



ACTUARIAL IMPACT ANALYSIS

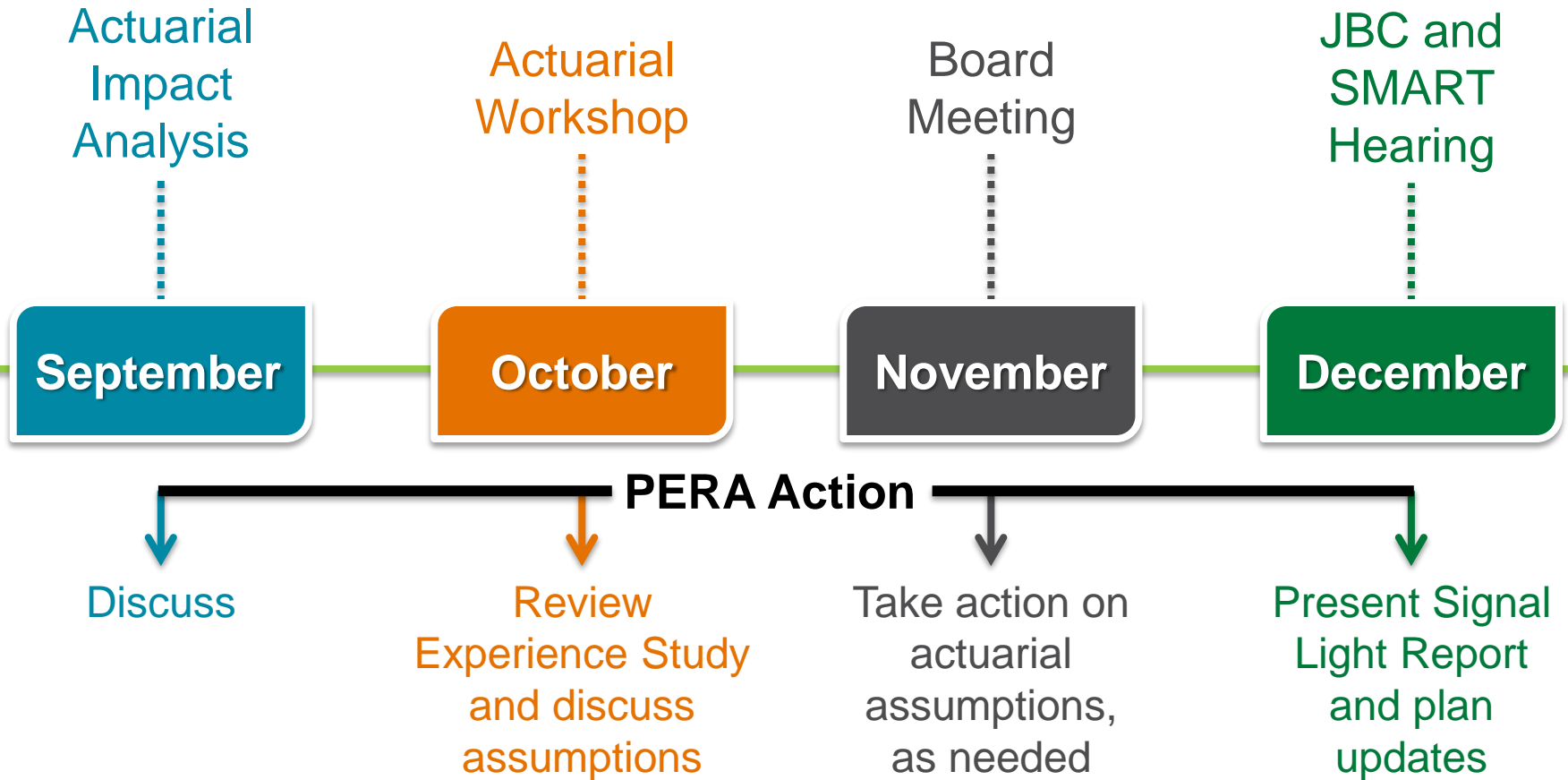
JANUARY 20, 2017

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Our Process – Realized Goals



Our Process – Current and Future Goals

Review Updated Actuarial Impacts and Outreach Planning

Outreach Begins

2016 Actuarial Valuation Information is Available

Board Annual Planning Meeting

January

March

June

September

PERA Action

Discuss path and possibilities now that revised assumptions are known

Engage all stakeholders in discussions




Report and disclose most recent actuarial information

Review findings and formulate advisement to the legislature

The Grid

- » Updated table *Colorado PERA – Impact of Change Presented in Years of Amortization until 100% Funded*
 - Known as “The Grid”
- » The Grid is an actuarial analysis of possible reforms and/or investment experience and
 - Based on recently revised actuarial assumptions and a 7.25 percent assumed rate of return
 - » As adopted November 18, 2016
 - Intended for informational and educational use only
 - The amortization impacts shown are not additive, meaning:
 - » Adoption of a combination of more than one of the items likely would produce a notably different result than if the estimated impact amounts are simply added together
 - Provides information for the State, School, Local Government, and DPS Divisions
 - » Judicial Division is addressed separately

Actuarial Options and Impacts

- » School Division impact results are shown for illustrative purposes
- » Three scenario categories, each with multiple variables
 -  Contribution Changes
 -  Plan Design
 -  Economic Experience
- » For each variable, the impact is provided in two ways:
 - Expected amortization period in number of years from December 31, 2015
 - Deviation from the current amortization period (+/-)
- » The impact for each variable is provided as if it were the only change made and should not be combined with the impact of other variables
- » General Counsel is available to address the legality of certain scenarios and potential litigation risk

Contribution Changes





Employer Contributions Beginning in 2018

School Division

Employer Contribution	Expected Period When 100% Funding is Reached	Current Amortization 74.6 Years ← Decrease years to full funding Increase years to full funding →
Additional 2%	52.4 years	← 22.2 years
For pre-2007 hires— Additional 2% For post-2006 hires— Additional 1% to trust fund, 1% to AI reserve	59.3 years	← 15.3 years



Employee Contributions Beginning in 2018

School Division

Employee Contribution	Expected Period When 100% Funding is Reached	Current Amortization 74.6 Years ← Decrease years to full funding Increase years to full funding →
Additional 2%	53.9 years	← 20.7 years
For pre-2007 hires— Additional 2% For post-2006 hires— Additional 1% to trust fund, 1% to AI reserve	63.0 years	11.6 years ←

Plan Design





Retirement Eligibilities—Unreduced Retirement




School Division

Age 67 and Any Years of Service	Expected Period When 100% Funding is Reached	Current Amortization 74.6 Years
New hires only	63.4 years	
New hires and non-vested members only	62.3 years	
Age 65 and 5 Years of Service, or Any Age and 40 Years of Service		
New hires only	68.8 years	
New hires and non-vested members only	68.1 years	



Retirement Eligibilities—Reduced Retirement

School Division

Age 55 and 25 Years of Service, if Reduced From Earlier Age 65 or 40 Years of Service	Expected Period When 100% Funding is Reached	Current Amortization 74.6 Years 
New hires only	54.7 years	
New hires and non-vested members only	53.1 years	

* Assumes and includes the adoption of the “Age 65 & 5 years” and “Any Age & 40 years” unreduced retirement eligibilities shown on previous page.



Highest Average Salary (HAS) Calculation

School Division—Effective in 2020

	Expected Period When 100% Funding is Reached	Current Amortization 74.6 Years
5-Year HAS		
New hires only	71.1 years	3.5 years
New hires and non-vested members only	70.3 years	4.3 years
7-Year HAS		
New hires only	68.0 years	6.6 years
New hires and non-vested members only	66.8 years	7.8 years
Career Average		
New hires only	43.3 years	31.3 years
New hires and non-vested members only	35.9 years	38.7 years



Changes in HAS Calculation— Effect on Benefits

Projected Reduction on Initial Base Benefit

	3-Year HAS	5-Year HAS	7-Year HAS	Career HAS
At Retirement Eligibility	N/A	(3%)–(5%)	(6%)–(11%)	(35%)–(55%)



Annual Increases (AI or COLA)






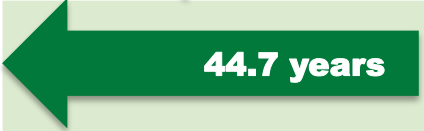
School Division—For Pre-2007 Hires

Annual Increase	Expected Period When 100% Funding is Reached	Current Amortization 74.6 Years ← Decrease years to full funding Increase years to full funding →
One-year holiday	70.4 years	4.2 years ←
One-year holiday with added second year for those not yet retired	67.2 years	7.4 years ←
Reduce AI cap to 1% for 5 years; restore 2% cap	65.7 years	8.9 years ←
Reduce AI cap to 1% for 10 years; restore 2% cap	58.3 years	16.3 years ←



Annual Increases (AI or COLA)

School Division—For Pre-2007 Hires

Annual Increase	Expected Period When 100% Funding is Reached	Current Amortization 74.6 Years 
Reduce AI cap to 1.75%	62.3 years	12.3 years 
Reduce AI cap to 1.50%	54.0 years	20.6 years 
Reduce AI cap to 1.25%	47.9 years	26.7 years 
Reduce AI cap to 1.00%	42.8 years	31.8 years 
Reduce AI cap to 0.00%	29.9 years	44.7 years 



Changes in AI—Effect on Benefits and Purchasing Power

Projected Reduction in Benefits

	0.0% AI	1.0% AI
10 Years	(17.9%)	(9.4%)
20 Years	(32.7%)	(17.9%)
30 Years	(44.8%)	(25.6%)

Projected Loss of Purchasing Power*








	0.0% AI	1.0% AI	2.0% AI
10 Years	(21.1%)	(12.8%)	(3.8%)
20 Years	(37.8%)	(24.1%)	(7.5%)
30 Years	(50.9%)	(33.8%)	(11.1%)

* Assuming annual inflation at 2.4%



Multiplier (Reduction on Prospective Service)

School Division

	Expected Period When 100% Funding is Reached	Current Amortization 74.6 Years 
Reduce Multiplier 2.0%		
For new hires only	59.7 years	14.9 years 
For new hires and non-vested members only	58.0 years	16.6 years 
For all current and future members	51.8 years	22.8 years 
Reduce Multiplier 1.5%		
For new hires only	47.6 years	27.0 years 
For new hires and non-vested members only	46.1 years	28.5 years 
For all current and future members	41.4 years	33.2 years 



Multiplier Reduction—Effect on Benefits

Multiplier	Reduction in Initial Benefits
2.5%	N/A
2.0%	(20.0%)
1.5%	(40.0%)



Matching Schedule for Refunds

School Division

Matching Schedule	Expected Period When 100% Funding is Reached	Current Amortization 74.6 Years ← Decrease years to full funding Increase years to full funding →
Prior to age 65, 25% match from 1-4 years and 50% match at 5 years	74.1 years	0.5 years



Section 125 Plan Deductions

School Division

Allow PERA to Collect Contributions on Section 125 Plan Deductions	Expected Period When 100% Funding is Reached	Current Amortization 74.6 Years ← Decrease years to full funding Increase years to full funding →
1% of payroll – 25% occurrence	70.1 years	4.5 years ←
1% of payroll – 50% occurrence	66.3 years	8.3 years ←




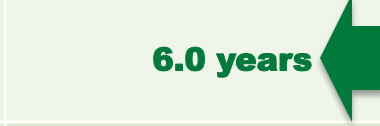


Economic Experience





Short-Term Investment Return Scenarios





School Division

Investment Return— Single-Year Event	Expected Period When 100% Funding is Reached	Current Amortization 74.6 Years ← Decrease years to full funding Increase years to full funding →	
1.25%	109.7 years		35.1 years 
3.25%	92.8 years		18.2 years 
5.25%	82.3 years		7.7 years 
9.25%	68.6 years	6.0 years 	
11.25%	63.7 years	10.9 years 	
13.25%	59.5 years	15.1 years 	



Short-Term Investment Return Scenarios

School Division
(continued)

Investment Return	Expected Period When 100% Funding is Reached	Current Amortization 74.6 Years 
One-year disaster event like 2008: -25.8%	Exhaustion	Exhaustion
Next five years like the last five years	71.6 years	3.0 years 
Replicate 1990s boom era over next 10 years	12.0 years	62.6 years 
Average return over next 10 years of 6.0%	Exhaustion	Exhaustion
Average return over next 10 years of 7.0%	81.4 years	6.8 years 
Average return over next 10 years of 8.0%	54.6 years	20.0 years 