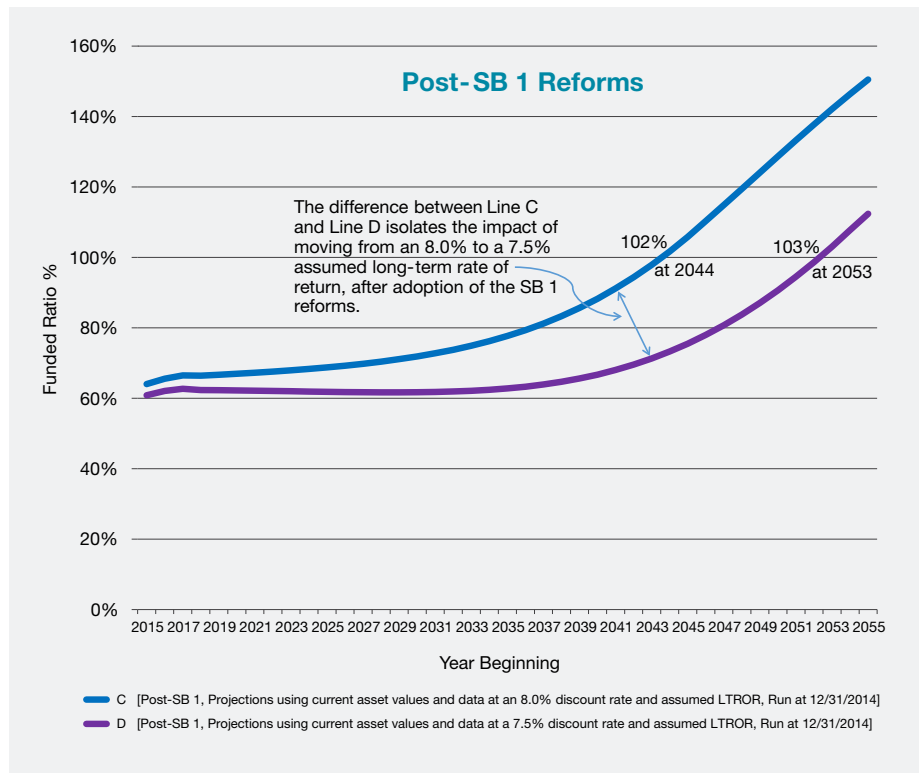
Both Line C and Line D use asset values and data as of December 31, 2014, and plan provisions with consideration of the SB 1 reforms, but Line C reflects an 8.0 percent assumed LTROR, while Line D reflects a 7.5 percent assumed LTROR.

By adopting a more conservative assumed LTROR, the Board recognized lowered economic expectations and sensitivity to risk. Due to this lower assumed LTROR, the time frame for bringing the plan to the desired 100 percent or better funded ratio was extended. These projections indicate that the SB 1 package of reforms will continue to be sufficient to allow PERA to reach full funding over time while continuing to pay all the benefits earned by PERA's members.

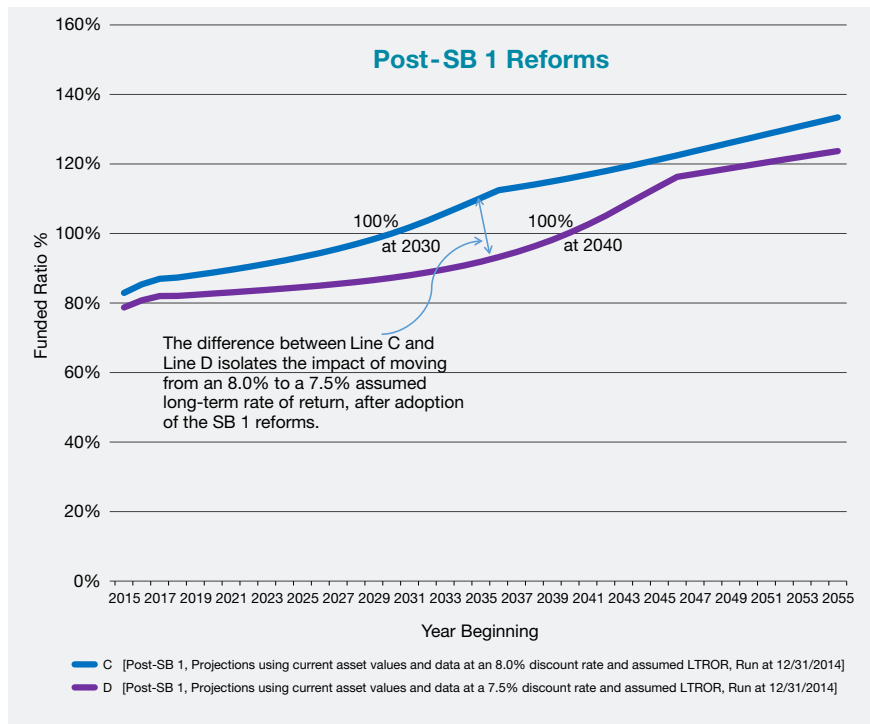
As detailed on each graph, this change moved the anticipated 100 percent funded ratio target further down the timeline by seven years (from 2045 to 2052) for the State Division, and nine years (from 2044 to 2053) for the School Division.

Following are the funded ratio projection graphs for the School and Local Government Divisions showing Lines C and D.

**Colorado PERA—School Division**  
**Projection of Funded Ratio on Actuarial Asset Value**  
**Projection Lines C and D**



Colorado PERA—Local Government Division  
 Projection of Funded Ratio on Actuarial Asset Value  
 Projection Lines C and D



**Initial SB 1 Projections—Updated**

The fourth set of funded ratio projection graphs responds to the question of the “...progress made toward eliminating the unfunded liabilities of each division of the association” after consideration of SB 1 reforms.

**If continuing under an 8.0 percent LTROR assumption in effect at the time of SB 1’s enactment, PERA generally would be on course regarding the original path established in 2010.**

If analyzing this fourth set of projection graphs for the two largest divisions based on the original plan considering an 8.0 percent assumed LTROR, it is noted that the State Division would have achieved a 100 percent funded ratio one year earlier than originally predicted and one year later than originally predicted in the School Division.

Both divisions, however, show better progress in the first 10 to 20 years due to the actual better than expected asset performance over the last five-year period. This initial better than expected asset experience is, however, ultimately counteracted by the less than expected active membership growth over the last five-year period, which results in the **two divisions achieving a 100 percent funded ratio relatively close to the initial projections under the 8.0 percent scenario.**

These graphs focus on projection Lines A3, C, and D. Line A3 considers December 31, 2009, data and an 8.0 percent assumed LTROR, but also incorporates the economic effect of the SB 1 reforms.

Line A3 replicates the projections presented following the December 31, 2009, actuarial valuation and the passage of the SB 1 reforms. Projection Lines C and Line D also are shown in these graphs in order to overlay the current projections, assuming both an 8.0 percent (Line C) and a 7.5 percent (Line D) LTROR, on the initial projections considering the SB 1 reforms.

Therefore, **the area between Line A3 and Line C isolates the difference between anticipated progress versus actual progress** by comparing the original projections performed as of December 31, 2009, to the current projections as of December 31, 2014, under an 8.0 percent assumed LTROR. The difference in these two projection lines encompasses the total impact, over the last five years, of asset and member experience and the difference in actual versus expected active membership growth under an 8.0 percent assumed LTROR. The area between Line A3 and Line D also encompasses these differences, but additionally includes the impact of moving from an 8.0 percent to a 7.5 percent assumed LTROR.

## V. SENATE BILL 10-001 REFORMS ENSURE COLORADO PERA SUSTAINABLE FOR FORESEEABLE FUTURE

The Local Government, Judicial, and DPS Divisions are a little more complicated, each with a unique situation, reflecting the actual employer contributions versus the ADC and rates of active membership growth over the last five-year period versus expected growth.

Regarding the DPS Division, the predominant reasons for less favorable projections result from the impact of the statutory systematic defunding of this division (projected to equate to the School Division funded status within 30 years from January 1, 2010), the continuous refinancing of the Pension Certificates of Participation (PCOPs) and enactment of House Bill 15-1391, which lowered the total DPS employer contribution by 3.6 percent as a percentage of annual payroll.

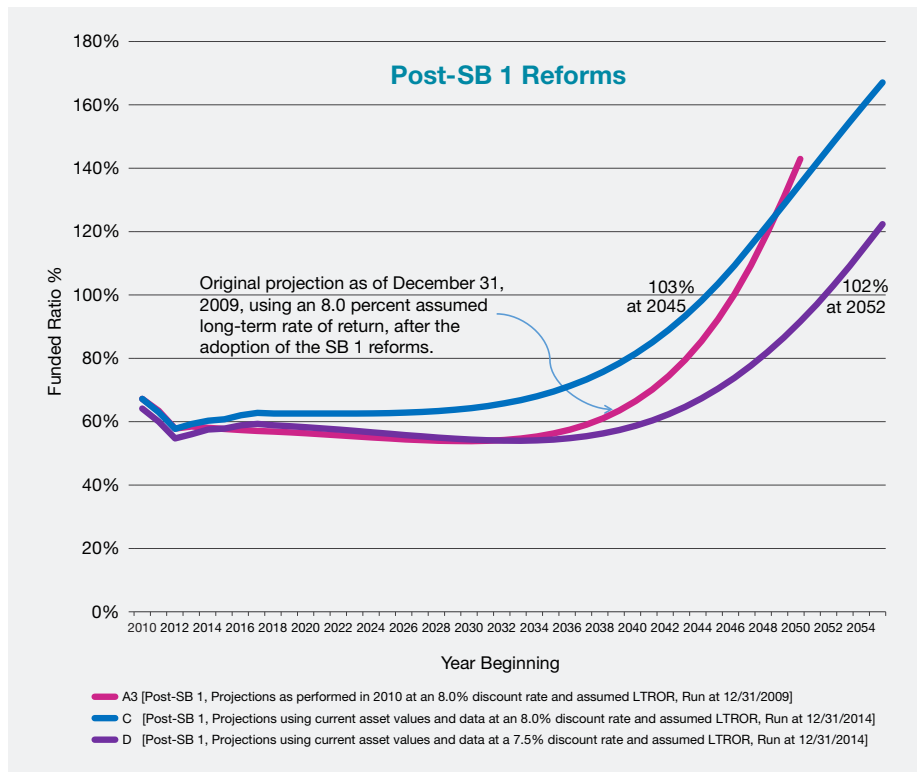
The Local Government Division, better funded than the State or School Divisions as of December 31, 2009, has benefited from receiving employer contributions representing a higher percentage of the ADC over the last five-year period. This, in concert with closer to anticipated active membership growth (after consideration of the Memorial Health Systems disaffiliation), results in current projections, under an 8.0 percent LTROR scenario, that produce a 100 percent funded ratio 10 years earlier than originally anticipated.

Since moving to a 7.5 percent LTROR cost 10 years, the Local Government Division is the only PERA division projected to attain a 100 percent funded ratio, as planned in 2040.

Following are the funded ratio projection graphs for the State, Local Government, and DPS Divisions showing Lines A3, C, and D.

A complete set of the funded ratio projection line graphs for each PERA division are available in Appendix C.

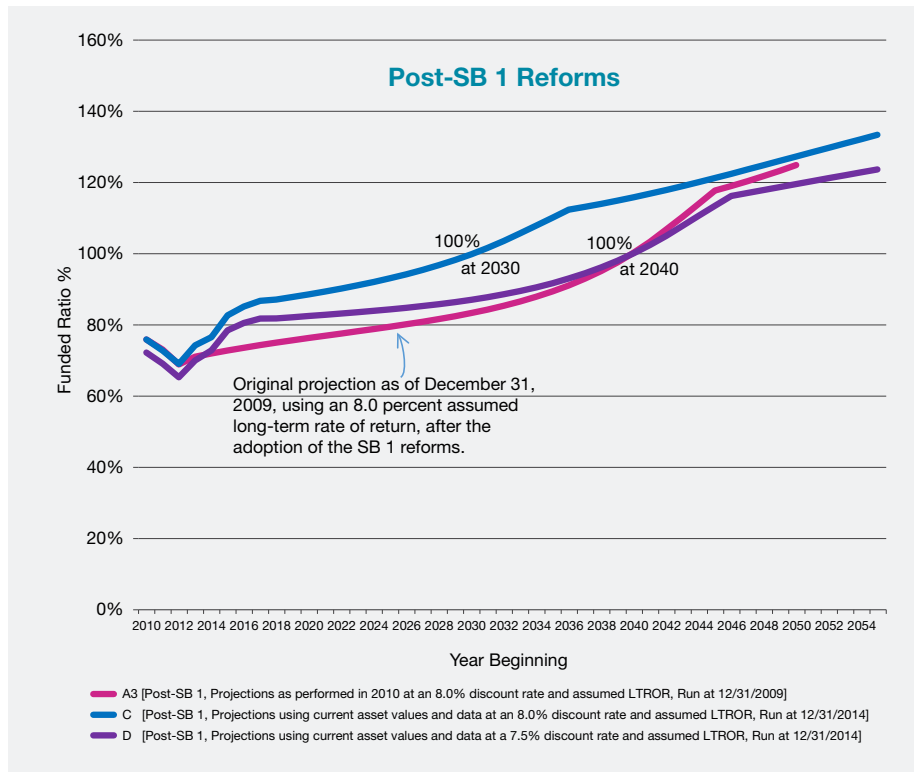
**Colorado PERA—State Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines A3, C, and D**



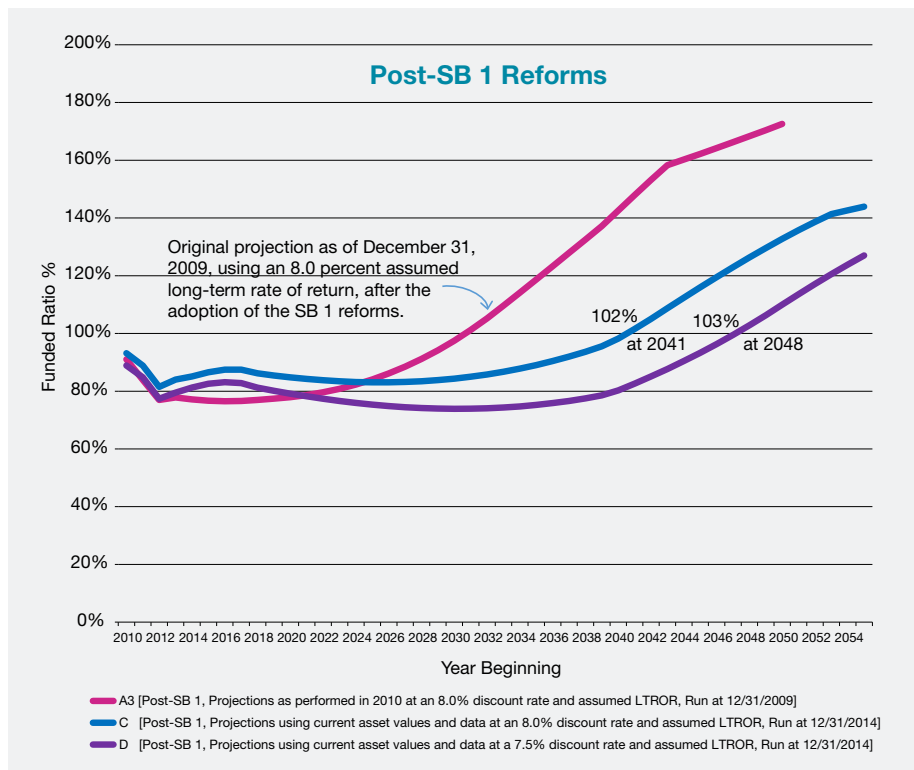


## V. SENATE BILL 10-001 REFORMS ENSURE COLORADO PERA SUSTAINABLE FOR FORESEEABLE FUTURE

### Colorado PERA—Local Government Division Projection of Funded Ratio on Actuarial Asset Value Projection Lines A3, C, and D



### Colorado PERA—DPS Division Projection of Funded Ratio on Actuarial Asset Value Projection Lines A3, C, and D



## V. SENATE BILL 10-001 REFORMS ENSURE COLORADO PERA SUSTAINABLE FOR FORESEEABLE FUTURE

The funded ratio projection graphs shown in this section encompass a significant number of assumptions and are projected forward throughout a long time-horizon in order to provide information on trends in actuarial measurements. The assumptions are long-term in nature and thus, the projections are simply an indication of what may occur and do not provide absolute results.

### *Understanding the Active Membership Growth Assumption*

One of the assumptions is the active membership growth assumption mentioned previously. It is assumed that the active

membership for the State, School, and DPS Divisions will grow over time by approximately 1.5 percent per year, and the Local Government and Judicial Divisions by 1.0 percent per year. Valuation assumptions for decrement rates of retirement, termination, disability, and mortality also are employed to appropriately shift the population from one status to another from year to year over the projection period.

The predictions for each division's population in receipt of benefits (retirees and beneficiaries) closely paralleled actual experience.

#### EXHIBIT 9

**Summary of Projected Active Membership Growth and Population Shifts as of December 31, 2009 Versus Actual Experience as of December 31, 2014\***

Division/Member Category	December 31, 2009	December 31, 2014		Average Rate of Growth	
	Actual	Expected	Actual	Expected	Actual
<b>State</b>					
Retirees & Beneficiaries	31,463	36,527	35,937	3.03%	2.69%
Inactives & Term Vested	58,443	62,556	72,008	1.37%	4.26%
Actives	54,333	58,532	55,300	1.50%	0.35%
Total Members	144,239	157,615	163,245	1.79%	2.51%
<b>School</b>					
Retirees & Beneficiaries	47,641	58,203	58,145	4.09%	4.07%
Inactives & Term Vested	91,416	100,529	115,410	1.92%	4.77%
Actives	119,390	128,617	119,618	1.50%	0.04%
Total Members	258,447	287,349	293,173	2.14%	2.55%
<b>Local Government</b>					
Retirees & Beneficiaries	4,692	6,291	6,466	6.04%	6.62%
Inactives & Term Vested	17,525	18,906	23,744	1.53%	6.26%
Actives	16,166	16,991	12,084	1.00%	-5.65%
Total Members	38,383	42,188	42,294	1.91%	1.96%
<b>Judicial</b>					
Retirees & Beneficiaries	292	351	331	3.75%	2.54%
Inactives & Term Vested	14	25	14	12.30%	0.00%
Actives	317	333	334	1.00%	1.05%
Total Members	623	709	679	2.62%	1.74%
<b>DPS</b>					
Retirees & Beneficiaries	6,218	6,722	6,698	1.57%	1.50%
Inactives & Term Vested	584	1,661	7,637	23.25%	67.23%
Actives	12,155	13,095	15,414	1.50%	4.87%
Total Members	18,957	12,478	29,749	2.53%	9.43%
<b>Total of All Divisions</b>					
Retirees & Beneficiaries	90,306	108,094	107,577	3.66%	3.56%
Inactives & Term Vested	167,982	183,677	218,813	1.80%	5.43%
Actives	202,361	217,568	202,750	1.46%	0.04%
Total Members	460,649	509,339	529,140	2.03%	2.81%

\* Provided by Cavanaugh Macdonald Consulting, LLC.

Exhibit 9 above summarizes the active membership growth and population shifts experienced over the last five-year period compared to the expected experience projected for the same five-year period beginning December 31, 2009.

Exhibit 9 also shows each division's active population was impacted by a greater than expected number of terminations (without refund). Whereas a higher number of terminations than expected in each year's (gain)/loss analysis would reflect a gain or benefit to the plan, the loss of employer contribution dollars associated with the active member group over the projection period, had the opposite effect.

## V. SENATE BILL 10-001 REFORMS ENSURE COLORADO PERA SUSTAINABLE FOR FORESEEABLE FUTURE

### *Tier 2 Benefits Less Expensive = Future Accelerated Savings*

Another aspect of impact of the active population growth is the rate at which members in the less costly Tier 2 benefit structure are replacing the members with the more costly benefit structures.

This affects the dollars, in excess of contributions to cover the annual accrual rates (or normal costs) of the active population at any point in time, as supported by Exhibit 8 on page 28, which lists the ultimate normal cost rate by division. The greater the number of Tier 2 members, the more dollars flow to pay down the unfunded liabilities of each division. Shown in Exhibit 10 below are actual counts from the previous table along with the saturation percentage by division of Tier 2 members.

#### EXHIBIT 10

**Tier 2 Active Member Population Saturation**

Division	Active Population as of December 31, 2009*	Percentage of Active Population With Tier 2 Benefits†	Active Population as of December 31, 2014*	Percentage of Active Population With Tier 2 Benefits†
State	54,333	28%	55,300	51%
School	119,390	28%	119,618	50%
Local Government	16,166	32%	12,084	56%
Judicial	317	13%	334	30%
DPS	12,155	N/A	15,414	64%
<b>Totals</b>	<b>202,361</b>	<b>28%</b>	<b>202,750</b>	<b>51%</b>

\* Provided by Cavanaugh Macdonald Consulting, LLC.

† From internal PERA data and assessment.

The average Tier 2 saturation percentage is 51 percent considering all active members of the five pension division trust funds. The DPS Division has the greatest concentration of Tier 2 members at 64 percent, reflecting a large inflow of hourly employees<sup>17</sup> who joined PERA under the Tier 2 structure as of the merger date, January 1, 2010.

### *Gain/Loss Analysis*

In attempting to explain the differences between the original projections performed in 2010, and the current projections shown in the graphs above, certain items of gain/loss and change must be considered. Included in the key elements are annual demographic and investment gain/loss, impact due to changes in assumptions, benefit provision, and actuarial methods, gains and losses due to growth in active membership, or the lack thereof, and finally the passage of time.

All elements of (gain)/loss will have some degree of impact, and are important to understand, but based on the analysis, **the investment (gain)/loss component is the biggest driver regarding variances impacting funding progress.** The actual time it will take to eliminate the unfunded liabilities of each division will heavily depend on investment return performance. This concept is reinforced by the results of the SB 14-214 Sensitivity Study, discussed in Section VIII.

Exhibit 11 presents a cumulative (gain)/loss amount in each of the three major (gain)/loss categories regarding liabilities, assets, and growth, including both the liability and contribution elements of growth. The valuation liability (gain)/loss shown in Exhibit 11 incorporates annual valuation (gain)/loss from demographic assumptions, changes in actuarial assumptions, and changes in actuarial methods and programming.

The third element included in Exhibit 11 that typically is not available in the annual actuarial valuation (gain)/loss analysis, is the impact of actual experience in active membership growth versus expected active membership growth. Since the actuarial valuation is a snapshot assessment of the active membership as of the valuation date, it does not and cannot consider the effect of less than or greater than anticipated active membership growth. PERA's actuaries, CMC, provided PERA with estimates of impact of the two components of the less than expected active membership growth and accumulated these impacts over the study period.

<sup>17</sup> Hourly employees of the Denver Public Schools were not automatically covered by DPSRS, prior to merger, but immediately became members of PERA under the PERA Tier 2 structure as of the merger date.

## V. SENATE BILL 10-001 REFORMS ENSURE COLORADO PERA SUSTAINABLE FOR FORESEEABLE FUTURE

### EXHIBIT 11

Estimated Cumulative Summary of (Gain)/Loss Over the Five-Year Study Period (2010–2014, inclusive)  
(In Millions of Dollars)

Division	Cumulative Impact of Valuation Liability <sup>†</sup> (Gain)/Loss	Cumulative Investment (Gain)/Loss MVA Basis <sup>‡</sup>	Cumulative Impact of Active Membership Growth Assumption (Gain)/Loss*		Cumulative Calculations Considering all Categories
			Liability: Expected vs. Actual	Contribution Dollars	
State	\$479.5	(\$1,354.8)	(\$25.0)	\$77.5	(\$822.8)
School	\$659.3	(\$2,197.1)	(\$43.8)	\$130.3	(\$1,451.3)
Local Government	(\$75.6)	(\$327.3)	(\$29.2)	\$17.6	(\$414.5)
Judicial	(\$5.8)	(\$24.6)	(\$0.1)	\$0.4	(\$30.1)
DPS	(\$241.1)	(\$328.7)	\$17.1	(\$0.1)	(\$552.8)
All Divisions	\$816.3	(\$4,232.5)	(\$81.0)	\$225.7	(\$3,271.5)

\* Provided by Cavanaugh Macdonald Consulting, LLC.

<sup>†</sup> This column includes annual valuation (gain)/loss from demographic assumptions, changes in benefit provisions, changes in actuarial assumptions, and changes in actuarial methods and programming.

<sup>‡</sup> This column shows the cumulative asset (gain)/loss on a market value of assets basis over the five-year study period.

Exhibit 11 above reflects the passage of time and the immediate advantage of the better than expected 9.9 percent annualized investment return experienced by the plan.

Included in Appendix D is a complete summary of gains and losses experienced by each division regarding demographic and economic actuarial assumptions and contribution deficiencies, impact of changes in actuarial assumptions, methods and programming, and the impact of actual member growth different than expected.

### Estimated Impact of Major SB 1 Reforms

#### Impact to Valuation Metrics

In addition to the projection line graphs, PERA requested CMC perform an analysis reflecting the impact of the major SB 1 reforms on the typical actuarial valuation metrics, including impact of the following:

- Changes to the AED/SAED contribution schedules.
- Revisions to the AI provisions, including a lower cap and the delayed payment of the first increase.
- Removal of the 50 percent match previously available to terminating members with less than five years of service credit.
- Revision to the early retirement reduction factors from a certain subsidized reduction percentage to an actuarially determined reduction percentage.
- Adoption of the Rule of 85, with minimum age 55, for those with less than five years of service credit as of January 1, 2011.
- Adoption of the Rule of 88, with minimum age of 58, for those who began membership on or after January 1, 2011.

Based on the calculations shown in Exhibit 6 for each division, **the reforms to the AI provisions had the most significant impact in ensuring the sustainability of PERA.**

To determine the impact of each reform, CMC estimated the additional UAAL, the revised funded ratio, and the increase or (decrease) in the net ADC (after consideration of the AED and SAED contributions in each scenario) as of December 31, 2014, as if that particular reform had not been adopted. Note that the UAAL, funded ratio, and ADC less AED/SAED is provided as of the December 31, 2014, actuarial valuation as a baseline to which to compare the same valuation metrics, estimated as of December 31, 2014, if each reform had not been adopted.

In looking at the rows pertaining to the State Division, Exhibit 12 shows that if the AI reforms were not put in place five years ago, as of December 31, 2014, the UAAL would be approximately \$5 billion more, the funded ratio would be over 11.0 percentage points less, and the net ADC would be over 11.0 percentage points higher (as a percentage of pay).

It should be noted the AED/SAED contribution structure for the four PERA divisions<sup>18</sup> was in place prior to the 2008 market decline. The additional AED and SAED contribution rates were scheduled to reach their 3.0 percent maximums as of 2012 and 2013, respectively. The SB 1 reforms simply expanded and gradually increased the incremental contribution schedule to higher maximum values in later years<sup>19</sup> for the State and School Divisions. The SB 1 reforms for both the Local Government and Judicial Divisions froze the AED/SAED contribution levels at 2.20 percent and 1.50 percent, respectively, resulting in lower contribution rates than initially scheduled.

<sup>18</sup> The AED/SAED contribution impact analysis was not performed for the DPS Division due to the timing of the merger of the Denver Public Schools Retirement System (DPSRS) into PERA, effective as of January 1, 2010, and the reflection of AED/SAED reforms in the December 31, 2009, actuarial valuation. The AED/SAED contribution schedules in place prior to SB 1 were never modeled for the DPS Division.

<sup>19</sup> Please see Section IV for further details on the changes made to the AED/SAED schedule as well as the other SB 1 reforms referred to in this section.

## V. SENATE BILL 10-001 REFORMS ENSURE COLORADO PERA SUSTAINABLE FOR FORESEEABLE FUTURE

The impact of the AED/SAED reforms for each of the State and School Divisions is relatively small, since the impact of the AED increments due to SB 1 only reflect two years of application and the impact of the SAED increments reflect one year of application. The impact of the SB 1 AED/SAED increments for the State and School Divisions will continue to grow in significance over time as the UAAL is paid off.

The impact for the Local Government and Judicial Divisions reflect an opposite effect, since the original AED/SAED structure was abbreviated by the SB 1 reforms. Exhibit 12 below reflects the impact of the SB 1 reforms as of December 31, 2014. It is expected the impacts of the SB 1 reforms will grow in magnitude as of each scheduled five-year assessment required in the legislation.

### EXHIBIT 12

#### Summary of Estimated Impact of Major SB 1 Reforms (Benefit Provisions and Contribution Schedules)

Summary of Estimated Impact of Major SB 1 Reforms* on Actuarial Metrics <sup>†</sup> Regarding UAAL (in Millions of Dollars), Funded Ratio, and Actuarially Determined Contribution (ADC, as a Percent of Pay)								
Actuarial Metric	Valuation as of December 31, 2014	Results If The Reform Had Not Been Adopted						
		AED/SAED	AI/COLA	Match on Refunds	Actuarial Equivalent Early Retire Reductions	Rule of 85	Rule of 88	Total **
<b>State Division</b>								
UAAL	\$9,885	\$9,934	\$15,072	\$9,945	\$9,933	\$9,902	\$9,890	\$15,194
Additional UAAL		\$50	\$5,187	\$60	\$48	\$17	\$5	\$5,309
Funded Ratio	57.8%	57.6%	46.3%	57.6%	57.6%	57.7%	57.8%	46.0%
ADC less AED/SAED	12.41%	16.41%	23.82%	13.20%	12.65%	12.54%	12.48%	28.13%
Incr/(Decr) in Net ADC		4.00%	11.41%	0.79%	0.24%	0.13%	0.07%	15.72%
<b>School Division</b>								
UAAL	\$14,243	\$14,318	\$22,071	\$14,321	\$14,312	\$14,268	\$14,252	\$22,245
Additional UAAL		\$75	\$7,827	\$78	\$68	\$25	\$8	\$8,002
Funded Ratio	60.9%	60.7%	49.5%	60.7%	60.7%	60.8%	60.8%	49.2%
ADC less AED/SAED	12.49%	16.46%	23.62%	13.21%	12.72%	12.63%	12.58%	27.89%
Incr/(Decr) in Net ADC		3.97%	11.13%	0.72%	0.23%	0.14%	0.09%	15.40%
<b>Local Government Division</b>								
UAAL	\$982	\$930	\$1,919	\$1,003	\$992	\$985	\$983	\$1,883
Additional UAAL		(\$52)	\$937	\$22	\$10	\$4	\$1	\$902
Funded Ratio	78.7%	79.8%	65.2%	78.3%	78.5%	78.6%	78.7%	66.0%
ADC less AED/SAED	8.28%	5.48%	18.11%	9.19%	8.52%	8.40%	8.35%	15.64%
Incr/(Decr) in Net ADC		(2.80%)	9.83%	0.91%	0.24%	0.12%	0.07%	7.36%
<b>Judicial Division</b>								
UAAL	\$100	\$97	\$175	\$101	\$101	\$101	\$100	\$166
Additional UAAL		(\$3)	\$74	\$0	\$1	\$0	\$0	\$66
Funded Ratio	73.0%	73.9%	60.0%	72.9%	72.8%	72.9%	73.0%	61.9%
ADC less AED/SAED	18.37%	15.65%	28.99%	18.39%	18.69%	18.51%	18.38%	25.99%
Incr/(Decr) in Net ADC		(2.72%)	10.62%	0.02%	0.32%	0.14%	0.01%	7.62%
<b>DPS Division</b>								
UAAL	\$665		\$1,264	\$677	\$680	\$670	\$667	\$1,292
Additional UAAL			\$600	\$12	\$16	\$5	\$2	\$627
Funded Ratio	82.6%		71.0%	82.3%	82.2%	82.5%	82.5%	70.5%
ADC less AED/SAED	0.59%		6.62%	1.32%	0.99%	0.81%	0.77%	10.92%
Incr/(Decr) in Net ADC			6.03%	0.73%	0.40%	0.22%	0.18%	10.33%

\* The results shown were provided by Cavanaugh Macdonald Consulting, LLC, and reflect actual plan experience related to each SB 1 reform over the last four years except for the AI/COLA reform, which reflects five years of experience. Due to rounding, items may not add.

† The UAAL is the difference between the actuarial accrued liability and the actuarial value of assets and the funded ratio is the actuarial value of assets as a percentage of the actuarial accrued liability. An ADC is an actuarially determined contribution, or the recommended employer contribution developed in the annual actuarial valuation determined to be sufficient to pay the normal cost of the plan and an amortization payment (determined over a closed period) on the UAAL, shown as a percentage of pay. The "ADC less AED/SAED" is the ADC rate calculated for the division less the expected AED and SAED rate for that division. Therefore, reference to "Incr/Decr in Net ADC" means the additional (or reduced) amount, also shown as a percentage of pay, necessary if the reform had not been adopted.

\*\* Each column of results in Exhibit 12 reflects the major reform noted in the column header and is independent of the results shown in the other columns. Since some of these items are interdependent, the sum of the items across the page will not match the "Total" column of results.

## V. SENATE BILL 10-001 REFORMS ENSURE COLORADO PERA SUSTAINABLE FOR FORESEEABLE FUTURE

As stated earlier in Section III of this report, it was estimated that the retirees and current and future members bore approximately 90 percent of the burden through changes in the structure to annual increases, benefit provision reforms, and foregone compensation increases, which is reflected in Exhibit 12. Out of the six columns depicting the individual impacts of the major SB 1 reforms, five of the columns and the portion of the first column pertaining to SAED changes, are borne by the membership and retirees. Only the portion of the first column pertaining to AED directly impacts Colorado employers and taxpayers. Appendix E has additional details on this analysis.

### Impact to Trust Fund Dollars

While Exhibit 12 considers the projection of benefits into the future discounted back to December 31, 2014, and the impact on plan assets, Exhibit 13 **considers the four or five years of member experience since the effective date of the reform shown in each column and its impact to the dollars in each trust fund.** CMC estimated the impact of each major reform on

the Market Value of Assets (MVA) by analyzing member data provided by PERA.

As in Exhibit 12, each column shows the estimated MVA as if that particular reform had not been adopted.

For example, Exhibit 13 shows that if the AI reforms had not been adopted and the majority of benefit recipients had continued to receive a 3.5 percent annual increase over the last five years, the State Division trust fund would have an estimated \$554 million less in trust assets as of December 31, 2014.

In addition to the savings in recognized reduced pension liabilities of the plan, the total savings in terms of trust fund dollars is estimated to be approximately \$1.3 billion as of December 31, 2014.

Exhibit 13 below reflects the impact of the SB 1 reforms as of December 31, 2014. It is expected the impact to the MVA of each division will grow in magnitude as of each scheduled five-year assessment required in the legislation.

### EXHIBIT 13

#### Summary of Estimated Dollar Impact of Major SB 1 Reforms (Benefit Provisions and Contribution Schedules)

Summary of Estimated Dollar Impact of Major SB 1 Reforms* Regarding the Market Value of Assets of Each Division Trust Fund (in Millions of Dollars)								
	Valuation as of Dec 31, 2014	Results If The Reform Had Not Been Adopted						Total†
		AED/SAED	AI/COLA	Match on Refunds	Actuarial Equivalent Early Retire Reductions	Rule of 85	Rule of 88	
<b>State Division</b>								
MVA	\$13,957	\$13,907	\$13,403	\$13,924	\$13,942	\$13,957	\$13,957	\$13,353
Incr/(Decr) in MVA		(\$50)	(\$554)	(\$33)	(\$15)	\$0	\$0	(\$604)
<b>School Division</b>								
MVA	\$22,846	\$22,772	\$22,303	\$22,809	\$22,824	\$22,846	\$22,846	\$22,228
Incr/(Decr) in MVA		(\$74)	(\$543)	(\$37)	(\$22)	\$0	\$0	(\$618)
<b>Local Government Division</b>								
MVA	\$3,733	\$3,786	\$3,703	\$3,718	\$3,731	\$3,733	\$3,733	\$3,755
Incr/(Decr) in MVA		\$53	(\$30)	(\$15)	(\$2)	\$0	\$0	\$22
<b>Judicial Division</b>								
MVA	\$279	\$282	\$270	\$279	\$279	\$279	\$279	\$273
Incr/(Decr) in MVA		\$3	(\$9)	\$0	\$0	\$0	\$0	(\$6)
<b>DPS Division</b>								
MVA	\$3,254		\$3,186	\$3,251	\$3,251	\$3,254	\$3,254	\$3,186
Incr/(Decr) in MVA			(\$68)	(\$3)	(\$3)	\$0	\$0	(\$68)
<b>Total of all Divisions</b>								
MVA	\$44,069		\$42,865	\$43,981	\$44,027	\$44,069	\$44,069	\$42,795
Incr/(Decr) in MVA			(\$1,204)	(\$88)	(\$42)	\$0	\$0	(\$1,274)

\* The results shown were provided by Cavanaugh Macdonald Consulting, LLC, and reflect actual plan experience related to each SB 1 reform over the last four years except for the AI/COLA reform which reflects five years of experience.

† Each column of results in Exhibit 13 reflects the major reform noted in the column header and is independent of the results shown in the other columns. Since some of these items are interdependent, the sum of the items across the page will not match the "Total" column of results.

**Impact to Members and Member Behavior**

This section includes an internal analysis of the impact of SB 1 reforms on member benefits/refunds and member behavior. The categories reviewed included:

- **Terminating members with less than 5 years of service**
  - To assess the impact of the removal of the 50 percent match on refunds of member contributions
- **Terminated vested members with 25 or more years of service credit**
  - To assess the impact of the removal of indexed benefits for this membership group
- **Early reduced retirements**
  - To assess the impact of moving from subsidized reductions to actuarially equivalent reductions

- **Retired members who have returned to work**
  - Non-suspended – to assess the additional contributions these individuals must contribute at member contribution rates
  - Suspended – to assess the difference between the summation of two benefit segments versus the “recalculation” approach, considering all service, applied prior to the SB 1 reforms.

This assessment focuses on the impact to members and on member behavior by analyzing the effect, by division, of the SB 1 reforms listed by comparing activity in the five year period leading up to the adoption of SB 1 reforms (2006 through 2010, inclusive) to the activity in the five-year period following the adoption of SB 1 reforms (2011 through 2015, inclusive, as available).

The results of this analysis are reported in Exhibit 14, with respect to total member activity for all five PERA divisions. Appendix F has a detailed summary of the member experience by division.

**EXHIBIT 14**

**Summary of General Observations Regarding SB 1 Reforms**

SB 1 Reform	Summary of Actual Experience	Impact on Member Behavior
Terminating members with less than five years of service	Including only those with a membership date on or after January 1, 2011, to exclude any matching dollars, refunds in the last five-year period were significantly less than refunds in the five-year period leading up to adoption of SB 1. Considering only these members, PERA saved approximately \$16 million over the last four years.	Considering all terminating members with less than five years of service, there was not a significant difference in the number who refunded at termination when comparing the period prior to the adoption of SB 1 and the period following the adoption of SB 1.
Terminated vested members with 25 or more years of service credit	The members qualifying for indexed benefits prior to SB 1, realized an average \$244/per month increase. Members meeting the same criteria after adoption of SB 1 reforms did not receive this increase in benefits at retirement date.	The revised plan provision has no anticipated impact on member behavior.
Early reduced retirements	Members retiring under an early reduced retirement eligibility during the last five years experienced between a 24% and 52% increase in the reductions applied to their benefits when compared to the five-year period prior to SB 1. Looking at it another way, early retirement benefits in the five-year period prior to SB 1, averaged between a total reduction of 2.2% and 3.3%; whereas early retirement benefits in the five-year period following SB 1, experienced a total average reduction between 3.1% and 4.9%.	There were 12.9% fewer early reduced retirements in the five-year period following SB 1 than the five-year period prior to SB 1.
<b>Retirees Returning to Work</b>		
Non-suspended	Contributions at the member rate delivered an approximate \$49.8 million to the total PERA trust fund.	There was an estimated 14.2% decrease in the number of retirees returning to work in a non-suspended status over the last five-year period compared to the five-year period leading up to SB 1.
Suspended	The changes implemented by SB 1 resulted in an average \$252/month additional benefit as opposed to an average \$867/month additional benefit at re-retirement, prior to the adoption of SB 1.	There was an 88.3% decrease in the occurrence of retirees returning to work in a suspended status over the last five-year period compared to the five-year period leading up to SB 1.

## V. SENATE BILL 10-001 REFORMS ENSURE COLORADO PERA SUSTAINABLE FOR FORESEEABLE FUTURE

To provide perspective and context to the SB 1 reforms mentioned in Exhibit 14, a few hypothetical, but typical, members are described below to better illustrate the impact of the SB 1 reforms on actual benefit calculations.

### *Current Retirees*

- A member, retired January 1, 2008, who is receiving a \$3,000 monthly benefit as of January 1, 2010, over the next 25 years will receive:
  - At least \$249,000 fewer dollars in annual increases.
  - A total reduction in retirement income equating to approximately seven fewer years of base retirement payments from what this member would have received without consideration of SB 1 reforms.

### *Active Members Who Retire*

- A member who began PERA membership prior to July 1, 2005, with less than five years of service credit at January 1, 2011, but eventually attains 25 years of service credit by age 55 and retires with a monthly HAS equal to \$5,000 and a monthly benefit of \$2,625, would realize:
  - A retirement benefit providing \$500 per month less in retirement income (or a 16 percent reduction) as of the date of retirement.
  - Over a 25-year period, \$150,000 less in base retirement benefits and at least \$301,700 less in annual increases due to the combination of lower benefits and lower assumed rate of annual increases.
  - Over a 25-year period, a total reduction in retirement income equating to approximately 12 fewer years of base retirement payments, from what this member would have received without consideration of SB 1 reforms.
- A member who began PERA membership after January 1, 2007, who retires under an early reduced retirement eligibility at age 55 with 20 years of service credit, and a monthly HAS of \$4,167 with a monthly benefit of \$1,458 will receive:
  - Approximately \$313 per month less in retirement income (or an 18 percent reduction) as of the date of retirement.
  - Over a 25-year period, \$93,900 less in base retirement benefits and at least \$173,500 less in annual increases due to the combination of lower benefits and lower assumed rate of annual increases. In addition, a total reduction in retirement income equating to approximately 13 fewer years of base retirement payments, from what this member would have received without consideration of SB 1 reform.

- An individual who became a member as of January 1, 2011, and wants to retire with an unreduced benefit must attain age 58 (age 60 for membership date on or after January 1, 2017) with 30 years of service credit, while an individual who became a member on December 31, 2010, can receive an unreduced benefit at age 55 with 30 years of service credit.

### *Active Members Who Terminate With Less Than Five Years of Service*

- An individual who began PERA membership on March 1, 2011, and terminated PERA-covered employment on March 1, 2014, with an \$8,000 accumulated member account, would:
  - Receive \$8,000 upon termination if requesting a refund as opposed to receiving a 50 percent match, available prior to adoption of SB 1 reforms, which would have totaled \$12,000.
  - Experience a 33 percent reduction when compared to a similarly situated PERA member who began membership in 2007 and terminated in 2010.

### *All Members*

- Reduced AIs for all PERA members who currently receive, or one day will receive a PERA benefit.

These are only a few examples of the significant sacrifices made by the PERA membership in order to ensure the sustainability of their pension plan. Shared sacrifice was key to the success of the SB 1 reforms since, for many PERA members, PERA is the main source of guaranteed retirement income.

The following section discusses, in more detail, the impact of the AI reforms as they relate and compare to the national rate of inflation experienced over the last five years.



---

**SECTION VI**  
**Colorado PERA Retirees Keeping Pace With Inflation**

---



## VI. COLORADO PERA RETIREES KEEPING PACE WITH INFLATION

The second primary objective of the five-year progress report is to compare “...the economic impact of the 2010 legislative changes to the annual increase provisions on the retirees and benefit recipients...” to the actual rate of inflation.<sup>20</sup>

As illustrated below in Exhibit 15, **for the majority of PERA retirees and benefit recipients annual increases tracked closely to inflation, and buying power was retained over the five-year period since the adoption of the SB 1 Annual Increase (AI) reforms.**

The assessment was performed over the five-year study period comparing the applicable AI provisions, with consideration of the SB 1 reforms, to actual inflation.

Shown below are the results of the analysis for the retirees under the PERA Tier 1 benefit structure, representing 92 percent of the PERA retiree population. The first row displays the annual increase, applicable for each year shown, regarding both the PERA increase provisions and the rate of national inflation. The second row shows the cumulative increase, incrementally, considering each additional year from left to right. The third row shows the average increase, considering each additional year from left to right.

Exhibit 16 below, describes the AI provisions, prior to and following the adoption of SB 1, as they related to each benefit structure tier.

<sup>20</sup>The definition of inflation for purposes of these comparisons was aligned with the same metric as referenced in C.R.S. § 24-51-1009(4)(b). The applicable rate of inflation is based on “...the average of the annual increases determined for each month, ...in the national consumer price index for urban wage earners and clerical workers [CPI-W] during the calendar year preceding the increase in the benefit for the year...”

### EXHIBIT 15

Summary of Annual Increase (AI) Provision Increases Compared to National Inflation

	Increase for 2010		Increase for 2011		Increase for 2012		Increase for 2013		Increase for 2014	
	PERA	CPI-W*	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W
Applicable Annual Increase	0.0%	-0.7%	2.0%	2.1%	2.0%	3.6%	2.0%	2.1%	2.0%	1.4%
Cumulative Increase	0.0%	-0.7%	2.0%	1.4%	4.0%	5.0%	6.1%	7.2%	8.2%	8.7%
Average Increase	0.0%	-0.7%	1.0%	0.7%	1.3%	1.7%	1.5%	1.8%	1.6%	1.7%

\* For purposes of determining purchasing power, CPI-W was allowed to reflect a negative value in these calculations even though PERA would never apply a reduction to benefits if/when in an indexing scenario.

### EXHIBIT 16

Summary of Annual Increase (AI) Provisions, Prior to and Following the Adoption of SB 1

Description of Membership Group Affected	Annual Increase Prior to SB 1	Annual Increase Pursuant to SB 1
<b>PERA Tier 1 and DPS Tier 1</b>		
For members who began membership on or before June 30, 2005	The AI was 3.50 percent for the PERA benefit structure and 3.25 percent for the DPS benefit structure.	The AI was reduced to a fixed AI cap of 2.0 percent per year, unless PERA has a negative investment year. If PERA has a negative investment year, then for the next three years the AI becomes the lesser of 2.0 percent or the change in the CPI-W from the prior calendar year.
<b>PERA Tier 1A and DPS Tier 2</b>		
For members in the PERA benefit structure who began membership between July 1, 2005, and December 31, 2006, or members in the DPS benefit structure who began membership between July 1, 2005 and December 31, 2009	The AI was the lesser of 3.0 percent or the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W).*	
<b>PERA Tier 2</b>		
For members in the PERA benefit structure who began membership on or after January 1, 2007	The AI was the lesser of 3.0 percent or the CPI-W and in no case could exceed 10 percent of the AI reserve.	The AI cap was lowered to the lesser of 2.0 percent or the CPI-W, and in no case can it exceed 10 percent of the AI reserve.

\* The initial application of CPI-W used for PERA Tier 1A and DPS Tier 2 differed from the definition and application employed in the AI provisions under the reforms of SB 1. Initially, the AI granted during the year reflected the increase in the CPI-W value from the previous December in relationship to the December value from the prior year (two years prior to the year the increase was granted).

## VI. COLORADO PERA RETIREES KEEPING PACE WITH INFLATION

The AI cap, currently 2.0 percent, applicable to all groups, will adjust based on PERA’s overall funded status, with increases occurring when the funded status reaches 103 percent and decreases occurring when the funded status subsequently falls below 90 percent. The AI cap cannot fall below 2.0 percent.

In addition to the information shown in Exhibit 15, a second assessment was performed comparing the AI provisions, without consideration of the SB 1 reforms, to actual inflation. This analysis was conducted to illustrate how the pre-SB 1 AI provisions compared to inflation over the same five-year period. Currently, 98 percent of all PERA retirees and benefit recipients, are represented in the PERA and DPS Tier 1 groups. Exhibit 17 below, summarizes the saturation level for these members and the results of the AI comparative analysis as described.

Considering the PERA and DPS Tier 1 membership groups under the two scenarios, the PERA provided increase is compared to national average CPI-W on an average increase basis and a cumulative increase basis. The AI provisions, in place prior to the enactment of SB 1, would have provided increases that were equal to or above the rate of inflation reflecting the five-year study period. The actual PERA-provided increases, after consideration of the SB 1 reforms, more closely align with the rate of inflation for the majority of the retirees.

Appendix G provides a summary of all CPI-W data used to determine the applicable rate of inflation in comparison to the PERA Annual Increase for each year. The calculations associated with Exhibit 17 below are also provided in Appendix G.

### EXHIBIT 17

**Summary of AI Provision Increases Compared to National Inflation With and Without Consideration of SB 1 Reforms**

Membership Group	Without Consideration of SB 1 Reforms				Considering SB 1 Reforms			
	Average Increase		Cumulative Increase		Average Increase		Cumulative Increase	
	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W
<b>PERA Tier 1*</b>								
5-Year Experience	3.5%	1.7%	18.8%	8.7%	1.6%	1.7%	8.2%	8.7%
<b>DPS Tier 1†</b>								
5-Year Experience	3.3%	1.7%	17.3%	8.7%	1.7%	1.7%	8.8%	8.7%

\* PERA Tier 1 comprises approximately 92 percent of PERA's total retiree and benefit recipient population.

† DPS Tier 1 comprises approximately 6 percent of PERA's total retiree and benefit recipient population.

---

**SECTION VII**  
**Legal Rulings Allow for Continued**  
**Application of Senate Bill 10-001 Reform**

---



## VII. LEGAL RULINGS ALLOW FOR CONTINUED APPLICATION OF SENATE BILL 10-001 REFORM

---

Shortly after SB 1 was signed into law, a civil action was filed in Denver District Court (*Justus, et al. v. State of Colorado et al.*), alleging the modifications to the Annual Increase (AI) in SB 1 were unconstitutional.

On June 29, 2011, the Denver District Court ruled in favor of PERA and the State of Colorado and determined there is not a contractual right to a specific AI formula in place at retirement, for life without change. On July 25, 2011, the plaintiffs appealed the District Court's decision. In October 2012, the Court of Appeals remanded the case to the District Court for further review.

In remanding the case to the District Court, the Court of Appeals set forth the legal test for when benefits can be reduced and determined the plaintiffs are not entitled to a fixed AI formula for life without change. The Court determined the AI is a vested contract right, but the AI percentage can be reduced in certain circumstances. The AIs can be reduced if the modification was reasonable and necessary to address a legitimate public purpose.

In November 2012, all parties petitioned the Colorado Supreme Court for review of the Court of Appeals' ruling. On October 20, 2014, the Colorado Supreme Court issued its decision, finding the changes constitutional to the AI provisions in SB 1.

The Court stated, "[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."

The major takeaways from the decision are as follows:

- 1 There is no guaranteed right to receive a specific COLA amount for life in place on the date of retirement or on the date the retiree became eligible for retirement.
- 2 The decision is limited to whether there is a right to the specific COLA formula in place on the date of retirement or on the date the retiree became eligible for retirement.
- 3 COLA formulas have changed repeatedly over the years for current and future retirees.
- 4 The Court noted the difference in the statutory language defining the COLA (no guaranteed right to receive a specific COLA amount) versus the language defining the monthly base benefit.
- 5 The case provides the legal framework for when changes to current benefits are constitutional, but the case did not address any benefits other than the COLA.
- 6 The decision does not prevent any legal challenges to future changes in the COLA formula.





---

**SECTION VIII**  
**Senate Bill 14-214 Studies Highlight Efficient,  
Low-Cost Plan Design and Deliver Useful Analytic Tools**

---



In 2014, the Colorado General Assembly commissioned three independent studies to further the General Assembly's understanding of how well the Colorado PERA Hybrid Defined Benefit Plan is working for the State of Colorado. This section discusses how the results of the three reports were influenced by the scope and magnitude of the SB 1 reforms. The following three studies were commissioned by the General Assembly:

- 1 Total Compensation Study with Retirement Benefits**

The Colorado Department of Personnel and Administration prepares an annual compensation study for the workforce of the State of Colorado. The 2015 analysis included a comparison of the value of retirement benefits provided to PERA-covered state employees to the value of retirement benefits offered to employees in similar workforce structures, including private companies and other states.
- 2 Plan Design Study**

The Office of the State Auditor oversaw and commissioned an independent actuarial firm to conduct a comprehensive study comparing the cost and effectiveness of the design of the current PERA Hybrid Defined Benefit Plan to alternative plan designs currently in use in the public and private sector.
- 3 Sensitivity Analysis of PERA's Actuarial Assumptions**

The Office of the State Auditor oversaw and commissioned a separate independent actuarial firm to perform a sensitivity analysis and to develop an early warning mechanism to determine whether model actuarial assumptions used by PERA are meeting targets and achieving sustainability.

### Total Compensation Study

The Department of Personnel and Administration contracted with the actuarial firm of Milliman, Inc. to conduct the Retirement Benefits Survey authorized in the Senate Bill 14-214 legislation. Milliman's study compared the retirement value provided to state employees rather than the cost borne by the State with respect to the retirement benefits.

The report concluded the State's total compensation package is on par with the market median considering retirement health benefits.<sup>21</sup>

<sup>21</sup> Based on the findings of Milliman Inc., "When the total compensation package is valued, the State is just slightly below the prevailing market (0.2%)." Milliman's analysis included employee compensation and employer-provided retirement and retiree health benefits. The benefits, valued separately, resulted in a value above the prevailing market.

<sup>22</sup> GRS Plan Design Study Report, June 2015, page 2.

<sup>23</sup> GRS Plan Design Study Report, June 2015, page 59.

<sup>24</sup> GRS Plan Design Study Report, June 2015, page 65.

<sup>25</sup> GRS Plan Design Study Report, June 2015, page 65.

<sup>26</sup> GRS Plan Design Study Report, June 2015, page 83.

### Plan Design Study

The Office of the State Auditor contracted with the actuarial firm of Gabriel, Roeder, Smith and Company (GRS) to conduct the Plan Design Study. The comprehensive study compares the cost and effectiveness of the design of the Colorado PERA Hybrid Defined Benefit Plan to alternative plan designs in the public and private sector.

The results of this independent study show the reforms to the benefit provisions of PERA, modified by SB 1, created a plan design that "...is more efficient and uses dollars more effectively than the other types of plans in use today."<sup>22</sup>

The study further concluded:

- "...the existing PERA Hybrid Plan provides a higher level of benefit at the current cost than all alternative plans."<sup>23</sup>
- "...the retirement benefits provided by the PERA Hybrid Plan are neither too generous nor too low when compared to other similarly situated public sector employers."<sup>24</sup>
- "When comparing the PERA Hybrid Plan to the private sector, those private sector plans that combine Social Security with a defined contribution plan do not replace as much income as PERA..."<sup>25</sup>
- "The State cannot eliminate the unfunded liability by moving new hires to an alternative plan..."<sup>26</sup>

The SB 1 reforms reduced the cost of providing benefits for employees hired on or after January 1, 2011, to a level where the majority of the cost of the accruing benefit is funded by the member—while maintaining a plan design that provides the highest replacement income in retirement of any plan design in use for the purpose of providing retirement security considering all starting ages and career lengths.

### Sensitivity Analysis of PERA's Actuarial Assumptions

The Office of the State Auditor contracted with the actuarial firm of Pension Trustee Advisors (PTA) to conduct the sensitivity study. The principal objective of this comprehensive study is to develop an early warning mechanism designed to identify and communicate whether model actuarial assumptions used by PERA are meeting targets and achieving sustainability. The study also tested the assumptions to indicate under which conditions targets will not be achieved and the plan may no longer be sustainable.

## VIII. SENATE BILL 14-214 STUDIES HIGHLIGHT EFFICIENT, LOW-COST PLAN DESIGN AND DELIVER USEFUL ANALYTIC TOOLS

---

PTA developed a “signal light” approach to communicate the key findings regarding the variability in the PERA’s key actuarial assumptions, such as investment rate of return, payroll growth, and mortality. The methodology used reflects the possibility of actual future experience varying from the assumptions in both the short and long term. In this signal light methodology, the current projection of each PERA division is compared to the following signals:

- Light green phasing up to dark green—positive, well-funded and hitting targets.
- Yellow—warning, increasing negative caution.
- Orange phasing down to dark red—danger, insolvent or soon to be insolvent.

The projections of the Sensitivity Study as of December 31, 2014, for each PERA division, reflecting the SB 1 reforms and applying PERA’s current set of actuarial assumptions, all result in positive (light green) indicators with the exception of the Judicial Division which shows a warning (yellow) indicator.

The case study performed by PTA and using the signal-light methodology, illustrates the effectiveness of the pension reform implemented via SB 1 by showing the signal lights as dark red or red for each PERA division as of December 31, 2008 (projected to be insolvent or technically insolvent), for all but the Judicial Division, which would have been orange. After reflection of the impact of SB 1, as of December 31, 2009, the signal lights were improved to a green shade for all divisions. The study also illustrates that the four largest divisions of PERA, annually, would have tested light green or better since that time, and Judicial Division, light green varying to yellow.

PTA summarized by stating, “...*the PERA Hybrid Defined Benefit Plan is currently on track to be fully funded...Prior to the changes in Senate Bill 10-001, the PERA Plan was projected to become insolvent.*”

During their analysis, PTA was able to replicate the funded ratio projections performed by Cavanaugh Macdonald Consulting, LLC, (CMC), PERA’s actuaries, and confirmed the reasonableness of PERA’s actuarial assumptions including the 7.5 percent LTROR and discount rate. PTA’s analysis also revealed the assumed long-term investment rate is by far the most significant variable in determining when PERA will achieve full-funded status.

In addition, the PTA report encompassed three recommendations related to enhanced disclosure and use of the signal-light methodology, each of which PERA agreed to implement. PERA, as an ongoing advocate of sustainability and transparency, will be the first public pension plan in the nation to incorporate such a tool in its annual reporting to policymakers and stakeholders.

## VIII. SENATE BILL 14-214 STUDIES HIGHLIGHT EFFICIENT, LOW-COST PLAN DESIGN AND DELIVER USEFUL ANALYTIC TOOLS

### Economic Impact on Colorado PERA Employers and Taxpayers

In order to answer the question as to how PERA contributions impact the economy from the employers and taxpayers' perspectives, comparing contribution rates with other states and/or similarly structured public pension plans and then the actual cost of the plan as a percentage of the state's Gross Domestic Product (GDP) is useful. If available, one also could compare the percentage of GDP to the cost of peer public pension plans in terms of their respective state's GDP.

PERA's maximum employee and employer rates are lower than the average maximum contribution rates of peer pension plans. The summary of results of the PERA Public Pension Plan Contribution Rate Analysis is available in Appendix H.

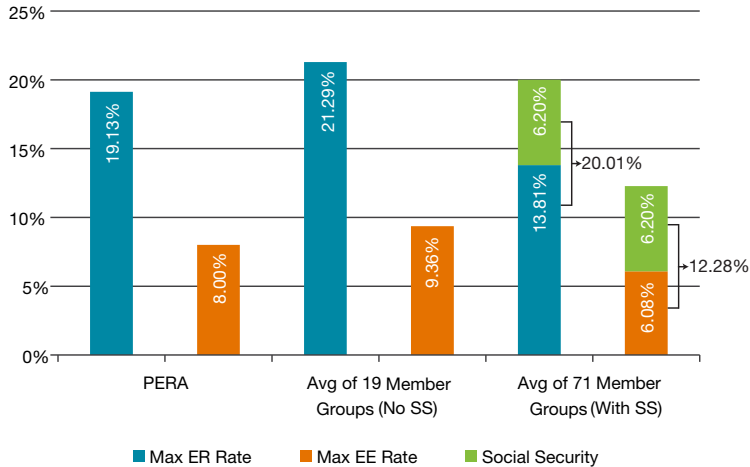
For a more in-depth analysis as to how PERA's member and employer contribution rates compare to contribution rates of peer pension plans, PERA conducted a study of public retirement plans considering the state and school employees and teachers from 19 public plans/member groups who do not participate in Social Security (including Colorado State and School Divisions) and 71 public plans/member groups who participate in Social Security.

In order to provide a fair comparison, 6.20 percent (the current Social Security rates) was added to both the average member and average employer contribution rates of the member groups participating in Social Security, as PERA is intended to be a replacement plan for Social Security, and is the only safety net available to the majority of PERA members.<sup>27</sup> Results of this analysis are shown below in Exhibit 18.

<sup>27</sup> A few Local Government Division employers participate in both PERA and Social Security.

#### EXHIBIT 18

Comparison of Maximum Contribution Rates of Identified Member Groups\*  
(As a Percent of Covered Payroll)



\*Results are based on the analysis performed by Colorado PERA (August 2015). Maximum employer contribution rates were recorded, if available, and contribution rates related to health care benefits were excluded, where separately identified.

## VIII. SENATE BILL 14-214 STUDIES HIGHLIGHT EFFICIENT, LOW-COST PLAN DESIGN AND DELIVER USEFUL ANALYTIC TOOLS

Pacey Economics, Inc. conducted a review of PERA-employer financial statements.<sup>28</sup>

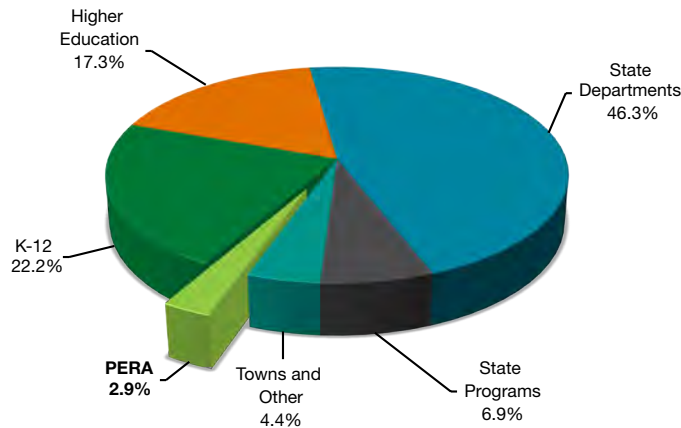
The results of their assessment, as shown in Exhibit 19 below, communicate that PERA employer contributions account for 2.9 percent of their employer budgets. Based on a [recent report from the National Association of State Retirement Administrators \(NASRA\)](#), this is substantially below the national average of 3.9 percent of direct governmental general

spending. The per capita costs per Colorado resident to pay for the PERA-provided pension benefit for teachers, state and local government employees, and judges serving those residents, is approximately \$280 per year while the per capita benefit distributions amount to approximately \$655 per year, or about 2.34 times the employer contributions.

<sup>28</sup> The estimate is based upon 92 percent of PERA employer financial statements representing over 98 percent of actual active PERA membership.

### EXHIBIT 19

Expenses by Employer Type as a Percent of Budget



### EXHIBIT 20

PERA Employer Contributions as a Percent of State GDP by Year\*



\* Includes 1/2 of SAED contributions.

A further examination of PERA employer contributions reveal even with the recent increases in contributions under SB 1, the historical economic metrics related to these costs did not

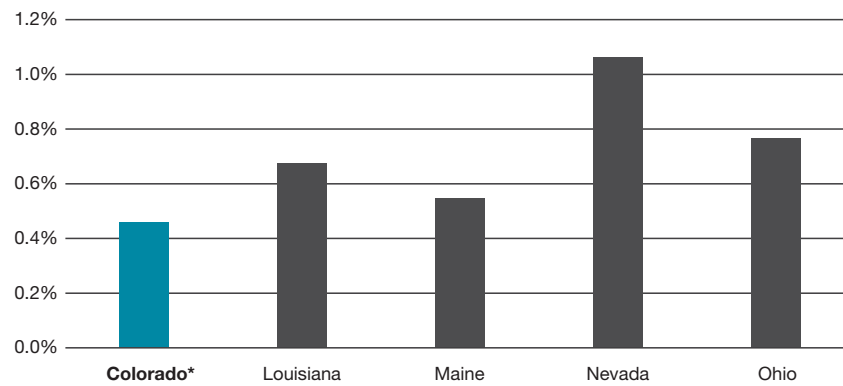
change. As shown in Exhibit 20 above, since the adoption of SB 1 reforms, PERA employer contributions remained at relatively the same share of total Colorado GDP.

## VIII. SENATE BILL 14-214 STUDIES HIGHLIGHT EFFICIENT, LOW-COST PLAN DESIGN AND DELIVER USEFUL ANALYTIC TOOLS

Exhibit 21 below, compares PERA's cost as a percentage of Colorado's GDP to the costs of peer public pension plans (those in which all state and education workers do not participate in Social Security) as a percentage of their respective state's GDP.

### EXHIBIT 21

**Employer Contributions as a Percentage of State GDP  
for Selected States in 2014**



Includes Colorado PERA, Louisiana SERS, Louisiana TRSL, Maine PERS, Nevada Regular Employees, Ohio PERS, Ohio STRS, and Ohio SERS

\* Includes employer base contribution, AED, all SAED, and the settlement dollars received in 2014 for the disaffiliation of the Memorial Health System.

The [2015 Colorado PERA Economic and Fiscal Impacts report](#) and the additional data from Pacey Economics, Inc., reflected above, can be found in Appendix I.





---

**SECTION IX**  
**Economic Impact Studies Show Colorado PERA**  
**is One of Colorado's Best Investments**

---



## IX. ECONOMIC IMPACT STUDIES SHOW COLORADO PERA IS ONE OF COLORADO'S BEST INVESTMENTS

With the passage of SB 1 in 2010, the General Assembly showed support for Colorado PERA's Hybrid Defined Benefit Plan by implementing a reduced defined benefit structure and a systematic approach to paying for promised retirement obligations, the combination which reduced the funding shortfall predominantly resulting from the 2008 economic crisis. As described earlier in Section VIII of this report, Gabriel Roeder Smith & Company (GRS) confirmed, "...that the current PERA Hybrid [Defined Benefit] Plan is more efficient and uses dollars more effectively than the other types of plans in use today."<sup>29</sup>

In April 2015, Pacey Economics, Inc. delivered to PERA an update to previous studies regarding the economic impact of PERA's benefit distributions throughout the State of Colorado. With over 510,000 members and retirees of PERA representing more than 10 percent of the adult population of the state, PERA is one of Colorado's best investments.

### Current Perspective: Statewide Economic Impact

Shown below are the general highlights of the 2015 Pacey economic update.

- In 2014, PERA distributed over \$3.5 billion in benefits to Colorado residents representing 3.5 percent of state payroll (U.S. Census Bureau) or 1.15 percent of the State Gross Domestic Product (GDP).
  - Creating \$5.2 billion in economic output.
  - Sustaining an additional 29,357 jobs or 1.2 percent of total non-farm payroll employment.
  - Producing \$2.52 billion in value-added to State GDP beyond the \$3.5 billion in benefit distributions.
  - Generating \$267 million in state and local tax revenue which equals 22 percent of employer pension contributions.

Ultimately, because of the 80-year long-term investment in PERA by the State, PERA provides significantly more in economic output annually to Colorado than the total contribution cost to employees, employers, and taxpayers. In addition, the contribution changes and benefit reforms contained in SB 1 keep the total cost of the benefits as a percentage of the economy and employer budgets, stable.

### Estimated Impact of Alternative Retirement Plan Designs

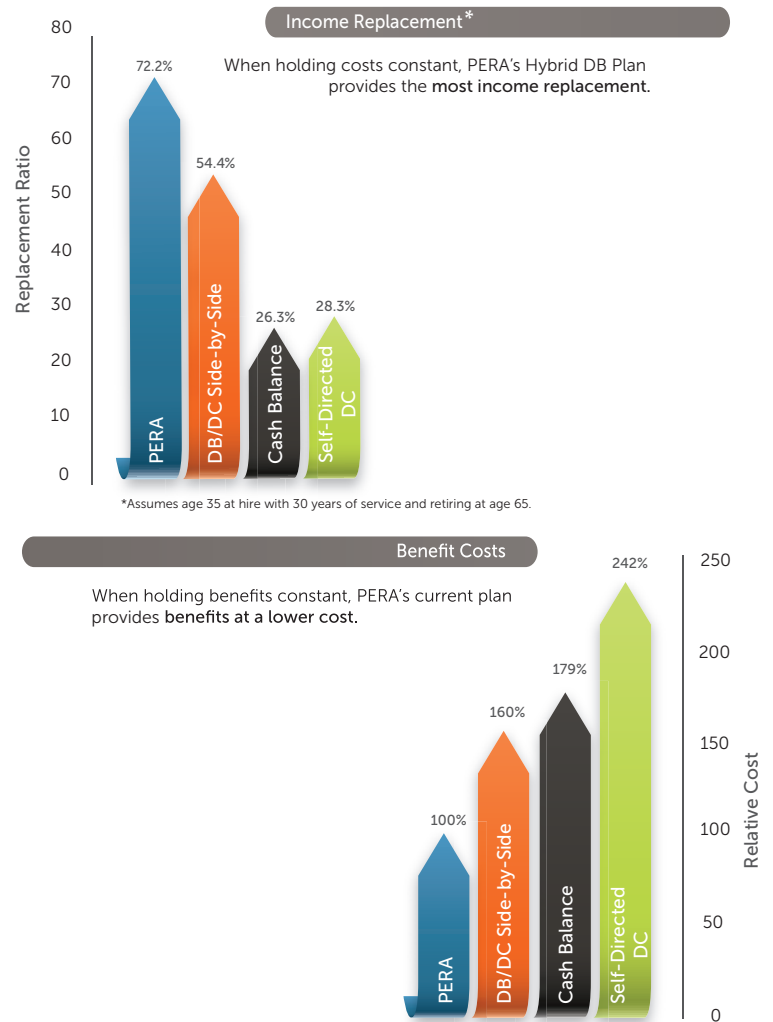
The General Assembly directed that an independent assessment of PERA's Hybrid Defined Benefit Plan be compared to other common and potential plan designs (SB 14-214), including variations on defined contribution (DC) designs and cash balance designs. The Office of the State Auditor commissioned GRS to provide the assessment on cost/

benefit efficiency basis. The analysis showed all other retirement benefit plans produced lower benefits for higher costs.

If considering the same cost structure as the PERA Hybrid DB Plan, the retirement benefits provided to a typical full service career employee at age 65 under the PERA Hybrid DB Plan structure would be significantly greater than the benefits provided to that same career employee under the alternative plan structures. Or looking at it another way, to provide the same benefits as the PERA Hybrid DB Plan for a typical full service career at age 65 under an alternative plan structure would cost significantly more, as illustrated in Exhibit 22.

EXHIBIT 22

### Comparison of the PERA Hybrid DB Plan to Alternative Plan Designs COMPARED TO OTHER TYPES OF PLANS, PERA'S HYBRID PLAN IS MORE EFFICIENT AND USES DOLLARS MORE EFFECTIVELY



<sup>29</sup> GRS Plan Design Report, June 2015, page 2.

## IX. ECONOMIC IMPACT STUDIES SHOW COLORADO PERA IS ONE OF COLORADO'S BEST INVESTMENTS

The cost and benefit inputs and outputs of these various plan designs are significantly different when compared to the existing PERA Hybrid DB Plan design. The results of the GRS study indicate that Colorado's overall economic health, wealth, and vitality would have been dramatically less had Colorado adopted one these different plan designs for its public employees.

Pacey Economics used the GRS study and PERA's historical asset values and benefit disbursements to perform a historical simulation of the estimated impacts of alternative plan structures over the previous 30-year period.

### Historical Perspective: PERA Hybrid DB Plan vs. Ideal and Self-Directed DC Plans

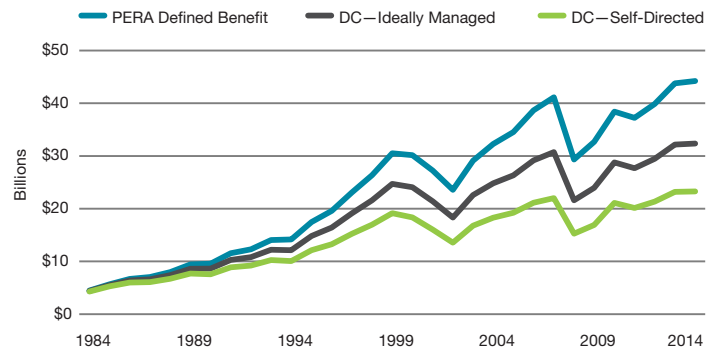
In 1984, PERA had a balance (assets for active members and retirees) of approximately \$3.9 billion with 99,000 active members and 27,700 benefit recipients.

Thirty years later the fund has grown to \$44.2 billion for approximately 202,700 members, 218,800 inactive members, and 107,600 benefit recipients, representing over 10 percent of the adult population of Colorado.

With the same historical contributions by PERA members and employers and the same withdrawals (as a percent of available funds) over this 30-year period, the assets available to active and inactive members and retirees, even in an "ideally managed" (same low fees as a DB plan) DC plan, would result in an approximate fund balance of \$32.4 billion. Under the same scenario, but assuming a self-directed DC plan had been adopted, the fund balance would be approximately \$23.3 billion. Exhibit 23, below, illustrates the actual and hypothetical accumulations of trust assets as described.

#### EXHIBIT 23

**Actual PERA Ending Balance and Projected Ending Balance Under a DC Plan  
(Assets of Active Members and Retirees) by Year**



Source: PERA CAFRs, Morningstar, National Institute on Retirement Security, GRS Plan Design Study

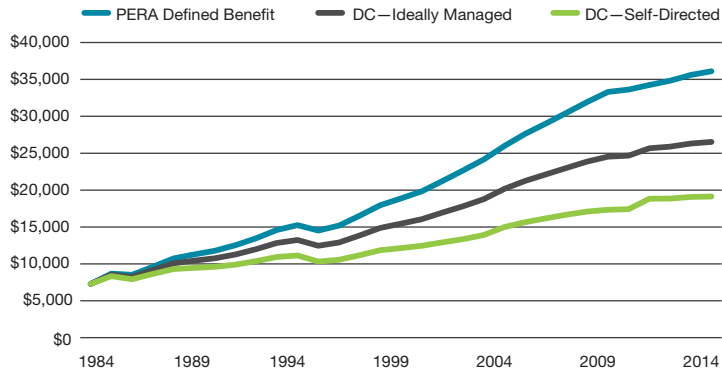
Note: Includes one-time DPS transfer of \$2.75 billion as of January 2010

Assumptions: 2.0% lower return in an "ideally managed" DC plan than PERA DB;  
2.5% lower return in self-direct DC plan than "ideally managed" DC plan

## IX. ECONOMIC IMPACT STUDIES SHOW COLORADO PERA IS ONE OF COLORADO'S BEST INVESTMENTS

### EXHIBIT 24

**Actual PERA Benefits Per Capita and Projected Benefits Per Capita Under a DC Plan by Year**



Source: PERA CAFRs, Morningstar, National Institute on Retirement Security

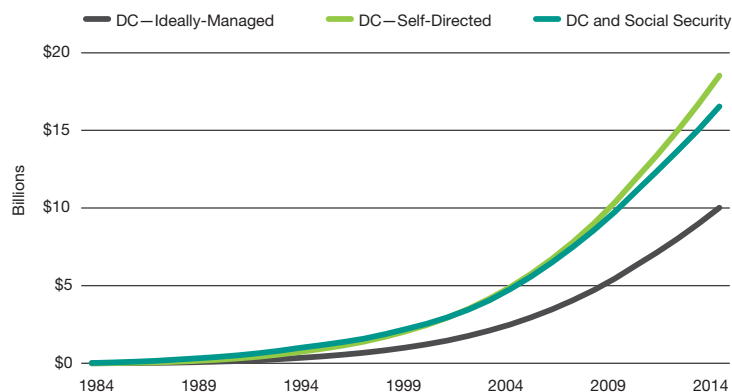
The reductions in the standard of living for retirees and the flexibility of the employer workforce structures would have been dramatic. With the same member and employer contributions since 1984, per capita benefits under ideal DC management would be significantly lower with an average annual benefit of \$26,500, compared to the current average of \$36,100 per year under PERA. Under typical DC self-directed management, the results show an even greater difference with

expected annual benefit of only \$19,100 per year. Adding in Social Security with a DC Plan only marginally improves the annual benefit to \$24,700 per year.

Adopting these alternative retirement plans would not only be adverse for public employees and their standard of living, but after 30 years, the State of Colorado would be measurably worse off with less total wealth and less annual income as shown in Exhibit 24 above.

### EXHIBIT 25

**Cumulative Loss to State GDP if Colorado had been in a DC Plan by Year**



## IX. ECONOMIC IMPACT STUDIES SHOW COLORADO PERA IS ONE OF COLORADO'S BEST INVESTMENTS

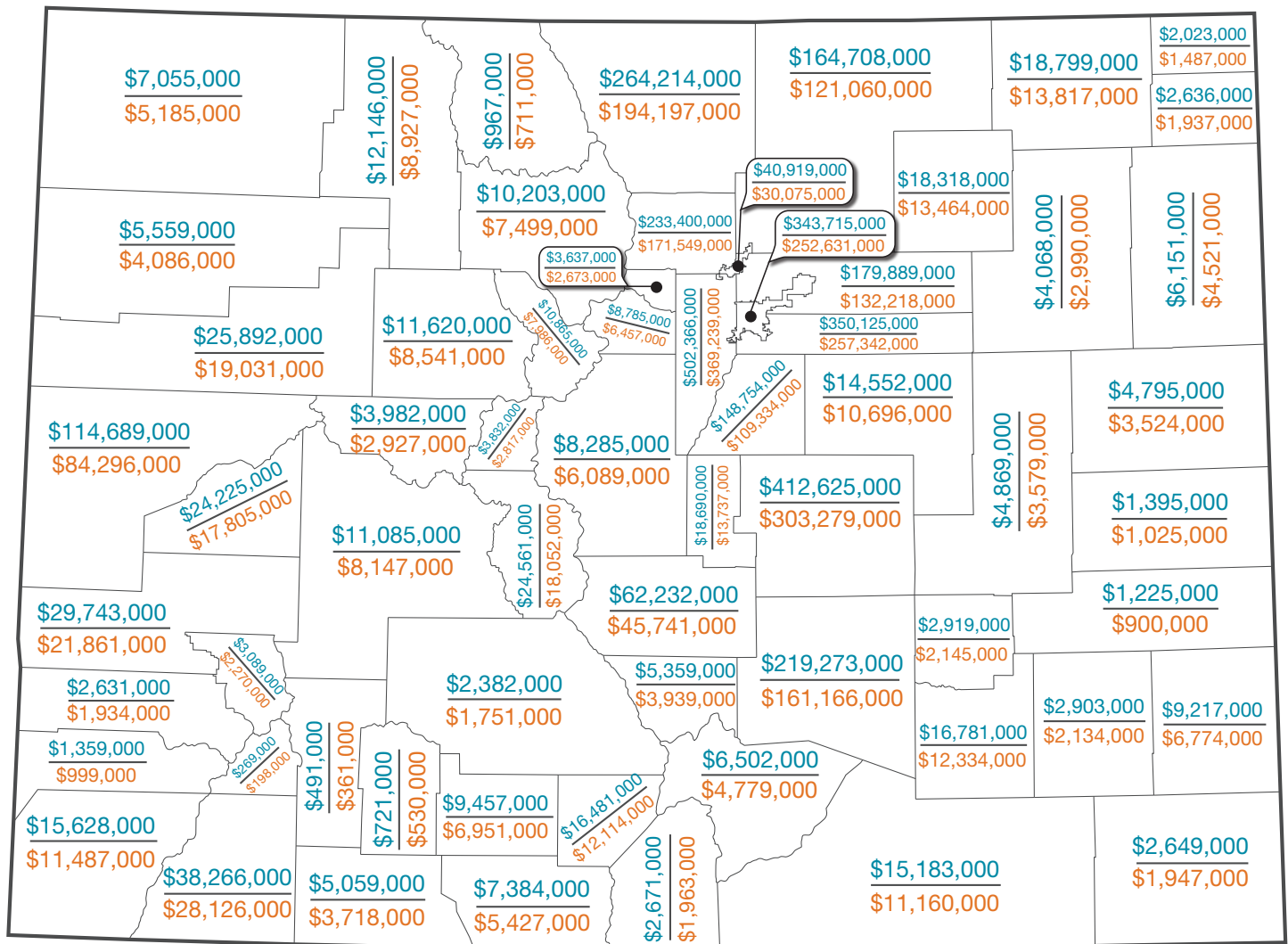
Pacey Economics calculations show even under an ideally managed DC plan, the State's annual GDP would be more than \$1 billion less today than it otherwise would be and cumulative losses to State GDP would be over \$10 billion since 1984 as shown in Exhibit 25 on the previous page.

Under a DC plus Social Security plan, the annual and cumulative losses would be even greater at approximately \$1.5 billion and \$16.5 billion, respectively. These amounts are in addition to the estimated loss to the portfolio of assets of \$12 billion under an ideally managed DC plan.

EXHIBIT 26

### PERA Benefit Distributions by County

- PERA Hybrid DB Plan Distributions\*
- Ideally Managed DC Plan Distributions† (had it been implemented in 1984)



\* Colorado PERA Economic and Fiscal Impacts, Pacey Economics, Inc., April 2015. Reflects PERA distributions as of September 2014.

† Information provided by Pacey Economics, Inc., using scaling factor of 73.5%.

## IX. ECONOMIC IMPACT STUDIES SHOW COLORADO PERA IS ONE OF COLORADO'S BEST INVESTMENTS

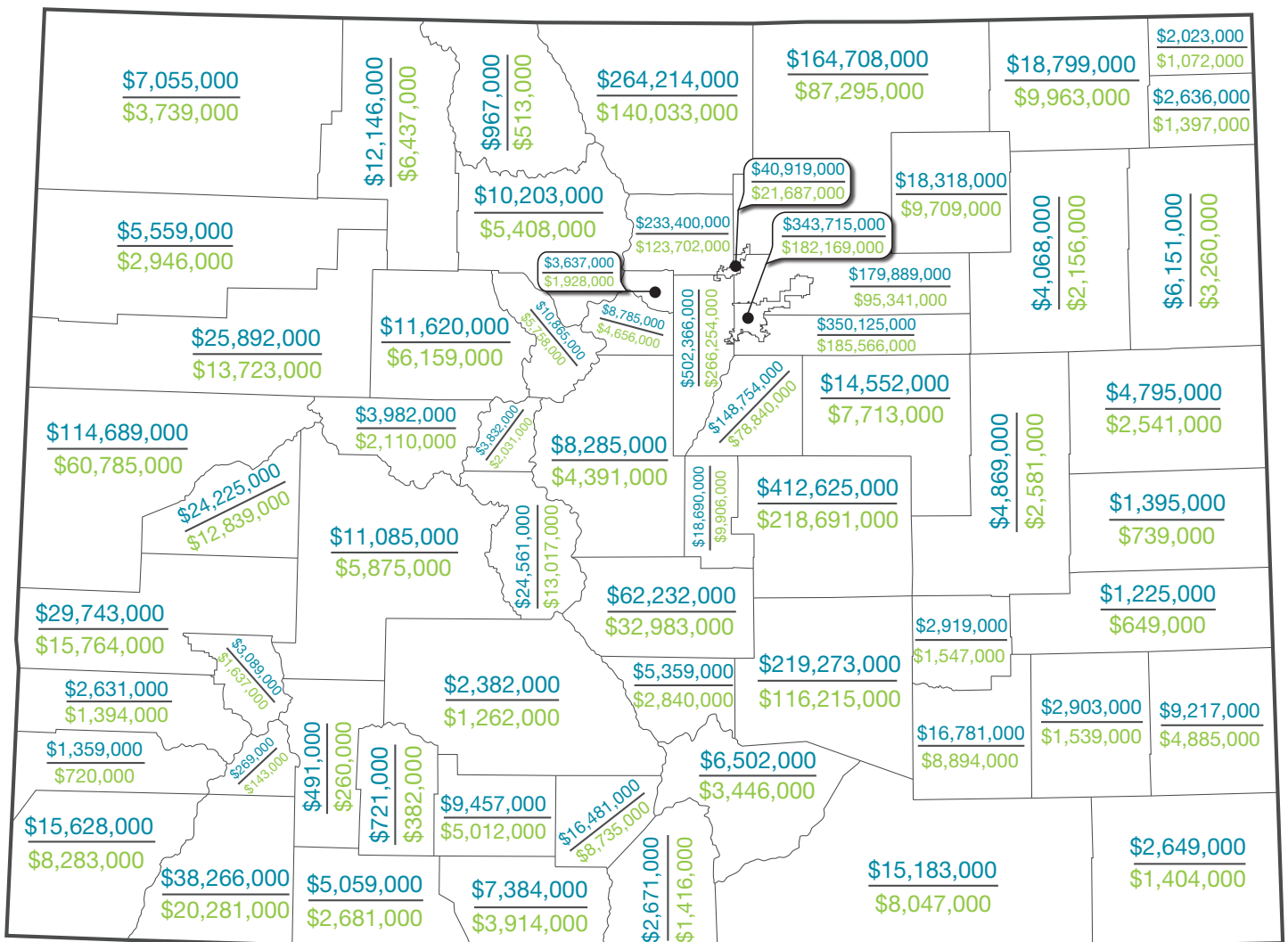
Switching to a cash balance plan or a side-by-side DB and DC plan would not have been as extreme as switching to an ideally managed DC plan. The State would have less wealth, less income, and retirees' standard of living would be lower with regard to an ideally managed or a self-directed DC plan, as shown in Exhibits 26 and 27.

The [2015 Colorado PERA Economic and Fiscal Impacts Report](#) and the additional data from Pacey Economics, Inc. is reflected in this section can be found in Appendix I.

### EXHIBIT 27

#### PERA Benefit Distributions by County

- PERA Hybrid DB Plan Distributions\*
- Self-Directed DC Plan Distributions† (had it been implemented in 1984)



\* Colorado PERA Economic and Fiscal Impacts, Pacey Economics, Inc., April 2015. Reflects PERA distributions as of September 2014.

† Information provided by Pacey Economics, Inc., using scaling factor of 53.0%.





---

**SECTION X**  
**Revised Pension Funding Policy Yields**  
**Greater Transparency and Stability**

---



### Revised Pension Funding Policy

On March 20, 2015, the PERA Board adopted a revised pension funding policy. Even though PERA does not set the funding levels of the PERA divisions, a unified funding philosophy is recommended for both administrative and fiduciary purposes.<sup>30</sup>

The Board-adopted pension funding policy can be found in Appendix J of this report.

In response to the need for a new funding benchmark, the Board agreed upon an actuarially determined contribution (ADC), generally reflecting a 30-year closed period for amortizing the unfunded actuarial accrued liability (UAAL) as of December 31, 2014. As the funding policy delineates, this benchmark is only one of a number of actuarial metrics used to gauge funding progress of PERA and the statutory rates provided for in PERA statute. The revised funding policy also clarifies, *“In Colorado PERA’s situation, until future scheduled contribution increases are fully realized, the results of the actuarial projections will be the best indication of the adequacy of the statutorily prescribed contribution schedule.”*

### Funded Ratio Projections Based on ARC/ADC

Included in this section are a few variations of the actuarial projections presented in Section V, which reflect the ADC. The graphs on pages 70–71 show the projected funding ratios and period assuming the current 7.5 percent assumed LTROR and payment of the ARC and/or newly defined ADC.

The first alternative scenario assumes the ARC was paid over each of the previous five years and future payments will be dictated by the SB 1 contribution structure, thereafter.

The second alternative scenario assumes payment of the ARC, over each of the previous five years, and payment

of the ADC for each future year during the projection period. This illustrates the projected full funding date under the contribution benchmark, both historic (ARC) and future (ADC).

Line D in the funded ratio projection graphs on pages 70–71 is shown under the same assumptions as delineated in Section V of this report. For these illustrations, Line D should be considered the baseline or assumed scenario, and is shown for comparative purposes.

As illustrated on each funded ratio projection graph by Line D2, if the ARC was paid over the last five years, and assuming the SB 1 contribution structure is followed over the remaining years of the projection period, projected full funding would be achieved approximately three years sooner in the State Division, four years sooner in the School Division, and eight years sooner in both the Judicial and DPS Divisions.

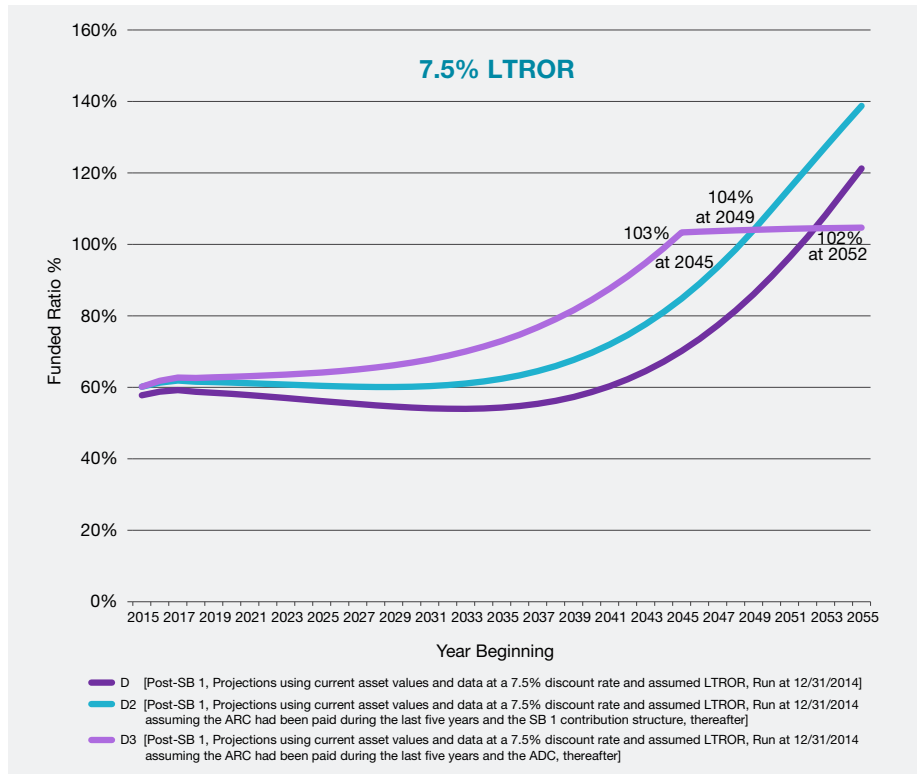
If the ARC was paid over the last five years, and the recently defined ADC was paid over the remaining years of the projection period (represented by Line D3), the projected full funding date would be accelerated by approximately seven years in the State Division, eight years in the School Division, 19 years in the Judicial Division, and four years in the DPS Division.

Following are the funded ratio projection graphs for the State, School, and Local Government Divisions showing Lines D, D2, and D3.

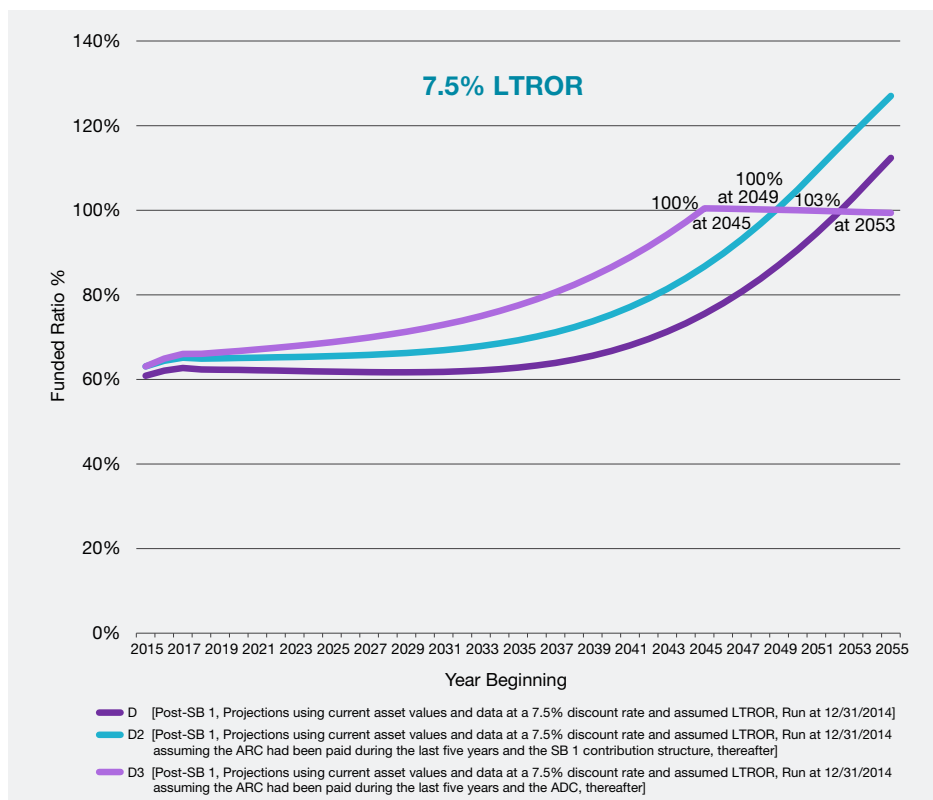
<sup>30</sup>The discussion regarding revising the funding policy in place since 2007 initially was borne of the necessity for the Board to define a contribution rate benchmark since the previous benchmark defined by the Governmental Accounting Standards Board (GASB)—the Annual Required Contribution (ARC)—was discontinued due to the release of new accounting and financial reporting requirements related to defined benefit pension plans. The revised GASB statements purposefully delinked the requirements of the funding of pensions from the requirements relating to the accounting and financial reporting of pensions, and thus, no revised funding benchmark was included in the new GASB statements.

## X. REVISED PENSION FUNDING POLICY YIELDS GREATER TRANSPARENCY AND STABILITY

**Colorado PERA—State Division**  
**Projection of Funded Ratio on Actuarial Asset Value**  
**Projection Lines D, D2, and D3**



**Colorado PERA—School Division**  
**Projection of Funded Ratio on Actuarial Asset Value**  
**Projection Lines D, D2, and D3**



## X. REVISED PENSION FUNDING POLICY YIELDS GREATER TRANSPARENCY AND STABILITY

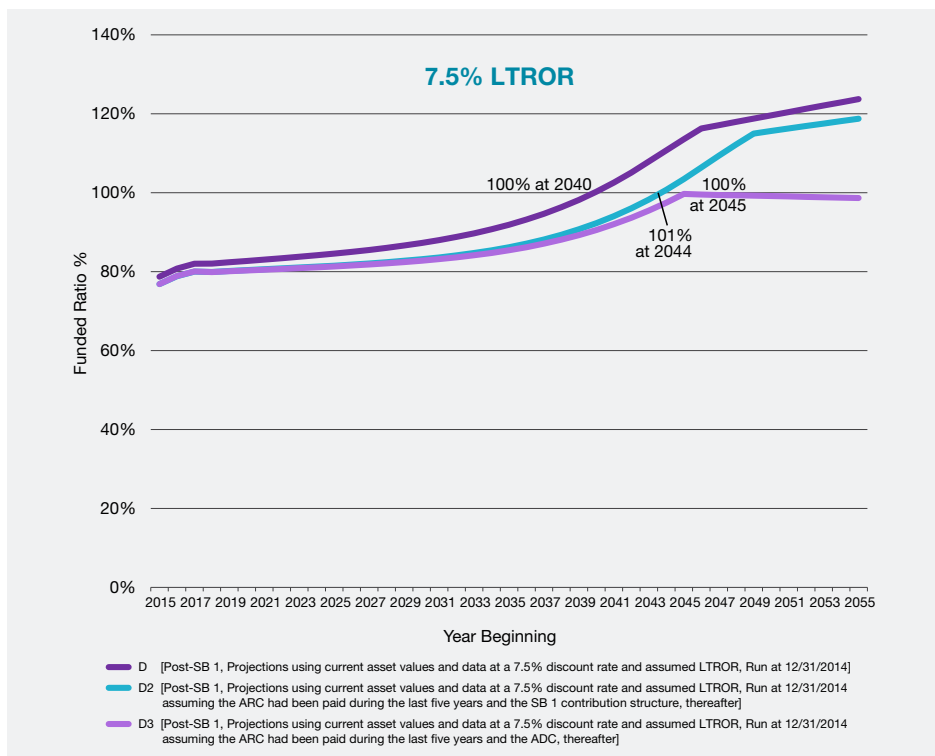
The funded ratio projection graphs for the State and School Divisions are shown in this section since these two divisions represent approximately 86 percent of PERA’s total population and approximately 93 percent of PERA’s UAAL, and thus represent the most significant funding challenges in the future.

The difference between the Line D3 (light purple) and Line D (purple) depicts the difference in the expected funding period given the contribution patterns assumed under each scenario.

Since Line D3 assumes the ARC/ADC was paid since 2010 and will continue to be paid into the future, the line is continually increasing over the 30-year period until reaching 100 percent by 2045.

Based on statutory contribution rates, the scheduled employer contributions for these divisions are not currently covering the interest on the UAAL, as is illustrated by Line D in each graph. Line D continues to slightly decline or hold steady for these two divisions over the next 17 to 20 years, assuming all other assumptions are met. With the expected increases to the AED, SAED, salaries and population growth, and anticipated decreases to the normal cost, or accrual rates of the active populations, the funded ratios are projected to increase by approximately 2032 and accelerate toward 100 percent thereafter.

**Colorado PERA—Local Government Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines D, D2, and D3**



As shown in the funded ratio projection graph above, the same situation is not true for the Local Government Division. The current employer contribution rates, including AED and SAED, exceed the new benchmark ADC calculated rate and therefore, Line D for the Local Government Division is projected to attain a 100 percent funded ratio in 25 years; five years prior to Line D3.

These funded ratio projection graphs are exhibited to show a projection of the new funding benchmark as detailed in the recently adopted PERA pension funding policy. The graphs for each division can be found in Appendix J.



---

**APPENDIX A**  
**Senate Bill 10-001 Legislative Act**

---





# An Act

SENATE BILL 10-001

BY SENATOR(S) Shaffer B. and Penry, Bacon, Boyd, Brophy, Carroll M., Foster, Gibbs, Heath, Hodge, Hudak, Johnston, Keller, Kester, Morse, Newell, Romer, Sandoval, Schwartz, Steadman, Tapia, Tochtrop, Whitehead, Williams;  
also REPRESENTATIVE(S) Kerr A., Benefield, Fischer, Kagan, Labuda, Pommer, Schafer S., Tyler.

CONCERNING MODIFICATIONS TO THE PUBLIC EMPLOYEES' RETIREMENT ASSOCIATION NECESSARY TO REACH A ONE HUNDRED PERCENT FUNDED RATIO WITHIN THE NEXT THIRTY YEARS.

*Be it enacted by the General Assembly of the State of Colorado:*

**SECTION 1.** 24-51-101 (6.5) and (30), Colorado Revised Statutes, are amended, and the said 24-51-101 is further amended BY THE ADDITION OF A NEW SUBSECTION, to read:

**24-51-101. Definitions.** As used in this article, unless the context otherwise requires and except as otherwise defined in part 17 of this article:

(6.5) "Base benefit" means the initial benefit for a benefit ~~which~~ THAT becomes effective after ~~March 1, 2000~~ MARCH 1, 2009. For a benefit ~~which~~ THAT became effective on or before ~~March 1, 2000~~ MARCH 1, 2009,

"base benefit" means the total benefit payable as of ~~February 28, 2001~~ JUNE 30, 2010, including the sum of the initial benefit, accumulated annual increases, and cost of living increases.

(30) "Member contribution" means the money paid to the association ~~which~~ THAT equals a percentage of the member's salary as determined pursuant to the provisions of section 24-51-401 (1.7). "MEMBER CONTRIBUTION" DOES NOT INCLUDE WORKING RETIREE CONTRIBUTIONS AS DEFINED IN SUBSECTION (53) OF THIS SECTION.

(53) "WORKING RETIREE CONTRIBUTIONS" MEANS AN AMOUNT PAID TO THE ASSOCIATION THAT EQUALS THE PERCENTAGE OF SALARY THAT WOULD BE PAID AS MEMBER CONTRIBUTIONS PURSUANT TO SECTION 24-51-401 (1.7) (a); EXCEPT THAT WORKING RETIREE CONTRIBUTIONS SHALL NOT BE CONSIDERED MEMBER CONTRIBUTIONS AND SHALL NOT BE DEPOSITED IN THE MEMBER CONTRIBUTION ACCOUNT.

**SECTION 2.** 24-51-101 (25) (b), Colorado Revised Statutes, is amended BY THE ADDITION OF A NEW SUBPARAGRAPH to read:

**24-51-101. Definitions.** As used in this article, unless the context otherwise requires and except as otherwise defined in part 17 of this article:

(25) (b) (V) NOTWITHSTANDING ANY OTHER PROVISION OF THIS PARAGRAPH (b), IN CALCULATING HIGHEST AVERAGE SALARY FOR A MEMBER OR INACTIVE MEMBER NOT ELIGIBLE FOR SERVICE OR REDUCED SERVICE RETIREMENT ON JANUARY 1, 2011, THE ASSOCIATION SHALL DETERMINE THE HIGHEST ANNUAL SALARIES ASSOCIATED WITH FOUR PERIODS OF TWELVE CONSECUTIVE MONTHS OF SERVICE CREDIT. THE LOWEST OF SUCH ANNUAL SALARIES SHALL BE THE BASE SALARY. THE FIRST ANNUAL SALARY TO BE USED IN THE HIGHEST AVERAGE SALARY CALCULATION SHALL BE THE ACTUAL SALARY REPORTED UP TO ONE HUNDRED EIGHT PERCENT OF THE BASE SALARY. THE SECOND ANNUAL SALARY TO BE USED IN THE HIGHEST AVERAGE SALARY CALCULATION SHALL BE THE ACTUAL SALARY REPORTED UP TO ONE HUNDRED EIGHT PERCENT OF THE FIRST ANNUAL SALARY USED IN THE HIGHEST AVERAGE SALARY CALCULATION. THE THIRD ANNUAL SALARY TO BE USED IN THE HIGHEST AVERAGE SALARY CALCULATION SHALL BE THE ACTUAL SALARY REPORTED UP TO ONE HUNDRED EIGHT PERCENT OF THE SECOND ANNUAL SALARY USED IN THE HIGHEST AVERAGE SALARY CALCULATION. THIS SUBPARAGRAPH (V) SHALL NOT APPLY TO MEMBERS OF

THE JUDICIAL DIVISION, EXCEPT FOR DPS MEMBERS OF THE JUDICIAL DIVISION WHO HAVE EXERCISED PORTABILITY PURSUANT TO SECTION 24-51-1747 AND SELECTED THE DENVER PUBLIC SCHOOLS BENEFIT STRUCTURE. THIS SUBPARAGRAPH (V) SHALL APPLY TO DPS MEMBERS IN ACCORDANCE WITH SECTION 24-51-1702 (17).

**SECTION 3.** 24-51-204 (7), Colorado Revised Statutes, is amended to read:

**24-51-204. Duties of the board.** (7) (a) The board or its designated agent shall submit an annual actuarial valuation report to the legislative audit committee and the joint budget committee of the general assembly, together with any recommendations concerning such liabilities that have accrued.

(b) IN THE ANNUAL ACTUARIAL VALUATION, THE BOARD SHALL FIRST DETERMINE THE TOTAL AGGREGATE ACTUARIAL FUNDED RATIO OF THE ASSOCIATION, APPLY THE ADJUSTMENTS PURSUANT TO SECTION 24-51-1009.5, AND THEN DETERMINE THE ACTUARIAL FUNDED RATIO OF EACH DIVISION SEPARATELY.

**SECTION 4.** Part 2 of article 51 of title 24, Colorado Revised Statutes, is amended BY THE ADDITION OF A NEW SECTION to read:

**24-51-211.5. Notice of possible change in benefits - actuarial necessity.** THE ASSOCIATION SHALL PROVIDE WRITTEN NOTICE TO EACH MEMBER, DPS MEMBER, AND INACTIVE MEMBER OF THE ASSOCIATION THAT THE POSSIBILITY OF AN ACTUARIAL NECESSITY COULD OCCUR IN THE FUTURE, AND THE GENERAL ASSEMBLY MAY MODIFY BY BILL THE BENEFITS ALLOWED TO MEMBERS OF THE DEFINED BENEFIT PLAN.

**SECTION 5.** Part 2 of article 51 of title 24, Colorado Revised Statutes, is amended BY THE ADDITION OF A NEW SECTION to read:

**24-51-220. Report to general assembly.** THE ASSOCIATION SHALL PROVIDE A REPORT TO THE GENERAL ASSEMBLY ON JANUARY 1, 2016, AND EVERY FIVE YEARS THEREAFTER, REGARDING THE ECONOMIC IMPACT OF THE 2010 LEGISLATIVE CHANGES TO THE ANNUAL INCREASE PROVISIONS ON THE RETIREES AND BENEFIT RECIPIENTS AS COMPARED TO THE ACTUAL RATE OF INFLATION AND THE PROGRESS MADE TOWARD ELIMINATING THE UNFUNDED

LIABILITIES OF EACH DIVISION OF THE ASSOCIATION.

**SECTION 6.** 24-51-401 (1.7) (a) and (3), Colorado Revised Statutes, are amended to read:

**24-51-401. Employer and member contributions.**

(1.7) (a) Employers shall deliver a contribution report and the full amount of employer and CONTRIBUTIONS, member contributions, AND WORKING RETIREE CONTRIBUTIONS to the association within five days after the date members and retirees are paid. Except as provided in subsection (7) of this section and section 24-51-408.5, such contributions shall be based upon the rates for the appropriate division as set forth in the following table multiplied by the salary, as defined in section 24-51-101 (42), paid to members and retirees for the payroll period:

**TABLE A  
CONTRIBUTION RATES**

<b>Division</b>	<b>Membership</b>	<b>Employer Rate</b>	<b>Member Rate</b>
State	All Members	10.15%	8.0%
	Except		
	State Troopers	12.85%	10.0%
School	<del>All Members</del>	<del>10.15%</del>	<del>8.0%</del>
	<del>1/1/2006 through</del>	<del>10.15%</del>	<del>8.0%</del>
	<del>12/31/2012</del>	<del>10.55%</del>	<del>8.0%</del>
	<del>1/1/2013 and thereafter</del>	<del>10.55%</del>	<del>8.0%</del>
	ALL MEMBERS	10.15%	8.0%
Local			
Government	All Members	10.0%	8.0%
Judicial	All Members	13.66%	8.0%
DPS	<del>1/1/2010 through</del>	<del>13.75%</del>	<del>8.0%</del>
	<del>12/31/2012</del>	<del>14.15%</del>	<del>8.0%</del>
	<del>1/1/2013 and thereafter</del>	<del>14.15%</del>	<del>8.0%</del>
	<del>thereafter</del>	<del>14.15%</del>	<del>8.0%</del>
	ALL MEMBERS	13.75%	8.0%

(3) The employer shall be assessed by the association, pursuant to rules adopted by the board, interest on the contributions, INCLUDING WORKING RETIREE CONTRIBUTIONS, if either contributions or member information is not submitted by the date established in subsection (1.7) of

this section.

**SECTION 7.** 24-51-403, Colorado Revised Statutes, is amended to read:

**24-51-403. Contributions assumed and paid by the employer.**

For purposes of deferring federal income tax imposed on salary, the member contributions AND THE WORKING RETIREE CONTRIBUTIONS assumed and paid for by the employer shall be in lieu of paying such amounts as salary and shall be treated as employer contributions pursuant to the provisions of 26 U.S.C. sec. 414 (h) (2), as amended. For all other purposes of this article, member contributions assumed and paid for by the employer shall be considered member contributions.

**SECTION 8.** The introductory portion to 24-51-408 (2) and 24-51-408 (4), Colorado Revised Statutes, are amended, and the said 24-51-408 is further amended BY THE ADDITION OF A NEW SUBSECTION, to read:

**24-51-408. Matching employer contributions.** (2) For members who HAVE FIVE OR MORE YEARS OF EARNED SERVICE CREDIT AND receive a refund prior to sixty-five years of age and prior to meeting the age and service requirements for a service or reduced service retirement benefit, the amount of matching employer contributions paid shall be one-half of an amount equal to the member contribution account less:

(2.5) NOTWITHSTANDING SUBSECTION (2) OF THIS SECTION, FOR A MEMBER WHO HAS LESS THAN FIVE YEARS OF EARNED SERVICE CREDIT AS OF THE DATE OF REFUND AND WHO RECEIVES A REFUND PRIOR TO SIXTY-FIVE YEARS OF AGE AND PRIOR TO MEETING THE AGE AND SERVICE REQUIREMENTS FOR A SERVICE OR REDUCED SERVICE RETIREMENT BENEFIT, THE AMOUNT OF MATCHING EMPLOYER CONTRIBUTIONS PAID SHALL BE ONE-HALF OF AN AMOUNT EQUAL TO THE MEMBER CONTRIBUTION ACCOUNT ACCUMULATED PRIOR TO JANUARY 1, 2011, LESS:

- (a) ANY AMOUNTS PAID FOR THE PURCHASE OF SERVICE CREDIT;
- (b) ANY PAYMENTS IN LIEU OF MEMBER CONTRIBUTIONS; AND
- (c) ANY INTEREST ACCRUED ON THE AMOUNTS SPECIFIED IN

PARAGRAPHS (a) AND (b) OF THIS SUBSECTION (2.5).

(4) The provisions of this section shall not apply to DPS member CONTRIBUTION accounts that exist on December 31, 2009, with regard to past contributions or future contributions. Member CONTRIBUTION accounts in the Denver public schools division created on or after January 1, 2010, shall be governed by this section.

**SECTION 9.** 24-51-411, Colorado Revised Statutes, is amended to read:

**24-51-411. Amortization equalization disbursement.**

(1) Beginning January 1, 2006, each employer shall deliver to the association an amortization equalization disbursement and, beginning January 1, 2008, a supplemental amortization equalization disbursement pursuant to the same procedures specified for employer contributions in section 24-51-401 (1.7).

(2) For the calendar year beginning January 1, 2006, the amortization equalization disbursement shall be one-half of one percent of the employer's total payroll. The amortization equalization payment shall increase by one-half of one percent of total payroll on January 1, 2007, and, SUBJECT TO SUBSECTION (4) OF THIS SECTION, shall increase by four-tenths of one percent of total payroll at the start of each of the calendar years following 2007 through 2012. For purposes of this section, the employer's total payroll shall be calculated by applying the definition of salary, pursuant to section 24-51-101 (42), to the payroll for all employees working for the employer who are members of the association, or who were eligible to elect to become members of the association on or after January 1, 2006, including any amounts paid in connection with the employment of a retiree by an employer pursuant to section 24-51-1101 (2). Beginning January 1, 2010, employers of the Denver public schools division shall pay the then-applicable accumulated rate of amortization equalization disbursement and the escalating rate in accordance with the provisions of this section.

(3) FOR THE CALENDAR YEAR BEGINNING JANUARY 1, 2013, FOR EMPLOYERS IN THE SCHOOL AND DENVER PUBLIC SCHOOLS DIVISIONS, THE AMORTIZATION EQUALIZATION DISBURSEMENT PAYMENT SHALL INCREASE BY FOUR-TENTHS OF ONE PERCENT OF TOTAL PAYROLL AT THE START OF EACH OF THE CALENDAR YEARS THROUGH 2015. FOR THE CALENDAR YEAR

2016, FOR EMPLOYERS IN THE SCHOOL AND DENVER PUBLIC SCHOOLS DIVISIONS, THE AMORTIZATION EQUALIZATION DISBURSEMENT PAYMENT SHALL INCREASE BY THREE-TENTHS OF ONE PERCENT OF TOTAL PAYROLL AT THE START OF THE 2016 CALENDAR YEAR. FOR PURPOSES OF THIS SECTION, THE EMPLOYER'S TOTAL PAYROLL SHALL BE CALCULATED BY APPLYING THE DEFINITION OF SALARY, PURSUANT TO SECTION 24-51-101 (42), TO THE PAYROLL FOR ALL EMPLOYEES WORKING FOR THE EMPLOYER WHO ARE MEMBERS OF THE ASSOCIATION, OR WHO WERE ELIGIBLE TO ELECT TO BECOME MEMBERS OF THE ASSOCIATION ON OR AFTER JANUARY 1, 2006, INCLUDING ANY AMOUNTS PAID IN CONNECTION WITH THE EMPLOYMENT OF A RETIREE BY AN EMPLOYER PURSUANT TO SECTION 24-51-1101 (2).

(3.5) FOR THE CALENDAR YEAR BEGINNING JANUARY 1, 2013, FOR EMPLOYERS IN THE STATE DIVISION, THE AMORTIZATION EQUALIZATION DISBURSEMENT PAYMENT SHALL INCREASE BY FOUR-TENTHS OF ONE PERCENT OF TOTAL PAYROLL AT THE START OF EACH OF THE CALENDAR YEARS THROUGH 2017. FOR PURPOSES OF THIS SECTION, THE EMPLOYER'S TOTAL PAYROLL SHALL BE CALCULATED BY APPLYING THE DEFINITION OF SALARY, PURSUANT TO SECTION 24-51-101 (42), TO THE PAYROLL FOR ALL EMPLOYEES WORKING FOR THE EMPLOYER WHO ARE MEMBERS OF THE ASSOCIATION, OR WHO WERE ELIGIBLE TO ELECT TO BECOME MEMBERS OF THE ASSOCIATION ON OR AFTER JANUARY 1, 2006, INCLUDING ANY AMOUNTS PAID IN CONNECTION WITH THE EMPLOYMENT OF A RETIREE BY AN EMPLOYER PURSUANT TO SECTION 24-51-1101 (2).

(4) FOR EMPLOYERS IN THE LOCAL GOVERNMENT DIVISION AND THE JUDICIAL DIVISION, THE AMORTIZATION EQUALIZATION DISBURSEMENT SHALL NOT EXCEED THE 2010 CALENDAR YEAR RATES UNLESS THE RATES ARE REQUIRED TO INCREASE IN ACCORDANCE WITH SUBSECTION (9) OF THIS SECTION.

~~(3.2)~~ (5) For the calendar year beginning January 1, 2008, the supplemental amortization equalization disbursement shall be one-half of one percent of the employer's total payroll. The supplemental amortization equalization disbursement, SUBJECT TO SUBSECTION (7) OF THIS SECTION, shall increase by one-half of one percent of total payroll on January 1 of each year following 2008 through 2013. For purposes of this section, the employer's total payroll shall be calculated by applying the definition of salary, pursuant to section 24-51-101 (42), to the payroll for all employees working for the employer who are members of the association, or who were

eligible to elect to become members of the association on or after January 1, 2006, including any amounts paid in connection with the employment of a retiree by an employer pursuant to section 24-51-1101 (2). Beginning on January 1, 2010, employers of the Denver public schools division shall pay the then-applicable accumulated rate of supplemental amortization equalization disbursement and the escalating rate in accordance with the provisions of this section.

(6) FOR THE CALENDAR YEAR BEGINNING JANUARY 1, 2014, FOR EMPLOYERS IN THE SCHOOL AND DENVER PUBLIC SCHOOLS DIVISIONS, THE SUPPLEMENTAL AMORTIZATION EQUALIZATION DISBURSEMENT PAYMENT SHALL INCREASE BY ONE-HALF OF ONE PERCENT OF TOTAL PAYROLL AT THE START OF EACH OF THE CALENDAR YEARS THROUGH 2018. FOR PURPOSES OF THIS SECTION, THE EMPLOYER'S TOTAL PAYROLL SHALL BE CALCULATED BY APPLYING THE DEFINITION OF SALARY, PURSUANT TO SECTION 24-51-101 (42), TO THE PAYROLL FOR ALL EMPLOYEES WORKING FOR THE EMPLOYER WHO ARE MEMBERS OF THE ASSOCIATION, OR WHO WERE ELIGIBLE TO ELECT TO BECOME MEMBERS OF THE ASSOCIATION ON OR AFTER JANUARY 1, 2006, INCLUDING ANY AMOUNTS PAID IN CONNECTION WITH THE EMPLOYMENT OF A RETIREE BY AN EMPLOYER PURSUANT TO SECTION 24-51-1101 (2).

(6.5) FOR THE CALENDAR YEAR BEGINNING JANUARY 1, 2014, FOR EMPLOYERS IN THE STATE DIVISION, THE SUPPLEMENTAL AMORTIZATION EQUALIZATION DISBURSEMENT PAYMENT SHALL INCREASE BY ONE-HALF OF ONE PERCENT OF TOTAL PAYROLL AT THE START OF EACH OF THE CALENDAR YEARS THROUGH 2017. FOR PURPOSES OF THIS SECTION, THE EMPLOYER'S TOTAL PAYROLL SHALL BE CALCULATED BY APPLYING THE DEFINITION OF SALARY, PURSUANT TO SECTION 24-51-101 (42), TO THE PAYROLL FOR ALL EMPLOYEES WORKING FOR THE EMPLOYER WHO ARE MEMBERS OF THE ASSOCIATION, OR WHO WERE ELIGIBLE TO ELECT TO BECOME MEMBERS OF THE ASSOCIATION ON OR AFTER JANUARY 1, 2006, INCLUDING ANY AMOUNTS PAID IN CONNECTION WITH THE EMPLOYMENT OF A RETIREE BY AN EMPLOYER PURSUANT TO SECTION 24-51-1101 (2).

(7) FOR EMPLOYERS IN THE LOCAL GOVERNMENT DIVISION AND THE JUDICIAL DIVISION, THE SUPPLEMENTAL AMORTIZATION EQUALIZATION DISBURSEMENT SHALL NOT EXCEED THE 2010 CALENDAR YEAR RATES UNLESS THE RATES ARE REQUIRED TO INCREASE IN ACCORDANCE WITH SUBSECTION (9) OF THIS SECTION.



~~(3.5)~~ (8) The amortization equalization disbursement and the supplemental amortization equalization disbursement payments by ~~all~~ EMPLOYERS IN THE STATE, SCHOOL, AND DENVER PUBLIC SCHOOLS divisions shall continue AT THE RATE SPECIFIED IN SUBSECTIONS (3), (3.5), (6), AND (6.5) OF THIS SECTION until adjusted pursuant to this ~~subsection (3.5)~~ SUBSECTION (8). When the actuarial funded ratio of ~~a particular~~ THE STATE, SCHOOL, OR DENVER PUBLIC SCHOOLS division of the association, BASED ON THE ACTUARIAL VALUE OF ASSETS, is AT OR ABOVE one hundred THREE percent as determined in the annual actuarial study of the association, ~~the actuary shall determine the amount by which the~~ OF THE amortization equalization disbursement and supplemental amortization equalization disbursement ~~can~~ SHALL be reduced, in equal parts, for that particular division and still maintain the actuarial funded ratio of that division at one hundred percent. ~~The amortization equalization disbursement and supplemental amortization equalization disbursement shall be reduced for that division in the amounts determined by the actuary effective January 1 of the following year. At such time as a division is determined in the annual actuarial valuation to have reached a thirty-year or less amortization period of its unfunded liabilities, the board shall cause to be conducted an actuarial study to assess the amortization equalization disbursement and the supplemental amortization equalization disbursement, and the board may make appropriate recommendations to the general assembly~~ BY ONE-HALF OF ONE PERCENT EACH. IF THE ACTUARIAL FUNDED RATIO OF THE DIVISION BASED ON THE ACTUARIAL VALUE OF ASSETS REACHES ONE HUNDRED THREE PERCENT AND SUBSEQUENTLY THE ACTUARIAL FUNDED RATIO OF THE DIVISION IS BELOW NINETY PERCENT, THE AMORTIZATION EQUALIZATION DISBURSEMENT AND SUPPLEMENTAL AMORTIZATION EQUALIZATION DISBURSEMENT SHALL BE INCREASED BY ONE-HALF OF ONE PERCENT EACH; EXCEPT THAT, AT NO TIME SHALL THE AMORTIZATION EQUALIZATION DISBURSEMENT FOR THE SCHOOL AND DENVER PUBLIC SCHOOLS DIVISIONS EXCEED FOUR AND ONE-HALF PERCENT OR FOR THE STATE DIVISION EXCEED FIVE PERCENT NOR SHALL THE SUPPLEMENTAL AMORTIZATION EQUALIZATION DISBURSEMENT FOR THE SCHOOL AND DENVER PUBLIC SCHOOLS DIVISIONS EXCEED FIVE AND ONE-HALF PERCENT EACH OR FOR THE STATE DIVISION EXCEED FIVE PERCENT.

(9) THE AMORTIZATION EQUALIZATION DISBURSEMENT AND THE SUPPLEMENTAL AMORTIZATION EQUALIZATION DISBURSEMENT PAYMENTS BY EMPLOYERS IN THE LOCAL GOVERNMENT DIVISION AND JUDICIAL DIVISION SHALL CONTINUE AT THE RATE SPECIFIED IN SUBSECTIONS (4) AND (7) OF

THIS SECTION UNTIL ADJUSTED PURSUANT TO THIS SUBSECTION (9). WHEN THE ACTUARIAL FUNDED RATIO OF THE LOCAL GOVERNMENT DIVISION OR JUDICIAL DIVISION OF THE ASSOCIATION, BASED ON THE ACTUARIAL VALUE OF THE ASSETS, IS AT OR ABOVE ONE HUNDRED THREE PERCENT AS DETERMINED IN THE ANNUAL ACTUARIAL STUDY OF THE ASSOCIATION, THE AMOUNT OF THE AMORTIZATION EQUALIZATION DISBURSEMENT AND SUPPLEMENTAL AMORTIZATION EQUALIZATION DISBURSEMENT SHALL BE REDUCED FOR EMPLOYERS IN THAT PARTICULAR DIVISION BY ONE-HALF OF ONE PERCENT EACH. IF THE ACTUARIAL FUNDED RATIO OF THE DIVISION BASED ON THE ACTUARIAL VALUE OF THE ASSETS REACHES NINETY PERCENT AND SUBSEQUENTLY THE ACTUARIAL FUNDED RATIO OF THE DIVISION IS BELOW NINETY PERCENT, THE AMORTIZATION EQUALIZATION DISBURSEMENT AND SUPPLEMENTAL AMORTIZATION EQUALIZATION DISBURSEMENT SHALL BE INCREASED BY ONE-HALF OF ONE PERCENT EACH; EXCEPT THAT, AT NO TIME SHALL THE AMORTIZATION EQUALIZATION DISBURSEMENT OR THE SUPPLEMENTAL AMORTIZATION EQUALIZATION DISBURSEMENT EXCEED FIVE PERCENT EACH.

~~(3.7)~~ (10) For state employers in the state division, for the 2007-08 state fiscal year and for each fiscal year through the ~~2012-13~~ 2016-17 state fiscal year, from the amount of changes to state employees' salaries and any adjustments to the annual general appropriation act pursuant to section 24-50-104, an amount equal to one-half of one percent of total salary shall be deducted and such amount shall be utilized by the employer to fund the supplemental amortization equalization disbursement. For the school, local government, judicial, and Denver public schools divisions, and the remaining employers in the state division who are not state employers, the supplemental amortization equalization disbursement shall, to the extent permitted by law, be funded by allocation of funds otherwise available for use as employee compensation increases prior to award as salary or other compensation to employees.

~~(4)~~ (11) ~~Any reduction in the amortization equalization disbursement and in the supplemental amortization equalization disbursement pursuant to subsection (3.5) of this section shall be irrevocable. If the disbursements become no longer necessary pursuant to subsection (3.5) of this section, then the association shall notify the revisor of statutes to repeal this section. Moneys made available due to any reduction in the supplemental amortization equalization disbursement pursuant to subsection (3.5)~~ SUBSECTION (8) OR (9) of this section, WHICHEVER IS APPLICABLE, shall, to

the extent permitted by law, be allocated to employee compensation increases to the extent such source was originally used by an employer to fund the supplemental amortization equalization disbursement.

~~(5) This section is repealed, effective upon receipt by the revisor of statutes of a notice pursuant to subsection (4) of this section.~~

**SECTION 10.** 24-51-501 (1), Colorado Revised Statutes, is amended to read:

**24-51-501. Earned service credit.** (1) Service credit is earned for periods of employment with an employer during which salary is received by such employee and contributions are made to the association pursuant to the provisions of section 24-51-401 (1.7). NO SERVICE CREDIT SHALL BE EARNED IN CONNECTION WITH THE PAYMENT OF WORKING RETIREE CONTRIBUTIONS.

**SECTION 11.** 24-51-509, Colorado Revised Statutes, is amended to read:

**24-51-509. Combining service credit.** Service credit earned by a member during the most recent period of membership shall be combined with the service credit associated with the existing member contribution account of such member. Notwithstanding the provisions of this section, members exercising portability between the Denver public schools division and other association divisions are governed by the provisions of section 24-51-1747, RETIREES SUSPENDING RETIREMENT OR REDUCED SERVICE RETIREMENT BENEFITS ARE GOVERNED BY SECTION 24-51-1103 (1), AND DPS RETIREES SUSPENDING RETIREMENT BENEFITS ARE GOVERNED BY SECTION 24-51-1726.5.

**SECTION 12.** 24-51-602 (1) and (5), Colorado Revised Statutes, are amended, and the said 24-51-602 is further amended BY THE ADDITION OF THE FOLLOWING NEW SUBSECTIONS, to read:

**24-51-602. Service retirement eligibility.** (1) (a) Members, except state troopers, WHO HAVE FIVE YEARS OF SERVICE CREDIT AS OF JANUARY 1, 2011, AND who have met the age and service credit requirements stated in the following table shall, upon written application and approval of the board, receive service retirement benefits pursuant to the benefit formula set

forth in section 24-51-603 (1) (a), (2), and (3):

**TABLE B  
SERVICE RETIREMENT ELIGIBILITY**

<b>Age Requirement (years)</b>	<b>Service Credit Requirement (years)</b>
50	30
60	20
65	5

(a.5) Notwithstanding paragraph (a) of this subsection (1), any person except a state trooper WHO HAD FIVE YEARS OF SERVICE CREDIT AS OF JANUARY 1, 2011, AND who was not a member, inactive member, or retiree on June 30, 2005, but was a member, inactive member, or retiree on December 31, 2006, shall, upon written application and approval of the board, receive service retirement benefits pursuant to the benefit formula set forth in section 24-51-603 (1) (a), (2), and (3) if the member has met the age and service credit requirements stated in the following table:

**TABLE B.05  
SERVICE RETIREMENT ELIGIBILITY**

<b>Age Requirement (years)</b>	<b>Service Credit Requirement (years)</b>
Any age	35
55	30
60	20
65	5

(a.7) Notwithstanding paragraphs (a) and (a.5) of this subsection (1), any person except a state trooper who was not a member, inactive member, or retiree on December 31, 2006, OR WHO WAS A MEMBER, INACTIVE MEMBER, OR RETIREE ON DECEMBER 31, 2006, BUT AS OF JANUARY 1, 2011, DID NOT HAVE FIVE YEARS OF SERVICE CREDIT, OR WHO IS A DPS MEMBER WITH LESS THAN FIVE YEARS OF SERVICE CREDIT AS OF JANUARY 1, 2011, shall, upon written application and approval of the board, receive service retirement benefits pursuant to the benefit formula set forth in section 24-51-603 (1) (a), (2), and (3), if the member has met the age and service credit requirements stated in the following table:

**TABLE B.07  
SERVICE RETIREMENT ELIGIBILITY**

<b>Age Requirement (years)</b>	<b>Service Credit Requirement (years)</b>
Any age	35
55	30
60	25
65	5

(b) State troopers who have met the age and service credit requirements stated in the following table shall, upon written application and approval of the board, receive service retirement benefits pursuant to the benefit formula set forth in section 24-51-603 (1) and (3):

**TABLE B.1  
SERVICE RETIREMENT ELIGIBILITY**

<b>Age Requirement (years)</b>	<b>Service Credit Requirement (years)</b>
Any age	30
50	25
55	20
65	5

(c) Members who were members, inactive members, or retirees on December 31, 2006, WHO HAD FIVE YEARS OF SERVICE CREDIT AS OF JANUARY 1, 2011, and who are fifty-five years of age or older shall, upon written application and approval of the board, receive service retirement benefits pursuant to the benefit formula set forth in section 24-51-603, without reduction pursuant to section 24-51-604, if they have at least five years of service credit and if the number of years of their age plus the number of years of their service credit equals eighty years or more.

(d) Members who were not members, inactive members, or retirees on December 31, 2006, BUT WHO WERE MEMBERS, INACTIVE MEMBERS, OR RETIREES ON DECEMBER 31, 2010, OR MEMBERS WHO WERE MEMBERS, INACTIVE MEMBERS, OR RETIREES ON DECEMBER 31, 2006, BUT AS OF JANUARY 1, 2011, DID NOT HAVE FIVE YEARS OF SERVICE CREDIT, OR DPS MEMBERS WITH LESS THAN FIVE YEARS OF SERVICE CREDIT AS OF JANUARY

1, 2011, and who are fifty-five years of age or older shall, upon written application and approval of the board, receive service retirement benefits pursuant to the benefit formula set forth in section 24-51-603, without reduction pursuant to section 24-51-604, if they have at least five years of service credit and if the number of years of their age plus the number of years of their service credit equals eighty-five years or more.

(1.5) (a) MEMBERS, EXCEPT STATE TROOPERS, WHO WERE NOT MEMBERS, INACTIVE MEMBERS, OR RETIREES ON DECEMBER 31, 2010, BUT WHO WERE MEMBERS, INACTIVE MEMBERS, OR RETIREES ON DECEMBER 31, 2016, AND WHO HAVE MET THE AGE AND SERVICE REQUIREMENTS STATED IN THE FOLLOWING TABLE SHALL, UPON WRITTEN APPLICATION AND APPROVAL OF THE BOARD, RECEIVE SERVICE RETIREMENT BENEFITS PURSUANT TO THE BENEFIT FORMULA SET FORTH IN SECTION 24-51-603:

**TABLE B.2  
SERVICE RETIREMENT ELIGIBILITY**

<b>AGE REQUIREMENT (YEARS)</b>	<b>SERVICE CREDIT REQUIREMENT (YEARS)</b>
ANY AGE	35
58	30
65	5

(b) MEMBERS WHO ARE ELIGIBLE FOR A BENEFIT PURSUANT TO THIS SUBSECTION (1.5) AND WHO ARE FIFTY-EIGHT YEARS OF AGE OR OLDER SHALL, UPON WRITTEN APPLICATION AND APPROVAL OF THE BOARD, RECEIVE SERVICE RETIREMENT BENEFITS PURSUANT TO THE BENEFIT FORMULA SET FORTH IN SECTION 24-51-603, WITHOUT REDUCTION PURSUANT TO SECTION 24-51-604, IF THEY HAVE AT LEAST FIVE YEARS OF SERVICE CREDIT AND IF THE NUMBER OF YEARS OF THEIR AGE PLUS THE NUMBER OF YEARS OF THEIR SERVICE CREDIT EQUALS EIGHTY-EIGHT YEARS OR MORE.

(1.7) (a) MEMBERS WHO WERE NOT MEMBERS, INACTIVE MEMBERS, OR RETIREES ON DECEMBER 31, 2016, WHO HAVE MET THE AGE AND SERVICE REQUIREMENTS STATED IN THE FOLLOWING TABLE AND WHO ARE NOT ELIGIBLE FOR SERVICE RETIREMENT BENEFITS PURSUANT TO SUBSECTION (1.8) OF THIS SECTION SHALL, UPON WRITTEN APPLICATION AND APPROVAL OF THE BOARD, RECEIVE SERVICE RETIREMENT BENEFITS PURSUANT TO THE BENEFIT FORMULA SET FORTH IN SECTION 24-51-603:

**TABLE B.3  
SERVICE RETIREMENT ELIGIBILITY**

<b>AGE REQUIREMENT (YEARS)</b>	<b>SERVICE CREDIT REQUIREMENT (YEARS)</b>
ANY AGE	35
60	30
65	5

(b) MEMBERS WHO ARE ELIGIBLE FOR A BENEFIT PURSUANT TO THIS SUBSECTION (1.7) AND WHO ARE SIXTY YEARS OF AGE OR OLDER SHALL, UPON WRITTEN APPLICATION AND APPROVAL OF THE BOARD, RECEIVE SERVICE RETIREMENT BENEFITS PURSUANT TO THE BENEFIT FORMULA SET FORTH IN SECTION 24-51-603, WITHOUT REDUCTION PURSUANT TO SECTION 24-51-604, IF THEY HAVE AT LEAST FIVE YEARS OF SERVICE CREDIT AND IF THE NUMBER OF YEARS OF THEIR AGE PLUS THE NUMBER OF YEARS OF THEIR SERVICE CREDIT EQUALS NINETY YEARS OR MORE.

(1.8) (a) MEMBERS OF THE SCHOOL DIVISION OR DENVER PUBLIC SCHOOLS DIVISION WHO WERE NOT MEMBERS, INACTIVE MEMBERS, OR RETIREES ON DECEMBER 31, 2016, WHO HAVE MET THE AGE AND SERVICE REQUIREMENTS STATED IN THE FOLLOWING TABLE SHALL, UPON WRITTEN APPLICATION AND APPROVAL OF THE BOARD, RECEIVE SERVICE RETIREMENT BENEFITS PURSUANT TO THE BENEFIT FORMULA SET FORTH IN SECTION 24-51-603, PROVIDED, HOWEVER, THAT AT LEAST THE MOST RECENT TEN YEARS OF SERVICE CREDIT USED IN MEETING THE REQUIREMENTS OF THE TABLE BELOW MUST BE EARNED IN THE SCHOOL OR DENVER PUBLIC SCHOOLS DIVISIONS IN ORDER FOR THE MEMBER TO BE ELIGIBLE PURSUANT TO THIS PARAGRAPH (a):

**TABLE B.4  
SERVICE RETIREMENT ELIGIBILITY**

<b>AGE REQUIREMENT (YEARS)</b>	<b>SERVICE CREDIT REQUIREMENT (YEARS)</b>
ANY AGE	35
58	30
65	5

(b) MEMBERS WHO ARE ELIGIBLE FOR A BENEFIT PURSUANT TO THIS

SUBSECTION (1.8) AND WHO ARE FIFTY-EIGHT YEARS OF AGE OR OLDER SHALL, UPON WRITTEN APPLICATION AND APPROVAL OF THE BOARD, RECEIVE SERVICE RETIREMENT BENEFITS PURSUANT TO THE BENEFIT FORMULA SET FORTH IN SECTION 24-51-603, WITHOUT REDUCTION PURSUANT TO SECTION 24-51-604, IF THEY HAVE AT LEAST FIVE YEARS OF SERVICE CREDIT AND IF THE NUMBER OF YEARS OF THEIR AGE PLUS THE NUMBER OF YEARS OF THEIR SERVICE CREDIT EQUALS EIGHTY-EIGHT YEARS OR MORE.

(5) ~~Retirement benefits of DPS members shall be governed by the provisions of sections 24-51-1713 to 24-51-1726 and 24-51-1747.~~

**SECTION 13.** The introductory portion to 24-51-603 (1) (a) and 24-51-603 (3) (a), Colorado Revised Statutes, are amended to read:

**24-51-603. Benefit formula for service retirement.** (1) (a) Except as otherwise provided in subsection (2) of this section, effective July 1, 1997, the option 1 benefit OR OPTION A BENEFIT, WHICHEVER IS APPLICABLE, for service retirement for members shall be calculated by multiplying the highest average salary by two and one-half percent times each year and fraction of a year of service credit. The following formula shall be used for this calculation:

(3) (a) Regardless of total years of service credit, the option 1 benefit OR OPTION A BENEFIT, WHICHEVER IS APPLICABLE, calculated pursuant to the provisions of this part 6 shall not exceed an amount equal to one hundred percent of the highest average salary, nor shall the option 1 benefit OR OPTION A BENEFIT, WHICHEVER IS APPLICABLE, exceed the maximum permitted under federal income tax law.

**SECTION 14.** The introductory portion to 24-51-604, Colorado Revised Statutes, is amended to read:

**24-51-604. Reduced service retirement eligibility.** DPS MEMBERS WITH LESS THAN FIVE YEARS OF SERVICE CREDIT AS OF JANUARY 1, 2011, AND members who have met the age and service credit requirements stated in the following table and who do not meet the requirements of section 24-51-602 shall, upon written application and approval of the board, receive reduced service retirement benefits pursuant to the benefit formula set forth in section 24-51-605:



**SECTION 15.** 24-51-605 (1) and the introductory portion to 24-51-605 (3), Colorado Revised Statutes, are amended, and the said 24-51-605 is further amended BY THE ADDITION OF A NEW SUBSECTION, to read:

**24-51-605. Benefit formula for reduced service retirement.**

(1) (a) FOR A MEMBER WHO IS A STATE TROOPER, WHO IS ELIGIBLE TO RETIRE on and after July 1, 1998, ~~for a member who is a state trooper~~ BUT ON OR BEFORE JANUARY 1, 2011, and who retires upon reaching fifty years of age or older but before reaching sixty years of age, a reduced service retirement benefit shall be the option 1 benefit for service retirement, as calculated according to the formula set forth in section 24-51-603, reduced by three percent for each year and a proportional percentage for each fraction of a year from the effective date of reduced service retirement to the date the member would have become eligible for a service retirement pursuant to the provisions of section 24-51-602 (1).

(b) FOR A MEMBER WHO IS NOT A STATE TROOPER, WHO IS ELIGIBLE TO RETIRE on and after July 1, 1998, ~~for a member who is not a state trooper~~ BUT ON OR BEFORE JANUARY 1, 2011, and who retires upon reaching fifty-five years of age or older but before reaching sixty years of age, a reduced service retirement benefit shall be the option 1 benefit for service retirement, as calculated according to the formula set forth in section 24-51-603, reduced by:

(I) Three percent for each year and a proportional percentage for each fraction of a year from the effective date of reduced service retirement to the date the member would have reached sixty years of age, or the date the member would have become eligible for a service retirement pursuant to the provisions of section 24-51-602 (1), if earlier than sixty years of age; and

(II) Four percent for each year and a proportional percentage for each fraction of a year from the date the member reaches sixty years of age to the date the member would have become eligible for a service retirement pursuant to the provisions of section 24-51-602 (1), if on such date the member would have been older than sixty years of age.

(c) FOR A MEMBER WHO IS NOT A STATE TROOPER, WHO IS ELIGIBLE TO RETIRE on and after July 1, 1998, ~~for a member who is not a state trooper~~

BUT ON OR BEFORE JANUARY 1, 2011, and who retires upon reaching sixty years of age or older but before reaching sixty-five years of age, a reduced service retirement benefit shall be the option 1 benefit for service retirement, as calculated according to the formula set forth in section 24-51-603, reduced by four percent for each year and a proportional percentage for each fraction of a year from the effective date of reduced service retirement to the date the member would have become eligible for a service retirement pursuant to the provisions of section 24-51-602 (1).

(3) Notwithstanding the provisions of subsection (1) of this section, on and after July 1, 1993, for a member who is not a state trooper, WHO IS ELIGIBLE FOR A REDUCED SERVICE RETIREMENT BENEFIT AS OF JANUARY 1, 2011, and who retires upon reaching fifty years of age or older but before reaching fifty-five years of age, a reduced service retirement benefit shall be the option 1 benefit for service retirement, as calculated according to the formula set forth in section 24-51-603, reduced by:

(4) FOR A MEMBER, DPS MEMBER, OR INACTIVE MEMBER WHO IS NOT ELIGIBLE FOR A RETIREMENT BENEFIT AS OF JANUARY 1, 2011, THE FOLLOWING PROVISIONS SHALL APPLY:

(a) FOR A MEMBER OR INACTIVE MEMBER WHO RETIRES PRIOR TO REACHING ELIGIBILITY FOR A FULL SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-602, A REDUCED SERVICE RETIREMENT BENEFIT SHALL BE THE OPTION 1 BENEFIT FOR SERVICE RETIREMENT, AS CALCULATED ACCORDING TO THE FORMULA SET FORTH IN SECTION 24-51-603, REDUCED BY AN ACTUARIALLY DETERMINED PERCENTAGE TO ENSURE THAT, AS OF THE EFFECTIVE DATE OF RETIREMENT, THE BENEFIT IS THE ACTUARIAL EQUIVALENT OF THE SERVICE RETIREMENT BENEFIT.

(b) FOR A DPS MEMBER WHO RETIRES PRIOR TO REACHING ELIGIBILITY FOR RETIREMENT PURSUANT TO SECTION 24-51-1713 OR 24-51-602, WHICHEVER IS APPLICABLE, A RETIREMENT WITH AN ACTUARIAL REDUCTION SHALL BE THE OPTION A BENEFIT AS CALCULATED ACCORDING TO THE FORMULA SET FORTH IN SECTION 24-51-1715 (1) (a) (I) OR 24-51-603, WHICHEVER IS APPLICABLE, REDUCED BY AN ACTUARIALLY DETERMINED PERCENTAGE TO ENSURE THAT THE BENEFIT, AS OF THE EFFECTIVE DATE OF RETIREMENT, IS THE ACTUARIAL EQUIVALENT OF THE RETIREMENT BENEFIT WITHOUT AN ACTUARIAL REDUCTION.

**SECTION 16.** 24-51-606.5, Colorado Revised Statutes, is amended to read:

**24-51-606.5. Indexation of benefits for vested inactive members.**

A vested inactive member who was a member or inactive member on December 31, 2006, WHO HAS REACHED THE AGE AND SERVICE REQUIREMENTS FOR A SERVICE OR REDUCED SERVICE RETIREMENT BENEFIT ON OR BEFORE JANUARY 1, 2011, AND who has at least twenty-five years of service credit prior to terminating membership shall be eligible, upon retirement, for a benefit, as calculated pursuant to the provisions of section 24-51-603 or 24-51-605, which has been increased by the annual increase specified in sections 24-51-1001 to 24-51-1003, from the date of termination of membership or July 1, 1993, whichever is later, to the effective date of retirement.

**SECTION 17.** 24-51-802 (2), Colorado Revised Statutes, is amended to read:

**24-51-802. Change in option or cobeneficiary.** (2) The election of an option or the designation of a cobeneficiary may be changed if the retiree returns to membership and thereafter earns one year of service credit; HOWEVER, A MEMBER WHOSE RETIREMENT OR REDUCED SERVICE RETIREMENT BENEFITS ARE IN SEPARATE BENEFIT SEGMENTS PURSUANT TO SECTION 24-51-1103 (1.5) SHALL ELECT THE SAME OPTION AND DESIGNATE THE SAME COBENEFICIARY FOR ALL OF HIS OR HER SEPARATE BENEFIT SEGMENTS.

**SECTION 18.** 24-51-908 (1), Colorado Revised Statutes, is amended to read:

**24-51-908. Survivor benefits.** (1) Survivor benefits paid to a cobeneficiary pursuant to the provisions of section 24-51-906 (1) (a) shall be calculated in the same manner as option 3 benefits pursuant to the provisions of section 24-51-910. Survivor benefits paid to a surviving spouse pursuant to the provisions of section 24-51-905 (2) (a) shall be calculated in the same manner as option 3 benefits pursuant to the provisions of section 24-51-910, and if the deceased vested inactive member had at least twenty-five years of service credit AND WAS ELIGIBLE FOR A RETIREMENT BENEFIT ON OR BEFORE JANUARY 1, 2011, such benefits shall be increased by the annual increase specified in sections 24-51-1001

to 24-51-1003, from the date of termination of membership or July 1, 1993, whichever is later, to the date benefits commence.

**SECTION 19.** 24-51-1001 (1) and (3) (b), Colorado Revised Statutes, are amended, and the said 24-51-1001 (3) is further amended BY THE ADDITION OF A NEW PARAGRAPH, to read:

**24-51-1001. Types of benefit increases.** (1) For benefit recipients whose benefits are based on the account of a member who was a member, inactive member, or retiree on December 31, 2006, OR FOR BENEFIT RECIPIENTS WHOSE BENEFITS ARE BASED ON THE ACCOUNT OF A DPS MEMBER OR DPS RETIREE, annual increases in retirement benefits and survivor benefits shall ~~occur on March 1 if said benefits have been paid for at least three months preceding March 1~~ BE EFFECTIVE WITH THE JULY BENEFIT. Such increases in benefits shall be calculated in accordance with the provisions of sections 24-51-1002 and 24-51-1003 and shall be paid from the ~~division trust funds~~ RETIREMENT BENEFITS RESERVE OR THE SURVIVOR BENEFITS RESERVE, AS APPROPRIATE, SO LONG AS THE FOLLOWING REQUIREMENTS ARE SATISFIED:

(a) FOR BENEFIT RECIPIENTS WHOSE BENEFIT IS BASED ON A RETIREE OR DPS RETIREE WHOSE EFFECTIVE DATE OF RETIREMENT IS PRIOR TO JANUARY 1, 2011, OR WHOSE SURVIVOR BENEFITS ARE BASED ON A DATE OF DEATH THAT OCCURRED PRIOR TO JANUARY 1, 2011, THE BENEFITS HAVE BEEN PAID TO THE BENEFIT RECIPIENT FOR AT LEAST SEVEN MONTHS PRECEDING JULY 1.

(b) FOR BENEFIT RECIPIENTS WHOSE BENEFIT IS BASED ON A RETIREE OR DPS RETIREE WHOSE EFFECTIVE DATE OF RETIREMENT IS ON OR AFTER JANUARY 1, 2011, OR WHOSE SURVIVOR BENEFITS ARE BASED ON A DATE OF DEATH THAT IS ON OR AFTER JANUARY 1, 2011, THE BENEFITS HAVE BEEN PAID TO THE BENEFIT RECIPIENT FOR THE TWELVE MONTHS PRIOR TO JULY 1, AND FOR BENEFIT RECIPIENTS WHOSE BENEFIT IS BASED UPON A RETIREE OR DPS RETIREE WHO WAS NOT ELIGIBLE TO RETIRE AS OF JANUARY 1, 2011, THE RETIREE MET THE FOLLOWING REQUIREMENTS:

(I) FOR DPS MEMBERS WITH FIVE OR MORE YEARS OF SERVICE CREDIT AS OF JANUARY 1, 2011, AND FOR MEMBERS WHO BEGAN MEMBERSHIP PRIOR TO JULY 1, 2005, AND HAVE FIVE OR MORE YEARS OF SERVICE CREDIT AS OF JANUARY 1, 2011, THE RETIREE RETIRED WITH A

SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-602 OR 24-51-1713, WHICHEVER IS APPLICABLE, OR RETIRED WITH A REDUCED SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-604 OR 24-51-1714, WHICHEVER IS APPLICABLE, BUT HAS, AS OF JANUARY 1, ATTAINED THE AGE AND SERVICE CREDIT YEARS THAT WHEN COMBINED TOTAL AT LEAST EIGHTY YEARS, OR RETIRED WITH A REDUCED SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-604 BUT HAS, AS OF JANUARY 1, ATTAINED THE AGE OF SIXTY;

(II) FOR MEMBERS WHO BEGAN MEMBERSHIP ON OR AFTER JULY 1, 2005, BUT PRIOR TO JANUARY 1, 2007, THE RETIREE RETIRED WITH A SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-602, OR RETIRED WITH A REDUCED SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-604 BUT HAS, AS OF JANUARY 1, ATTAINED THE AGE AND SERVICE CREDIT YEARS THAT WHEN COMBINED TOTAL AT LEAST EIGHTY-FIVE YEARS, OR RETIRED WITH A REDUCED SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-604 BUT HAS, AS OF JANUARY 1, ATTAINED THE AGE OF SIXTY; OR

(III) FOR DPS MEMBERS WITH LESS THAN FIVE YEARS OF SERVICE CREDIT AS OF JANUARY 1, 2011, AND FOR MEMBERS WHOSE MEMBERSHIP BEGAN PRIOR TO JANUARY 1, 2007, WITH LESS THAN FIVE YEARS OF SERVICE CREDIT AS OF JANUARY 1, 2011, THE RETIREE RETIRED WITH A SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-602, OR RETIRED WITH A REDUCED SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-604 BUT HAS, AS OF JANUARY 1, ATTAINED THE AGE AND SERVICE CREDIT YEARS THAT WHEN COMBINED TOTAL AT LEAST EIGHTY-FIVE YEARS, OR RETIRED WITH A REDUCED SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-604 BUT HAS, AS OF JANUARY 1, ATTAINED THE AGE OF SIXTY.

(c) NO MINIMUM AGE OR SERVICE CREDIT REQUIREMENT SHALL APPLY TO DISABILITY RETIREES OR SURVIVOR BENEFIT RECIPIENTS.

(3) For benefit recipients whose benefits are based on the account of a member who was not a member, inactive member, or retiree on December 31, 2006, annual increases in retirement benefits and survivor benefits, if any, shall be effective with the July benefit in accordance with the provisions of section 24-51-1009 and shall be paid from the retirement benefits reserve or the survivor benefits reserve, as appropriate, so long as the following requirements are satisfied:

(b) (I) FOR MEMBERS WHOSE MEMBERSHIP BEGAN ON OR AFTER JANUARY 1, 2007, BUT PRIOR TO JANUARY 1, 2011, the retiree retired with a service retirement benefit pursuant to section 24-51-602, or retired with a reduced service retirement benefit pursuant to section 24-51-604 but has, as of January 1, attained the age and service credit years that when combined total at least eighty-five years, or retired with a reduced service retirement benefit pursuant to section 24-51-604 but has, as of January 1, attained the age of sixty; ~~No minimum age or service credit requirement shall apply to disability retirees or survivor benefit recipients.~~

(II) FOR MEMBERS WHOSE MEMBERSHIP BEGAN ON OR AFTER JANUARY 1, 2011, BUT PRIOR TO JANUARY 1, 2017, THE RETIREE RETIRED WITH A SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-602, OR RETIRED WITH A REDUCED SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-604 BUT HAS, AS OF JANUARY 1, ATTAINED THE AGE AND SERVICE CREDIT YEARS THAT WHEN COMBINED TOTAL AT LEAST EIGHTY-EIGHT YEARS, OR RETIRED WITH A REDUCED SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-604 BUT HAS, AS OF JANUARY 1, ATTAINED THE AGE OF SIXTY; OR

(III) SUBJECT TO THE PROVISIONS OF SUBPARAGRAPH (IV) OF THIS PARAGRAPH (b), FOR MEMBERS WHOSE MEMBERSHIP BEGAN ON OR AFTER JANUARY 1, 2017, THE RETIREE RETIRED WITH A SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-602, OR RETIRED WITH A REDUCED SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-604 BUT HAS, AS OF JANUARY 1, ATTAINED THE AGE AND SERVICE CREDIT YEARS THAT WHEN COMBINED TOTAL AT LEAST NINETY YEARS, OR RETIRED WITH A REDUCED SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-604 BUT HAS, AS OF JANUARY 1, ATTAINED THE AGE OF SIXTY.

(IV) FOR MEMBERS WHOSE MEMBERSHIP BEGAN ON OR AFTER JANUARY 1, 2017, THE RETIREE RETIRED FROM THE SCHOOL OR DENVER PUBLIC SCHOOLS DIVISIONS WITH A REDUCED SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-604 AND THE RETIREE'S MOST RECENT TEN YEARS OF SERVICE CREDIT WAS EARNED IN THE SCHOOL OR DENVER PUBLIC SCHOOLS DIVISIONS, BUT, AS OF JANUARY 1, THE RETIREE'S AGE AND TOTAL SERVICE CREDIT TOTAL AT LEAST EIGHTY-EIGHT YEARS, OR THE RETIREE RETIRED WITH A REDUCED SERVICE RETIREMENT BENEFIT PURSUANT TO SECTION 24-51-604 BUT HAS, AS OF JANUARY 1, ATTAINED THE AGE OF SIXTY.

(c) NO MINIMUM AGE OR SERVICE CREDIT REQUIREMENT SHALL APPLY TO DISABILITY RETIREES OR SURVIVOR BENEFIT RECIPIENTS.

**SECTION 20.** 24-51-1002, Colorado Revised Statutes, is REPEALED AND REENACTED, WITH AMENDMENTS, to read:

**24-51-1002. Annual percentages to be used.** (1) FOR BENEFIT RECIPIENTS WHOSE BENEFITS ARE BASED ON THE ACCOUNT OF A MEMBER WHO WAS A MEMBER, INACTIVE MEMBER, OR RETIREE ON DECEMBER 31, 2006, OR FOR BENEFIT RECIPIENTS WHOSE BENEFITS ARE BASED ON THE ACCOUNT OF A DPS MEMBER OR DPS RETIREE, THE INCREASE APPLIED TO BENEFITS FOR THE YEAR 2010 SHALL BE THE LESSER OF TWO PERCENT OR THE AVERAGE OF THE ANNUAL INCREASES DETERMINED FOR EACH MONTH, TO THE NEAREST ONE-TENTH OF A PERCENT, AS CALCULATED BY THE UNITED STATES DEPARTMENT OF LABOR, IN THE NATIONAL CONSUMER PRICE INDEX FOR URBAN WAGE EARNERS AND CLERICAL WORKERS FOR EACH OF THE MONTHS IN THE 2009 CALENDAR YEAR.

(2) BEGINNING IN THE YEAR 2011, SUBJECT TO THE PROVISIONS OF SECTION 24-51-1009.5, FOR BENEFIT RECIPIENTS WHOSE BENEFITS ARE BASED ON THE ACCOUNT OF A MEMBER WHO WAS A MEMBER, INACTIVE MEMBER, OR RETIREE ON DECEMBER 31, 2006, OR FOR BENEFIT RECIPIENTS WHOSE BENEFITS ARE BASED ON THE ACCOUNT OF A DPS MEMBER OR DPS RETIREE, THE INCREASE APPLIED TO BENEFITS PAID SHALL BE THE LESSER OF TWO PERCENT OR THE AVERAGE OF THE ANNUAL INCREASES DETERMINED FOR EACH MONTH, TO THE NEAREST ONE-TENTH OF A PERCENT, AS CALCULATED BY THE UNITED STATES DEPARTMENT OF LABOR, IN THE NATIONAL CONSUMER PRICE INDEX FOR URBAN WAGE EARNERS AND CLERICAL WORKERS DURING THE CALENDAR YEAR PRECEDING THE INCREASE IN THE BENEFIT. NOTWITHSTANDING THE PROVISIONS OF THIS SUBSECTION (2), THE INCREASE SHALL BE THE MAXIMUM PERMITTED UNDER THIS SUBSECTION (2) AND SECTION 24-51-1009.5 UNLESS THE ASSOCIATION'S ANNUAL AUDITED RETURN ON INVESTMENTS IS NEGATIVE FOR THE PRECEDING CALENDAR YEAR, AT WHICH POINT THE ANNUAL INCREASE FOR THE SUBSEQUENT THREE YEARS SHALL BE THE LESSER OF TWO PERCENT OR THE AVERAGE OF THE ANNUAL INCREASES DETERMINED FOR EACH MONTH, TO THE NEAREST ONE-TENTH OF A PERCENT, AS CALCULATED BY THE UNITED STATES DEPARTMENT OF LABOR, IN THE NATIONAL CONSUMER PRICE INDEX FOR URBAN WAGE EARNERS AND CLERICAL WORKERS DURING THE CALENDAR YEAR PRECEDING THE INCREASE IN THE BENEFIT. THE INCREASE APPLIED TO

SUCH BENEFITS SHALL BE RECALCULATED ANNUALLY AS OF JULY 1, AND SHALL BE THE COMPOUNDED ANNUAL PERCENTAGE OF THE ANNUAL INCREASES APPLIED TO SUCH BENEFITS. IN THE FIRST YEAR THAT THE BENEFIT RECIPIENT IS ELIGIBLE TO RECEIVE AN ANNUAL INCREASE PURSUANT TO SECTION 24-51-1001, THE ANNUAL INCREASE SHALL BE PRORATED.

(3) BENEFITS FOR VESTED INACTIVE MEMBERS WITH AT LEAST TWENTY-FIVE YEARS OF SERVICE CREDIT AND BENEFITS FOR SURVIVORS OF DECEASED VESTED INACTIVE MEMBERS WHO HAD AT LEAST TWENTY-FIVE YEARS OF SERVICE CREDIT SHALL BE INCREASED BY THE ANNUAL INCREASE SPECIFIED IN THIS SECTION AND SECTIONS 24-51-1001 AND 24-51-1003 UNDER PRIOR LAW FROM THE DATE OF TERMINATION OF MEMBERSHIP OR JULY 1, 1993, WHICHEVER IS LATER, TO MARCH 1, 2009, OR THE DATE BENEFITS COMMENCE, WHICHEVER IS EARLIER. THIS SUBSECTION (3) SHALL ONLY APPLY TO MEMBERS AND INACTIVE MEMBERS WHO ARE ELIGIBLE TO RECEIVE A RETIREMENT BENEFIT AS OF JANUARY 1, 2011.

(4) NOTWITHSTANDING THE PROVISIONS OF SUBSECTION (1) OF THIS SECTION, THE INCREASE, IF ANY, APPLIED TO THE BENEFITS OF PERSONS WHOSE BENEFITS ARE BASED ON THE ACCOUNT OF A MEMBER WHO WAS NOT A MEMBER, INACTIVE MEMBER, OR RETIREE ON DECEMBER 31, 2006, WILL BE CALCULATED AND PAID IN ACCORDANCE WITH SECTION 24-51-1009.

**SECTION 21.** 24-51-1003, Colorado Revised Statutes, is amended to read:

**24-51-1003. Annual increases in the base benefit.** The percentage recalculated pursuant to the provisions of section 24-51-1002 shall be multiplied by the base benefit OR RETIREMENT ALLOWANCE AS DEFINED IN SECTION 24-51-1702 (34), WHICHEVER IS APPLICABLE, to determine the increased benefit. In no case shall the benefit paid be less than the base benefit OR RETIREMENT ALLOWANCE, WHICHEVER IS APPLICABLE.

**SECTION 22.** The introductory portion to 24-51-1009 (4) and 24-51-1009 (4) (a) and (4) (b), Colorado Revised Statutes, are amended, and the said 24-51-1009 is further amended BY THE ADDITION OF A NEW SUBSECTION, to read:

**24-51-1009. Annual increase reserve - creation.** (4) An actuarial valuation shall be conducted each year for the annual increase reserve of



each division for the purposes of this section. The actuarial valuation shall include a determination of the total market value of the assets in the reserve and a calculation of the net present value of the actuarial liabilities associated with providing each of the annual increases described in paragraphs (a), (b), and (c) of this subsection (4). SUBJECT TO SECTION 24-51-1009.5, the maximum annual increase awarded by the board shall be the lesser of the following calculations:

(a) A permanent increase equal to ~~three~~ TWO percent of current benefits payable to benefit recipients then eligible for an annual increase in accordance with section 24-51-1001 (3);

(b) SUBJECT TO THE PROVISIONS OF SUBSECTION (4.5) OF THIS SECTION, a permanent increase of current benefits payable to benefit recipients then eligible for an annual increase in accordance with section 24-51-1001 (3) that is equal to ~~the actual increase~~ THE AVERAGE OF THE ANNUAL INCREASES DETERMINED FOR EACH MONTH, TO THE NEAREST ONE-TENTH OF A PERCENT, as calculated by the United States department of labor, in the national consumer price index for urban wage earners and clerical workers DURING THE CALENDAR YEAR PRECEDING THE INCREASE IN THE BENEFIT for the year associated with the actuarial valuation of the annual increase reserve; or

(4.5) FOR THE YEAR 2010, THE ASSOCIATION SHALL USE THE AVERAGE OF THE ANNUAL INCREASES DETERMINED FOR EACH MONTH, TO THE NEAREST ONE-TENTH OF A PERCENT, AS CALCULATED BY THE UNITED STATES DEPARTMENT OF LABOR, IN THE NATIONAL CONSUMER PRICE INDEX FOR URBAN WAGE EARNERS AND CLERICAL WORKERS FOR EACH OF THE MONTHS IN THE 2009 CALENDAR YEAR.

**SECTION 23.** Part 10 of article 51 of title 24, Colorado Revised Statutes, is amended BY THE ADDITION OF A NEW SECTION to read:

**24-51-1009.5. Annual increase amount changes.** WHEN THE ACTUARIAL FUNDED RATIO OF THE ASSOCIATION, BASED ON THE ACTUARIAL VALUE OF ASSETS, IS AT OR ABOVE ONE HUNDRED THREE PERCENT AS DETERMINED IN THE ANNUAL ACTUARIAL STUDY OF THE ASSOCIATION, THE UPPER LIMIT OF THE ANNUAL INCREASE SHALL BE INCREASED BY ONE-QUARTER OF ONE PERCENT. IF THE ACTUARIAL FUNDED RATIO OF THE ASSOCIATION, BASED ON THE ACTUARIAL VALUE OF ASSETS, REACHES ONE

HUNDRED THREE PERCENT AND SUBSEQUENTLY ANY ANNUAL ACTUARIAL STUDY REFLECTS THE ACTUARIAL FUNDED RATIO OF THE ASSOCIATION, BASED ON THE ACTUARIAL VALUE OF ASSETS, IS BELOW NINETY PERCENT, THE UPPER LIMIT OF THE ANNUAL INCREASE SHALL BE DECREASED BY ONE-QUARTER OF ONE PERCENT. AT NO TIME SHALL THE UPPER LIMIT OF THE ANNUAL INCREASE FALL BELOW TWO PERCENT.

**SECTION 24.** The introductory portion to 24-51-1101 (1) and 24-51-1101 (2), Colorado Revised Statutes, are amended, and the said 24-51-1101 is further amended BY THE ADDITION OF A NEW SUBSECTION, to read:

**24-51-1101. Employment after service retirement.** (1) Except as otherwise provided in ~~subsection (1.5) or (1.7)~~ SUBSECTION (1.8) of this section or part 17 of this article, a service retiree from any division may be employed by an employer, whether or not in a position subject to membership, and receive a salary without reduction in benefits if the service retiree has not worked for any employer, as defined in section 24-51-101 (20), during the month of the effective date of retirement, and if:

(1.8) (a) A SERVICE RETIREE WHO IS HIRED BY A STATE COLLEGE OR UNIVERSITY OR BY AN EMPLOYER IN THE SCHOOL OR DENVER PUBLIC SCHOOLS DIVISION OF THE ASSOCIATION PURSUANT TO PARAGRAPH (b) OF THIS SUBSECTION (1.8) MAY RECEIVE SALARY WITHOUT REDUCTION IN BENEFITS IF EMPLOYMENT OF MORE THAN FOUR HOURS PER DAY DOES NOT EXCEED ONE HUNDRED FORTY DAYS IN THE CALENDAR YEAR, IF EMPLOYMENT OF FOUR HOURS OR LESS PER DAY DOES NOT EXCEED NINE HUNDRED SIXTEEN HOURS IN THE CALENDAR YEAR, OR IF EMPLOYMENT CONSISTING OF A COMBINATION OF DAILY AND HOURLY EMPLOYMENT DOES NOT EXCEED ONE HUNDRED FORTY DAYS PER CALENDAR YEAR, AND IF THE SERVICE RETIREE HAS NOT WORKED FOR ANY EMPLOYER, AS DEFINED IN SECTION 24-51-101 (20), DURING THE MONTH OF THE EFFECTIVE DATE OF RETIREMENT. A SERVICE RETIREE DESCRIBED IN THIS PARAGRAPH (a) WHO WORKS FOR ANY EMPLOYER, AS DEFINED IN SECTION 24-51-101 (20), DURING THE MONTH OF THE EFFECTIVE DATE OF RETIREMENT SHALL BE SUBJECT TO A REDUCTION IN BENEFITS AS PROVIDED IN SECTION 24-51-1102 (2).

(b) A STATE COLLEGE OR UNIVERSITY OR AN EMPLOYER IN THE SCHOOL OR DENVER PUBLIC SCHOOLS DIVISION MAY HIRE UP TO TEN SERVICE RETIREES IN AREAS WHERE THE EMPLOYER DETERMINES THAT THERE IS A

CRITICAL SHORTAGE OF QUALIFIED CANDIDATES AND THAT THE SERVICE RETIREE HAS UNIQUE EXPERIENCE, SKILL, OR QUALIFICATIONS THAT WOULD BENEFIT THE EMPLOYER. THE EMPLOYER SHALL NOTIFY THE ASSOCIATION UPON HIRING A SERVICE RETIREE PURSUANT TO THIS SUBSECTION (1.8). A LIST OF ANY AND ALL SERVICE RETIREES EMPLOYED BY THE EMPLOYER SHALL BE PROVIDED TO THE ASSOCIATION AT THE START OF EACH CALENDAR YEAR AND SHALL BE UPDATED PRIOR TO ANY ADDITIONAL HIRINGS DURING THE SAME CALENDAR YEAR.

(c) A STATE COLLEGE OR UNIVERSITY OR AN EMPLOYER IN THE SCHOOL OR DENVER PUBLIC SCHOOLS DIVISION SHALL PROVIDE FULL PAYMENT OF ALL EMPLOYER CONTRIBUTIONS AND ALL DISBURSEMENTS IN ACCORDANCE WITH PART 4 OF THIS ARTICLE, AND ALL WORKING RETIREE CONTRIBUTIONS IN ACCORDANCE WITH PART 11 OF THIS ARTICLE, ON THE SALARY PAID TO THE SERVICE RETIREE DESCRIBED IN PARAGRAPH (a) OF THIS SUBSECTION (1.8).

(d) A SERVICE RETIREE WHO IS EMPLOYED PURSUANT TO THIS SUBSECTION (1.8) SHALL NOT BE REQUIRED TO RESUME MEMBERSHIP. UPON TERMINATION OF SUCH RETIREE'S EMPLOYMENT, THERE SHALL BE NO BENEFIT CALCULATION REFLECTING ADDITIONAL SERVICE CREDIT OR ANY INCREASE IN THE HIGHEST AVERAGE SALARY OF SUCH PERSON.

(e) FOR PURPOSES OF THIS SUBSECTION (1.8), "STATE COLLEGE OR UNIVERSITY" MEANS ANY POSTSECONDARY EDUCATIONAL INSTITUTION, INCLUDING COMMUNITY AND JUNIOR COLLEGES, ESTABLISHED AND EXISTING PURSUANT TO TITLE 23, C.R.S., AS AN AGENCY OF THE STATE OF COLORADO AND SUPPORTED WHOLLY OR IN PART BY TAX REVENUES.

(2) Salary from the employment, engagement, retention, or other use of a service retiree OR DPS RETIREE in an individual capacity or of any entity owned or operated by a service retiree or affiliated party by an employer to perform any service as an employee, contract employee, consultant, independent contractor, or through any other arrangement, shall be subject to employer contributions but shall not be subject to member contributions. ~~except as provided in section 24-51-1103.~~ EFFECTIVE JANUARY 1, 2011, SUCH SALARY SHALL ALSO BE SUBJECT TO WORKING RETIREE CONTRIBUTIONS. Salary from employment by a retiree who is serving in a state elected official's position shall not be subject to employer contributions OR WORKING RETIREE CONTRIBUTIONS. SALARY FROM

EMPLOYMENT OF A RETIREE WHO IS PARTICIPATING IN AN EDUCATIONAL EMPLOYEES' OPTIONAL RETIREMENT PLAN PURSUANT TO ARTICLE 54.5 OF THIS TITLE SHALL NOT BE SUBJECT TO WORKING RETIREE CONTRIBUTIONS.

**SECTION 25.** 24-51-1103 (1) and (3), Colorado Revised Statutes, are amended, and the said 24-51-1103 is further amended BY THE ADDITION OF A NEW SUBSECTION, to read:

**24-51-1103. Contributions for a retiree who returns to membership - benefit calculation upon subsequent retirement - survivor benefit rights - disability retirement benefits.** (1) Except as otherwise provided in section 24-51-1747, a retiree who returns to work in a position that is subject to membership may voluntarily suspend the service retirement benefits or the reduced service retirement benefits and resume membership. Upon such suspension, employer and member contributions are required to be made pursuant to the provisions of part 4 of this article. ~~Any additional service credit accumulated and any increase in the highest average salary of such person shall be reflected in the benefit calculation upon subsequent termination of membership only after one year of service credit has been earned.~~

(1.5) A RETIREE WHO, ON OR AFTER JANUARY 1, 2011, SUSPENDS HIS OR HER SERVICE RETIREMENT OR REDUCED SERVICE RETIREMENT BENEFITS SHALL NOT ADD ANY SERVICE CREDIT TO THE BENEFIT SEGMENT FROM WHICH THE RETIREE SUSPENDS HIS OR HER RETIREMENT. SUBJECT TO THE ELECTION SET FORTH BELOW, ANY ADDITIONAL SERVICE CREDIT ACCUMULATED WILL BE REFLECTED IN SEPARATE BENEFIT SEGMENTS UPON SUBSEQUENT TERMINATION OF MEMBERSHIP, BUT ONLY AFTER ONE YEAR OF SERVICE CREDIT HAS BEEN EARNED DURING A PERIOD OF SUSPENSION. THE SERVICE RETIREMENT OR REDUCED SERVICE RETIREMENT BENEFITS FOR EACH QUALIFYING SEPARATE BENEFIT SEGMENT WILL BE CALCULATED PURSUANT TO THE BENEFIT STRUCTURE UNDER WHICH THE RETIREE ORIGINALLY RETIRED. THE BENEFIT FOR EACH SEPARATE BENEFIT SEGMENT RESULTING FROM SUSPENSION SHALL BE DETERMINED USING THE MEMBER'S SALARY AND SERVICE CREDIT ACQUIRED DURING THE PERIOD OF SUSPENSION. THE MEMBER'S AGE AND TOTAL SERVICE CREDIT WITH THE ASSOCIATION UPON RETIREMENT AFTER EACH SUSPENSION SHALL GOVERN WHETHER THE MEMBER SHALL RECEIVE A SERVICE RETIREMENT CALCULATION OR A REDUCED SERVICE RETIREMENT CALCULATION PURSUANT TO SECTION 24-51-605 FOR THAT SEGMENT. PREVIOUS SEPARATE

BENEFIT SEGMENTS SHALL BE SUBJECT TO RECALCULATION ONLY TO REFLECT A CHANGE IN THE SELECTED OPTION OR A DESIGNATED COBENEFICIARY, IF APPLICABLE, AND NO BENEFIT INCREASES PURSUANT TO SECTION 24-51-1001 WILL BE APPLICABLE TO ANY SEPARATE BENEFIT SEGMENT DURING ANY PERIOD OF SUSPENSION. UPON REINSTATEMENT OF THE RETIREMENT BENEFIT ALLOWANCE PAYMENTS, NO INCREASE SHALL BE MADE UNTIL SUCH RESUMED PAYMENTS HAVE BEEN PAID CONTINUOUSLY FOR THE TWELVE MONTHS PRIOR TO JULY 1. UPON RESUMPTION OF RETIREMENT AFTER SUSPENSION, THE ASSOCIATION SHALL REFUND ALL MONEYS CREDITED TO THE MEMBER CONTRIBUTION ACCOUNT DURING THE PERIOD OF SUSPENSION PURSUANT TO SECTION 24-51-405 UNLESS, WITHIN A TIME PERIOD SET BY THE ASSOCIATION, THE RETIREE MAKES WRITTEN ELECTION TO ESTABLISH A SEPARATE BENEFIT SEGMENT CALCULATED AS SET FORTH ABOVE. THE REFUND SHALL BE AN AMOUNT EQUAL TO ALL MONEYS CREDITED TO THE MEMBER CONTRIBUTION ACCOUNT DURING THE PERIOD OF SUSPENSION AND PAYMENT OF MATCHING EMPLOYER CONTRIBUTIONS PURSUANT TO SECTION 24-51-408. THE REQUIREMENT TO HAVE AT LEAST FIVE YEARS OF SERVICE CREDIT TO BE ELIGIBLE FOR THE MATCHING EMPLOYER CONTRIBUTIONS PROVIDED IN SECTION 24-51-408 SHALL NOT APPLY IN THE EVENT OF RETURNING TO RETIREMENT AFTER SUSPENSION. NO REFUND MAY BE ISSUED FOR ANY BENEFIT SEGMENT FROM WHICH A BENEFIT HAS BEEN DRAWN. SUCH REFUND SHALL BE REQUIRED FOR ANY SEPARATE BENEFIT SEGMENT DURING WHICH LESS THAN ONE YEAR OF SERVICE CREDIT HAS BEEN EARNED.

~~(3) Disability retirement benefits provided for in part 7 of this article shall be available to a retiree after five years of service credit has been earned during the most recent period of membership.~~

**SECTION 26.** 24-51-1702 (17) and (34), Colorado Revised Statutes, are amended to read:

**24-51-1702. Definitions.** As used in this part 17, unless the context otherwise requires:

(17) "Highest average salary" means the average monthly compensation of the thirty-six months of accredited service having the highest rates, multiplied by twelve, or the "career average salary", whichever is greater, and shall be applied to benefits, except for benefits under sections 24-51-1727 to 24-51-1731, attributable to retirement or death

on or after July 1, 1994. For benefits under sections 24-51-1727 to 24-51-1731, "highest average salary" applies to cases where termination of service occurs on or after July 1, 1994. THIS SUBSECTION (17) SHALL APPLY ONLY TO DPS MEMBERS ELIGIBLE FOR A RETIREMENT BENEFIT AS OF JANUARY 1, 2011. FOR DPS MEMBERS NOT ELIGIBLE FOR A RETIREMENT BENEFIT AS OF JANUARY 1, 2011, THE DEFINITION OF "HIGHEST AVERAGE SALARY" SPECIFIED IN SECTION 24-51-101 (25) (b) (V) SHALL APPLY.

(34) "Retirement allowance" or "total retirement allowance" means ~~the total of pension, annuity, and all postretirement increases~~ INITIAL BENEFIT FOR A BENEFIT THAT BECOMES EFFECTIVE ON OR AFTER JANUARY 1, 2010. FOR A BENEFIT THAT BECAME EFFECTIVE BEFORE JANUARY 1, 2010, "RETIREMENT ALLOWANCE" MEANS THE TOTAL BENEFIT PAYABLE AS OF JUNE 30, 2010, INCLUDING THE SUM OF THE INITIAL BENEFIT, ACCUMULATED ANNUAL INCREASES, AND COST OF LIVING INCREASES.

**SECTION 27.** 24-51-1713, Colorado Revised Statutes, is amended to read:

**24-51-1713. Eligibility - retirements without actuarial reduction.**

(1) THIS SECTION SHALL ONLY APPLY TO DPS MEMBERS WHO HAVE FIVE OR MORE YEARS OF SERVICE CREDIT AS OF JANUARY 1, 2011. FOR DPS MEMBERS WHO HAVE LESS THAN FIVE YEARS OF SERVICE CREDIT AS OF JANUARY 1, 2011, ELIGIBILITY FOR RETIREMENT WITHOUT AN ACTUARIAL REDUCTION SHALL BE GOVERNED BY SECTION 24-51-602 (1) (a.7) AND (1) (d).

~~(1)~~ (2) Whenever a contributing member or affiliate member pursuant to the DPS plan has completed a period of twenty-five years of active service, of which not less than fifteen years shall have been with the district, and has attained the age of fifty-five years while in the service of the district, said member shall be eligible for retirement for superannuation. Such retirement shall be made upon due application and subject to such rules as may be prescribed by the association.

~~(2)~~ (3) Whenever a contributing member or affiliate member of the DPS plan has completed a period of five years of active service and has attained the age of sixty-five while in the service of the district, said member shall be eligible for retirement for superannuation. Such retirement shall be made upon due application and subject to such rules as may be

prescribed by the board of trustees.

~~(3)~~ (4) Whenever a contributing member or affiliate member pursuant to the DPS plan has completed a period of thirty years of active service with the district and has attained the age of fifty years while in the service of the district, said member shall be eligible for retirement for superannuation. Such retirement shall be made upon due application and subject to such rules as may be prescribed by the association.

**SECTION 28.** 24-51-1714, Colorado Revised Statutes, is amended to read:

**24-51-1714. Eligibility - retirements requiring actuarial reduction.** (1) THIS SECTION SHALL ONLY APPLY TO DPS MEMBERS WHO HAVE FIVE OR MORE YEARS OF SERVICE CREDIT AS OF JANUARY 1, 2011. FOR DPS MEMBERS WHO HAVE LESS THAN FIVE YEARS OF SERVICE CREDIT AS OF JANUARY 1, 2011, ELIGIBILITY FOR RETIREMENT REQUIRING AN ACTUARIAL REDUCTION SHALL BE GOVERNED BY SECTION 24-51-604.

~~(1)~~ (2) Whenever a contributing member or affiliate member pursuant to the DPS plan has completed a period of twenty-five years of active service with the district but has not attained the age of fifty-five years, said member shall be eligible for retirement for superannuation but with reduced benefits in accordance with the applicable provisions of section 24-51-1715. Any such retirement shall be voluntary and reflect the choice of the member.

~~(2)~~ (3) Whenever a contributing member or affiliate member pursuant to the DPS plan has completed a period of fifteen years of active service with the district and has attained the age of fifty-five years while in the service of the district, said member shall be eligible for retirement for superannuation but with reduced benefits in accordance with the applicable provisions of section 24-51-1715. Any such retirement shall be voluntary and reflect the choice of the contributing member.

~~(3)~~ (4) Whenever a contributing member or affiliate member pursuant to the DPS plan has completed a period of thirty years of active service with the district but has not attained the age of fifty years, said contributing member shall nevertheless be eligible for retirement for superannuation but with reduced benefits in accordance with the applicable

provisions of section 24-51-1715. Any such retirement shall be voluntary and reflect the choice of the member.

**SECTION 29.** 24-51-1715 (1) (a) and (1) (c), Colorado Revised Statutes, are amended to read:

**24-51-1715. Benefits.** (1) The annual superannuation retirement allowance shall be determined in the following manner:

(a) Subject to the provisions of paragraph (c) of this subsection (1) pertaining to certain members appointed or reappointed on or after July 1, 2005, and for persons who become affiliate members on or after July 1, 2005, the following calculations shall apply:

(I) If said member shall retire pursuant to section 24-51-1713, the highest average salary as defined in section 24-51-1702 (17) shall be multiplied by the primary percentage which shall determine the annual retirement allowance expressed as a single life annuity and known as option A.

(II) If, however, said member shall retire pursuant to section ~~24-51-1714 (1)~~ 24-51-1714 (2), and if the member HAS REACHED RETIREMENT ELIGIBILITY AS OF JANUARY 1, 2011, AND has attained a minimum age of fifty years, the annual retirement allowance, calculated pursuant to subparagraph (I) of this paragraph (a), shall be reduced by the lesser of four percent for each year that fifty-five exceeds said member's attained age or four percent for each year that thirty exceeds said member's number of years of active service with the district, in either case prorated for a partial year. FOR MEMBERS WHO HAVE NOT REACHED RETIREMENT ELIGIBILITY AS OF JANUARY 1, 2011, THE ANNUAL RETIREMENT ALLOWANCE, CALCULATED PURSUANT TO SUBPARAGRAPH (I) OF THIS PARAGRAPH (a), SHALL BE REDUCED BY AN ACTUARIALLY DETERMINED PERCENTAGE AS OF THE EFFECTIVE DATE OF RETIREMENT TO ENSURE THAT THE BENEFIT IS THE ACTUARIAL EQUIVALENT OF THE ANNUAL RETIREMENT ALLOWANCE, CALCULATED PURSUANT TO SUBPARAGRAPH (I) OF THIS PARAGRAPH (a).

(III) If said member shall retire pursuant to section ~~24-51-1714 (1)~~ 24-51-1714 (2), and if the member HAS REACHED RETIREMENT ELIGIBILITY AS OF JANUARY 1, 2011, AND is younger than age fifty, the annual retirement allowance, calculated pursuant to subparagraph (I) of this paragraph (a),



shall be reduced by the greater of four percent for each year that fifty exceeds said member's attained age or FOUR percent for each year that thirty exceeds said member's number of years of active service with the district, in either case prorated for a partial year. FOR MEMBERS WHO HAVE NOT REACHED RETIREMENT ELIGIBILITY AS OF JANUARY 1, 2011, THE ANNUAL RETIREMENT ALLOWANCE, CALCULATED PURSUANT TO SUBPARAGRAPH (I) OF THIS PARAGRAPH (a), SHALL BE REDUCED BY AN ACTUARIALLY DETERMINED PERCENTAGE AS OF THE EFFECTIVE DATE OF RETIREMENT TO ENSURE THAT THE BENEFIT IS THE ACTUARIAL EQUIVALENT OF THE ANNUAL RETIREMENT ALLOWANCE, CALCULATED PURSUANT TO SUBPARAGRAPH (I) OF THIS PARAGRAPH (a).

(IV) If said member shall retire pursuant to section ~~24-51-1714 (2)~~ 24-51-1714 (3), AND THE MEMBER HAS REACHED RETIREMENT ELIGIBILITY AS OF JANUARY 1, 2011, the annual retirement allowance, calculated pursuant to subparagraph (I) of this paragraph (a), shall be reduced by the lesser of four percent for each year that twenty-five exceeds said member's number of years of active service with the district or four percent for each year that sixty-five exceeds said member's age, in either case prorated for a partial year. FOR MEMBERS WHO HAVE NOT REACHED RETIREMENT ELIGIBILITY AS OF JANUARY 1, 2011, THE ANNUAL RETIREMENT ALLOWANCE, CALCULATED PURSUANT TO SUBPARAGRAPH (I) OF THIS PARAGRAPH (a), SHALL BE REDUCED BY AN ACTUARIALLY DETERMINED PERCENTAGE AS OF THE EFFECTIVE DATE OF RETIREMENT TO ENSURE THAT THE BENEFIT IS THE ACTUARIAL EQUIVALENT OF THE ANNUAL RETIREMENT ALLOWANCE, CALCULATED PURSUANT TO SUBPARAGRAPH (I) OF THIS PARAGRAPH (a).

(V) If said member shall retire pursuant to section ~~24-51-1714 (3)~~, 24-51-1714 (4), AND IF THE MEMBER HAS REACHED RETIREMENT ELIGIBILITY AS OF JANUARY 1, 2011, the annual retirement allowance, calculated pursuant to subparagraph (I) of this paragraph (a), shall be reduced by four percent for each year that fifty exceeds said member's age. FOR MEMBERS WHO HAVE NOT REACHED RETIREMENT ELIGIBILITY AS OF JANUARY 1, 2011, THE ANNUAL RETIREMENT ALLOWANCE, CALCULATED PURSUANT TO SUBPARAGRAPH (I) OF THIS PARAGRAPH (a), SHALL BE REDUCED BY AN ACTUARIALLY DETERMINED PERCENTAGE AS OF THE EFFECTIVE DATE OF RETIREMENT TO ENSURE THAT THE BENEFIT IS THE ACTUARIAL EQUIVALENT OF THE ANNUAL RETIREMENT ALLOWANCE, CALCULATED PURSUANT TO SUBPARAGRAPH (I) OF THIS PARAGRAPH (a).

(c) In making the calculation of the annual retirement allowance adjustment for a member who initially was appointed or who became an affiliate member on or after July 1, 2005, AND WHO HAS REACHED RETIREMENT ELIGIBILITY AS OF JANUARY 1, 2011, the reduction percentage provided in paragraph (a) of this subsection (1) shall be changed in each instance from four percent to six percent. ~~This paragraph (c) shall not apply to a member whose contributing or affiliate membership began on or before June 30, 2005, and whose accumulated contribution balance remains continuously on deposit in the Denver public schools division through the effective date of such member's retirement.~~ FOR MEMBERS WHO HAVE NOT REACHED RETIREMENT ELIGIBILITY AS OF JANUARY 1, 2011, THE ANNUAL RETIREMENT ALLOWANCE, CALCULATED PURSUANT TO SUBPARAGRAPH (I) OF PARAGRAPH (a) OF THIS SUBSECTION (1), SHALL BE REDUCED BY AN ACTUARIALLY DETERMINED PERCENTAGE AS OF THE EFFECTIVE DATE OF RETIREMENT TO ENSURE THAT THE BENEFIT IS THE ACTUARIAL EQUIVALENT OF THE ANNUAL RETIREMENT ALLOWANCE, CALCULATED PURSUANT TO SUBPARAGRAPH (I) OF PARAGRAPH (a) OF THIS SUBSECTION (1).

**SECTION 30.** Part 17 of article 51 of title 24, Colorado Revised Statutes, is amended BY THE ADDITION OF A NEW SECTION to read:

**24-51-1726.5. Contributions for a retiree who returns to membership - benefit calculation upon subsequent retirement - survivor benefit rights.** (1) EXCEPT AS OTHERWISE PROVIDED IN SECTION 24-51-1747, A DPS RETIREE WHO RETURNS TO WORK IN A POSITION THAT IS SUBJECT TO MEMBERSHIP MAY VOLUNTARILY SUSPEND HIS OR HER RETIREMENT ALLOWANCE AND RESUME MEMBERSHIP. UPON SUCH SUSPENSION, EMPLOYER AND MEMBER CONTRIBUTIONS ARE REQUIRED TO BE MADE PURSUANT TO THE PROVISIONS OF PART 4 OF THIS ARTICLE.

(2) A DPS RETIREE WHO, ON OR AFTER JANUARY 1, 2011, SUSPENDS HIS OR HER RETIREMENT ALLOWANCE SHALL NOT ADD ANY SERVICE CREDIT TO THE BENEFIT SEGMENT FROM WHICH THE RETIREE SUSPENDS HIS OR HER RETIREMENT. SUBJECT TO THE ELECTION SET FORTH BELOW, ANY ADDITIONAL SERVICE CREDIT ACCUMULATED WILL BE REFLECTED IN SEPARATE BENEFIT SEGMENTS UPON SUBSEQUENT TERMINATION OF MEMBERSHIP, BUT ONLY AFTER ONE YEAR OF SERVICE CREDIT HAS BEEN EARNED DURING A PERIOD OF SUSPENSION. THE RETIREMENT ALLOWANCE FOR EACH QUALIFYING SEPARATE BENEFIT SEGMENT WILL BE CALCULATED PURSUANT TO THE BENEFIT STRUCTURE UNDER WHICH THE RETIREE

ORIGINALLY RETIRED. THE BENEFIT FOR EACH SEPARATE BENEFIT SEGMENT RESULTING FROM SUSPENSION SHALL BE DETERMINED USING THE DPS MEMBER'S SALARY AND SERVICE CREDIT ACQUIRED DURING THE PERIOD OF SUSPENSION. THE DPS MEMBER'S AGE AND TOTAL SERVICE CREDIT WITH THE ASSOCIATION UPON RETIREMENT AFTER EACH SUSPENSION SHALL GOVERN WHETHER THE DPS MEMBER SHALL RECEIVE A RETIREMENT ALLOWANCE PURSUANT TO SECTION 24-51-1713 OR 24-51-1714 FOR THAT SEGMENT. PREVIOUS SEPARATE BENEFIT SEGMENTS SHALL BE SUBJECT TO RECALCULATION ONLY TO REFLECT A CHANGE IN THE SELECTED OPTION OR A DESIGNATED COANNUITANT, IF APPLICABLE, AND NO BENEFIT INCREASES PURSUANT TO SECTION 24-51-1001 WILL BE APPLICABLE TO ANY SEPARATE BENEFIT SEGMENT DURING ANY PERIOD OF SUSPENSION. UPON REINSTATEMENT OF THE RETIREMENT BENEFIT ALLOWANCE PAYMENTS, NO INCREASE SHALL BE MADE UNTIL SUCH RESUMED PAYMENTS HAVE BEEN PAID CONTINUOUSLY FOR THE TWELVE MONTHS PRIOR TO JULY 1. UPON RESUMPTION OF RETIREMENT AFTER SUSPENSION, THE ASSOCIATION SHALL REFUND ALL MONEYS CREDITED TO THE MEMBER CONTRIBUTION ACCOUNT DURING THE PERIOD OF SUSPENSION PURSUANT TO SECTION 24-51-405 UNLESS, WITHIN A TIME SET BY THE ASSOCIATION, THE RETIREE MAKES WRITTEN ELECTION TO ESTABLISH A SEPARATE BENEFIT SEGMENT CALCULATED AS SET FORTH ABOVE. THE REFUND SHALL BE AN AMOUNT EQUAL TO ALL MONEYS CREDITED TO THE MEMBER CONTRIBUTION ACCOUNT DURING THE PERIOD OF SUSPENSION AND PAYMENT OF MATCHING EMPLOYER CONTRIBUTIONS PURSUANT TO SECTION 24-51-1711 OR 24-51-1729 (6) (a) (I), WHICHEVER IS APPLICABLE. NO REFUND CAN ISSUE FOR ANY BENEFIT SEGMENT FROM WHICH A BENEFIT HAS BEEN DRAWN. SUCH REFUND SHALL BE REQUIRED FOR ANY SEPARATE BENEFIT SEGMENT DURING WHICH LESS THAN ONE YEAR OF SERVICE CREDIT HAS BEEN EARNED.

(3) (a) A DPS MEMBER WHOSE RETIREMENT ALLOWANCES ARE IN SEPARATE BENEFIT SEGMENTS PURSUANT TO THIS SECTION MUST ELECT THE SAME OPTION AND DESIGNATE THE SAME COANNUITANT FOR ALL OF HIS OR HER SEPARATE BENEFIT SEGMENTS.

(b) A DPS RETIREE WHO SUSPENDS HIS OR HER RETIREMENT AND ELECTS A SEPARATE BENEFIT SEGMENT PURSUANT TO THIS SECTION MAY CHANGE HIS OR HER ORIGINAL OPTION AND COANNUITANT ELECTION ONLY IF THE ORIGINAL OPTION SELECTED WAS OPTION A, P2, OR P3. DPS RETIREES WHO SELECTED OPTION B, C, D, OR E SHALL NOT BE ALLOWED TO CHANGE THAT ELECTION.

(4) SURVIVOR BENEFIT RIGHTS PROVIDED FOR IN THIS PART 17 SHALL BE AVAILABLE TO A DPS RETIREE WHO VOLUNTARILY SUSPENDS THE BENEFITS AND RETURNS TO MEMBERSHIP AS IF SUCH RETIREE HAD NOT RETIRED.

**SECTION 31.** 24-51-1729 (1) (a) (V), Colorado Revised Statutes, is amended to read:

**24-51-1729. Benefits - deferred members.** (1) In the event the employment of such member with the district terminates on or after July 1, 1962, the deferred retirement allowance, subject to the limitations set forth in section 24-51-1731, shall be computed in the following manner and paid under the following conditions:

(a) The amount of the deferred retirement allowance under option A shall be determined in the same manner and subject to the same conditions as is set forth in section 24-51-1715, if the member was a contributing member or affiliate member at the time that employment was terminated, with the following limitations:

(V) In making the calculation of the deferred retirement allowance for one qualified for deferred benefits, the provisions of section 24-51-1715 (1) (c) changing the reduction percentage from four percent to six percent for certain retirements ~~and section 24-51-1732 basing the annual retirement allowance adjustment on the lesser of three percent or the actual increase, as calculated by the United States department of labor, in the national consumer price index for urban wage earners and clerical workers during the calendar year preceding the increase, but in no case less than zero,~~ shall not apply if the retiree terminated employment on or before June 30, 2005.

**SECTION 32.** 24-51-1732 (1), (2), (3), and (5), Colorado Revised Statutes, are amended to read:

**24-51-1732. Benefit increases - annual retirement allowance adjustment - contributing members - affiliate members - deferred members - survivors (2001 and 2005).** (1) (a) Monthly retirement and survivor benefit payments, including the increases determined under the provisions of the DPS plan document attributable to retirement or death of an eligible employee of the district who retired or died after December 1, 1945, shall be increased ~~as follows:~~ IN ACCORDANCE WITH PART 10 OF THIS

## ARTICLE.

~~(a) (I) Subject to section 24-51-1747 (13), effective on January 1 of every year, beginning January 1, 2001, the retirement allowance or survivor benefit payment payable on December 31 of the preceding year shall be increased by three and one-quarter percent, provided, however, that increases for contributing members initially appointed on or after July 1, 2005, and for persons who become affiliate members on or after July 1, 2005, or for benefits derived through such members, shall be calculated and shall be effective as follows:~~

~~(A) The increase shall be based on the lesser of three percent or the actual increase, as calculated by the United States department of labor, in the national consumer price index for urban wage earners and clerical workers during the calendar year preceding the increase, but in no case less than zero;~~

~~(B) The resulting percentage shall be prorated, for the initial increase only, based on the number of months and fractional months that the annuitant was retired or receiving survivor benefits by March 1 of the year following the year of retirement or the date survivor benefits initially became payable; and~~

~~(C) The increase shall be effective on March 1 of each year following the year in which the effective date of retirement falls or the year in which survivor benefits become payable.~~

~~(H) The increase last stated shall not apply to a member, or for benefits derived through such member, whose contributing or affiliate membership began on or before June 30, 2005, and whose accumulated contribution balance remains continuously on deposit in the Denver public schools division through the effective date of such member's retirement.~~

(b) Adjusted payments based on survivor benefits that are suspended by reason of the beneficiary not having attained the minimum age requirements provided in sections 24-51-1738 to 24-51-1740 or pursuant to the provisions of the DPS plan document shall not continue to accumulate or accrue during such period of suspension.

(2) Upon attainment of the minimum age requirements and

resumption of such survivor's benefit payments or reinstatement under the provisions of the DPS plan document, no increase shall be made until such resumed payments have been paid continuously for ~~an entire calendar year~~ THE TWELVE MONTHS PRIOR TO JULY 1.

~~(3) Annual retirement allowance adjustments shall be payable to retired employees, survivors, or beneficiaries meeting the above requirements who are eligible to receive monthly benefits under the provisions of the DPS plan document.~~

(5) PURSUANT TO SECTION 24-51-1726.5, adjusted payments based on benefits that are suspended by reason of the annuitant's having returned to service with ~~the district~~ AN EMPLOYER AFFILIATED WITH THE ASSOCIATION as a regular employee shall not continue to accumulate or accrue during such period of suspension. Upon reinstatement of the retirement allowance payments, no increase shall be made until such resumed payments have been paid continuously for ~~an entire calendar year~~ THE TWELVE MONTHS PRIOR TO JULY 1.

**SECTION 33.** 24-51-1747 (6) (a), Colorado Revised Statutes, is amended to read:

**24-51-1747. Portability between the Denver public schools division and the other four divisions within the association.** (6) (a) A person who is a retiree of the Denver public schools retirement system before January 1, 2010, shall not be subject to THE WORKING RETIREE CONTRIBUTIONS OR a benefit reduction due to postretirement employment with an affiliated employer of the association existing before January 1, 2010, as long as the retiree continues to be employed by that same employer. A retiree so situated shall be entitled to a second and entirely separate retirement coverage segment under the PERA benefit structure.

**SECTION 34.** 24-54.5-105 (2) (a), the introductory portion to 24-54.5-105 (2) (b), and 24-54.5-105 (2) (c) (II), (3) (b) (II), and (5), Colorado Revised Statutes, are amended to read:

**24-54.5-105. Participation.** (2) (a) Any eligible employee who is not a member, ~~or~~ inactive member, OR RETIREE of the association and who is initially appointed to an eligible position on or after the effective date of the establishment of one or more optional retirement plans at such eligible

employee's employing institution shall participate in an optional retirement plan established by the eligible employee's employing institution pursuant to the provisions of this article.

(b) Any eligible employee who is a member or inactive member of the association with at least one year of service credit OR WHO IS A RETIREE OF THE ASSOCIATION, and is initially appointed to an eligible position on or after the effective date of the establishment of one or more optional retirement plans at such eligible employee's employing institution shall elect, within thirty days after such appointment, either:

(c) Any eligible employee who elects to participate in an optional retirement plan established by such eligible employee's employing institution pursuant to the provisions of paragraph (b) of this subsection (2) shall specify one of the following options:

(II) To terminate membership in the association and to require payment by the association of all employee contributions and any accrued interest on such contributions. Such election shall constitute a waiver of all rights and benefits provided by the association except as otherwise provided by the provisions of this article. Within ninety days after receipt of notice of an election to terminate membership pursuant to the provisions of this subparagraph (II), the association shall pay to the employing institution's retirement plan on behalf of the eligible employee an amount equal to the employee's member contributions plus accrued interest on such contributions at the rate specified in section 24-51-101 (28) (a) through June 30, 1991, and at the rate specified in section 24-51-101 (28) (c) after June 30, 1991. THIS SUBPARAGRAPH (II) IS NOT APPLICABLE TO RETIREES OF THE ASSOCIATION.

(3) (b) Any eligible employee who elects to participate in an optional retirement plan established by such eligible employee's employing institution pursuant to the provisions of paragraph (a) of this subsection (3) shall specify one of the following options:

(II) To terminate membership in the association and to require payment by the association of all employee contributions and any accrued interest on such contributions. Such election shall constitute a waiver of all rights and benefits provided by the association except as otherwise provided by the provisions of this article. Within ninety days after receipt of notice

of an election to terminate membership pursuant to the provisions of this subparagraph (II), the association shall pay to the employing institution's retirement plan on behalf of the eligible employee an amount equal to the employee's retirement contributions plus accrued interest on such contributions at the rate specified in section 24-51-101 (28) (a) through June 30, 1991, and at the rate specified in section 24-51-101 (28) (c) after June 30, 1991. THIS SUBPARAGRAPH (II) IS NOT APPLICABLE TO RETIREES OF THE ASSOCIATION.

(5) An election by an eligible employee to participate in an optional retirement plan of the employing institution shall be irrevocable and shall be accompanied by an appropriate application, where required, for the issuance of a contract or contracts under such optional retirement plan. NOTWITHSTANDING THE PROVISIONS OF THIS SUBSECTION (5), A RETIREE WILL HAVE THE CHOICE PURSUANT TO THIS SUBSECTION (5) EACH TIME THE RETIREE IS EMPLOYED BY THE EMPLOYING INSTITUTION.

**SECTION 35. Specified effective date.** This act shall take effect January 1, 2011, except that the following sections of this act shall take effect upon passage: Section 24-51-101 (6.5), Colorado Revised Statutes, as contained in section 1 of this act; sections 19, 20, 21, 22, and 23; section 24-51-1702 (34), Colorado Revised Statutes, as contained in section 26 of this act; and sections 32, 35, and 36.

**SECTION 36. Safety clause.** The general assembly hereby finds,



determines, and declares that this act is necessary for the immediate preservation of the public peace, health, and safety.

---

Brandon C. Shaffer  
PRESIDENT OF  
THE SENATE

---

Terrance D. Carroll  
SPEAKER OF THE HOUSE  
OF REPRESENTATIVES

---

Karen Goldman  
SECRETARY OF  
THE SENATE

---

Marilyn Eddins  
CHIEF CLERK OF THE HOUSE  
OF REPRESENTATIVES

APPROVED \_\_\_\_\_

---

Bill Ritter, Jr.  
GOVERNOR OF THE STATE OF COLORADO



---

## **APPENDIX B**

**Complete List of Original Board Recommendations  
and Resulting Senate Bill 10-001 Reforms and January 15, 2010,  
Letter From the Three Governor-Appointed Colorado PERA  
Trustees to Senate President Brandon C. Shaffer**

---



**Comparison Between  
PERA Board's Initial Recommendations and Final Benefit and Contribution Reforms Enacted in SB 1**

Original Board Recommendations	Resulting SB 1 Reforms
<b>Changes to Benefit Provisions</b>	
The amount of the 2010 and 2011 Annual Increase (AI) to be based upon the CPI-W for specified periods during 2008 and 2009, respectively, resulting in zero or near-zero AI in 2010 and 2011. Beginning in 2012, reduce the AI to an amount equal to the CPI-W with a cap of 2.0%. The AI structure change is applicable to members with a PERA membership date prior to 2007 (and members with a DPS benefit structure). The AI cap reduction from 3.0% to 2.0% also is applicable to members with a PERA membership date on or after January 1, 2007, whose AI's are funded through an annual increase reserve. Effective immediately upon effective date of the bill.	The amount of the 2010 AI was based upon the CPI-W for specified periods in 2009, resulting in a zero AI for 2010. Applicable to members with a PERA membership date prior to 2007 (and members with a DPS benefit structure) the AI applied in years beginning in 2011 is based on the applicable AI cap, (currently 2.0%) unless PERA experiences a negative investment return year which triggers a three year period of determining the AI amount as the lesser of the AI cap, or the average CPI-W increase for the previous calendar year. The AI structure for members with a PERA membership date on or after January 1, 2007, is unchanged from originally proposed. Effective immediately upon effective date of the bill.
Change AI payment month from March to July. Effective immediately upon effective date of the bill.	Unchanged
Implement a one calendar year delay on the AI following retirement. Effective for retirements on or after January 1, 2011.	One calendar year delay was shortened to a 12-month delay from retirement date. Also a member retiring with a reduced service retirement must reach age 60 or meet an unredacted retirement eligibility prior to receiving annual increases. Effective for retirements on or after January 1, 2011.
Allow the AI cap to be adjusted based on PERA's overall year-end funded status, with increases allowed when PERA is over 110% funded and decreases mandated when the PERA's funded status subsequently falls below 90%. Effective January 1, 2011.	Unchanged, except replaced the targeted 110% funded status with 103%. Effective January 1, 2011.
Revise the existing reduction factors for early reduced retirements to reflect an actuarially equivalent reduction. Effective January 1, 2011.	Unchanged
Establish a five-year highest average salary (HAS) with a base year and an 8.0% annual salary increase cap. Effective January 1, 2011.	Retain a three-year HAS, with a base year, but reduce the annual salary increase cap from 15.0% to 8.0% for all members and inactive members not eligible for a service or reduced service retirement on January 1, 2011.
Establish a five-year earned service credit vesting requirement to qualify for the 50% refund match. Applicable to dollars contributed on or after January 1, 2011.	Unchanged
Implement a modified rule of 90 with a minimum retirement age of 60, while not negatively impacting retiree access to PERACare for current and future members. Effective January 1, 2011.	For existing members with less than five years of service credit as of January 1, 2011, implement a modified rule of 85 with a minimum retirement age of 55. For new hires on and after January 1, 2011, implement a modified rule of 88, with minimum retirement age of 58. For new hires on and after January 1, 2017, implement a rule of 90, with a minimum retirement age of 60. If, prior to retirement, the most recent 10 years of service credit was earned in the School and/or DPS Divisions, implement a rule of 88 with minimum retirement age of 58.
Retirees working after retirement (non-suspended): Retiree must contribute at the applicable employee contribution rate. These contributions are not credited to a member account and do not entitle the member to a refund of these dollars or an additional benefit. Effective January 1, 2011.	Unchanged
Retirees working after retirement (suspended): Prevent recalculation of original retirement benefits at subsequent date of retirement. Provide instead a separately calculated "second segment" retirement benefit (in addition to the "first segment" retirement benefit) based only on salary and service during suspension period. Effective for retirees who suspend retirement benefits on or after January 1, 2011.	Unchanged
Prevent accumulation of AI unless benefit is presently being paid. Removes the indexing of retirement benefits for vested terminated members with 25 or more years of service credit. Effective January 1, 2011.	Unchanged

**Comparison Between  
PERA Board's Initial Recommendations and Final Benefit and Contribution Reforms Enacted in SB 1**

Original Board Recommendations	Resulting SB 1 Reforms
<b>Changes to Contribution Provisions</b>	
<p>Continue to increase AED by 0.4% per year to a total maximum rate of 5.0% by 2017. Phased implementation starting in 2013. The AED for the Local Government and Judicial Divisions are frozen at the 2010 rate of 2.2%.</p> <p>(AED was originally capped at 3.0% in 2012.)</p> <p>Continue to increase SAED by 0.5% per year to a total maximum rate of 5.0% by 2017. Phased implementation starting in 2014. The SAED for the Local Government and Judicial Divisions are frozen at the 2010 rate of 1.5%. (SAED was originally capped at 3.0% in 2013.)</p> <p>The AED and SAED will be adjusted based on PERA's year-end funded status for each division's trust fund, with decreases allowed for the division when the division's year-end funded status reaches 110% and increases mandated when the division's funded status subsequently falls below 90%. Effective January 1, 2011.</p>	<p>AED increases in the School and DPS Divisions by 0.4% in 2013, 2014, 2015, and by 0.3% in 2016, for a total of 4.5%. The AED for the State Division increases to a total maximum rate of 5.0% in 2017, as initially proposed. Unchanged for the Local Government and Judicial Divisions.</p> <p>The SAED for the State, School and DPS Divisions increases to a total maximum rate of 5.0% in 2017, as initially proposed, with an additional increase of 0.5% in 2018 for the School and DPS Divisions. Unchanged for the Local Government and Judicial Divisions.</p> <p>The AED and SAED will be adjusted based on PERA's year-end funded status for each division's trust fund, with decreases allowed for the State, School and DPS Divisions when each division's year-end funded status reaches 103% and increases mandated when the division's funded status subsequently falls below 90%.</p> <p>Decreases will be allowed for the Local Government and Judicial Divisions when each division's year-end funded status reaches 103% and increases mandated when the division's funded status reaches 90% and subsequently falls below 90%. Effective January 1, 2011.</p>

**Howard M. Crane, CFA®**  
6649 S. Blackhawk Way, Aurora CO 80016  
**Susan G. Murphy, CPA, CFP®**  
333 Dexter St., Denver, CO 80220  
**Lynn E. Turner, CPA**  
13681 Fall Creek Circle Broomfield, Colorado 80020

January 15, 2010

RE: Colorado PERA Legislation SB 10-01

Brandon C. Shaffer  
Senate President  
Colorado State Capital  
200 East Colfax  
Denver, Colorado 80203

Dear Senator Shaffer:

We are the three independent members of the Colorado Public Employees' Retirement Association (PERA) Board of Trustees. We have been appointed by the Governor and confirmed unanimously by the Senate. While we are not beneficiaries of PERA, we do have a fiduciary obligation to the plan participants. We take this duty very seriously.

Our fellow trustees also take their fiduciary duty very seriously. They are in full support of our correspondence to you and of the content of this letter.

As you are aware, PERA is no longer financially sustainable. Two economic recessions in this decade accompanied by large declines in both the U.S. and global stock markets, and increases in employee benefits coupled with unfortunate cuts in funding, have significantly reduced the funding status of PERA as well as other benefit plans including 401k's. The Board of Trustees has spent the past year working diligently with PERA staff and our consultants in developing a plan to once again make PERA financially sound.

Soon you will have the opportunity to review and consider Senate Bill 10-01 which has been introduced by the Senate President and Minority Leader. We applaud the bipartisan efforts of our Senate leaders. This bill has received the unanimous support of the entire PERA Board and is consistent with the basic principles approved and proposed earlier by the PERA Board. These principles include:

- Avoiding intergenerational cost shifting by fully funding the retirement obligations within a 30-year amortization period, and thereby avoiding the travesty of passing costs on to future generations who will have received no services in return for their tax dollars.
- Increasing the level of funding provided by both employees and employers – a concept of “shared pain.” During the past six years, employer contributions have fallen \$2.6 billion short of the required contributions determined necessary by actuaries.
- Increasing the retirement age over time to 60. This modification is appropriate in light of the 58 year average age of a PERA retiree, the increasing retirement ages in the private sector, and the fact that retirement benefits are now being paid out over longer periods as people live longer lives.

As independent trustees, we strongly support this bill and urge you to support the bill as well. It is unfortunate for Colorado that the PERA Trust Funds are in this poorly funded condition. It creates problems and uncertainty both for taxpayers as well as for the 430,000 plus retirees, state and local government workers and school teachers who are members of PERA – and most of whom are also residents and taxpayers in Colorado. PERA members must depend on PERA for basic needs upon retirement, and their spending has significant impact on the communities in which they live.

The changes proposed in the legislation are well reasoned and balanced. The employees bear the vast majority of the costs involved through significant cuts in benefits, including the annual COLA. Significant underfunding of the plan in the past is also appropriately dealt with through the contribution levels of employers.

In a nutshell, Senate Bill 10-01 is a chance to fully address one of the largest problems looming over the taxpayers and public servants of our State. The bill that will be presented to you, while requiring sacrifice from beneficiaries and a long overdue financial commitment from employers, has been carefully crafted. It adheres to prudent standards of fiscal and legal responsibility, and provides for the long term sustainability of the core promises that have been made to our public servants.

To be frank, there is little to no room in this bill for error or modification. It is dependent upon achieving a long term 8 percent rate of return and obtaining a 30-year amortization, neither of which PERA has been able to achieve in the past decade. While PERA was able to achieve a 9 percent return over the past 25 years, some notable investors have expressed a view that such returns will not be achievable in upcoming years. It is also dependent upon an adjustment in *each of the next two years* to the COLA to zero or almost zero and a cap at 2 percent thereafter, subject to an appropriate “corridor cap.” The level of funding calculated for PERA is also dependent on using accounting rules for governments (These rules are currently under review). Were PERA to use the rules required of private and public companies, significantly greater liabilities and lower funding ratios would be reported to the public. As a result, *any* changes to this legislation that would increase the liabilities or costs of PERA will need to be quantified and counter balanced with changes offsetting them in the other direction. Failure to do so may very well lead to further underfunding of the plan and to putting employees, employers, and taxpayers at greater risk in the future.


Consequently, we implore you to support this legislation in concept, spirit, substance and entirety.

Thank you for your service to the State of Colorado, and for supporting our common goals.

Sincerely,



Howard M. Crane, CFA®  
howard.m.crane@gmail.com



Susan G. Murphy, CPA, CFP®  
susangmurphy@comcast.net



Lynn E. Turner, CPA  
lynneturne@aol.com



---

**APPENDIX C**  
**Summary of Details Regarding Projection Scenarios**  
**and Projection Graphs for Each Division**

---



Benefit Provisions, Actuarial Assumptions, and Contribution Structures

State, School, and DPS* Divisions						
	Lines A			Line B	Line C	Line D
	Line A1	Line A2	Line A3			
Projection Date (effective date of data and assets)	12/31/2009	12/31/2009	12/31/2009	12/31/2014	12/31/2014	12/31/2014
Benefit Provisions	Pre-SB 1	Pre-SB 1	Post-SB 1	Pre-SB 1	Post-SB 1	Post-SB 1
Demographic Assumptions	Post-SB 1	Post SB 1	Post SB 1	Post-2012	Post-2012	Post-2012
Discount Rate	8.00%	8.00%	8.00%	8.00%	8.00%	7.50%
Assumed Rate of Return	8.00%	9.50%	8.00%	8.00%	8.00%	7.50%
Wage/Price Inflation	4.50%/3.75%	4.50%/3.75%	4.50%/3.75%	4.25%/3.50%	4.25%/3.50%	3.90%/2.80%
AED/SAED†	Up to 3.00%	Up to 3.00%	Up to 5.00%	Up to 3.00%	Up to 5.00%	Up to 5.00%
ER Cont. Rate for School	10.55%	10.55%	10.15%	10.55%	10.15%	10.15%
Growth Assumption	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
Local Government and Judicial Divisions						
	Lines A			Line B	Line C	Line D
	Line A1	Line A2	Line A3			
Projection Date (effective date of data and assets)	12/31/2009	12/31/2009	12/31/2009	12/31/2014	12/31/2014	12/31/2014
Benefit Provisions	Pre-SB 1	Pre-SB 1	Post-SB 1	Pre-SB 1	Post-SB 1	Post-SB 1
Demographic Assumptions	Post-SB 1	Post SB 1	Post SB 1	Post-2012	Post-2012	Post-2012
Discount Rate	8.00%	8.00%	8.00%	8.00%	8.00%	7.50%
Assumed Rate of Return	8.00%	9.50%	8.00%	8.00%	8.00%	7.50%
Wage/Price Inflation	4.50%/3.75%	4.50%/3.75%	4.50%/3.75%	4.25%/3.50%	4.25%/3.50%	3.90%/2.80%
AED/SAED†	Up to 3.00%	Up to 3.00%	2.20%/1.50%	Up to 3.00%	2.20%/1.50%	2.20%/1.50%
Growth Assumption	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%

\* The benefit provisions, assumptions and contributions are only applicable to the DPS Division regarding Lines A3 through Lines D. Since the DPS Division was merged into PERA effective January 1, 2010, no projections were performed by PERA for periods prior to the recognition of SB 1 reforms.

† The projection graphs consider, for each division, the statutory decreases in AED and SAED following the attainment of a 103% funded ratio.

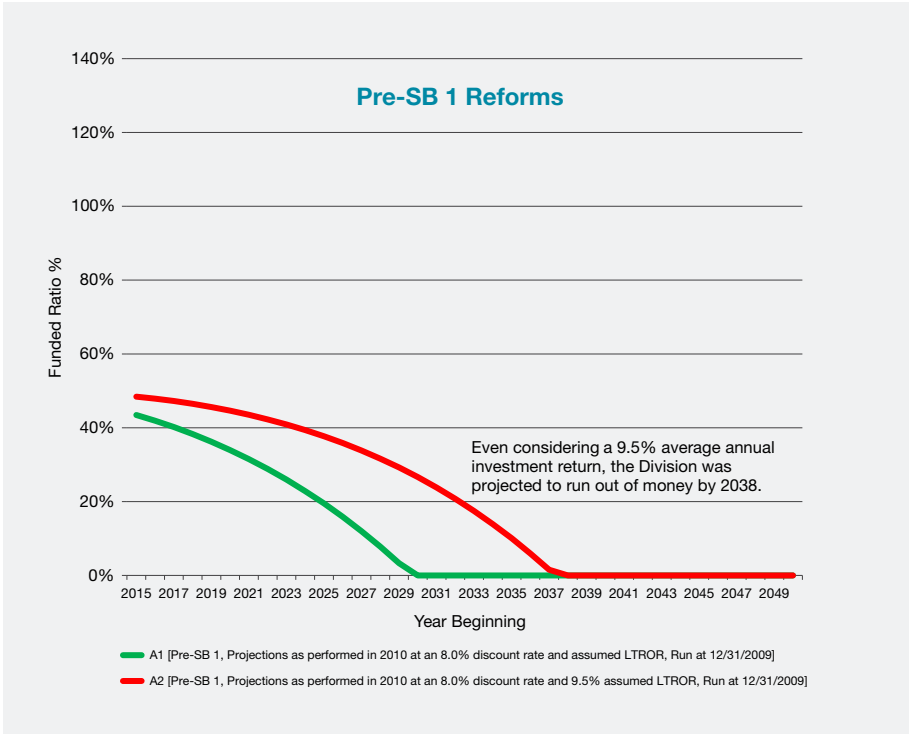
## APPENDIX C

### Descriptions of Projection Graph Sets Shown in Section V SB 1 Reforms Ensure PERA Sustainable for Foreseeable Future

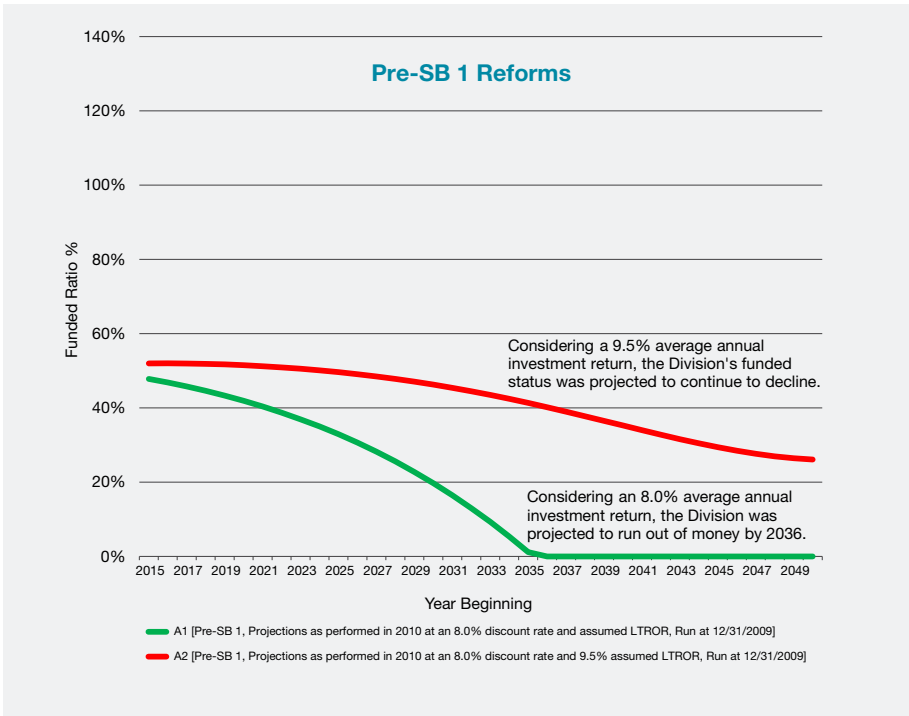
Graph Set	Divisions	Lines	Focus	Purpose
Set 1	4	Line A1*	Line A1 – baseline projection at 8.0% and without consideration of SB 1 Reforms	Provides a baseline of plan unsustainability prior to any proposed reforms.
		Line A2*	Line A2 – projection assuming an average 9.5% investment return and without consideration of SB 1 Reforms	Shows that PERA's sustainability issues could not be addressed through investment performance and illustrates that Local Government and Judicial Divisions are more sensitive to investment returns than the other two divisions.
Set 2	5	Line A1*	Area between Line B and Line A1	Shows the impact of favorable asset experience over the last five years (annualized ROR of 9.9%), without consideration of SB 1 reforms.
		Line B		Area between Line C and Line B
Set 3	5	Line C	Area between Line C and Line D	
		Line D		
Set 4	5	Line A3	Line A3 – original projection at 8.0% and with consideration of SB 1 Reforms	Shows the original projections as performed in 2010 at an 8.0% discount rate and assumed LTROR, with consideration of SB 1 reforms.
		Line C	Area between Line D and Line A3	Represents all member and asset experience, assumption changes, SB 1 reforms, and moving from an 8.0% to a 7.5% assumed LTROR.
		Line D	Area between Line C and Line D	Isolates the impact of moving from an 8.0% to a 7.5% assumed LTROR, with consideration of the SB 1 reforms.

\* Not performed for the DPS Division.

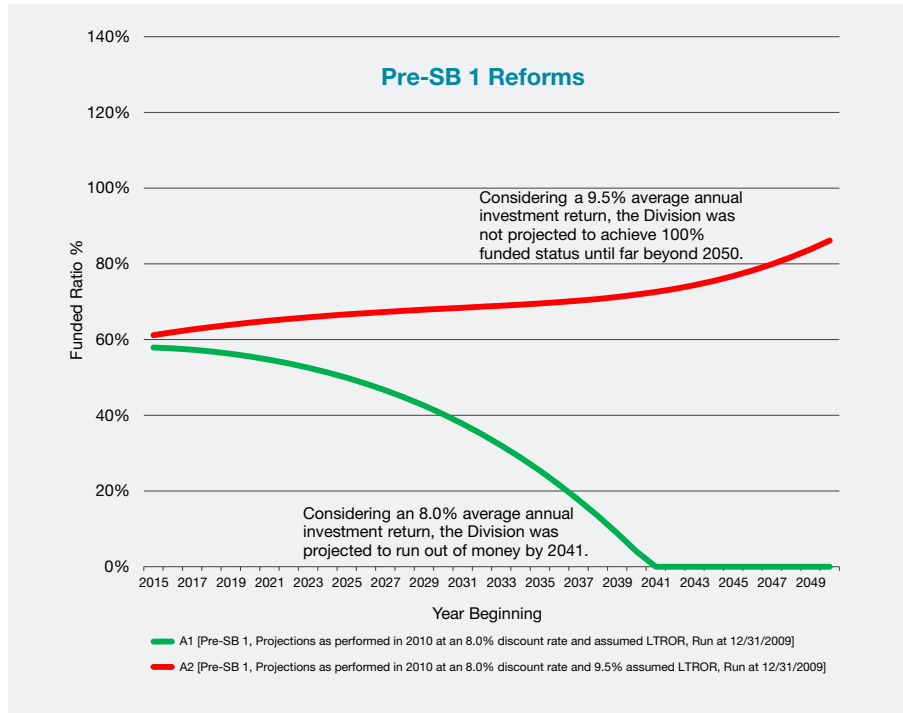
**Colorado PERA—State Division  
35-Year Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines A**



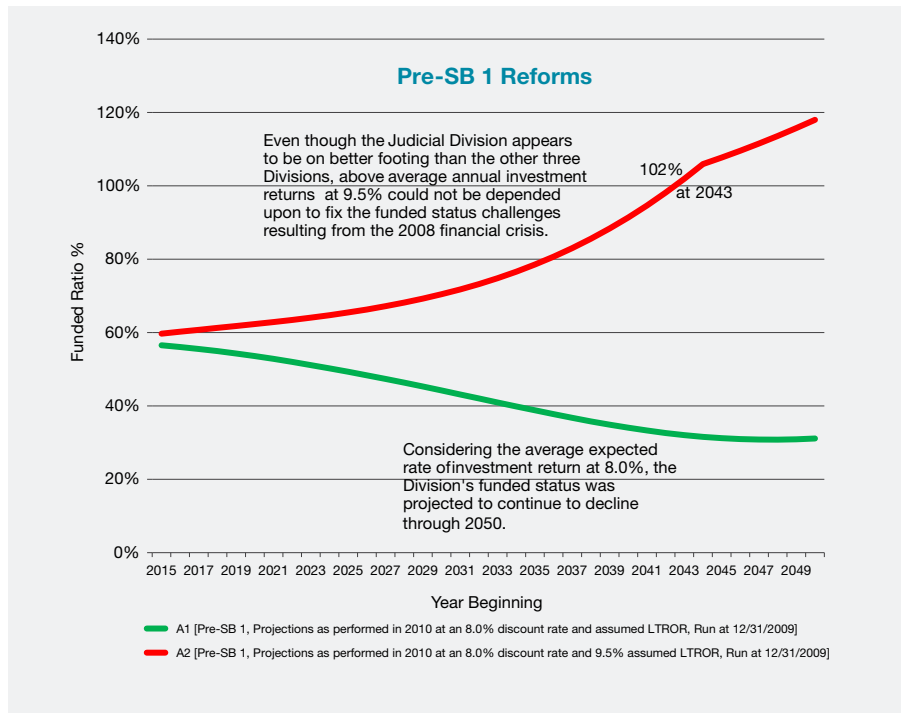
**Colorado PERA—School Division  
35-Year Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines A**



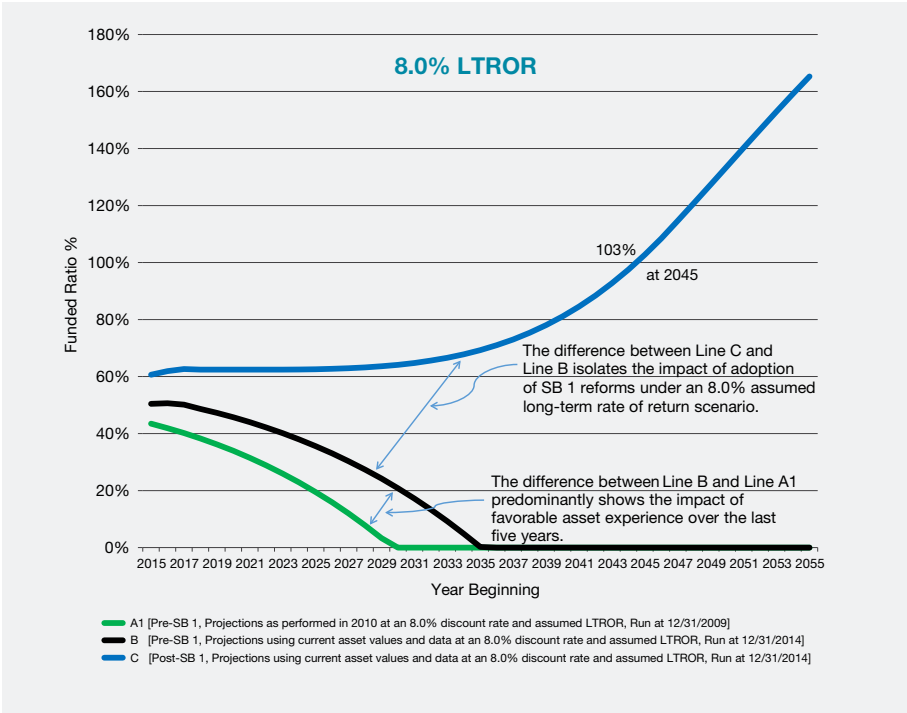
**Colorado PERA—Local Government Division  
35-Year Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines A**



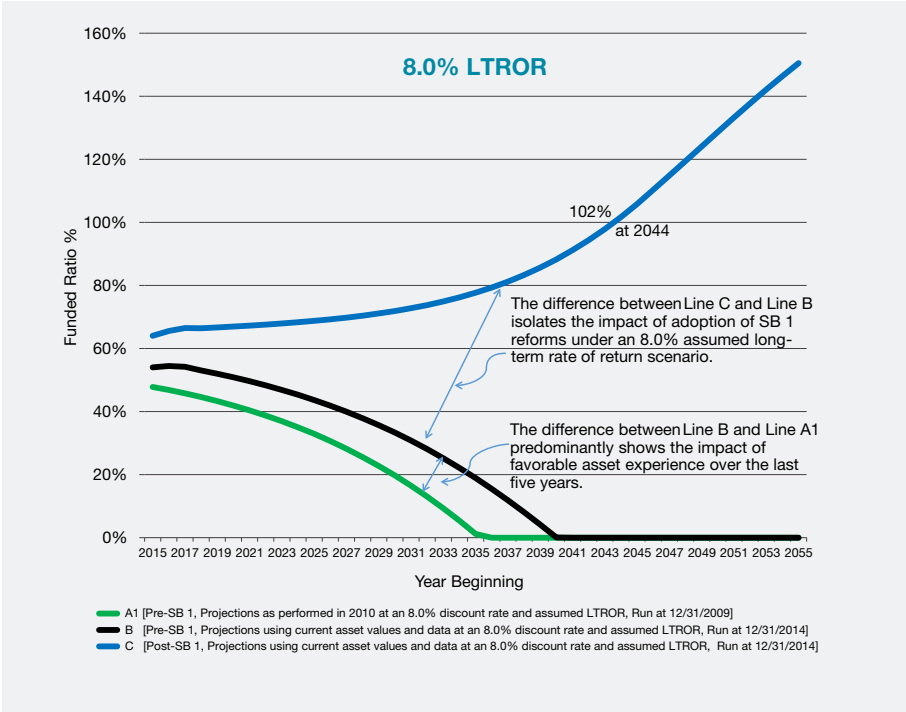
**Colorado PERA—Judicial Division  
35-Year Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines A**



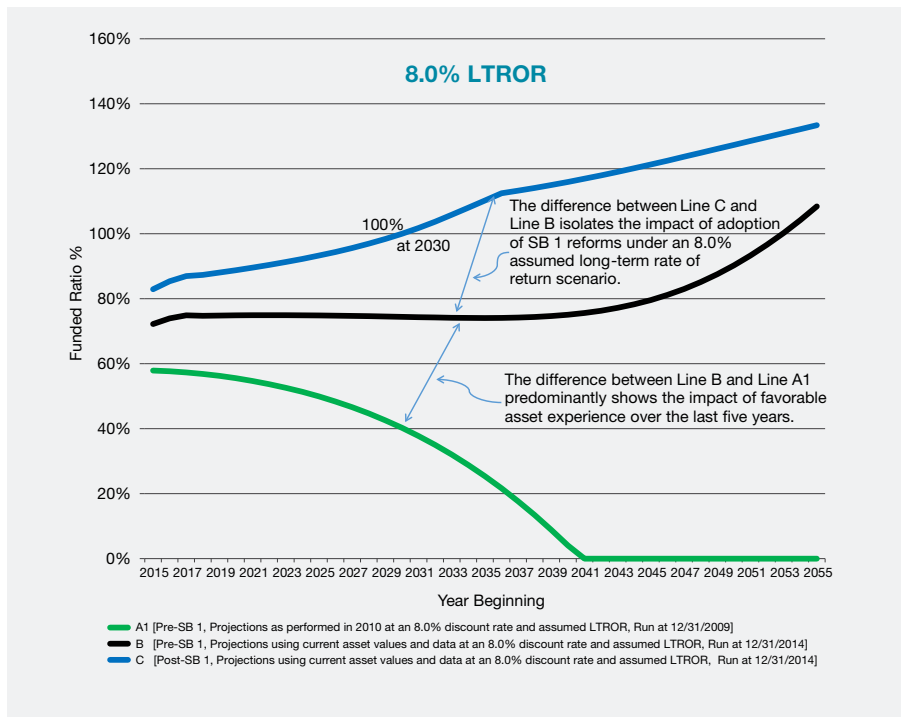
**Colorado PERA—State Division**  
**Projection of Funded Ratio on Actuarial Asset Value**  
**Projection Lines A1, B, and C**



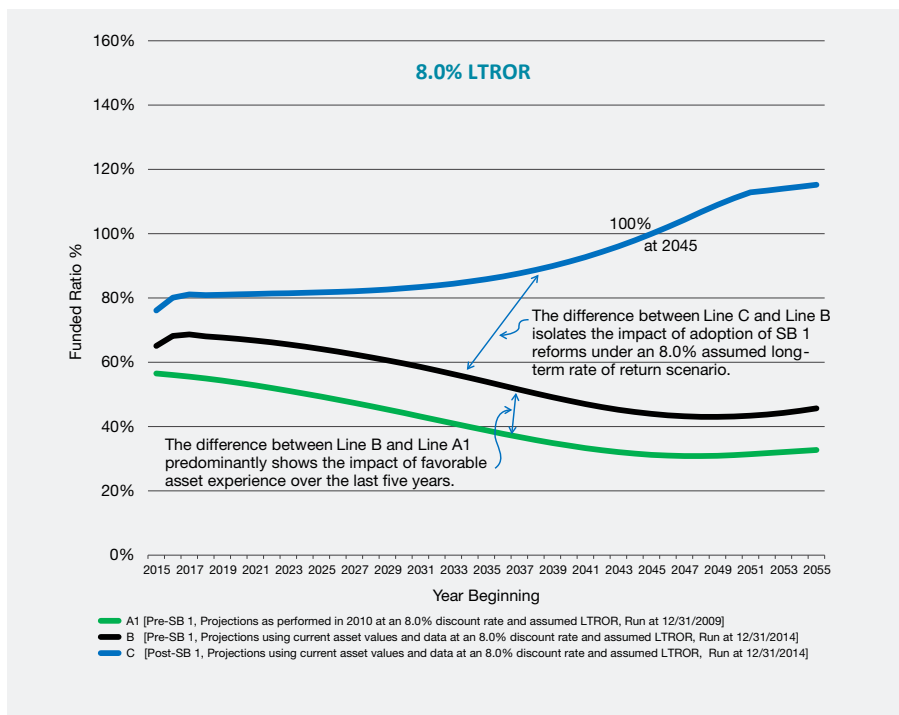
**Colorado PERA—School Division**  
**Projection of Funded Ratio on Actuarial Asset Value**  
**Projection Lines A1, B, and C**



**Colorado PERA—Local Government Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines A1, B, and C**

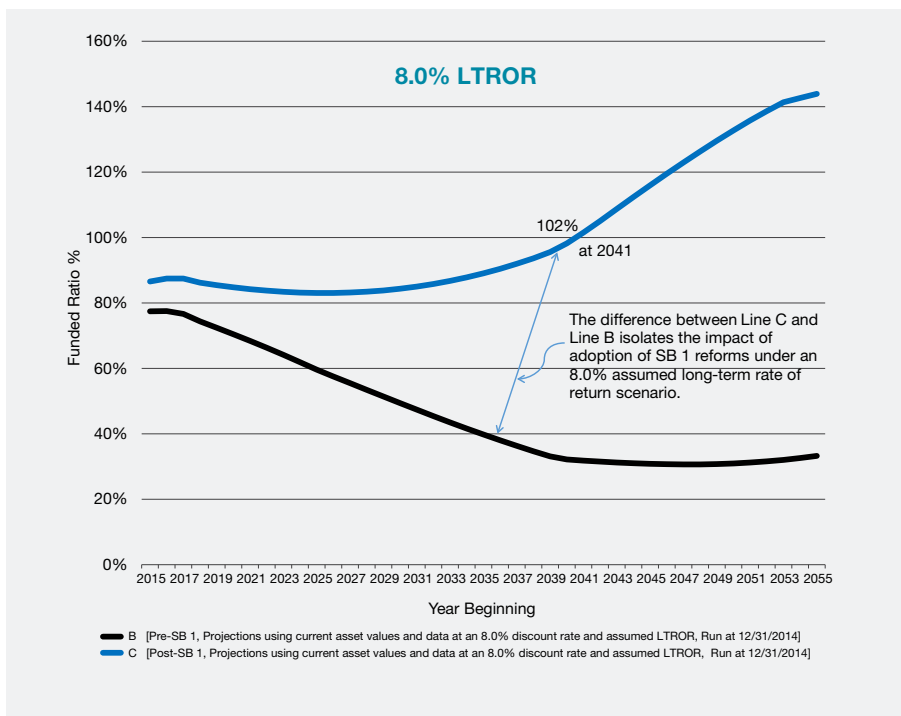


**Colorado PERA—Judicial Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines A1, B, and C**

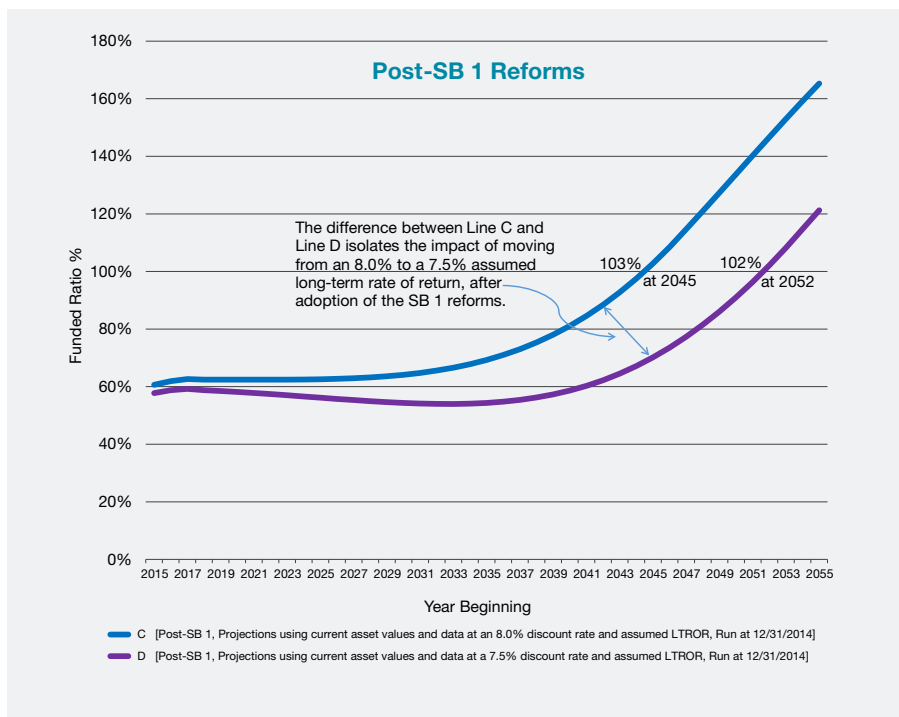




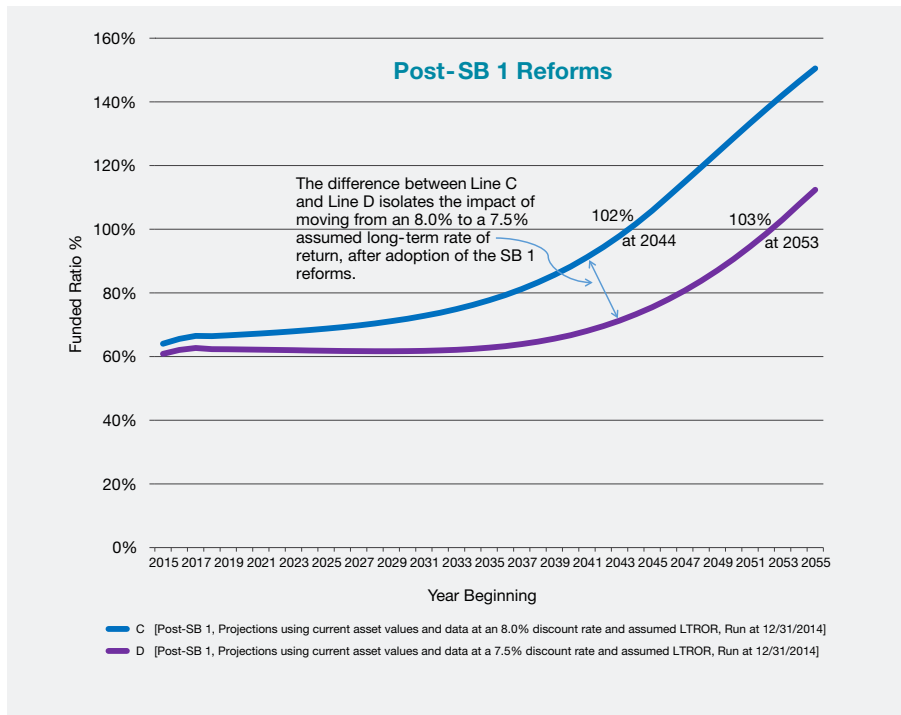
**Colorado PERA–DPS Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines B and C**



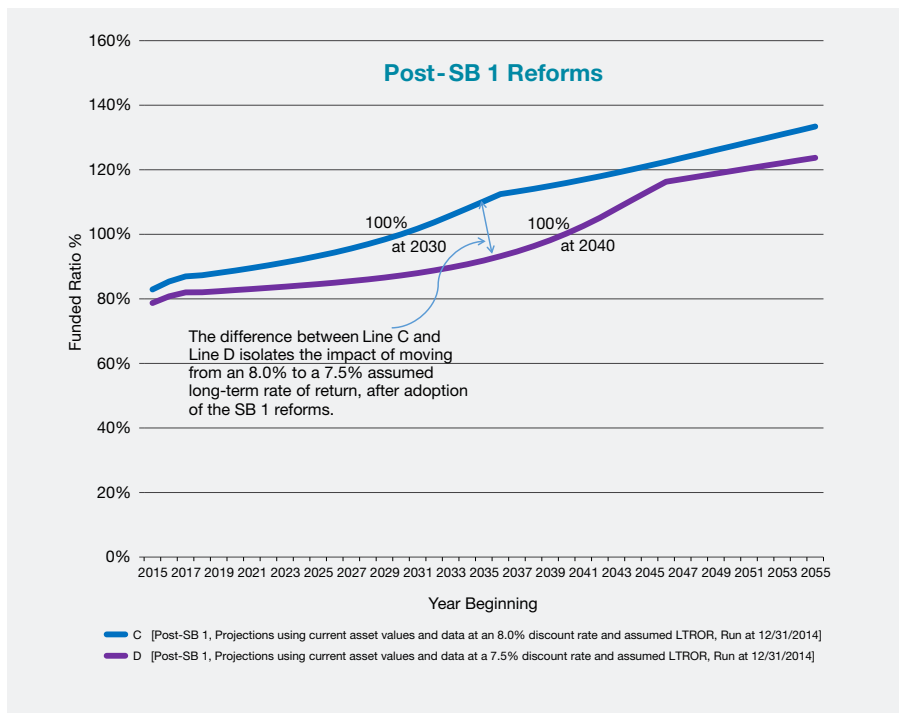
**Colorado PERA–State Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines C and D**



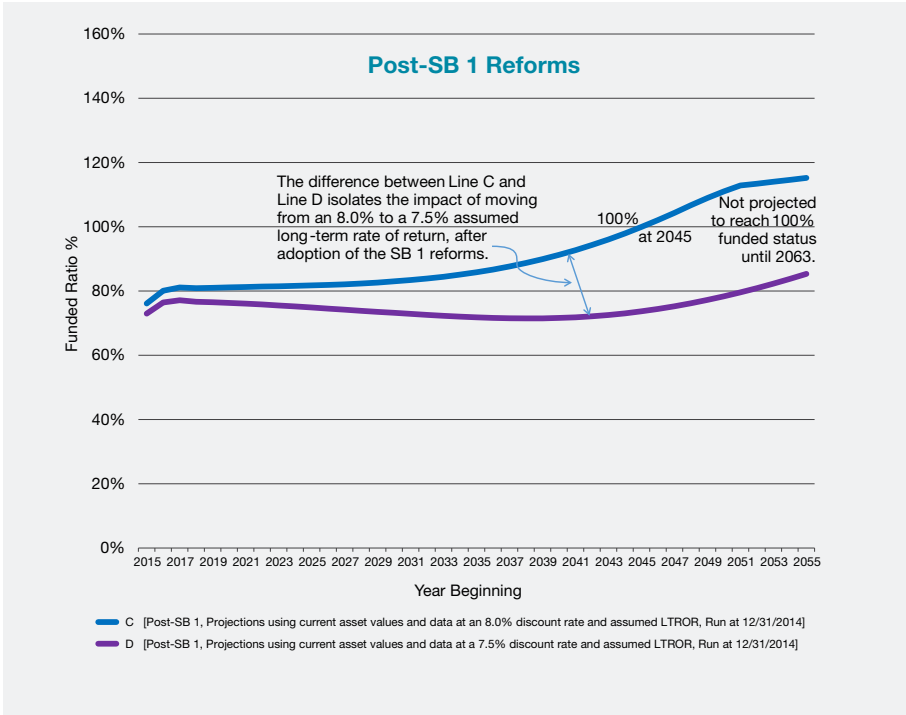
**Colorado PERA—School Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines C and D**



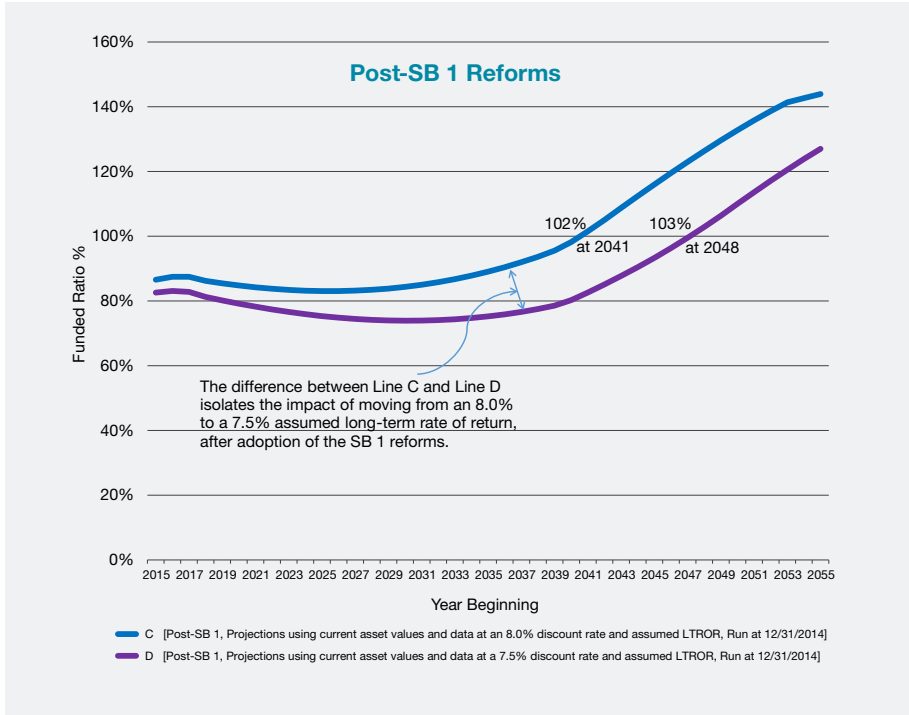
**Colorado PERA—Local Government Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines C and D**



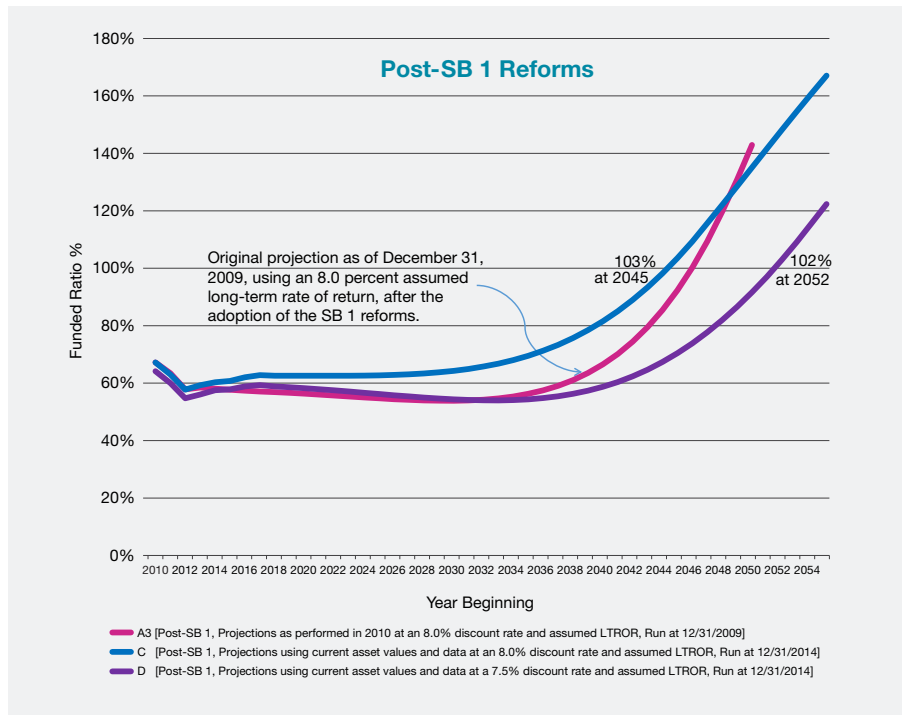
**Colorado PERA—Judicial Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines C and D**



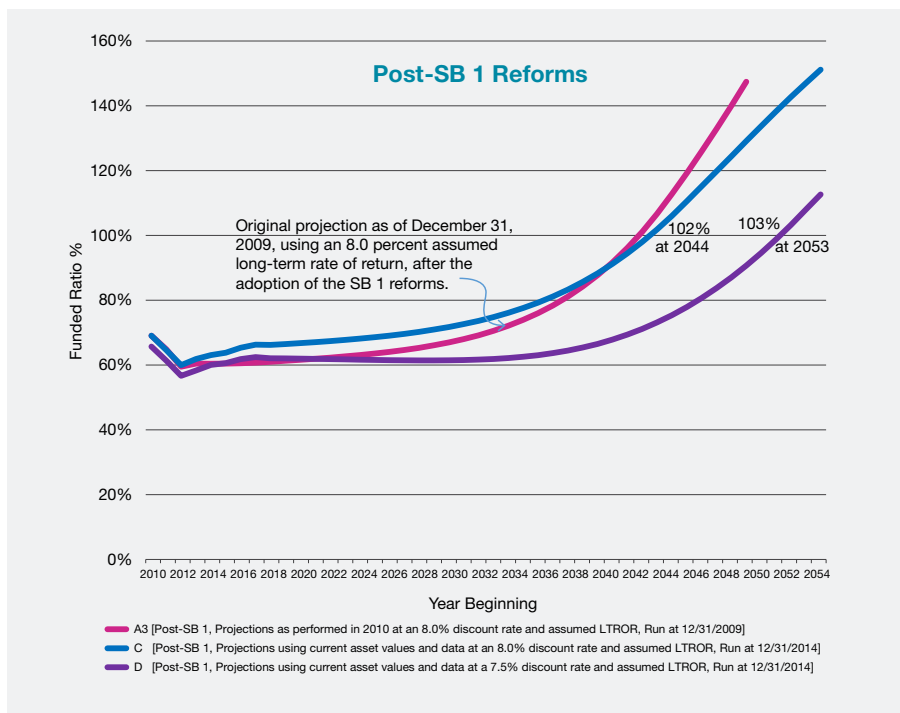
**Colorado PERA—DPS Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines C and D**



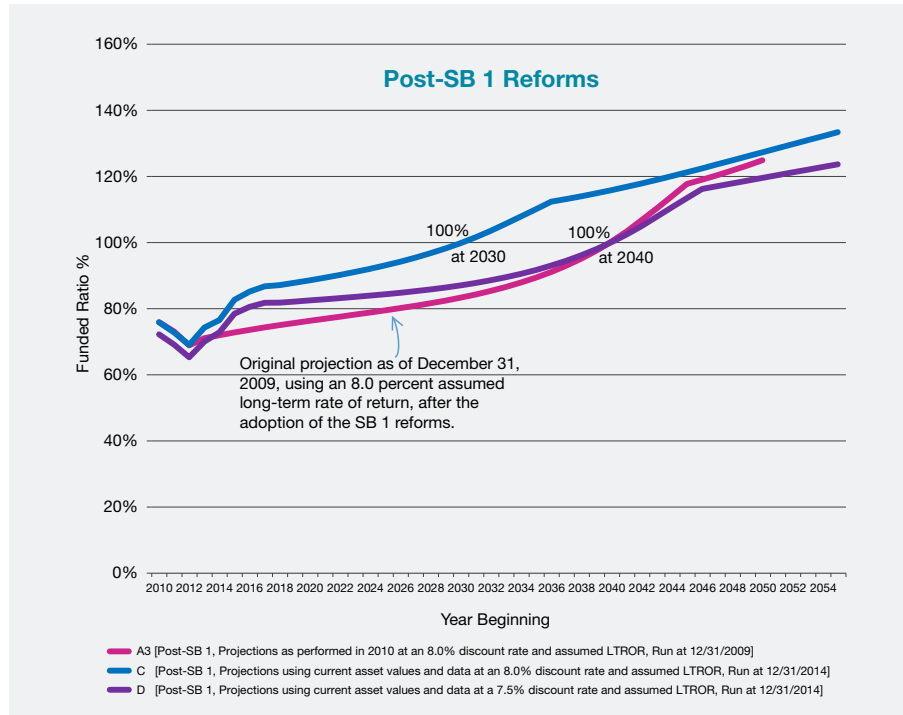
**Colorado PERA—State Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines A3, C, and D**



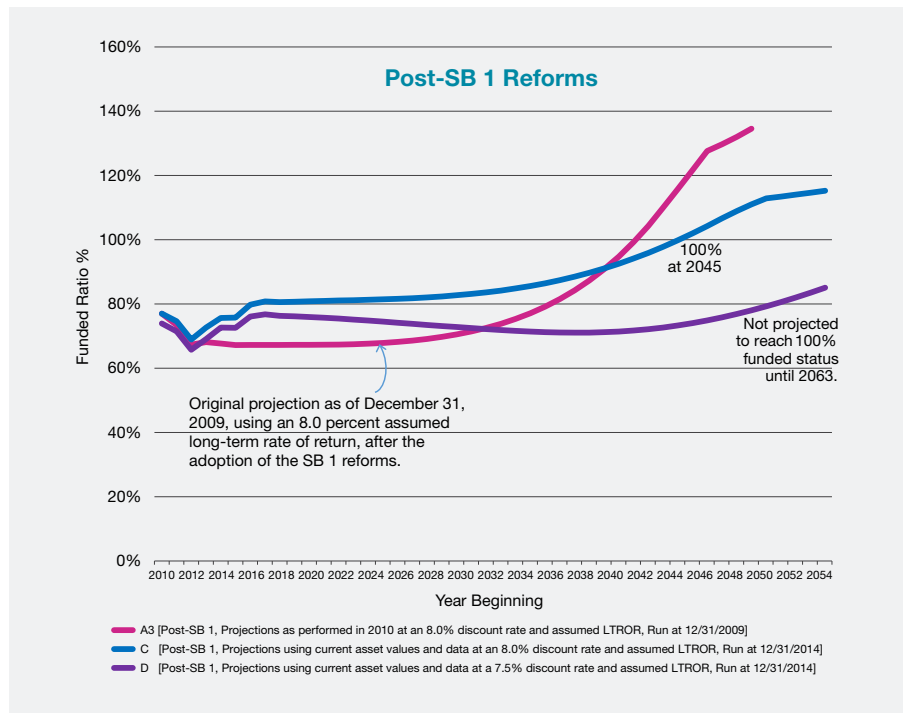
**Colorado PERA—School Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines A3, C, and D**



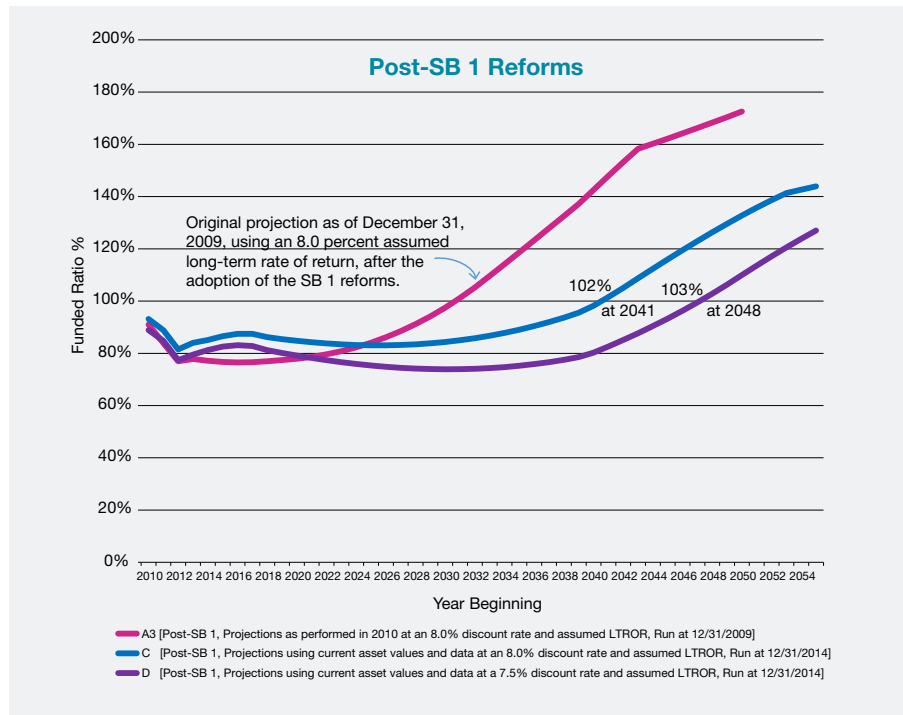
**Colorado PERA—Local Government Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines A3, C, and D**



**Colorado PERA—Judicial Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines A3, C, and D**



**Colorado PERA–DPS Division  
 Projection of Funded Ratio on Actuarial Asset Value  
 Projection Lines A3, C, and D**



---

**APPENDIX D**  
**Summary of Gain/Loss Information**

---





## Cumulative Impact on Actuarial Projections Regarding Differences Between Original and Updated Projections\*

(In Millions of Dollars)

## STATE DIVISION

ANNUAL VALUATION (GAIN)/LOSS BY ITEM						
	2010	2011	2012	2013	2014	TOTALS
Retirement	(\$0.4)	(\$6.1)	\$9.3	(\$25.3)	\$52.1	\$29.6
Withdrawal/Termination	2.5	50.1	41.3	35.5	70.0	199.4
Disability	(3.9)	(4.0)	(4.4)	9.9	11.8	9.4
Mortality	6.7	(10.9)	(16.6)	23.1	7.1	9.4
Pay Increases	(287.7)	(223.4)	(106.9)	(49.5)	17.9	(649.6)
New Members	54.4	57.1	60.3	76.6	63.4	311.8
Miscellaneous	(20.1)	9.7	53.4	(2.1)	(6.1)	34.8
Total Demographic	(\$248.5)	(\$127.5)	\$36.4	\$68.2	\$216.2	(\$55.2)
Impact of Actuarial Assumption Changes	0.0	0.0	(235.8)	1,034.8	0.0	799.0
Impact of Benefit Provision Changes	0.0	0.0	0.0	0.0	0.0	0.0
Impact of Method and Programming Changes	0.0	0.0	0.0	0.0	(194.4)	(194.4)
Increase in UAAL Due to Contribution Deficiency <sup>†</sup>	176.1	44.7	63.1	102.5	88.1	474.5
CHANGE OR (GAIN)/LOSS BY ITEM						
Valuation Liability (Gain)/Loss Total by Year <sup>‡</sup>	(\$248.5)	(\$127.5)	(\$199.4)	\$1,103.0	\$21.8	\$549.4
MVA Investment (Gain)/Loss Total by Year	(650.6)	736.7	(578.0)	(935.3)	238.7	(1,188.5)
Growth Assumption New Liability (Gain)/Loss Total by Year <sup>§</sup>	(1.1)	(5.6)	(6.7)	(2.3)	(6.3)	(22.0)
FIVE-YEAR CUMULATIVE (GAIN)/LOSS BY ITEM						
A. Impact of Valuation Liability (Gain)/Loss	(\$248.5)	(\$395.9)	(\$627.0)	\$425.8	\$479.5	
B. Impact of MVA (Gain)/Loss	(650.6)	73.7	(494.7)	(1,507.0)	(1,354.8)	
C. Impact Growth Liability (Gain)/Loss <sup>§</sup>	(1.1)	(6.8)	(14.0)	(17.4)	(25.0)	
D. Impact Growth Contributions (Gain)/Loss <sup>§</sup>	10.7	27.4	51.6	66.8	77.5	
Grand Total (Gain)/Loss 5-Year Cumulative (A + B + C + D)						(\$822.8)

## SCHOOL DIVISION

ANNUAL VALUATION (GAIN)/LOSS BY ITEM						
	2010	2011	2012	2013	2014	TOTALS
Retirement	\$3.7	\$5.1	\$31.0	\$46.5	\$100.5	\$186.8
Withdrawal/Termination	4.6	93.3	80.8	89.4	125.3	393.4
Disability	(4.2)	(4.5)	(4.7)	8.1	8.8	3.5
Mortality	47.4	46.8	31.1	57.6	69.3	252.2
Pay Increases	(303.1)	(617.4)	(248.6)	(145.4)	(60.9)	(1,375.4)
New Members	67.4	47.3	61.0	89.0	61.7	326.4
Miscellaneous	(15.8)	(18.5)	2.8	(9.5)	(37.3)	(78.3)
Total Demographic	(\$200.0)	(\$447.9)	(\$46.6)	\$135.7	\$267.4	(\$291.4)
Impact of Actuarial Assumption Changes	0.0	0.0	(342.8)	1,701.7	0.0	1,358.9
Impact of Benefit Provision Changes	0.0	0.0	0.0	0.0	0.0	0.0
Impact of Method and Programming Changes	0.0	0.0	0.0	0.0	(298.8)	(298.8)
Increase in UAAL Due to Contribution Deficiency <sup>†</sup>	223.1	59.0	103.3	165.0	120.2	670.6
CHANGE OR (GAIN)/LOSS BY ITEM						
Valuation Liability (Gain)/Loss Total by Year <sup>‡</sup>	(\$200.0)	(\$447.9)	(\$389.4)	\$1,837.4	(\$31.4)	\$768.7
MVA Investment (Gain)/Loss Total by Year	(1,040.5)	1,178.7	(932.4)	(1,521.9)	388.2	(1,927.9)
Growth Assumption New Liability (Gain)/Loss Total by Year <sup>§</sup>	(21.8)	(10.5)	(4.4)	3.3	0.4	(33.0)
FIVE-YEAR CUMULATIVE (GAIN)/LOSS BY ITEM						
A. Impact of Valuation Liability (Gain)/Loss	(\$200.0)	(\$663.9)	(\$1,106.4)	\$642.5	\$659.3	
B. Impact of MVA (Gain)/Loss	(1,040.5)	118.3	(798.7)	(2,445.0)	(2,197.1)	
C. Impact Growth Liability (Gain)/Loss <sup>§</sup>	(21.8)	(34.0)	(41.1)	(41.1)	(43.8)	
D. Impact Growth Contributions (Gain)/Loss <sup>§</sup>	19.1	50.8	84.8	111.5	130.3	
Grand Total (Gain)/Loss 5-Year Cumulative (A + B + C + D)						(\$1,451.3)

\* This summary is designed to help explain the differences between the original projections and the updated projections.

† This element was known and already included in projections, and thus, not included in this assessment of difference between original projections and updated projections.

‡ Valuation Liability (Gain)/Loss—Total by year includes all Valuation (Gain)/Loss elements except "Increase in UAAL Due to Contribution Deficiency."

§ Provided by Cavanaugh Macdonald Consulting, LLC.

## APPENDIX D

### Cumulative Impact on Actuarial Projections Regarding Differences Between Original and Updated Projections\* (In Millions of Dollars)

#### LOCAL GOVERNMENT DIVISION

ANNUAL VALUATION (GAIN)/LOSS BY ITEM						
	2010	2011	2012	2013	2014	TOTALS
Retirement	\$6.9	(\$0.2)	\$13.3	(\$0.8)	\$14.1	\$33.3
Withdrawal/Termination	6.1	6.8	(163.7)	8.6	12.9	(129.3)
Disability	(0.8)	(0.8)	(0.9)	3.5	1.2	2.2
Mortality	1.5	2.4	(4.3)	(7.8)	(7.8)	(16.0)
Pay Increases	(64.2)	(37.2)	(12.4)	(20.0)	(16.2)	(150.0)
New Members	10.7	12.6	11.3	12.2	10.6	57.4
Miscellaneous	7.2	(15.3)	9.8	2.6	(0.2)	4.1
Total Demographic	(\$32.6)	(\$31.7)	(\$146.9)	(\$1.7)	\$14.6	(\$198.3)
Impact of Actuarial Assumption Changes	0.0	0.0	(27.8)	219.0	0.0	191.2
Impact of Benefit Provision Changes	0.0	0.0	0.0	0.0	0.0	0.0
Impact of Method and Programming Changes	0.0	0.0	0.0	0.0	(37.0)	(37.0)
Increase in UAAL Due to Contribution Deficiency†	(1.3)	(27.3)	(47.3)	(9.9)	(196.5)	(282.3)
CHANGE OR (GAIN)/LOSS BY ITEM						
Valuation Liability (Gain)/Loss Total by Year‡	(\$32.6)	(\$31.7)	(\$174.7)	\$217.3	(\$22.4)	(\$44.1)
MVA Investment (Gain)/Loss Total by Year	(151.6)	174.8	(140.9)	(233.7)	64.0	(287.4)
Growth Assumption New Liability (Gain)/Loss Total by Year§	(1.0)	(1.5)	(20.5)	(1.8)	(0.2)	(25.0)
FIVE-YEAR CUMULATIVE (GAIN)/LOSS BY ITEM						
A. Impact of Valuation Liability (Gain)/Loss	(\$32.6)	(\$66.9)	(\$247.0)	(\$49.5)	(\$75.6)	
B. Impact of MVA (Gain)/Loss	(151.6)	20.3	(118.0)	(370.1)	(327.3)	
C. Impact Growth Liability (Gain)/Loss§	(1.0)	(2.6)	(23.3)	(27.0)	(29.2)	
D. Impact Growth Contributions (Gain)/Loss§	2.9	5.6	10.8	15.0	17.6	
Grand Total (Gain)/Loss 5-Year Cumulative (A + B + C + D)						(\$414.5)

#### JUDICIAL DIVISION

ANNUAL VALUATION (GAIN)/LOSS BY ITEM						
	2010	2011	2012	2013	2014	TOTALS
Retirement	\$0.0	\$0.3	(\$0.7)	(\$3.4)	(\$0.3)	(\$4.1)
Withdrawal/Termination	0.3	(0.4)	0.1	0.4	0.1	0.5
Disability	(0.2)	(0.2)	(0.2)	0.0	(0.1)	(0.7)
Mortality	0.8	1.3	(1.5)	0.7	(1.0)	0.3
Pay Increases	(6.4)	(5.5)	(4.1)	(3.4)	3.7	(15.7)
New Members	0.8	6.9	2.8	2.8	1.9	15.2
Miscellaneous	(4.6)	(1.2)	1.4	(1.2)	(0.1)	(5.7)
Total Demographic	(\$9.3)	\$1.2	(\$2.2)	(\$4.1)	\$4.2	(\$10.2)
Impact of Actuarial Assumption Changes	0.0	0.0	(6.8)	13.7	0.0	6.9
Impact of Benefit Provision Changes	0.0	0.0	0.0	0.0	0.0	0.0
Impact of Method and Programming Changes	0.0	0.0	0.0	0.0	1.2	1.2
Increase in UAAL Due to Contribution Deficiency†	1.4	1.1	1.2	2.2	1.7	7.6
CHANGE OR (GAIN)/LOSS BY ITEM						
Valuation Liability (Gain)/Loss Total by Year‡	(\$9.3)	\$1.2	(\$9.0)	\$9.6	\$5.4	(\$2.1)
MVA Investment (Gain)/Loss Total by Year	(11.5)	13.5	(10.6)	(17.9)	4.8	(21.7)
Growth Assumption New Liability (Gain)/Loss Total by Year§	(0.4)	1.4	(0.6)	(0.3)	(0.3)	(0.2)
FIVE-YEAR CUMULATIVE (GAIN)/LOSS BY ITEM						
A. Impact of Valuation Liability (Gain)/Loss	(\$9.3)	(\$8.8)	(\$18.5)	(\$10.4)	(\$5.8)	
B. Impact of MVA (Gain)/Loss	(11.5)	1.8	(8.6)	(27.8)	(24.6)	
C. Impact Growth Liability (Gain)/Loss§	(0.4)	1.0	0.5	0.2	(0.1)	
D. Impact Growth Contributions (Gain)/Loss§	0.1	0.1	0.3	0.5	0.4	
Grand Total (Gain)/Loss 5-Year Cumulative (A + B + C + D)						(\$30.1)

\* This summary is designed to help explain the differences between the original projections and the updated projections.

† This element was known and already included in projections, and thus, not included in this assessment of difference between original projections and updated projections.

‡ Valuation Liability (Gain)/Loss—Total by year includes all Valuation (Gain)/Loss elements except "Increase in UAAL Due to Contribution Deficiency."

§ Provided by Cavanaugh Macdonald Consulting, LLC.

**Cumulative Impact on Actuarial Projections Regarding Differences Between Original and Updated Projections\***  
(In Millions of Dollars)

**DPS DIVISION**

<b>ANNUAL VALUATION (GAIN)/LOSS BY ITEM</b>						
	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>TOTALS</b>
Retirement	(\$6.0)	(\$0.8)	(\$3.9)	\$15.7	\$14.0	\$19.0
Withdrawal/Termination	2.8	4.3	(2.6)	(11.5)	(4.2)	(11.2)
Disability	0.0	0.3	0.3	2.7	2.2	5.5
Mortality	3.3	(5.8)	(3.5)	(3.2)	(0.5)	(9.7)
Pay Increases	(65.7)	(17.5)	(13.3)	(11.9)	2.9	(105.5)
New Members	6.4	23.2	24.6	34.7	38.4	127.3
Miscellaneous	(196.9)	7.0	1.2	(1.2)	(8.3)	(198.2)
Total Demographic	(\$256.1)	\$10.7	\$2.8	\$25.3	\$44.5	(\$172.8)
Impact of Actuarial Assumption Changes	0.0	0.0	(50.5)	171.1	0.0	120.6
Impact of Benefit Provision Changes	0.0	0.0	0.0	0.0	0.0	0.0
Impact of Method and Programming Changes	0.0	0.0	0.0	0.0	(107.9)	(107.9)
Increase in UAAL Due to Contribution Deficiency†	69.8	48.3	37.0	41.9	41.8	238.8
<b>CHANGE OR (GAIN)/LOSS BY ITEM</b>						
Valuation Liability (Gain)/Loss Total by Year‡	(\$256.1)	\$10.7	(\$47.7)	\$196.4	(\$63.4)	(\$160.1)
MVA Investment (Gain)/Loss Total by Year	(159.1)	173.0	(136.3)	(219.9)	55.3	(287.0)
Growth Assumption New Liability (Gain)/Loss Total by Year§	2.1	1.7	1.1	6.5	3.9	15.3
<b>FIVE-YEAR CUMULATIVE (GAIN)/LOSS BY ITEM</b>						
A. Impact of Valuation Liability (Gain)/Loss	(\$256.1)	(\$265.9)	(\$334.9)	(\$165.3)	(\$241.1)	
B. Impact of MVA (Gain)/Loss	(159.1)	10.9	(124.0)	(363.2)	(328.7)	
C. Impact Growth Liability (Gain)/Loss§	2.1	4.0	5.4	12.3	17.1	
D. Impact Growth Contributions (Gain)/Loss§	0.0	0.0	0.0	0.0	(0.1)	
Grand Total (Gain)/Loss 5-Year Cumulative (A + B + C + D)						(\$552.8)

**ALL DIVISIONS**

<b>ANNUAL VALUATION (GAIN)/LOSS BY ITEM</b>						
	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>TOTALS</b>
Retirement	\$4.2	(\$1.7)	\$49.0	\$32.7	\$180.4	\$264.6
Withdrawal/Termination	16.3	154.1	(44.1)	122.4	204.1	452.8
Disability	(9.1)	(9.2)	(9.9)	24.2	23.9	19.9
Mortality	59.7	33.8	5.2	70.4	67.1	236.2
Pay Increases	(727.1)	(901.0)	(385.3)	(230.2)	(52.6)	(2,296.2)
New Members	139.7	147.1	160.0	215.3	176.0	838.1
Miscellaneous	(230.2)	(18.3)	68.6	(11.4)	(52.0)	(243.3)
Total Demographic	(\$746.5)	(\$595.2)	(\$156.5)	\$223.4	\$546.9	(\$727.9)
Impact of Actuarial Assumption Changes	0.0	0.0	(663.7)	3,140.3	0.0	2,476.6
Impact of Benefit Provision Changes	0.0	0.0	0.0	0.0	0.0	0.0
Impact of Method and Programming Changes	0.0	0.0	0.0	0.0	(636.9)	(636.9)
Increase in UAAL Due to Contribution Deficiency†	469.1	125.8	157.3	301.7	55.3	1,109.2
<b>CHANGE OR (GAIN)/LOSS BY ITEM</b>						
Valuation Liability (Gain)/Loss Total by Year‡	(\$746.5)	(\$595.2)	(\$820.2)	\$3,363.7	(\$90.0)	\$1,111.8
MVA Investment (Gain)/Loss Total by Year	(2,013.3)	2,276.7	(1,798.2)	(2,928.7)	751.0	(3,712.5)
Growth Assumption New Liability (Gain)/Loss Total by Year§	(22.2)	(14.5)	(31.1)	5.4	(2.5)	(64.9)
<b>FIVE-YEAR CUMULATIVE (GAIN)/LOSS BY ITEM</b>						
A. Impact of Valuation Liability (Gain)/Loss	(\$746.5)	(\$1,401.4)	(\$2,333.7)	\$843.3	\$816.3	
B. Impact of MVA (Gain)/Loss	(2,013.3)	224.9	(1,544.1)	(4,713.2)	(4,232.5)	
C. Impact Growth Liability (Gain)/Loss§	(22.2)	(38.5)	(72.7)	(73.1)	(81.0)	
D. Impact Growth Contributions (Gain)/Loss§	32.8	83.9	147.5	193.8	225.7	
Grand Total (Gain)/Loss 5-Year Cumulative (A + B + C + D)						(\$3,271.5)

\* This summary is designed to help explain the differences between the original projections and the updated projections.

† This element was known and already included in projections, and thus, not included in this assessment of difference between original projections and updated projections.

‡ Valuation Liability (Gain)/Loss—Total by year includes all Valuation (Gain)/Loss elements except "Increase in UAAL Due to Contribution Deficiency."

§ Provided by Cavanaugh Macdonald Consulting, LLC.



---

**APPENDIX E**  
**Estimated Impact of Major Senate Bill 10-001 Reforms**

---



**Summary of Estimated Impact of Major SB 1 Reforms on Actuarial Metrics**  
**September 2015**  
Prepared by Cavanaugh Macdonald Consulting, LLC

<b>Summary of Estimated AAL &amp; Asset Changes in Major SB 1 Altered Benefit Provisions and Altered Contribution Provisions</b> <b>Valuation as of December 31, 2014</b> (\$ in Millions)								
	Valuation	AED/SAED	COLA	Match	Act Equiv	Tier 2 R085	Tier 2A R088	Total
<b>State Division</b>								
Accrued Liability	\$23,408	\$23,408	\$28,048	\$23,436	\$23,442	\$23,425	\$23,414	\$28,120
Actuarial Value of Assets	\$13,523	\$13,474	\$12,976	\$13,491	\$13,509	\$13,523	\$13,523	\$12,927
Unfunded Accrued Liability	\$9,885	\$9,934	\$15,072	\$9,945	\$9,933	\$9,902	\$9,890	\$15,194
Difference		\$50	\$5,187	\$60	\$48	\$17	\$5	\$5,309
Funded Ratio	57.8%	57.6%	46.3%	57.6%	57.6%	57.7%	57.8%	46.0%
Normal Cost Rate	2.96%	2.96%	3.91%	3.63%	3.10%	3.05%	3.02%	4.08%
UAL Rate	19.35%	19.45%	29.81%	19.47%	19.45%	19.39%	19.36%	30.05%
ADC	22.31%	22.41%	33.72%	23.10%	22.55%	22.44%	22.38%	34.13%
Reduction for AED and SAED	-9.90%	-6.00%	-9.90%	-9.90%	-9.90%	-9.90%	-9.90%	-6.00%
Total Employer Contribution Rate	12.41%	16.41%	23.82%	13.20%	12.65%	12.54%	12.48%	28.13%
Difference from Valuation		4.00%	11.41%	0.79%	0.24%	0.13%	0.07%	15.72%
Market Value of Assets	\$13,957	\$13,907	\$13,403	\$13,924	\$13,942	\$13,957	\$13,957	\$13,353
<b>School Division</b>								
Accrued Liability	\$36,387	\$36,387	\$43,677	\$36,427	\$36,433	\$36,411	\$36,395	\$43,777
Actuarial Value of Assets	\$22,143	\$22,069	\$21,606	\$22,106	\$22,121	\$22,143	\$22,143	\$21,532
Unfunded Accrued Liability	\$14,243	\$14,318	\$22,071	\$14,321	\$14,312	\$14,268	\$14,252	\$22,245
Difference		\$75	\$7,827	\$78	\$68	\$25	\$8	\$8,002
Funded Ratio	60.9%	60.7%	49.5%	60.7%	60.7%	60.8%	60.8%	49.2%
Normal Cost Rate	4.33%	4.33%	5.55%	4.95%	4.47%	4.44%	4.41%	5.73%
UAL Rate	18.03%	18.13%	27.94%	18.13%	18.12%	18.06%	18.04%	28.16%
ADC	22.36%	22.46%	33.49%	23.08%	22.59%	22.50%	22.45%	33.89%
Reduction for AED and SAED	-9.87%	-6.00%	-9.87%	-9.87%	-9.87%	-9.87%	-9.87%	-6.00%
Total Employer Contribution Rate	12.49%	16.46%	23.62%	13.21%	12.72%	12.63%	12.58%	27.89%
Difference from Valuation		3.97%	11.13%	0.72%	0.23%	0.14%	0.09%	15.40%
Market Value of Assets	\$22,846	\$22,772	\$22,303	\$22,809	\$22,824	\$22,846	\$22,846	\$22,228

## APPENDIX E

**Summary of Estimated Impact of Major SB 1 Reforms on Actuarial Metrics**  
**September 2015**  
**Prepared by Cavanaugh Macdonald Consulting, LLC**

<b>Summary of Estimated AAL &amp; Asset Changes in Major SB 1 Altered Benefit Provisions and Altered Contribution Provisions</b>								
<b>Valuation as of December 31, 2014</b>								
<b>(\$ in Millions)</b>								
	Valuation	AED/SAED	COLA	Match	Act Equiv	Tier 2 R085	Tier 2A R088	Total
<b>Local Government Division</b>								
Accrued Liability	\$4,611	\$4,611	\$5,518	\$4,617	\$4,619	\$4,615	\$4,612	\$5,534
Actuarial Value of Assets	\$3,629	\$3,681	\$3,599	\$3,614	\$3,627	\$3,629	\$3,629	\$3,651
Unfunded Accrued Liability	\$982	\$930	\$1,919	\$1,003	\$992	\$985	\$983	\$1,883
Difference		(\$52)	\$937	\$22	\$10	\$4	\$1	\$902
Funded Ratio	78.7%	79.8%	65.2%	78.3%	78.5%	78.6%	78.7%	66.0%
Normal Cost Rate	2.60%	2.60%	3.48%	3.31%	2.75%	2.69%	2.66%	3.65%
UAL Rate	9.38%	8.88%	18.33%	9.58%	9.47%	9.41%	9.39%	17.99%
ADC	11.98%	11.48%	21.81%	12.89%	12.22%	12.10%	12.05%	21.64%
Reduction for AED and SAED	-3.70%	-6.00%	-3.70%	-3.70%	-3.70%	-3.70%	-3.70%	-6.00%
Total Employer Contribution Rate	8.28%	5.48%	18.11%	9.19%	8.52%	8.40%	8.35%	15.64%
Difference from Valuation		-2.80%	9.83%	0.91%	0.24%	0.12%	0.07%	7.36%
Market Value of Assets	\$3,733	\$3,786	\$3,703	\$3,718	\$3,731	\$3,733	\$3,733	\$3,755
<b>Judicial Division</b>								
Accrued Liability	\$371	\$371	\$436	\$371	\$372	\$372	\$371	\$437
Actuarial Value of Assets	\$271	\$274	\$262	\$271	\$271	\$271	\$271	\$271
Unfunded Accrued Liability	\$100	\$97	\$175	\$101	\$101	\$101	\$100	\$166
Difference		(\$3)	\$74	\$0	\$1	\$0	\$0	\$66
Funded Ratio	73.0%	73.9%	60.0%	72.9%	72.8%	72.9%	73.0%	61.9%
Normal Cost Rate	9.93%	9.93%	11.58%	9.93%	10.15%	10.03%	9.94%	11.87%
UAL Rate	12.14%	11.72%	21.11%	12.16%	12.24%	12.18%	12.14%	20.12%
ADC	22.07%	21.65%	32.69%	22.09%	22.39%	22.21%	22.08%	31.99%
Reduction for AED and SAED	-3.70%	-6.00%	-3.70%	-3.70%	-3.70%	-3.70%	-3.70%	-6.00%
Total Employer Contribution Rate	18.37%	15.65%	28.99%	18.39%	18.69%	18.51%	18.38%	25.99%
Difference from Valuation		-2.72%	10.62%	0.02%	0.32%	0.14%	0.01%	7.62%
Market Value of Assets	\$279	\$282	\$270	\$279	\$279	\$279	\$279	\$273



**Summary of Estimated Impact of Major SB 1 Reforms on Actuarial Metrics**  
**September 2015**  
**Prepared by Cavanaugh Macdonald Consulting, LLC**

<b>Summary of Estimated AAL &amp; Asset Changes in Major SB 1 Altered Benefit Provisions and Altered Contribution Provisions</b>								
<b>Valuation as of December 31, 2014</b>								
<b>(\$ in Millions)</b>								
	Valuation	AED/SAED	COLA	Match	Act Equiv	Tier 2 R085	Tier 2A R088	Total
<b>DPS Division</b>								
Accrued Liability	\$3,816		\$4,354	\$3,825	\$3,829	\$3,821	\$3,819	\$4,382
Actuarial Value of Assets	\$3,151		\$3,090	\$3,148	\$3,149	\$3,151	\$3,151	\$3,090
Unfunded Accrued Liability	\$665		\$1,264	\$677	\$680	\$670	\$667	\$1,292
Difference			\$600	\$12	\$16	\$5	\$2	\$627
Funded Ratio	82.6%		71.0%	82.3%	82.2%	82.5%	82.5%	70.5%
Normal Cost Rate	4.63%		5.40%	5.25%	4.89%	4.80%	4.79%	5.59%
UAL Rate	5.83%		11.09%	5.94%	5.97%	5.88%	5.85%	11.33%
ADC	10.46%		16.49%	11.19%	10.86%	10.68%	10.64%	16.92%
Reduction for AED and SAED	-9.87%		-9.87%	-9.87%	-9.87%	-9.87%	-9.87%	-6.00%
Total Employer Contribution Rate	0.59%		6.62%	1.32%	0.99%	0.81%	0.77%	10.92%
Difference from Valuation			6.03%	0.73%	0.40%	0.22%	0.18%	10.33%
Market Value of Assets	\$3,254		\$3,186	\$3,251	\$3,251	\$3,254	\$3,254	\$3,186



---

**APPENDIX F**  
**Analysis of Member Experience Related**  
**to Senate Bill 10-001 Reforms**

---



## Assess Progress on SB 1 Reforms—Internal

Terminating Members With Less than Five Years of Service								
Division	Pre-SB 1 Reforms (2006–2010)				Post-SB 1 Reforms (2011–2015)			
	Total Number	Number Refunding	Total of Refund Amount	Average Refund Amount	Total Number	Number Refunding	Total of Refund Amount	Average Refund Amount
State	38,053	19,760	\$87,558,900	\$4,431.12	36,646	16,439	\$84,923,825	\$5,166.00
School	59,596	30,511	120,186,216	3,939.11	61,994	26,123	109,054,555	4,174.66
Local Government	13,660	7,258	35,811,414	4,934.06	13,535	6,482	37,167,569	5,733.97
Judicial	4	2	36,919	18,459.50	6	2	119,547	59,773.50
<b>Totals</b>	<b>111,313</b>	<b>57,531</b>	<b>\$243,593,449</b>	<b>\$4,234.13</b>	<b>112,181</b>	<b>49,046</b>	<b>\$231,265,496</b>	<b>\$4,715.28</b>

Terminating Members With Less than Five Years of Service								
Division	Pre-SB 1 Reforms (2006–2010)				Post-SB 1 Reforms (2011–2015)*			
	Total Number	Number Refunding	Total of Refund Amount	Average Refund Amount	Total Number	Number Refunding	Total of Refund Amount	Average Refund Amount
State	38,053	19,760	\$87,558,900	\$4,431.12	19,874	5,582	\$14,440,280	\$2,586.94
School	59,596	30,511	120,186,216	3,939.11	29,854	6,739	12,346,213	1,832.05
Local Government	13,660	7,258	35,811,414	4,934.06	7,041	2,249	5,170,301	2,298.93
Judicial	4	2	36,919	18,459.50	3	1	18,439	18,439.00
<b>Totals</b>	<b>111,313</b>	<b>57,531</b>	<b>\$243,593,449</b>	<b>\$4,234.13</b>	<b>56,772</b>	<b>14,571</b>	<b>\$31,975,233</b>	<b>\$2,194.44</b>

\* Includes only those with a membership date on or after January 1, 2011, to exclude those with any matching dollars.

Terminated Vested Members With 25 or More Years of Service						
Division	Pre-SB 1 Reforms (2006–2010)				Post-SB 1 Reforms (2011–2015)	
	Number Retired During Study Period	Total of Est Initial Mon Benefit Amounts	Total of Actual Indexed Mon Benefit Amounts	Difference in Monthly Benefit Amounts	Number Retired During Study Period	Total of Actual Monthly Benefit Amounts
State	41	\$162,361.36	\$172,091.46	\$9,730.10	34	\$142,642.90
Averages		3,960.03	4,197.35	237.32		4,195.38
School	43	143,442.68	153,895.05	10,452.37	40	141,058.46
Averages		3,335.88	3,578.95	243.08		3,526.46
Local Government	12	46,120.27	49,373.00	3,252.73	38	138,749.24
Averages		3,843.36	4,114.42	271.06		3,651.30
Judicial	0	0.00	0.00	0.00	0	0.00
Averages						
<b>Totals</b>	<b>96</b>	<b>\$351,924.31</b>	<b>\$375,359.51</b>	<b>\$23,435.20</b>	<b>112</b>	<b>\$422,450.60</b>
<b>Averages</b>		<b>3,665.88</b>	<b>3,909.99</b>	<b>244.12</b>		<b>3,771.88</b>

Assess Progress on SB 1 Reforms—Internal

Division	Early Reduced Retirements						2006–2010 Total/Average Reduction %	2011–2015 Total/Average Reduction %
	Pre-SB 1 Reforms (2006–2010)			Post-SB 1 Reforms (2011–2015)				
	Total Number Retiring	Total of Years of Service at Early Retire	Total/Average of Early Retire Mon Benefit Amounts	Total Number Retiring	Total of Years of Service at Early Retire	Total/Average of Early Retire Mon Benefit Amounts		
State	1,626	28,867.000	\$3,117,697	1,295	21,154.000	\$2,336,280	5,350.3%	5,303.4%
Averages		17.753	1,917.40		16.335	1,804.08	3.2905%	4.0953%
School	3,122	52,694.000	4,615,021	2,841	46,479.000	4,268,734	9,300.2%	11,633.9%
Averages		16.878	1,478.23		16.360	1,502.55	2.9789%	4.0950%
Local Government	444	7,351.000	824,433	593	9,700.000	1,161,772	1,448.1%	2,933.4%
Averages		16.556	1,856.83		16.358	1,959.14	3.2615%	4.9467%
Judicial	8	119.000	25,757	6	85.000	18,956	17.7%	18.5%
Averages		14.875	3,219.63		14.167	3,159.33	2.2125%	3.0833%
<b>Totals</b>	<b>5,200</b>	<b>89,031.000</b>	<b>\$8,582,908</b>	<b>4,735</b>	<b>77,418.000</b>	<b>\$7,785,742</b>		
<b>Averages</b>		<b>17.121</b>	<b>1,650.56</b>		<b>16.350</b>	<b>1,644.30</b>		

Division	Retirees Returning to Work—Not Suspended			
	Pre-SB 1 Reforms (2006–2010)		Post-SB 1 Reforms (2011–2015)	
	Total Number Returning to Work	Total Number Returning to Work	Total of Contributions Paid by Retiree at Member Rate	Average Contributions Paid by Retiree at Member Rate
State	6,675	5,287	\$16,974,567	\$3,210.62
School	14,814	13,152	31,375,310	2,385.59
Local Government	736	631	1,347,296	2,135.18
Judicial	9	14	72,813	5,200.93
<b>Totals</b>	<b>22,234</b>	<b>19,084</b>	<b>\$49,769,986</b>	<b>\$2,607.94</b>

Division	Retirees Returning to Work—Suspended							
	Pre-SB 1 Reforms (2006–2010)				Post-SB 1 Reforms (2011–2015)			
	Total Number RTW and Retiring	Total of Initial Mon Benefit Amounts	Total of Recalculated Mon Benefit Amounts	Difference in Monthly Benefit Amounts	Total Number of RTW and Retiring	Total of Segment 1 Mon Benefit Amounts	Total of Segment 2 Mon Benefit Amounts	Total Actual Monthly Benefit Amts Post-2nd Ret
State	77	\$230,314.14	\$309,902.45	\$79,588.31	9	\$30,510.31	\$2,648.10	\$33,158.41
Averages		2,991.09	4,024.71	1,033.61		3,390.03	294.23	3,684.27
School	172	557,992.37	699,107.95	141,115.58	16	50,130.17	3,144.99	53,275.16
Averages		3,244.14	4,064.58	820.44		3,133.14	196.56	3,329.70
Local Government	7	8,149.71	9,417.96	1,268.25	5	15,555.71	1,770.07	17,325.78
Averages		1,164.24	1,345.42	181.18		3,111.14	354.01	3,465.16
Judicial	0	0.00	0.00	0.00	0	0.00	0.00	0.00
Averages								
<b>Totals</b>	<b>256</b>	<b>\$796,456.22</b>	<b>\$1,018,428.36</b>	<b>\$221,972.14</b>	<b>30</b>	<b>\$96,196.19</b>	<b>\$7,563.16</b>	<b>\$103,759.35</b>
<b>Averages</b>		<b>3,111.16</b>	<b>3,978.24</b>	<b>867.08</b>		<b>3,206.54</b>	<b>252.11</b>	<b>3,458.65</b>

---

**APPENDIX G**  
**CPI-W Data and Annual Increase Comparative Analysis**

---





## Consumer Price Index - Urban Wage Earners and Clerical Workers

Series Id	CWUR0000SA0
Not Seasonally Adjusted Area	U.S. city average
Item	All items
Base Period	1982-84=100
Years	2009 to 2013

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Annual Average
2009	205.700	206.708	207.218	207.925	208.774	210.972	210.526	211.156	211.322	211.549	212.003	211.703	209.630	-0.7%
2010	212.568	212.544	213.525	213.958	214.124	213.839	213.898	214.205	214.306	214.623	214.750	215.262	213.967	2.1%
2011	216.400	217.535	220.024	221.743	222.954	222.522	222.686	223.326	223.688	223.043	222.813	222.166	221.575	3.6%
2012	223.216	224.317	226.304	227.012	226.600	226.036	225.568	227.056	228.184	227.974	226.595	225.889	226.229	2.1%
2013	226.520	228.677	229.323	228.949	229.399	230.002	230.084	230.359	230.537	229.735	229.133	229.174	229.324	1.4%

**APPENDIX G**

**PERA - Tier 1**  
**Illustration of the Impact of PERA Granted AI's compared to Inflation (CPI-W) on Average Monthly Benefits for Early and Service Retirees (Illustration Recognizes Negative CPI)**  
**Based on SB 1 Provisions as of 2010**

		Year Granted											Based on SB 1 Provisions as of 2010			
		2010		2011		2012		2013		2014		5-Year Average Increase		5-Year Cumulative Increase		
	Service	Avg Monthly Benefit	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W
			0.0%	-0.7%	2.0%	2.1%	2.0%	3.6%	2.0%	2.1%	2.0%	1.4%	1.6%	1.7%	8.2%	8.7%
Shorter Service Benefit	0-19 yrs	\$1,500	\$1,500	\$1,490	\$1,530	\$1,521	\$1,561	\$1,576	\$1,592	\$1,609	\$1,624	\$1,632				
Mid-Service Benefit	20-29	\$2,500	\$2,500	\$2,483	\$2,550	\$2,535	\$2,601	\$2,626	\$2,653	\$2,681	\$2,706	\$2,719				
Longer Service Benefit	>=30	\$3,500	\$3,500	\$3,476	\$3,570	\$3,549	\$3,641	\$3,677	\$3,714	\$3,754	\$3,788	\$3,807				

This illustration allows CPI-W to be shown as negative, even though PERA would not reduce monthly benefits in pay status.

**DPS Structure - Tier 1**  
**Illustration of the Impact of PERA Granted AI's compared to Inflation (CPI-W) on Average Monthly Benefits for Early and Service Retirees (Illustration Recognizes Negative CPI)**  
**Based on SB 1 Provisions as of 2010**

		Year Granted											Based on SB 1 Provisions as of 2010			
		2010		2011		2012		2013		2014		5-Year Average Increase		5-Year Cumulative Increase		
	Service	Avg Monthly Benefit	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W
			0.5417%	-0.7%	2.0%	2.1%	2.0%	3.6%	2.0%	2.1%	2.0%	1.4%	1.7%	1.7%	8.8%	8.7%
Shorter Service Benefit	0-19 yrs	\$1,500	\$1,508	\$1,490	\$1,538	\$1,521	\$1,569	\$1,576	\$1,600	\$1,609	\$1,632	\$1,632				
Mid-Service Benefit	20-29	\$2,500	\$2,514	\$2,483	\$2,564	\$2,535	\$2,615	\$2,626	\$2,667	\$2,681	\$2,720	\$2,719				
Longer Service Benefit	>=30	\$3,500	\$3,519	\$3,476	\$3,589	\$3,549	\$3,661	\$3,677	\$3,734	\$3,754	\$3,809	\$3,807				

This illustration allows CPI-W to be shown as negative, even though PERA would not reduce monthly benefits in pay status.

**PERA - Tier 1**  
**Illustration of the Impact of PERA Granted AI's compared to Inflation (CPI-W) on Average Monthly Benefits for Early and Service Retirees (Illustration Recognizes Negative CPI) Based on Original Provisions**

			Year Granted										Based on Original Provisions			
			2010		2011		2012		2013		2014		5-Year Average Increase		5-Year Cumulative Increase	
	Service	Avg Monthly Benefit	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W
			3.5%	-0.7%	3.5%	2.1%	3.5%	3.6%	3.5%	2.1%	3.5%	1.4%	3.5%	1.7%	18.8%	8.7%
Shorter Service Benefit	0-19 yrs	\$1,500	\$1,553	\$1,490	\$1,607	\$1,521	\$1,663	\$1,576	\$1,721	\$1,609	\$1,781	\$1,632				
Mid-Service Benefit	20-29	\$2,500	\$2,588	\$2,483	\$2,679	\$2,535	\$2,773	\$2,626	\$2,870	\$2,681	\$2,970	\$2,719				
Longer Service Benefit	>=30	\$3,500	\$3,623	\$3,476	\$3,750	\$3,549	\$3,881	\$3,677	\$4,017	\$3,754	\$4,158	\$3,807				

This illustration allows CPI-W to be shown as negative, even though PERA would not reduce monthly benefits in pay status.

**DPS Structure - Tier 1**  
**Illustration of the Impact of PERA Granted AI's compared to Inflation (CPI-W) on Average Monthly Benefits for Early and Service Retirees (Illustration Recognizes Negative CPI) Based on Original Provisions**

			Year Granted										Based on Original Provisions			
			2010		2011		2012		2013		2014		5-Year Average Increase		5-Year Cumulative Increase	
	Service	Avg Monthly Benefit	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W	PERA	CPI-W
			3.25%	-0.7%	3.25%	2.1%	3.25%	3.6%	3.25%	2.1%	3.25%	1.4%	3.3%	1.7%	17.3%	8.7%
Shorter Service Benefit	0-19 yrs	\$1,500	\$1,549	\$1,490	\$1,599	\$1,521	\$1,651	\$1,576	\$1,705	\$1,609	\$1,760	\$1,632				
Mid-Service Benefit	20-29	\$2,500	\$2,581	\$2,483	\$2,665	\$2,535	\$2,752	\$2,626	\$2,841	\$2,681	\$2,933	\$2,719				
Longer Service Benefit	>=30	\$3,500	\$3,614	\$3,476	\$3,731	\$3,549	\$3,852	\$3,677	\$3,977	\$3,754	\$4,106	\$3,807				

This illustration allows CPI-W to be shown as negative, even though PERA would not reduce monthly benefits in pay status.



---

**APPENDIX H**  
**Colorado PERA Public Pension Plan Contribution Rate Analysis**

---



**Public Plan Contribution Rate Analysis for State and School Employees and Teacher Member Groups**  
**Colorado PERA Staff Analysis**  
**September 2015**

	EE Rate (Max)	ER Rate (Max)	Social Security	LTROR/ Discount Rate	EE Rate FYE 2013	ER Rate FYE 2013
Alabama ERS (Tier 2)	6.00%	14.09%	Yes	8.00%	6.00%	10.12%
Alabama TRS (Tier 2)	6.00%	10.84%	Yes	8.00%	6.00%	10.12%
Alaska PERS (Tier III)	6.75%	24.84%	No	8.00%	6.75%	22.60%
Alaska TRS (Tier II)	8.65%	48.06%	No	8.00%	8.65%	41.70%
Arizona State Retirement System	11.35%	10.85%	Yes	8.00%	10.74%	10.11%
Arkansas PERS	5.00%	14.50%	Yes	7.75%	5.00%	13.47%
Arkansas TRS	6.00%	14.00%	Yes	8.00%	6.00%	14.00%
California PERS						
State Employees	6.70%	25.278%	Yes/Some Members–No	7.50%	5.00%	20.457%
School Employees	6.97%	11.847%	Yes/Some Members–No	7.50%	7.00%	11.417%
California STRS	9.205%	25.43%	No	7.50%	8.000%	10.79%
Colorado PERA (State and School Divisions)	8.00%	19.13%	No	7.50%	8.00%	15.5300%
Connecticut SERS	2.21%	43.42%	Yes	8.00%	2.00%	25.70%
Connecticut TRS	6.00%	23.65%	No	8.50%	6.00%	20.70%
Delaware PERS	5.00%	9.58%	Yes	7.20%	5.00%	7.84%
Florida Retirement System	3.00%	5.93%	Yes	7.65%	3.00%	4.91%
Georgia ERS	1.25%	21.69%	Yes	7.50%	1.25%	7.42%
Georgia TRS	6.00%	13.15%	Yes	7.50%	6.00%	11.41%
Hawaii ERS	9.80%	17.00%	Yes	7.75%	7.80%	15.00%
Idaho PERS	6.79%	11.32%	Yes	7.50%	6.23%	10.39%
Illinois SERS (except Judges and Legislators)	4.00%	45.60%	Yes	7.25%	4.00%	32.10%
Illinois TRS	9.40%	36.06%	No	7.50%	9.40%	25.49%
Illinois MRF	4.50%	11.73%	Yes	7.50%	4.50%	12.09%
Indiana PERF	3.00%	11.20%	Yes	6.75%	3.00%	8.60%
Indiana TRF	3.00%	7.50%	Yes	6.75%	3.00%	7.50%
Iowa PERS	5.95%	8.93%	Yes	7.50%	5.38%	8.07%
Kansas PERS	6.00%	12.01%	Yes	8.00%	4.00%	8.77%
Kentucky ERS	5.00%	38.77%	Yes	7.75%	6.00%	19.82%
Kentucky CERS	5.00%	17.67%	Yes	7.75%	6.00%	18.96%
Kentucky TRS	9.105%	28.825%	No	7.50%	9.105%	23.265%
Louisiana SERS	8.00%	31.30%	No	7.75%	8.00%	25.60%
Louisiana TRSL	8.00%	26.30%	No	7.75%	8.00%	23.70%
Maine PERS						
State Employees	7.65%	22.69%	No	7.125%	7.65%	14.21%
Teachers	7.65%	13.38%	No	7.125%	7.65%	13.85%
Maryland State Retirement and Pension System						
State Employees	7.00%	17.89%	Yes	7.65%	6.00%	13.40%
Teachers	7.00%	16.15%	Yes	7.65%	6.00%	15.45%
Massachusetts PERAC	9.00%	11.30%	No	7.75%	9.00%	11.30%
Massachusetts Teachers	11.00%	19.10%	No	7.75%	11.00%	19.10%
Michigan Public School ERS	7.00%	19.61%	Yes	8.00%	4.00%	12.60%
Minnesota PERA	6.50%	7.50%	Yes	8.00%	6.25%	7.25%
Minnesota SRS	5.00%	5.00%	Yes	8.00%	5.00%	5.00%

## APPENDIX H

**Public Plan Contribution Rate Analysis for State and School Employees and Teacher Member Groups**  
**Colorado PERA Staff Analysis**  
**September 2015**

	EE Rate (Max)	ER Rate (Max)	Social Security	LTROR/ Discount Rate	EE Rate FYE 2013	ER Rate FYE 2013
Minnesota TRA	7.50%	8.18%	Yes	8.41%	6.00%	6.00%
Mississippi PERS	9.00%	15.75%	Yes	8.00%	9.00%	12.93%
Missouri State ERS	4.00%	16.97%	Yes	8.00%	4.00%	14.13%
Missouri PSRS	14.50%	14.50%	No	8.00%	14.50%	14.50%
Missouri PEERS	6.86%	6.86%	Yes	8.00%	6.86%	6.86%
Montana PERA	7.90%	10.84%	Yes	7.75%	7.90%	7.54%
Montana TRS	8.15%	11.06%	Yes	7.75%	7.15%	9.96%
Nebraska PERS (State Employees Cash Balance Plan)	4.80%	7.49%	Yes	7.75%	4.80%	7.49%
Nebraska Schools (Defined Benefit Plan)	9.78%	9.88%	Yes	8.00%	8.88%	10.63%
Nevada PERS	13.25%	13.25%	No	8.00%	12.25%	12.25%
New Hampshire Retirement System State (General) Employees Teachers	7.00% 7.00%	10.34% 12.09%	Yes Yes	7.75% 7.75%	7.00% 7.00%	8.84% 8.99%
New Jersey Division of Pension and Benefits PERS TPAF	7.50% 7.50%	22.97% 3.30%	Yes Yes	7.90% 7.90%	6.50% 6.50%	8.50% 3.30%
New Mexico Educational Retirement Board <20,000.00 >20,000.00	7.90% 10.70%	13.15% 13.15%	Yes Yes	7.75% 7.75%	7.90% 9.40%	12.40% 10.90%
New Mexico PERA (General Member)	8.92%	16.99%	Yes	7.75%	10.67%	13.34%
New York State & Local RS	6.00%	11.30%	Yes	7.50%	3.00%	16.30%
New York State TRS	6.00%	15.40%	Yes	8.00%	6.00%	11.05%
North Carolina Teachers and State Employees	6.00%	9.15%	Yes	7.25%	6.00%	8.33%
North Dakota PERS	7.00%	7.12%	Yes	8.00%	5.00%	5.12%
North Dakota Teachers	11.75%	12.75%	Yes	8.00%	7.75%	8.75%
Ohio PERS	10.00%	12.00%	No	8.00%	10.00%	13.00%
Ohio State Teachers Retirement System	14.00%	14.00%	No	7.75%	10.00%	14.00%
Ohio School Employees Retirement System	10.00%	12.44%	No	7.75%	10.00%	12.65%
Oklahoma PERS	6.41%	16.50%	Yes	7.50%	3.50%	16.50%
Oklahoma TRS	7.00%	17.20%	Yes	8.00%	7.00%	16.70%
Oregon PERS	0.00%	12.85%	Yes	7.50%	0.00%	9.90%
Pennsylvania Public Schools ERS	7.49%	25.00%	Yes	7.50%	7.50%	7.80%
Pennsylvania State ERS	9.30%	17.15%	Yes	7.50%	6.25%	9.80%
Rhode Island ERS State Employees Teachers	4.25% 3.75%	23.78% 32.03%	Yes Yes	7.50% 7.50%	3.75% 4.50%	21.18% 19.29%
South Carolina RS	8.16%	11.06%	Yes	7.50%	6.50%	10.73%
South Dakota Retirement System	6.00%	6.00%	Yes	7.25%	6.00%	6.00%
Tennessee Consolidated Retirement System State Employees Teachers	5.00% 5.00%	15.03% 8.88%	Yes Yes	7.50% 7.50%	0.00% 5.00%	14.91% 9.05%
Texas Employees Retirement System	7.50%	8.00%	Yes	8.00%	6.50%	6.00%
Texas Teachers Retirement System	7.70%	8.30%	No	8.00%	6.40%	6.00%



**Public Plan Contribution Rate Analysis for State and School Employees and Teacher Member Groups  
Colorado PERA Staff Analysis  
September 2015**

	EE Rate (Max)	ER Rate (Max)	Social Security	LTROR/ Discount Rate	EE Rate FYE 2013	ER Rate FYE 2013
Utah Retirement System	0.00%	10.00%	Yes	7.50%	0.00%	10.00%
Vermont State Employees Retirement System	4.85%	4.13%	Yes	8.50%	7.19%	10.46%
Vermont Teachers Retirement System	5.00%	1.70%	Yes	8.50%	5.67%	7.35%
Virginia Retirement System State Employees	5.00%	12.33%	Yes	7.00%	5.00%	7.00%
Teachers	5.00%	14.50%	Yes	7.00%	5.00%	7.00%
Washington PERS (Plan 2)	4.92%	9.21%	Yes	7.70%	4.64%	7.08%
Washington SERS (Plan 2)	4.64%	9.82%	Yes	7.70%	4.09%	7.58%
Washington TRS (Plan 2)	4.96%	10.39%	Yes	7.70%	4.69%	8.04%
West Virginia PERS	4.50%	14.50%	Yes	7.50%	4.50%	14.00%
West Virginia TRS	6.00%	7.50%	Yes	7.50%	6.00%	27.66%
Wyoming RS	8.25%	8.37%	Yes	7.75%	7.00%	7.12%
Wisconsin RS	6.60%	6.60%	Yes	7.20%	5.00%	6.90%

	Count	EE Rate (Max)	ER Rate (Max)
<b>Contribution Rate Averages</b>			
All	90	6.77%	15.39%
With Social Security	71	6.08%	13.81%
Without Social Security	19	9.36%	21.29%

	LTROR/ Discount Rate	EE Rate FYE 2013	ER Rate FYE 2013
	7.70%	6.26%	12.68%
	7.69%	5.53%	11.29%
	7.75%	8.97%	17.91%



---

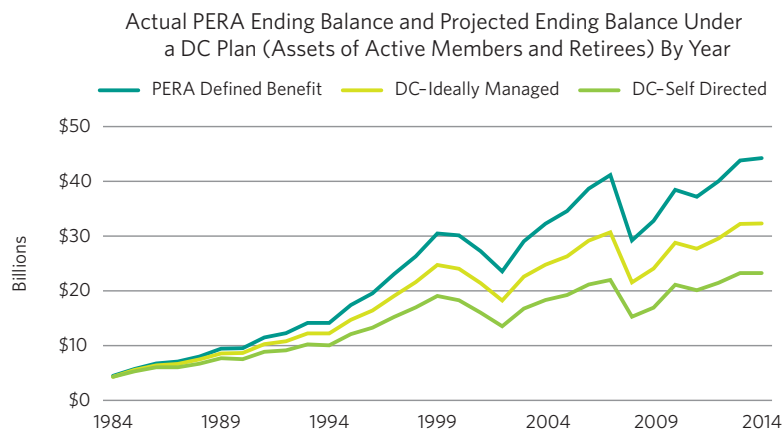
**APPENDIX I**  
**What if Colorado Public Employees Had Been**  
**in a Defined Contribution Plan?**  
**Additional Data From Pacey Economics, Inc., September 2015**

---



FIGURE I-1

### Defined Benefit Plans are More Efficient Than Defined Contribution Plans



Sources: PERA CAFRs, Morningstar, National Institute on Retirement Security, GRS Plan Design Study

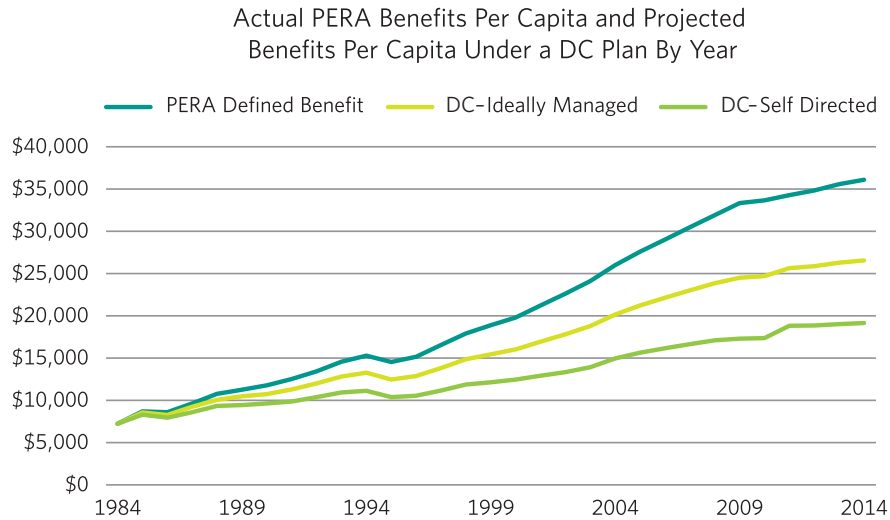
Note: Includes one-time DPS transfer of \$2.75 Billion as of January 2010

Assumptions: 2.0 percent lower return in an "ideally managed" DC plan than PERA DB;  
2.5 percent lower return in self-direct DC plan than "ideally managed" DC plan

- » In 1984, Colorado PERA had a balance (assets for active members and retirees) of some \$3.9 billion with 99,000 active members and 27,700 benefit recipients. 30 years later the fund has grown to \$44.2 billion for 202,750 members and 107,600 benefit recipients.
- » With the same historical contributions by PERA members and employers and the same withdrawals (as a percent of available funds) over this 30 year period, the assets available to active members and retirees, even in an "ideally managed" (same low fees as a DB plan) DC plan, would result in a fund balance of \$32.4 billion. Under a self-directed DC plan the fund balance would be \$23.3 billion.
- » The difference in these fund amounts results from the well-recognized reality that DC plans perform worse due to the inability to pool longevity risk, the need to shift asset allocations with age, as well as potential greater fees and lower returns, especially if self-directed.

FIGURE I-2

**Colorado Public Employees Receive Substantially Higher Benefits Than They Would Under a Defined Contribution Plan**

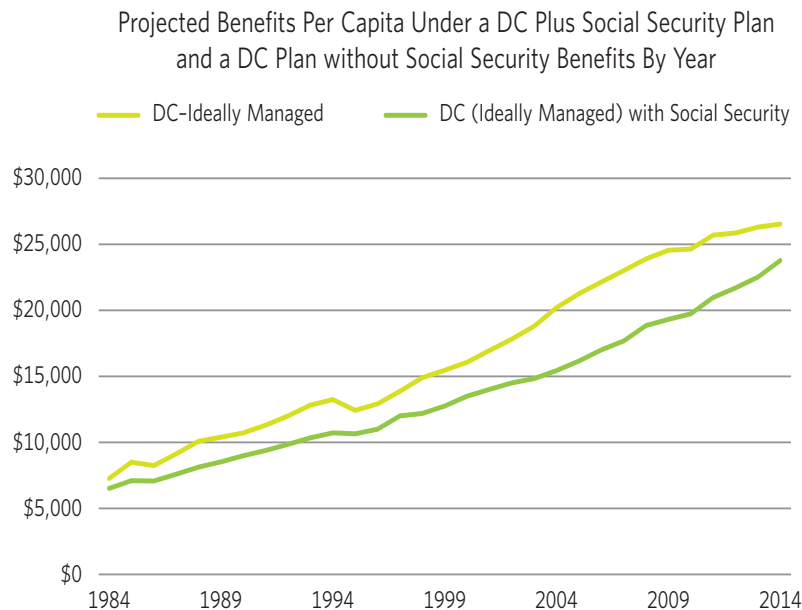


Sources: PERA CAFRs, Morningstar, National Institute on Retirement Security

- » Perhaps more illustrative than fund balance data is the difference in benefits per capita if a shift to a DC had taken place.
- » Again, with the same member and employer contributions since 1984, per capita benefits would be reduced from the current average of \$36,100 per year to \$26,500 per year, even under ideal management.
- » Under self-directed management the results are even more staggering, expected annual benefits would only amount to \$19,100 per year, nearly one-half of the amount available through the DB plan.

FIGURE I-3

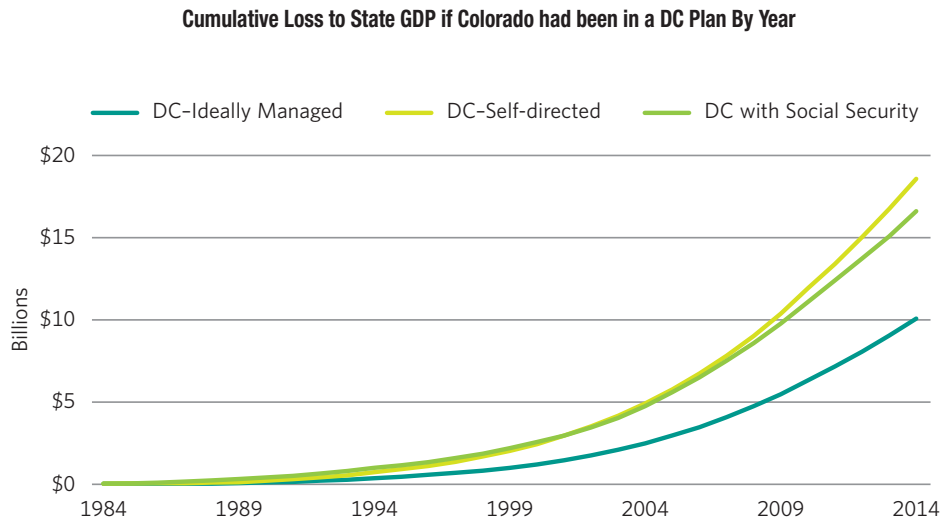
**A Defined Contribution Plus Social Security Plan Does Not Perform as well as a Defined Contribution Plan**



Sources: PERA CAFRs, Morningstar, National Institute on Retirement Security  
 Assumptions: Social Security benefits are conservatively assumed to be equal to the national average of female recipients in each year, actual amounts received likely would have been somewhat less

- » In large part due to inefficiencies in the investments of Social Security funds, Colorado would have been even worse off in a DC plus Social Security system as opposed to an DC Plan without Social Security contributions.
- » That is, Social Security is required to invest in government funds and their low internal rate of return indirectly results in lower benefit payments to its recipients than could be achieved in an alternative plan.

FIGURE I-4



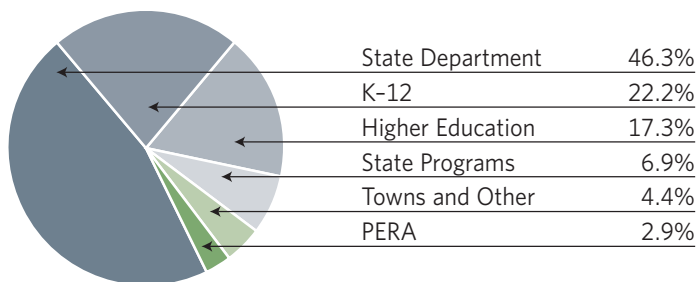
- » Figure I-4 presents the potential loss to state GDP if Colorado had been in a DC plan starting in 1984.
- » Pacey Economics calculates that even under an ideally managed DC plan, the state’s annual GDP would more than \$1 billion less today than it otherwise would be and that cumulative losses to State GDP would be over \$10 billion since 1984. Under a DC plus Social Security plan the annual and cumulative losses would be even greater at approximately \$1.5 billion and \$16.5 billion, respectively. These amounts are in addition to the estimated loss to the portfolio of assets of \$12 billion under an ideally managed DC plan.
- » Although historically switching to a Cash Balance plan or a Side-by-Side DB and DC plan would not have been as economically bad, the conclusions are the same. The state would have less wealth, less income and retirees’ standard of living would be lower.



Colorado PERA is Not a State “Cost Driver”

FIGURE I-5

Colorado PERA Employers' Expenses by Employer Type and PERA Expense



» PERA employer contributions account for only 2.9 percent of the overall budgets of its participating employers. The per capita costs per Colorado resident to pay for the pension benefits for the state’s teachers, law enforcement, judges, etc. (i.e., PERA members) is approximately \$280 per year.

FIGURE I-6

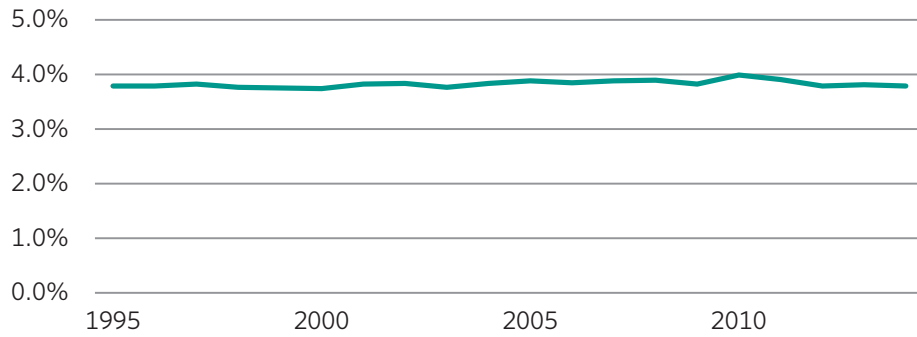
PERA Employer Contributions\* and PERA Benefits as a Percent of State GDP by Year



» Over the previous five years, PERA employer contributions have not increased as a percent of state GDP; that is, taxpayer costs as a percent of GDP are not increasing while benefit payments have increased marginally over the same period.

FIGURE I-7

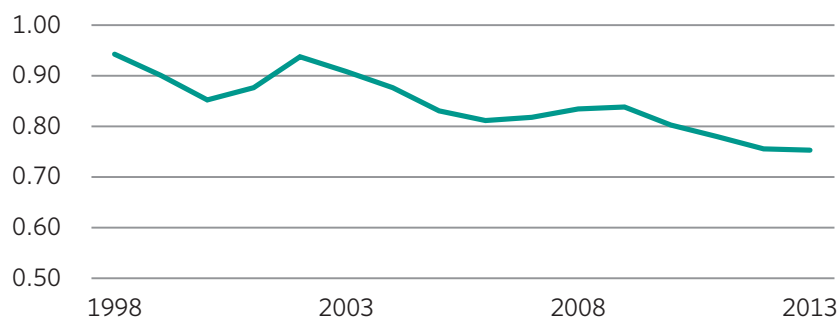
PERA Active Members as a Percent of the Colorado Population By Year



» Active PERA members have remained just under four percent (4.0 percent) of the Colorado population since 1995 and the trend is not increasing.

FIGURE I-8

Ratio of PERA Average Salary to Private Sector\* State of Colorado Average Payroll By Year



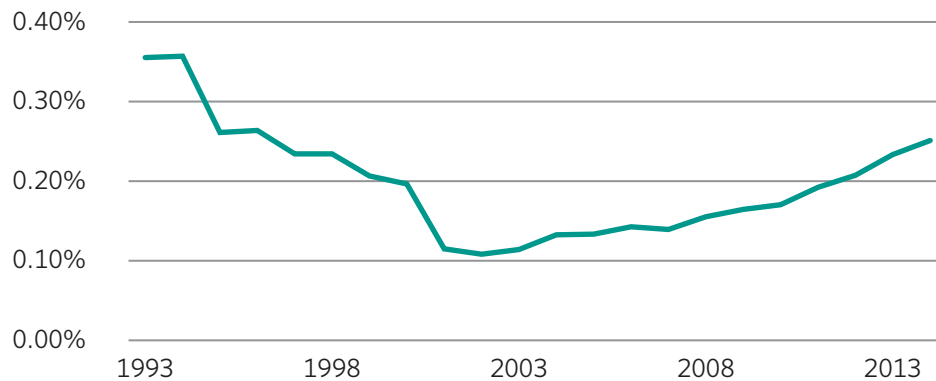
Sources: PERA CAFRs, County Business Patterns

\* Colorado annual payroll less PERA active member payroll (includes some non-PERA public sector wages)

» PERA active member wages were 94 percent of private sector wages in 1998 but have dropped to 75 percent of private sector wage in 2013.

FIGURE I-9

PERA Employer Contribution as a Percent of Colorado Total Market Valuation of Property By Year

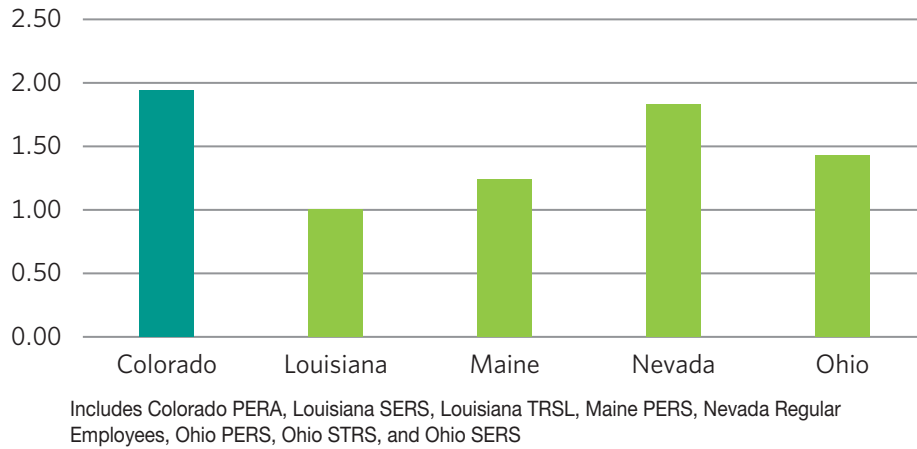


- » PERA employer contributions as a percent of Colorado total market valuation of property (a good measure of the state's wealth) has remained below 0.5 percent and is below early 1990s levels.
- » Charts for other macroeconomic measures (e.g., personal income, retail sales, tax revenues) look fairly similar.

Colorado PERA Performs Well When Compared to Other States with Similar Pension Plans

FIGURE I-10

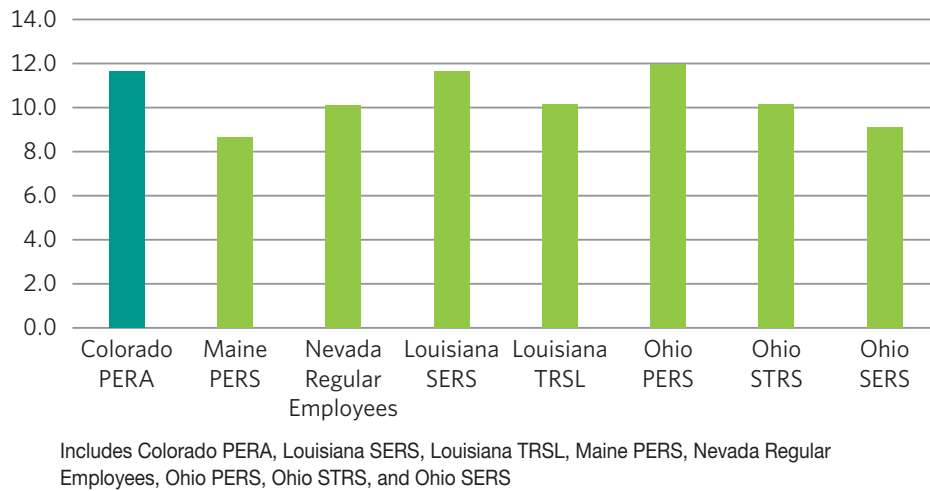
Ratio of Active Members to Retirees for Select States in 2014



» PERA benefits from having a large pool of active members compared to retirees.

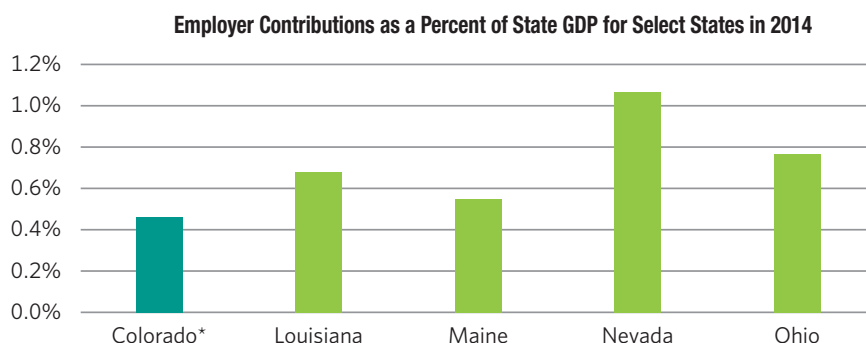
FIGURE I-11

Three-Year Average Rate of Return for Select State Plans in 2014



» PERA three year average rate of return is nearly 12 percent, comparable to or above the rate of return of similar state pension plans.

FIGURE I-12



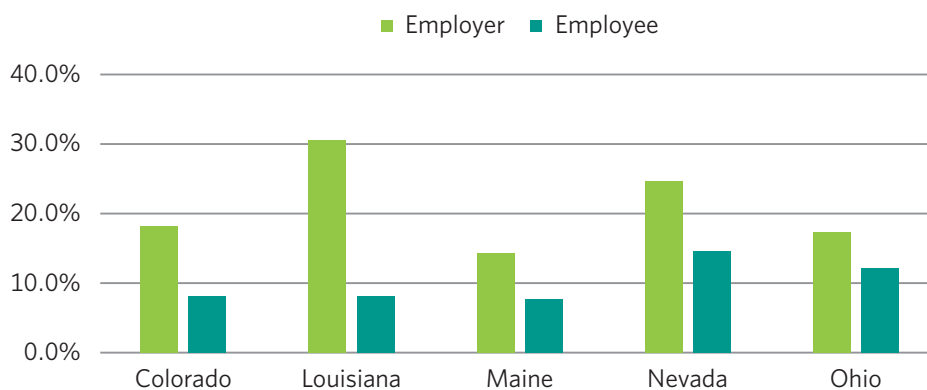
Includes Colorado PERA, Louisiana SERS, Louisiana TRSL, Maine PERS, Nevada Regular Employees, Ohio PERS, Ohio STRS, and Ohio SERS

\* Includes employer base contributions, AED, all SAED, and the settlement dollars received in 2014 for the disaffiliation of the Memorial Health System.

- » PERA employer contributions make up a comparable or lower percentage of state GDP than similar state pension plans.

FIGURE I-13

### Employer Contributions as a Percent of Covered Payroll and Employee Contribution Rates for Select States in 2014



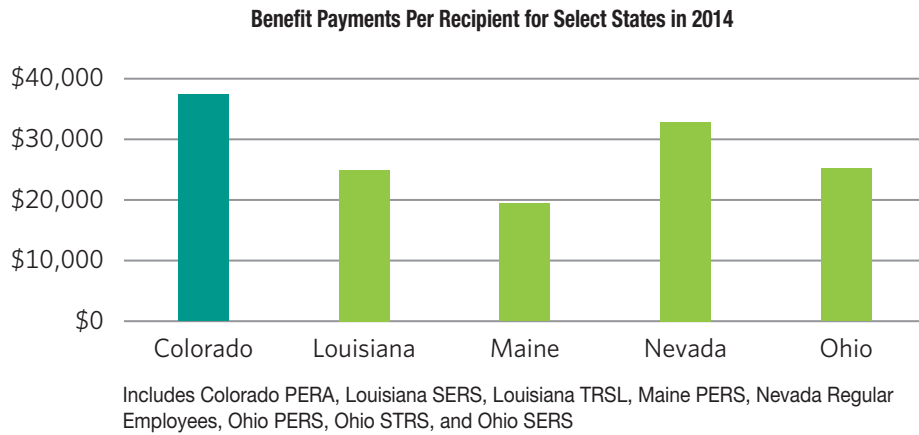
1. Includes Colorado PERA, Louisiana SERS, Louisiana TRSL, Maine PERS, Nevada Regular Employees, Ohio PERS, Ohio STRS, and Ohio SERS

2. Employer contribution calculated by dividing employer contributions by covered payroll per CAFRs

3. Ohio employee contributions of 12 percent reflects the rates for teachers only (Ohio STRS); Ohio PERS and Ohio SERS require a 10 percent employee contribution

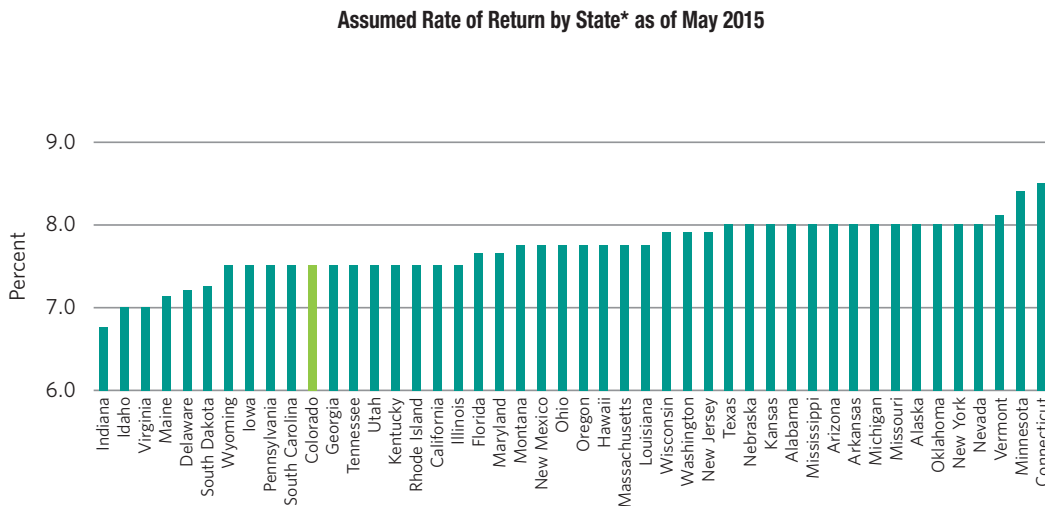
- » PERA employer and employee contributions are comparable or lower, as a percent of covered payroll, than similar state pension plans.

FIGURE I-14



» PERA benefit payments per recipient are greater than those provided by similar state pension plans despite comparable or lower employer and employee contributions, as demonstrated in Figure I-13.

FIGURE I-15



\*The plan that includes teachers is shown for states with multiple public pension plans.

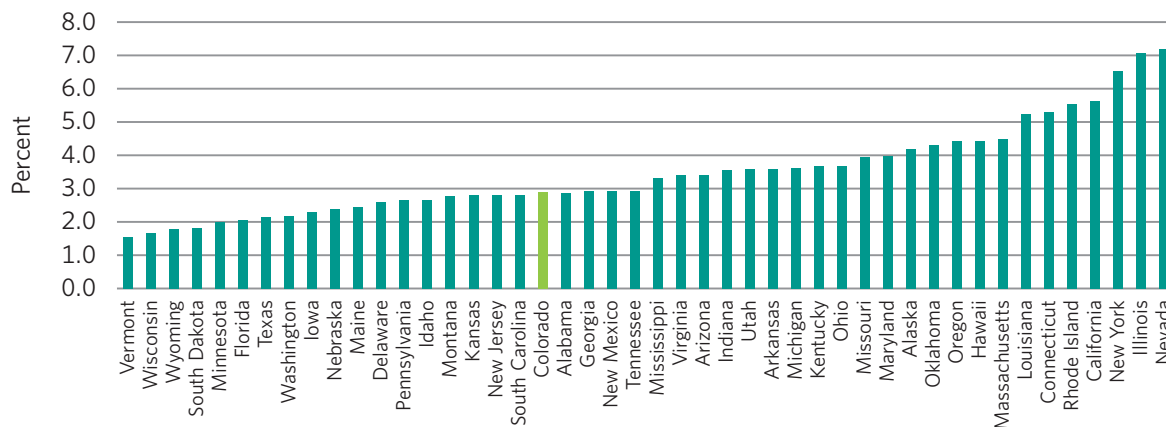
Source: NASRA

» Colorado PERA’s actuarial rate of return assumption of 7.5 percent is among the lowest (most conservative) of all state pension plans.

» Median public pension plan annualized investment returns over the previous 25 years were 8.5 percent and PERA’s rate of return was slightly greater; a long-term horizon is most appropriate for analysis to avoid unintended consequences of managing to the short-term market conditions.

FIGURE I-16

State and Local Contributions to Pensions vs. State and Local Direct General Spending—by State 2012



Source: NASRA

- » Colorado state and local contributions to pension as a percentage of direct general spending are substantially below the national average and amount to approximately 2.9 percent.





---

**APPENDIX J**  
**Colorado PERA Pension Funding Policy and Projection Graphs**  
**Reflecting Payment of the Actuarially Determined Contribution (ADC)**

---





# COLORADO PERA DEFINED BENEFIT PENSION PLAN FUNDING POLICY

ADOPTED MARCH 20, 2015



## CONTENTS

I. Introduction.....	1
II. Background .....	1
III. Funding Goals .....	2
IV. Annual Actuarial Metrics .....	3
V. Funding Valuation Elements.....	3
VI. Governance Policy/Processes .....	5
VII. Glossary of Funding Policy Terms .....	5

## I. INTRODUCTION

The Colorado Public Employees' Retirement Association (PERA) maintains five pre-funded, hybrid defined benefit pension plans (i.e., State, School, Local Government, Judicial, and Denver Public Schools). Each defined benefit pension plan is funded through PERA-affiliated employer contributions, employee contributions, and the investment earnings resulting from those contributions. The fixed contribution rate at which each division's employers contribute is determined by the Colorado General Assembly and defined within the statutes governing PERA.

The purposes of this funding policy are to state the overall funding goals and annual actuarial metrics and to guide the PERA Board of Trustees (Board) when considering whether to pursue or support proposed contribution and benefit legislation. Finally, the policy will include a brief list of governance responsibilities regarding the commissioning, collection, and review of actuarial information, as described in the Board's *Governance Manual*.

PERA also maintains two pre-funded retiree health care subsidy plans, classified as other postemployment benefit (OPEB) plans. The funding policy regarding the retiree health care subsidy plans will be revised and updated after the completion and release of the anticipated GASB Financial and Accounting Standards applicable to OPEB. Until that time, the current funding policy will remain in force with regard to the health care subsidy plans administered by PERA.

It is the intention of the Board that this funding policy be considered a working document, reviewed periodically and, as necessary, altered in the future through formal action of the Board. The final page of this document contains the review and revision/adoption history pertaining to the funding policy of the PERA defined benefit pension plans.

## II. BACKGROUND

In response to the unfavorable investment market of 2008, and in addition to the funding policy adopted in November 2007, the Board set the following guiding principles in 2009 in the development of a comprehensive package to maintain long-term sustainability:

- » Shared responsibility among members, retirees, and employers;
- » Intergenerational equity;
- » Preservation of the defined benefit plan;
- » Preservation of portability through the maintenance of existing benefit structures for the different divisions; and
- » Development of recommendations that would have little-to-no short-term impact on member behavior.

In 2009 and 2010, these guiding principles benefited the Board and all the stakeholders associated with the pension plan as solutions to the immediate funding situation were explored. The Board constructed a series of plan provision changes, enlisting the philosophy of the guiding principles—under the umbrella of shared responsibility—and communicated their recommendations to the General Assembly. Senate Bill 10-001 was the culmination of all the provisional and contribution changes that were to set PERA's course toward sustainability. Senate Bill 10-001 also contained the following funding and annual increase requirements, which now are embedded in Colorado Statute and will be implemented regardless of the Board's pension funding policy:

- » Per C.R.S. § 24-51-411(8), and § 24-51-411(9), the AED and the SAED are adjusted based on the year-end actuarial funded ratio within a particular division;
  - If a division trust fund's actuarial funded ratio;
    - Reaches 103 percent, a decrease in the AED and SAED is mandated, and,
    - Subsequently falls below 90 percent, an increase is mandated.

- For the Local Government and Judicial Divisions, if the actuarial funded ratio reaches 90 percent and subsequently falls below 90 percent, an increase in the AED and SAED is mandated.
- Increases in AED and SAED cannot exceed the statutory maximum allowable limitation.
- » Per C.R.S. § 24-51-1009.5, if the combined pension divisions' trust fund actuarial funded ratio;
  - Reaches 103 percent, the upper limit of the annual increase shall be increased by one-quarter of one percent, and,
  - Subsequently falls below 90 percent, the upper limit of the annual increase shall be decreased by one-quarter of one percent.

These statutory elements, in addition to the current schedule of employer contribution rates, assist in the ongoing balance of shared responsibility. It is not the intention of this Board, through the development of this funding policy, to undermine or circumvent the work accomplished by Senate Bill 10-001, but rather to ensure continued fiduciary commitment through sound governance practices and recognition of these statutory funding policies.

### III. FUNDING GOALS

- » Preservation of the **defined benefit plan structure** of providing lifetime benefits to the employees of PERA-affiliated employers, reflecting the fact that PERA members are not covered under Social Security.
- » Demonstration of **transparency and accountability** through the continued maintenance of a defined benefit pension plan funding policy for the stakeholders of PERA.
- » **Achievement of a combined divisions' trust fund actuarial funded ratio greater than or equal to 110 percent.** Once the 110 percent combined funded ratio is achieved, following (1) the complete discontinuance of AED and SAED contributions, and (2) the restoration of the annual increase to pre-2010 levels pursuant to C.R.S. § 24-51-1009.5, the Board will consider and/or support the following actions, as ordered, as long as the funded ratio, either combined or

individual by division, does not fall below 100 percent after consideration of the proposed change:

- Examination and possible action of de-risking the entire plan, including all divisions
- Reduction in the base contribution rate(s)
- Adoption of a benefit enhancement, beyond restoration of the annual increase as described above.

If the 110 percent funded ratio benchmark is attained through the assistance of certain funding arrangements where assets, outside of statutory contributions, are added to the plan, and results in additional tax-payer obligation, the payment method and duration of this debt should be considered prior to any supportive action taken regarding benefit enhancements.

- » Dedication to the balance between:
  - **Contribution rate stability**—keeping contributions relatively stable over time, and
  - **Intergenerational equity**—allocating costs over the employees' period of active service.
- » Dedication to the systematic **reduction of the unfunded actuarial accrued liabilities (UAAL)**, subject to the required action by the state legislature as described in C.R.S. § 24-51-411(8), § 24-51-411(9), and § 24-51-1009.5, and as briefly summarized above in Section II.
- » Recognition that within a multiple-employer cost-sharing defined benefit plan there are **beneficial elements of pooled risk**, both in the accrual of plan liabilities, recognizing actuarial gains and loss by division, rather than by employer; and in the accumulation of plan assets through the engagement of an appropriate level of asset risk management.

## IV. ANNUAL ACTUARIAL METRICS

Below is a list of actuarial metrics to be assessed on an **annual basis as of the actuarial valuation date**. The Board recognizes that a single year's results may not be indicative of long-term trends and projected results.

### FUNDED RATIOS

- » Calculate and review by division:
  - The actuarial funded ratio based on the actuarial value of plan assets divided by the defined benefit pension plan's actuarial accrued liability (AAL), and
  - The market value funded ratio based on the market value of plan assets divided by the defined benefit pension plan's AAL.

### FUNDING PERIOD

- » To be determined for each division with respect to the division's contribution rates. A funding period is the amortization period required to pay off that division's UAAL considering the resources available. Funding periods for each division will be determined in the annual actuarial valuation in relationship to both
  - Statutory contribution rates, and
  - Actuarially determined contribution (ADC) rates.

### CONTRIBUTION RATE COMPARISON

- » Calculate and review by division.

### ACTUARIAL PROJECTIONS

- » Perform and review, by division,
  - Actuarial projections considering appropriate benefit provisions, salary and demographic data, actuarial assumptions, membership growth, and statutory contribution rates in order to determine the sustainability of each division under their benefit provisions and statutory contribution rate structure.
  - Projection modeling that allows for the testing of projection results under various economic and demographic stress conditions.

## V. FUNDING VALUATION ELEMENTS

Annually, the Board's actuary will perform an actuarial valuation for funding purposes, and calculate ADC rates against which to compare contribution rates mandated under State statute. The ADC will be the sum of a payment based on normal cost and a payment on the UAAL. The normal cost and the amount of payment on the UAAL are determined by the following three major components of a funding valuation:

### ACTUARIAL COST METHOD

This component determines the attribution method upon which the cost/liability of the retirement benefits are allocated to a given period, defining the normal cost or annual accrual rate associated with the projected benefits.

- » The Entry Age Normal Cost Method (EAN), as is used for PERA's annual actuarial valuation purposes, is to be used for the determination of the normal cost rate and the actuarial accrued liability for purposes of calculating the ADC.
- » Under this method, normal cost is calculated using benefits based on projected service and salary at retirement and is allocated over an individual's career as a level percent of payroll. Because EAN normal cost rates are level for each participant, the normal cost pattern for the entire plan under EAN is more stable in the face of demographic shifts in the workforce. It is this normal cost stability that makes the EAN method the preferred funding method for the majority of public defined benefit pension plans.

### ASSET VALUATION METHOD

This component dictates the method by which the asset value, used in the determination of the UAAL, is determined, which could be a market value or a smoothed actuarial value of trust assets.

- » Because investment markets are volatile and defined benefit pension plans typically have long investment horizons, application of an asset-smoothing technique can be an effective tool to manage contribution volatility and provide a more consistent measure of pension plan funding over time. Asset-smoothing methods reduce the effect of short-term market volatility on contributions, while still tracking the overall

movement of the market value of plan assets, by recognizing the effects of investment gains and losses over a period of years.

- » The asset valuation method to be used shall be a four-year *smoothed* market value of assets. The difference between actual market value investment returns and the expected actuarial investment returns is recognized equally over a four-year period.

### AMORTIZATION METHOD

This component prescribes, in terms of duration and pattern, the systematic manner in which the difference between the actuarial accrued liability and the actuarial value of assets is reduced.

- » Once established for any component of the UAAL, the amortization period for that component will be closed and will decrease by one year annually.
- » The amortization payment will be determined on a level percentage of pay basis.
- » The length of the amortization periods will be as follows:
  - Existing UAAL on December 31, 2014—30 years.
  - Any increase (or decrease) in the UAAL existing as of December 31, 2014—remaining period of the initial 30-year period from the date of the valuation.
  - Annual future actuarial experience gains and losses—30 years from the date of the valuation.
  - Future assumption changes—30 years from the date of the valuation.
  - Future benefit enhancements/reductions—the number of years, as determined by the Board, to represent the anticipated duration of payment of the enhancement or, if a reduction, duration of the benefit to the plan. This determination will be based on the nature of the benefit change and the demographics of the membership group affected by the change, not to exceed 25 years from the date of the valuation.
- » If any future annual actuarial valuation indicates a division has a negative UAAL, the ADC shall be set equal to the Normal Cost until such time as the funded ratio equals or exceeds 120 percent. At that time, the ADC shall be equal to the Normal Cost less an amount equal to 15 year amortization of the portion of the negative UAAL above the 120 percent funded ratio.

- » The target amortization period noted above regarding new UAAL will be applied for funding benchmark and RSI reporting purposes. Alternative ADCs, will be determined by division, by applying the layered amortization methodology as described above, using a 25-year closed period, a 20-year closed period, and a 15-year closed period, in lieu of the 30-year period, for amortization of new UAAL. These comparatives are to appear in the *Comprehensive Annual Financial Report (CAFR)* as a demonstration of the transparency and accountability funding goal delineated in Section III of this document.

In conjunction with the three major components discussed above, a number of actuarial assumptions are used to develop the annual actuarial metrics, as well as the ADC rates, and are described in detail in the annual actuarial valuation report. The actuarial assumptions are derived and proposed by the Board's actuary and adopted by the PERA Board of Trustees in conformity with the *Actuarial Standards of Practice* issued by the Actuarial Standards Board. The assumptions represent the Board's best estimate of anticipated experience under the benefit provisions of PERA and are intended to be long-term in nature. In the development of actuarial assumptions, the Board considers not only past experience but also trends, external economic forces, and future demographic and economic expectations.

### ACTUARIAL ASSUMPTIONS

Actuarial assumptions are generally grouped into two major categories:

- » **Demographic assumptions**, which include rates of termination, retirement, disability, mortality, etc., and
- » **Economic assumptions**, which include investment return, salary increase, payroll growth, and inflation, etc.

Actuarial assumptions do not impact the total cost of the plan (benefit payments and expenses), but rather the timing of prescribed contributions. To the extent that actuarial experience deviates from the assumptions, and actual contributions deviate from projected, experience gains and losses will occur. These gains (or losses) then serve to reduce (or increase) the projected future contributions necessary to achieve or sustain a certain actuarial standard. It is in this vein that the ADC rates may



help indicate if the statutory contribution rates are adequate to meet the future cost requirements of the plan, although the ADC calculated in valuation results has limitations due to changing costs over time. In Colorado PERA's situation, until future scheduled contribution increases are fully realized, the results of the actuarial projections will be the best indication of the adequacy of the statutorily prescribed contribution schedule.

## VI. GOVERNANCE POLICY/PROCESSES

As delineated in the PERA *Governance Manual*, below is a list of specific actuarial and/or funding-related studies, the frequency at which they should be commissioned/requested by the Board, and additional responsibilities relating to the studies:

### ACTUARIAL VALUATION

*Perform Annually*

The Board is responsible for reviewing PERA's annual actuarial valuation report; and submitting a summary report to the Legislative Audit Committee and the Joint Budget Committee of the General Assembly, together with any recommendations concerning such liabilities that have accrued. In addition, the Board, in consultation with the pension actuary, will provide recommendations to the Colorado General Assembly regarding any necessary adjustments to the statutory employer and member contribution rates.

### EXPERIENCE ANALYSIS

*Perform Periodically, Historically Performed Approximately Every Four Years*

The Board is responsible for ensuring that an experience analysis is performed as prescribed, for reviewing the results of that study, and for approving the actuarial assumptions and methodologies to be used for all actuarial purposes relating to the defined benefit pension plans.

### ACTUARIAL AUDIT

*Perform Every Five Years, or The Appointment of a New Actuarial Firm Will Satisfy Requirement*

The Board is responsible for ensuring that an actuarial audit is performed as prescribed and for reviewing the results of that audit.

### ASSET LIABILITY STUDY

*Perform at Least Every Three To Five Years, or More Frequently If Necessary*

The Board is responsible for ensuring that a study of the relationship between the defined benefit trust assets and liabilities is performed as prescribed and for reviewing the results of that study.

### REVIEW OF THE DEFINED BENEFIT PENSION PLAN FUNDING POLICY

*Perform Periodically*

The Board is responsible for the periodic review of the defined benefit pension plan funding policy, as is deemed necessary.

## VII. GLOSSARY OF FUNDING POLICY TERMS

### ACTUARIAL ACCRUED LIABILITY (AAL)

The AAL is the value at a particular point in time of all past normal costs. This is the amount of assets the plan would have today if the current plan provisions, actuarial assumptions, and participant data had always been in effect, contributions equal to the normal cost had been made, and all actuarial assumptions had been met. For each of the PERA defined benefit plans, the AAL includes the balance in the affiliated annual increase reserve.

### ACTUARIAL COST METHOD

The actuarial cost method allocates a portion of the total cost (present value of benefits) to each year of service, both past service and future service.

### ANNUAL INCREASE RESERVE (AIR)

As of January 1, 2007, an AIR was created for each division trust fund for the purpose of funding annual increases for PERA benefit structure members hired on or after January 1, 2007. A portion of the employer contribution, equal to one percent of the salaries of affected members, is accumulated in the AIR to be paid out in annual increases each July 1, to the extent affordable. Although invested with the affiliated division assets, the reserve balances are accounted for separately.

**ASSET VALUES**

For each of the PERA defined benefit plans, the actuarial and market asset values include the balance in the affiliated AIR.

**ACTUARIAL VALUE OF ASSETS (AVA)**

The AVA is the market value of assets less the deferred investment gains or losses not yet recognized by the asset smoothing method.

**MARKET VALUE OF ASSETS (MVA)**

The MVA is the fair value of assets of the plan as reported in the plan’s audited financial statements.

**ENTRY AGE NORMAL ACTUARIAL COST METHOD (EAN)**

The EAN actuarial cost method is a funding method that calculates the normal cost as a level percentage of pay or level dollar amount over the working lifetime of the plan’s members.

**FUNDED RATIO**

The funded ratio is the ratio of the plan assets to the plan’s actuarial accrued liabilities.

**ACTUARIAL VALUE FUNDED RATIO**

The ratio of the AVA to the AAL.

**MARKET VALUE FUNDED RATIO**

The ratio of the MVA to the AAL.

**NORMAL COST**

The normal cost is the cost allocated under the actuarial cost method to each year of active member service.

**PRESENT VALUE OF BENEFITS (PVB) OR TOTAL COST**

The PVB is the value at a particular point in time of all projected future benefit payments for current plan members, plus the balance in the affiliated AIR. The future benefit payments and the value of those payments are determined using actuarial assumptions regarding future events. Examples of these assumptions are estimates of retirement and termination patterns, salary increases, investment returns, etc.

**SURPLUS**

A surplus refers to the positive difference, if any, between the AVA and the AAL.

**UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)**

The UAAL is the portion of the AAL that is not currently covered by the AVA. It is the positive difference between the AAL and the AVA.

**VALUATION DATE**

The valuation date is the annual date upon which an actuarial valuation is performed; meaning that the trust assets and liabilities of the plan are valued as of that date. PERA’s annual valuation date is December 31st.

.....  
Adopted: March 20, 2015

## Benefit Provisions, Actuarial Assumptions, and Contribution Structure

State, School, and DPS Divisions			
	Line D*	Line D2*	Line D3
Projection Date (effective date of data and assets)	12/31/2014	12/31/2014	12/31/2014
Benefit Provisions	Post-SB 1	Post-SB 1	Post-SB 1
Demographic Assumptions	Post-2012	Post-2012	Post-2012
Discount Rate	7.50%	7.50%	7.50%
Assumed Rate of Return	7.50%	7.50%	7.50%
Wage/Price Inflation	3.90%/2.80%	3.90%/2.80%	3.90%/2.80%
ER Contribution Assumption	SB 1 Reforms	ARC past 5 years/SB 1 in Future	ARC past 5 years/ADC in Future
AED/SAED	Up to 5.00%	Up to 5.00%	N/A
ER Contribution Rate for School	10.15%	N/A	N/A
Growth Assumption	1.50%	1.50%	1.50%
Local Government and Judicial Divisions			
	Line D*	Line D2*	Line D3
Projection Date (effective date of data & assets)	12/31/2014	12/31/2014	12/31/2014
Benefit Provisions	Post-SB 1	Post-SB 1	Post-SB 1
Demographic Assumptions	Post-2012	Post-2012	Post-2012
Discount Rate	7.50%	7.50%	7.50%
Assumed Rate of Return	7.50%	7.50%	7.50%
Wage/Price Inflation	3.90%/2.80%	3.90%/2.80%	3.90%/2.80%
ER Contribution Assumption	SB 1 Reforms	ARC past 5 years/SB 1 in Future	ARC past 5 years/ADC in Future
AED/SAED	2.20%/1.50%	2.20%/1.50%	N/A
Growth Assumption	1.00%	1.00%	1.00%

\*The projection graphs consider, for each division, the statutory decreases in AED and SAED following the attainment of a 103% funded ratio.

# APPENDIX J

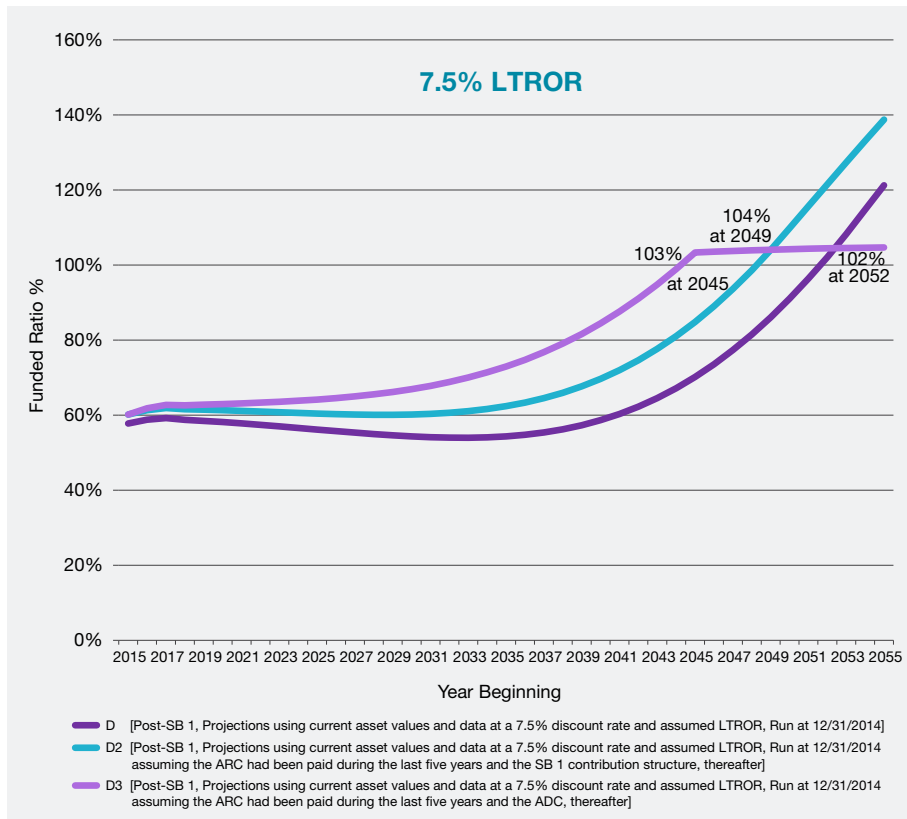
## Projection Lines Considering ARC/ADC

Line	Color	Projection Date	Description of Funded Ratio Projection Line
Line D	Purple	12/31/2014	Projections using current asset values and data at a 7.5% discount rate and assumed LTROR, with consideration of SB 1 Reforms
Line D2	Teal	12/31/2014	Projections using current asset values and data at a 7.5% discount rate and assumed LTROR, with consideration of SB 1 Reforms, assuming the ARC had been paid during the last five years, and the SB 1 contribution structure thereafter.
Line D3	Light Purple	12/31/2014	Projections using current asset values and data at a 7.5% discount rate and assumed LTROR, with consideration of SB 1 Reforms, assuming the ARC had been paid during the last five years, and the ADC is paid thereafter.

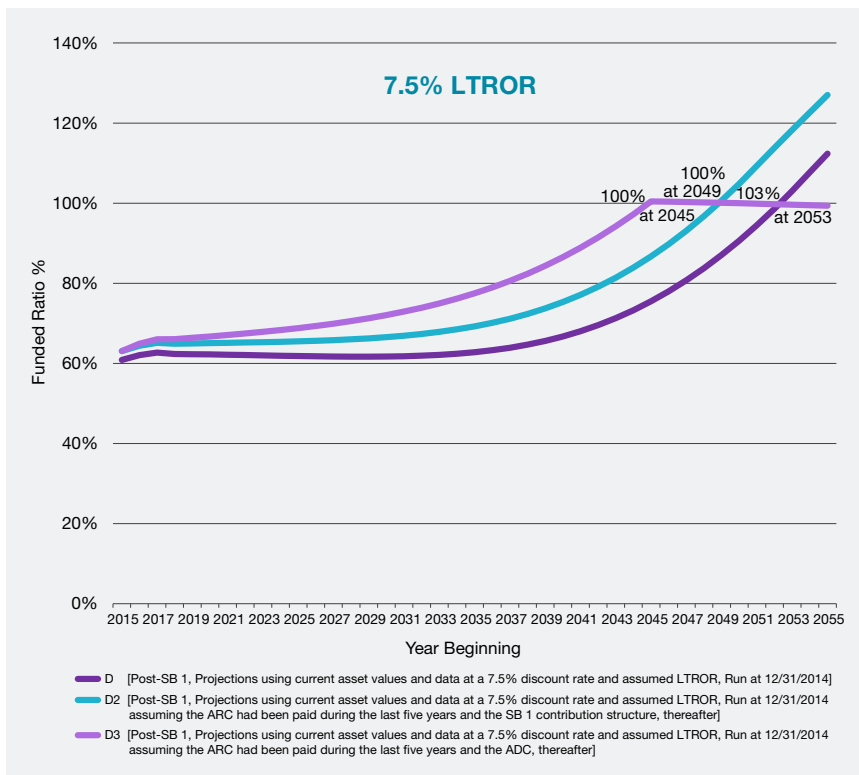
## Projection Graph Set Considering ARC/ADC

Graph Set	Divisions	Lines	Focus	Purpose
Set 5	5	Line D	Line D – Baseline	Projections using current asset values and data at a 7.5% discount rate and assumed LTROR, with consideration of SB 1 reforms.
		Line D2	Area between Line D2 and Line D	Represents progress that would have been made if ARC had been paid during the last five years, and the SB 1 contribution structure thereafter.
		Line D3	Area between Line D3 and Line D	Represents progress that would be made if ARC had been paid during the last five years, and ADC is paid thereafter.

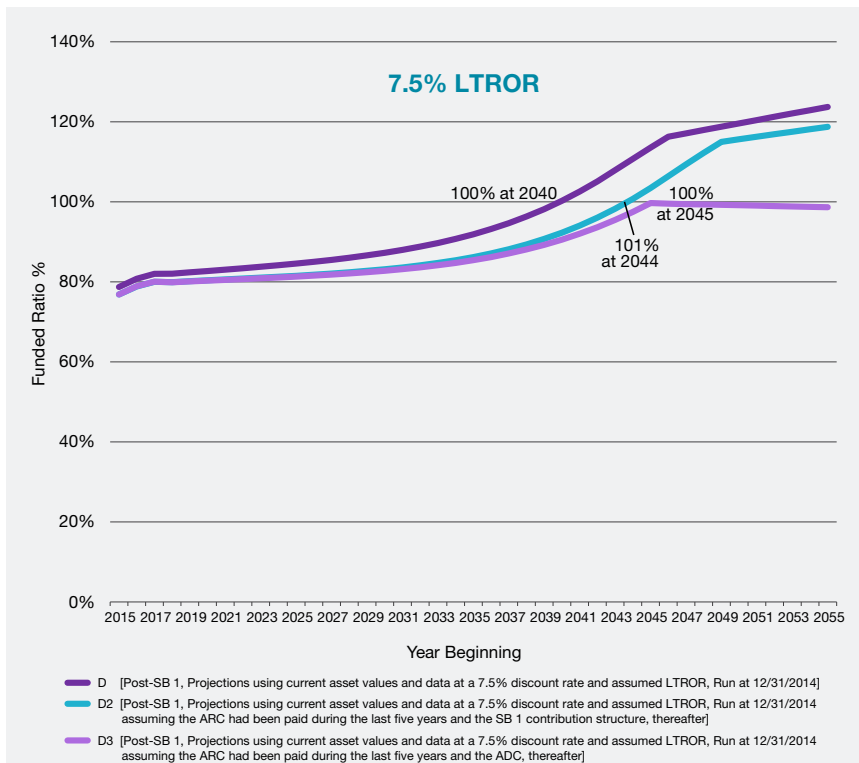
### Colorado PERA–State Division Projection of Funded Ratio on Actuarial Asset Value Projection Lines D



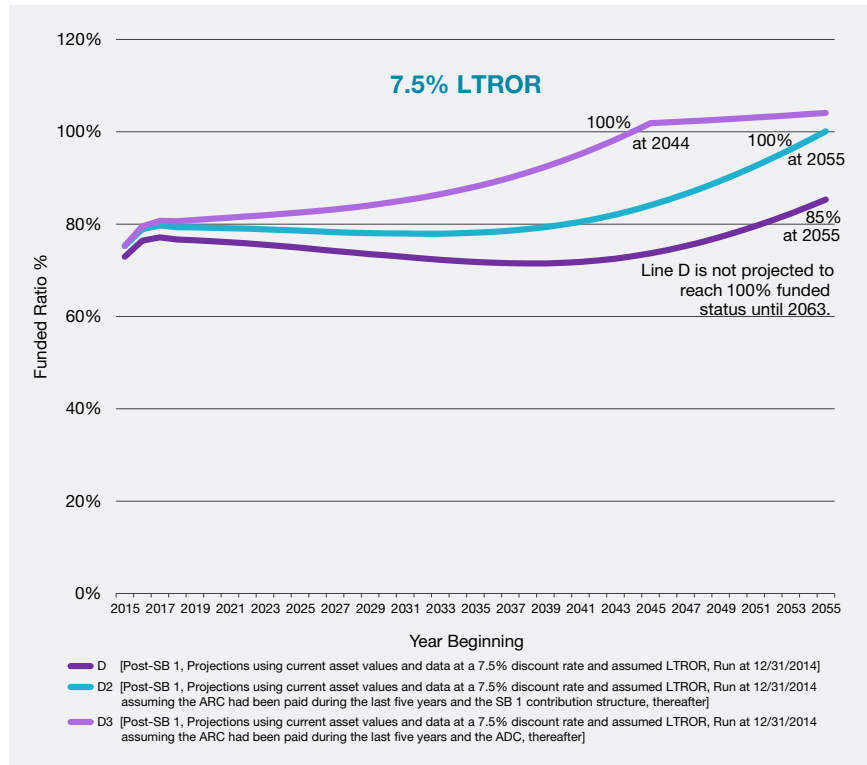
**Colorado PERA–School Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines D**



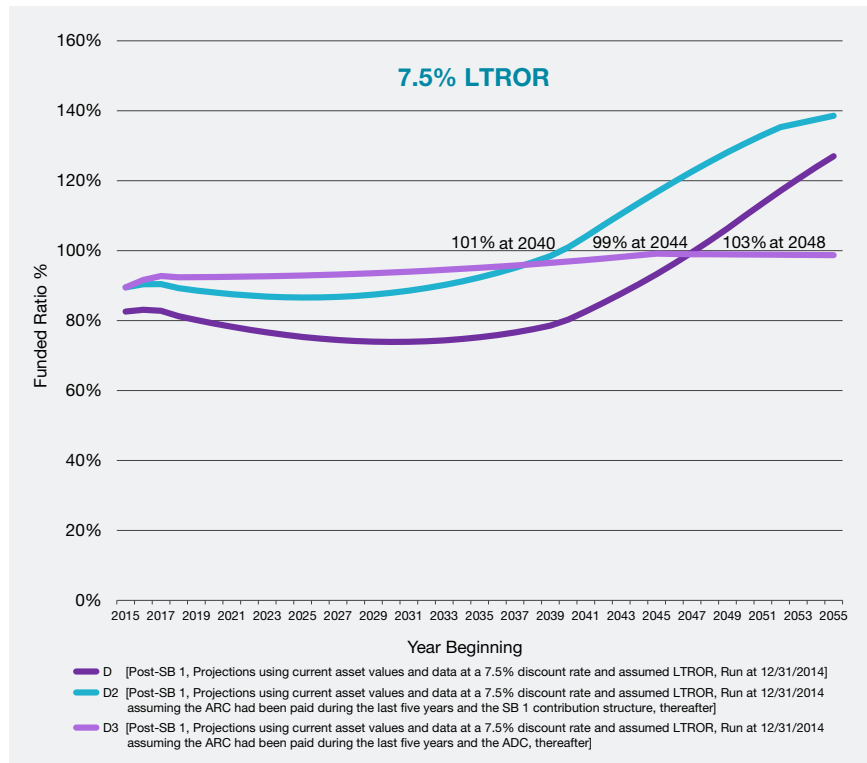
**Colorado PERA–Local Government Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines D**



**Colorado PERA—Judicial Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines D**



**Colorado PERA—DPS Division  
Projection of Funded Ratio on Actuarial Asset Value  
Projection Lines D**







*One of Colorado's Best Investments*

**Colorado Public Employees' Retirement Association**  
1301 Pennsylvania Street, Denver, Colorado 80203-5011  
1-800-759-7372 • [www.copera.org](http://www.copera.org)