Agenda

Proposed Funding Policy Edits
Funding Goals
Annual Actuarial Metrics
Funding Valuation Elements
Glossary
Proposed Edits – Section I & II

Section I – Introduction

• Within Introduction, suggest removing GASB references related to the other types of plans
  – Remove GASB 74/75 reference from the *Introduction* for Pension Funding Policy
  – Remove GASB 67/68 references from the *Introduction* for OPEB Funding Policy

Section II – Background

• Review guiding principles (first set in 2009)
  – 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

• Statutory alignment regarding mention of C.R.S. § 24-51-1009.5, as altered by Senate Bill 2018-200
Proposed Edits – Section VI & VII

Section VI – Governance Policy / Processes

• Suggest slightly altering language to better align with current Board Governance Manual
  – Experience Analysis
  – Actuarial Audit
  – Review of Defined Benefit Pension Plan Funding Policy and Defined Benefit OPEB Plan Funding Policy

Section VII – Glossary of Funding Policy Terms

• Initially, much debate regarding how to handle the Annual Increase Reserves during adoption of GASB 67/68
  – Suggest cleaning-up definitions of plan assets to better align with funding rather than GASB disclosure requirements

• For ease and clarity, suggest simplifying definitions of
  – Present Value of Benefits (PVB) or total cost
  – Unfunded Actuarial Accrued Liability (UAAL)
  – Valuation Date
Funding Goals (Section III)

Maintain the defined benefit structure while demonstrating transparency and accountability for stakeholders

Achievement of a combined divisions’ trust fund actuarial funded ratio greater than or equal to 110%

- 110% threshold is meant to mitigate volatility

Dedication to the balance between contribution rate stability and intergenerational equity

Dedication to the systematic reduction of the UAAL

Recognition that the cost-sharing element of PERA provides beneficial elements of pooled risk
Annual Actuarial Metrics (Section IV)

Actuarial metrics to be assessed on an annual basis as of the actuarial valuation date and calculated by division

Contribution rate comparison to determine surplus or deficiency of:

- Statutory contribution rates; and
- Actuarially determined contribution rates

Funded ratios based on actuarial and market values of assets

- Applicable asset value divided by division’s AAL
Target Pension Funded Ratios

- **AED/SAED**
  - Trigger to increase AED/SAED Contributions
  - **90%**

- **AAP Test**
  - Test ratio below 98% results in increased contribution rates and decreased COLA
  - **98%**

- **Projection Target**
  - Target % for open group projections and funding period
  - **100%**

- **ADC Trigger**
  - ADC becomes NC
  - **103%**

- **Funding Policy Goal**
  - Combined funded ratio benchmark
  - **110%**

- **AAP Test ADC Trigger**
  - AAP test ratio above 120% results in decreased contribution rates and increased COLA
  - **120%**

* Also applicable to Health Care Trust Funds.
Annual Actuarial Metrics (Section IV)

Funding period is the amortization period required to pay off a division’s UAAL based on:

- Actuarial value of assets
- Current demographics, normal cost rates and contribution rates

Actuarial projections of when each division is expected to reach a funded level of 100% based on:

- Projected asset values that reflect any deferred gains and losses
- Projected demographics and normal cost rates, which may reflect an increasing active headcount (based on assumptions)
- Any known projected contribution increases or AAP adjustments
Funding Valuation Elements (Section V)

The actuarial funding policy consists of three elements

**Asset Valuation Method**
- To mitigate investment volatility in the valuation process, investment gains and losses recognized over a period of years
- PERA uses a four-year smoothing method year to develop an actuarial value of assets (AVA)

**Actuarial Cost Method**
- Allocation of liability to past and future service, defining actuarial accrued liability (AAL) and normal cost (NC), respectively
- PERA uses the entry age normal cost method
- Allocates cost of member’s retirement benefit over expected career as a level % of salary
- Most common cost method among public sector retirement systems

**Amortization Method**
- Relies on two inputs (duration and pattern) to systematically close the difference between AAL and AVA
- PERA’s amortization method:
  - Existing UAAL on December 31, 2017 – 30 years
  - Subsequent experience gains and losses, and assumption changes – new 30-year periods
  - Plan changes – anticipated duration, not to exceed 25 years
  - Payments calculated to increase by 3% per year
Model UAAL Amortization Periods

Conference of Consulting Actuaries Public Plans Community (CCA PPC) “White Paper”

Issued October 2014; currently under revision

Not binding, but provides detailed discussion of policy components

“Model” UAAL amortization periods vary by source:

<table>
<thead>
<tr>
<th>Source of UAAL</th>
<th>Model Amortization Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience Gain/Loss</td>
<td>15 to 20 years</td>
</tr>
<tr>
<td>Assumption Changes</td>
<td>15 to 25 years</td>
</tr>
<tr>
<td>Active Plan Changes</td>
<td>Demographic, ≤ 15</td>
</tr>
<tr>
<td>Inactive Plan Changes</td>
<td>Demographic, ≤ 10</td>
</tr>
<tr>
<td>Early Retirement Incentives</td>
<td>5 years or less</td>
</tr>
<tr>
<td>Surplus</td>
<td>30 years</td>
</tr>
</tbody>
</table>
# UAAL Amortization Schedule

## Unfunded Actuarial Accrued Liability Amortization Schedule

<table>
<thead>
<tr>
<th>Description</th>
<th>Original Balance</th>
<th>Outstanding Balance as of 12/31/2021</th>
<th>1/1/2022 Amortization Payment</th>
<th>Outstanding Balance as of 12/31/2022</th>
<th>1/1/2023 Amortization Payment</th>
<th>Amortization Period as of 12/31/2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 31, 2017 legacy UAAL (revised funding policy effective December 31, 2018)</td>
<td>$10,525,675,186</td>
<td>$11,074,730,855</td>
<td>$674,640,777</td>
<td>$11,154,096,630</td>
<td>$694,880,000</td>
<td>25 years</td>
</tr>
<tr>
<td>December 31, 2018 contribution deficiency</td>
<td>117,830,228</td>
<td>122,101,934</td>
<td>7,438,099</td>
<td>122,976,933</td>
<td>7,661,242</td>
<td>25 years</td>
</tr>
<tr>
<td>December 31, 2018 UAAL base</td>
<td>401,011,824</td>
<td>417,010,708</td>
<td>24,873,534</td>
<td>420,567,119</td>
<td>25,619,740</td>
<td>26 years</td>
</tr>
<tr>
<td>December 31, 2019 contribution deficiency</td>
<td>21,085,848</td>
<td>21,543,325</td>
<td>1,312,357</td>
<td>21,697,713</td>
<td>1,351,728</td>
<td>25 years</td>
</tr>
<tr>
<td>December 31, 2019 UAAL base</td>
<td>(111,125,673)</td>
<td>(114,066,730)</td>
<td>(6,670,225)</td>
<td>(115,182,752)</td>
<td>(6,870,332)</td>
<td>27 years</td>
</tr>
<tr>
<td>December 31, 2020 contribution deficiency</td>
<td>93,468,886</td>
<td>94,266,021</td>
<td>5,742,145</td>
<td>94,941,167</td>
<td>5,914,688</td>
<td>25 years</td>
</tr>
<tr>
<td>December 31, 2020 assumption change</td>
<td>947,845,612</td>
<td>969,237,610</td>
<td>55,055,117</td>
<td>969,736,724</td>
<td>66,706,771</td>
<td>28 years</td>
</tr>
<tr>
<td>December 31, 2020 UAAL base</td>
<td>(902,590,243)</td>
<td>(913,438,324)</td>
<td>(52,426,483)</td>
<td>(923,435,198)</td>
<td>(53,989,277)</td>
<td>28 years</td>
</tr>
<tr>
<td>December 31, 2021 plan change</td>
<td>(486,946,484)</td>
<td>(486,946,484)</td>
<td>(30,959,857)</td>
<td>(496,798,331)</td>
<td>(31,888,786)</td>
<td>24 years</td>
</tr>
<tr>
<td>December 31, 2021 UAAL Base</td>
<td>(814,109,776)</td>
<td>(814,109,776)</td>
<td>(45,909,846)</td>
<td>(823,994,245)</td>
<td>(47,287,141)</td>
<td>29 years</td>
</tr>
<tr>
<td>December 31, 2022 contribution surplus</td>
<td>(183,339,888)</td>
<td>N/A</td>
<td>N/A</td>
<td>(183,339,888)</td>
<td>(10,176,779)</td>
<td>25 years</td>
</tr>
<tr>
<td>December 31, 2022 UAAL Base</td>
<td>(411,001,912)</td>
<td>N/A</td>
<td>N/A</td>
<td>(411,001,912)</td>
<td>(23,177,508)</td>
<td>30 years</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$9,780,329,667</td>
<td>$9,756,166,349</td>
<td>$9,275,673,361</td>
<td>$9,580,698,057</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total with interest to middle of the year</strong></td>
<td>$617,399,266</td>
<td>$601,380,059</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected payroll</td>
<td>$3,244,084,077</td>
<td>$3,340,031,240</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total as a percentage of projected payroll</td>
<td>19.03%</td>
<td>18.01%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equivalent single amortization period</td>
<td>22 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*State Division reflects an adjustment for the impact of AED and SAED as well as DC Supplement (for members hired on or after January 1, 2019) contributions received from employers on the estimated pensionable payroll of employees electing to participate in the defined contribution plan.*
# UAAL Amortization Schedule

## SCHOOL DIVISION

Unfunded Actuarial Accrued Liability Amortization Schedule

<table>
<thead>
<tr>
<th>Description</th>
<th>Original Balance</th>
<th>Outstanding Balance as of 12/31/2021</th>
<th>1/1/2022 Amortization Payment</th>
<th>Outstanding Balance as of 12/31/2022</th>
<th>1/1/2023 Amortization Payment</th>
<th>Amortization Period as of 12/31/2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 31, 2017 legacy UAAL (revised funding policy effective December 31, 2018)</td>
<td>$16,286,169,194</td>
<td>$17,144,668,915</td>
<td>$1,042,576,446</td>
<td>$17,237,319,173</td>
<td>$1,073,853,739</td>
<td>25 years</td>
</tr>
<tr>
<td>December 31, 2018 contribution deficiency</td>
<td>261,157,378</td>
<td>270,625,132</td>
<td>16,486,705</td>
<td>272,564,535</td>
<td>16,980,276</td>
<td>25 years</td>
</tr>
<tr>
<td>December 31, 2018 UAAL base</td>
<td>726,883,907</td>
<td>756,883,878</td>
<td>45,086,381</td>
<td>762,330,316</td>
<td>46,438,972</td>
<td>26 years</td>
</tr>
<tr>
<td>December 31, 2019 contribution deficiency</td>
<td>94,217,771</td>
<td>96,261,909</td>
<td>5,863,999</td>
<td>96,951,758</td>
<td>6,039,919</td>
<td>25 years</td>
</tr>
<tr>
<td>December 31, 2019 plan change</td>
<td>(829,604,881)</td>
<td>(840,381,342)</td>
<td>(55,003,455)</td>
<td>(842,298,334)</td>
<td>(56,653,659)</td>
<td>22 years</td>
</tr>
<tr>
<td>December 31, 2019 UAAL base</td>
<td>(5,724,283)</td>
<td>(6,875,781)</td>
<td>(343,595)</td>
<td>(6,933,289)</td>
<td>(353,903)</td>
<td>27 years</td>
</tr>
<tr>
<td>December 31, 2020 contribution deficiency</td>
<td>155,895,101</td>
<td>157,224,628</td>
<td>9,577,673</td>
<td>158,351,359</td>
<td>9,865,003</td>
<td>25 years</td>
</tr>
<tr>
<td>December 31, 2020 assumption change</td>
<td>1,039,281,320</td>
<td>1,061,387,334</td>
<td>106,833,695</td>
<td>1,081,258,077</td>
<td>110,038,705</td>
<td>28 years</td>
</tr>
<tr>
<td>December 31, 2020 UAAL base</td>
<td>(1,283,710,655)</td>
<td>(1,299,139,358)</td>
<td>(74,563,663)</td>
<td>(1,313,357,433)</td>
<td>(76,800,673)</td>
<td>28 years</td>
</tr>
<tr>
<td>December 31, 2021 plan change</td>
<td>(889,390,510)</td>
<td>(889,390,510)</td>
<td>(55,407,417)</td>
<td>(894,446,867)</td>
<td>(57,069,639)</td>
<td>24 years</td>
</tr>
<tr>
<td>December 31, 2021 UAAL Base</td>
<td>(1,035,675,422)</td>
<td>(1,035,675,422)</td>
<td>(58,404,530)</td>
<td>(1,048,123,032)</td>
<td>(60,156,666)</td>
<td>29 years</td>
</tr>
<tr>
<td>December 31, 2022 contribution surplus</td>
<td>(178,110,689)</td>
<td>N/A</td>
<td>N/A</td>
<td>(178,110,689)</td>
<td>(11,096,874)</td>
<td>25 years</td>
</tr>
<tr>
<td>December 31, 2022 UAAL Base</td>
<td>(91,254,945)</td>
<td>N/A</td>
<td>N/A</td>
<td>(91,254,945)</td>
<td>(5,146,112)</td>
<td>30 years</td>
</tr>
<tr>
<td>Total</td>
<td>$16,083,611,995</td>
<td>$15,933,025,000</td>
<td>$899,540,399</td>
<td>$1,011,266,207</td>
<td>$976,487,851</td>
<td>25 years</td>
</tr>
<tr>
<td>Total with interest to middle of the year</td>
<td>$1,011,266,207</td>
<td>$1,024,783,631</td>
<td>$5,759,730,879</td>
<td>$5,973,034,063</td>
<td>$5,973,034,063</td>
<td>25 years</td>
</tr>
<tr>
<td>Projected payroll</td>
<td>$5,759,730,879</td>
<td>$5,759,730,879</td>
<td>$5,759,730,879</td>
<td>$5,759,730,879</td>
<td>$5,759,730,879</td>
<td>25 years</td>
</tr>
<tr>
<td>Total as a percentage of projected payroll</td>
<td>17.56%</td>
<td>17.16%</td>
<td>17.16%</td>
<td>17.16%</td>
<td>17.16%</td>
<td>25 years</td>
</tr>
<tr>
<td>Equivalent single amortization period</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25 years</td>
</tr>
</tbody>
</table>
Negative Amortization

Explanation of negative amortization

With **level dollar** payments, payments are always greater than interest.

With **level percentage of payroll** payments, early payments can be less than interest:

- Depends on assumptions, but generally if (remaining) amortization period is 20 years or longer.
- UAAL increases (but not as a percentage of payroll).
- Eventually larger payments cover interest plus increased UAAL.
Illustration of Amortization Periods

Annual Payment ($ in 000s)

Annual Payment on $1 Million Initial UAAL Balance

- 30 Years Level Dollar
- 30 Years Level Percent
- 25 Years Level Percent
- 20 Years Level Percent
- 15 Years Level Percent
Illustration of Amortization Periods
Outstanding UAAL Balance ($ in millions)

Impact of negative amortization on outstanding UAAL balance
Additional amortization method items to consider

If a division has a surplus position (i.e., negative UAAL):

- ADC set equal to normal cost until funded ratio hits 120%
- After 120% funded, ADC equals normal cost less 15-year “credit” of the portion of UAAL above 120%

For sensitivity purposes, the actuarial valuations include alternative ADCs replacing the 30-year period for amortization of new UAAL with:

- 25-year closed period
- 20-year closed period
- 15-year closed period
Comparison of 30-year to 25-year Amortization

Impact from hypothetical immediate recognition of 2022 investment losses compared to current 4-year AVA smoothing

<table>
<thead>
<tr>
<th>December 31, 2022 Valuation Results 2024 Actuarially Determined Contribution</th>
<th>State</th>
<th>School</th>
<th>Local Government</th>
<th>Judicial</th>
<th>DPS</th>
<th>AAP Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-year amortization (actual)</td>
<td>19.77%</td>
<td>20.58%</td>
<td>8.28%</td>
<td>12.78%</td>
<td>6.04%</td>
<td>105.69%</td>
</tr>
<tr>
<td>25-year amortization</td>
<td>19.62%</td>
<td>20.63%</td>
<td>8.02%</td>
<td>12.29%</td>
<td>5.82%</td>
<td>105.79%</td>
</tr>
<tr>
<td>Delta</td>
<td>−0.15%</td>
<td>+0.05%</td>
<td>−0.26%</td>
<td>−0.49%</td>
<td>−0.22%</td>
<td>+0.10%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2024 ADC Considering Immediate Recognition of 2022 Investment Losses</th>
<th>State</th>
<th>School</th>
<th>Local Government</th>
<th>Judicial</th>
<th>DPS</th>
<th>AAP Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-year amortization</td>
<td>25.04%</td>
<td>25.73%</td>
<td>14.76%</td>
<td>19.99%</td>
<td>10.80%</td>
<td>90.65%</td>
</tr>
<tr>
<td>25-year amortization</td>
<td>25.44%</td>
<td>26.32%</td>
<td>15.18%</td>
<td>20.25%</td>
<td>11.09%</td>
<td>89.37%</td>
</tr>
<tr>
<td>Delta</td>
<td>+0.40%</td>
<td>+0.59%</td>
<td>+0.42%</td>
<td>+0.26%</td>
<td>+0.29%</td>
<td>−1.28%</td>
</tr>
</tbody>
</table>

The smoothing of investment experience over 4 years and amortizing investment gains and losses over 30 years provides additional stability in valuation results.
Funding Valuation Elements (Section V)

Actuarial assumptions represent the Board’s best estimate of anticipated experience and are long-term in nature.

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, 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.
Glossary

Glossary of common acronyms used throughout the Funding Policy

- **AAL** – Actuarial Accrued Liability
- **AAP** – Automatic Adjustment Provision
- **AED/SAED** – Amortization Equalization Disbursement/Supplemental Amortization Equalization Disbursement
- **ADC** – Actuarially Determined Contribution
- **AVA** – Actuarial Value of Assets
- **GASB** – Governmental Accounting Standards Board
- **MVA** – Market Value of Assets
- **NC** – Normal Cost
- **OPEB** – Other Post Employment Benefits
- **PVB** – Present Value of Benefits
- **UAAL** – Unfunded Actuarial Accrued Liability