



Pennsylvania Public School Employees' Retirement System

Update of Administrative Option Factors

August 5, 2021

Disclosures

The information contained herein is developed for the Board of Trustees and Staff of PSERS by Buck Global, LLC using generally accepted actuarial principles and techniques in accordance with all applicable Actuarial Standards of Practice (ASOPs). The purpose of this presentation is to provide key results of the analysis of the Administrative Option Factors. All recommendations contained in this report are consistent with each other, as appropriate.

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The material contained herein is based actuarial assumptions and methods, and System provisions applicable for the June 30, 2020 experience investigation of the Pennsylvania Public School Employees' Retirement System.

Future actuarial measurements may differ significantly from current measurements due to System experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in System provisions or applicable law. An analysis of the potential range of future results is beyond the scope of this study.

David L. Driscoll is a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. Edward Quinn and Salvador Nakar are Members of the American Academy of Actuaries. We meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. We are available to answer any questions on the material contained herein, or to provide explanations or further details as may be appropriate.

Agenda

- **Review option factors**

- The option factors were last revised in 2018 to use the valuation mortality
- Should the factors be revised to use the valuation mortality tables adopted after the current 2015 – 2020 experience review?

Option Factors

- **What are option factors?**
 - Reduction to maximum option to “pay” for cost of providing annuity in another form
 - All or portion of cost of option is paid by member
 - If portion paid by employer, benefit is “subsidized”

Retirement Benefit Options

- **Maximum Option** - Single life annuity with a guarantee of total payments equal to the Accumulated Deductions
- **Option 1** - Guarantee of total payments equal to maximum option reserve
- **Option 2** - 100% joint and survivor annuity
- **Option 3** - 50% joint and survivor annuity
- **Option 4** - Special option

Maximum Option – Single Life Annuity

- **No reduction in monthly benefit**
- **Benefits paid for member's lifetime only**
- **Death benefit if member dies**
 - Lump sum to survivor
 - Member's contributions with interest less retirement benefits paid

Option 1 – Guarantee of Total Payments Equal to the Present Value of the Maximum Option Single Life Annuity

- **Reduced monthly benefit**
- **Benefits paid for member's lifetime only**
- **Larger death benefit than under maximum option**
- **Death benefit if member dies**
 - Lump sum to survivor
 - Maximum single life annuity reserve at retirement less retirement benefits paid

Option 2 - 100% Joint and Survivor Annuity

- **Reduced monthly benefit**
- **Benefits paid for member's and survivor's lifetimes**
- **Death benefit if member dies first**
 - 100% of member's reduced monthly benefit continues to survivor for life
- **Death benefit if survivor dies first**
 - 100% of reduced monthly benefit continues to member for life

Option 3 - 50% Joint and Survivor Annuity

- **Reduced monthly benefit**
- **Benefits paid for member's and survivor's lifetimes**
- **Death benefit if member dies first**
 - 50% of member's reduced monthly benefit continues to survivor for life
- **Death benefit if survivor dies first**
 - 100% of reduced monthly benefit continues to member for life

Option 4 - Special Option

- **Special option examples**
 - Refund of accumulated deductions
 - Survivor annuity with a continuation percentage other than 50% or 100%
 - Special death benefit
 - Pop-up option
- **Actuarially equivalent to the maximum option benefit but subject to the System's Code restrictions**
- **The actuary is requested to calculate certain special options or benefits for special situations**

Allocation of Recent Retiree Options

July 1, 2015 – June 30, 2020 Retirements

Option*	Percent Electing Option
Maximum	47%
Option 1	23
Option 2	20
Option 3	9
Option 4 - annuity elections	1
Total	100%

* Regardless of withdrawal of member's accumulated deduction.

- 72% of recent Class T-C and Class T-D retirements elect to receive a partial or full withdrawal of the member's accumulated deductions
- 48% of recent Class T-E and Class T-F retirements elect to receive a partial or full withdrawal of the member's accumulated deductions
- No information is available for Class T-G and Class T-H retirements

Early Retirement Factors

- **Early retirement reductions**

- If age 55 with 25 years (57 with 25 years for Class T-G) , 3% for each year under superannuation
- Otherwise, actuarial equivalent

Definition of Actuarial Equivalent

- **Present value of optional form = Present value of maximum option**
- **Based on two assumptions**
 - Interest rate
 - Mortality table
- **“True” actuarial equivalent based on current assumptions**
 - Board approved assumed long-term return on System assets: 7.25% per annum
 - Board approved base mortality tables for the valuation
 - For administrative ease, projected to 2025* with the Buck Modified scale MP-2020
 - Unisex blend based on plan demographics (25% male/75% female)
- **Code requires PSERS option factors to be based on:**
 - Prior to Act 5-2017: 4% interest rate
 - Act 5-2017 amendments:
 - For Class T-G and T-H members, early retirement factors from age 62 to superannuation are based on the statutory interest rate of 4%. From commencement age to age 62, early retirement factors are based on the assumed long-term return on System assets as adopted by the Board
 - For Class T-E, T-F, T-G and T-H members, cost neutral Option 4 refund of Accumulated Deductions are based on the assumed long-term return on System assets as adopted by the Board

* The projection of the mortality table to 2025 is the mid-point of the period during which the factors would be utilized.

Current Option Factor Basis

- **4% (statutory) interest rate**
- **Base mortality tables currently used for actuarial valuations projected to 2020 with the Buck Modified 2015 improvement scale**
 - Male annuitants: RP-2014 male mortality table adjusted backward to 2006 with the MP-2014 mortality improvement scale and projected to the 2015 valuation date with the Buck Modified 2015 projection scale
 - Female annuitants: RP-2014 female mortality table adjusted backward to 2006 with the MP-2014 mortality improvement scale, projected to 2013 with the Buck Modified 2015 projection scale and adjusted by, approximately, 93% for credibility
- **Unisex mortality (25% male/75% female)**

Reasons to Review Option Factor Basis

- **The PSERS Code requires option factors to be based on statutory interest rate and mortality tables adopted by the Board**
- **The option factor basis should be reviewed whenever the valuation mortality tables are revised**

Recommended Option Factors

- **Applicable statutory interest rate**
- **Board approved base mortality tables proposed for actuarial valuation, effective June 30, 2021, generationally projected to 2025 with the Buck Modified MP-2020 improvement scale**
 - Male annuitants: Blended table based on 50% PubT-2010 Retiree (Total Teacher dataset) and 50% PubG-2010 Retiree (Total General Employees dataset) Amount Weighted Male Tables, with a 99.7% adjustment
 - Female annuitants: Blended table based on 50% PubT-2010 Retiree (Total Teacher dataset) and 50% PubG-2010 Retiree (Total General Employees dataset) Amount Weighted Female Tables, with a 95.4% adjustment
- **Unisex mortality (25% male/75% female)**

Comparison of Option Factor Bases

- **Current basis**

- Actuarial equivalent

- Unisex table based on 25% males and 75% females blend of the base mortality tables currently used for actuarial valuations, generationally projected to 2020 with the Buck 2015 improvement scale
- 4%, pre-Act 5, statutory interest rate

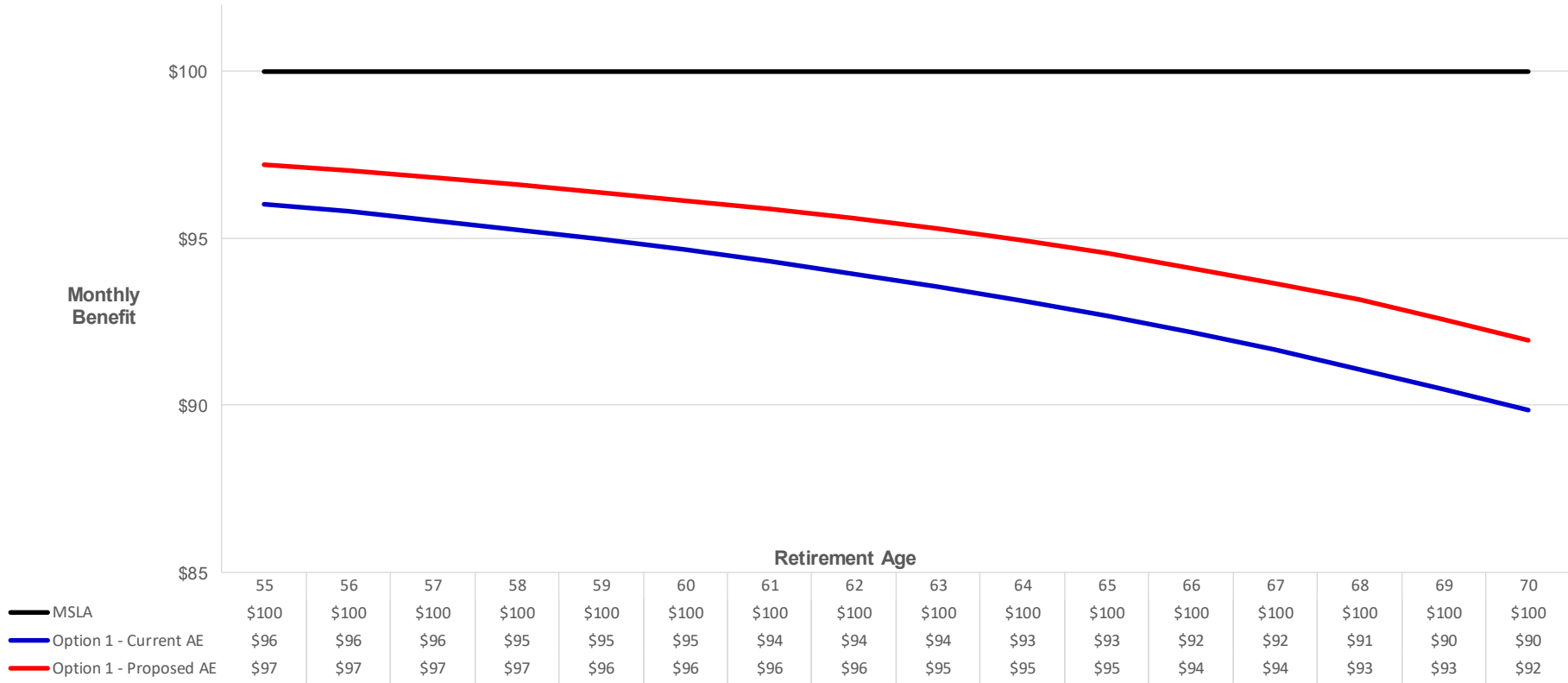
- **Recommended**

- Actuarial equivalent

- Unisex table based on 25% males and 75% females blend of the Board approved base mortality tables to be used for actuarial valuations beginning June 30, 2021, generationally projected to 2025 with the Buck Modified MP-2020 improvement scale
- Applicable statutory interest rate

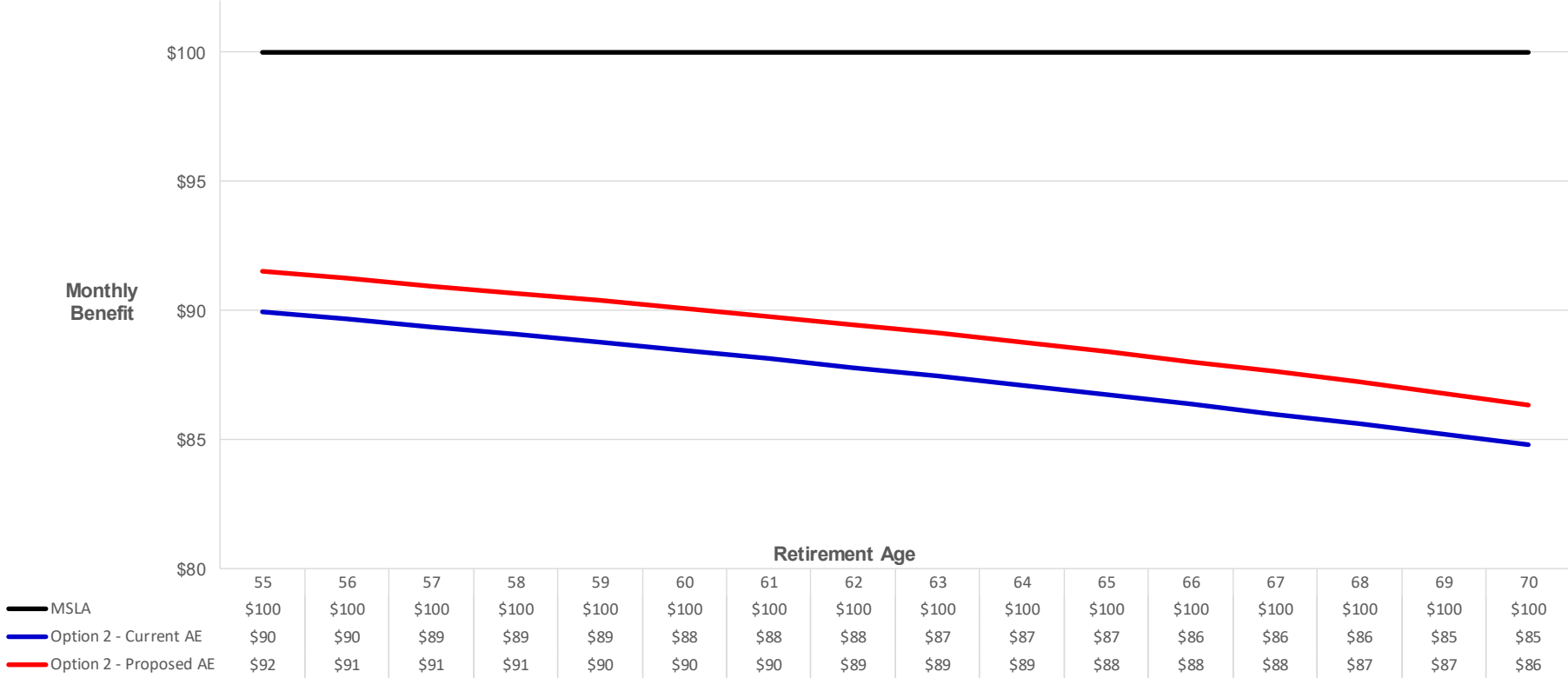
Option 1 – Guarantee of Total Payments Equal to the Present Value of the Maximum Option Single Life Annuity

\$100 Maximum Option Monthly Benefit Payable under an Option 1 Election at Retirement



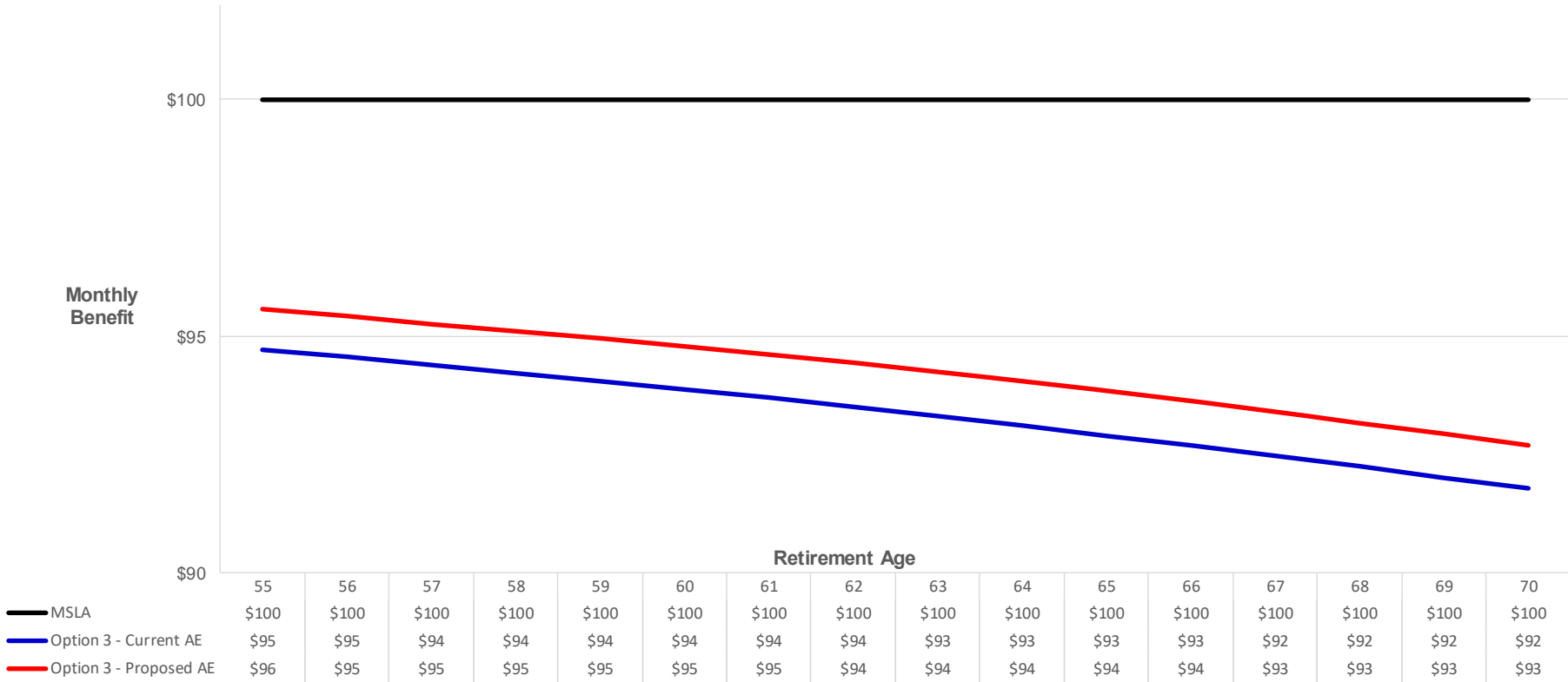
Option 2 - 100% Joint and Survivor Annuity

\$100 Maximum Option Monthly Benefit Payable under an Option 2 Election at Retirement
 (Assuming Spouse is the same age as Member)



Option 3 - 50% Joint and Survivor Annuity

\$100 Maximum Option Monthly Benefit Payable under an Option 3 Election at Retirement
 (Assuming Spouse is the same age as Member)



Cost of Changing Option Factors

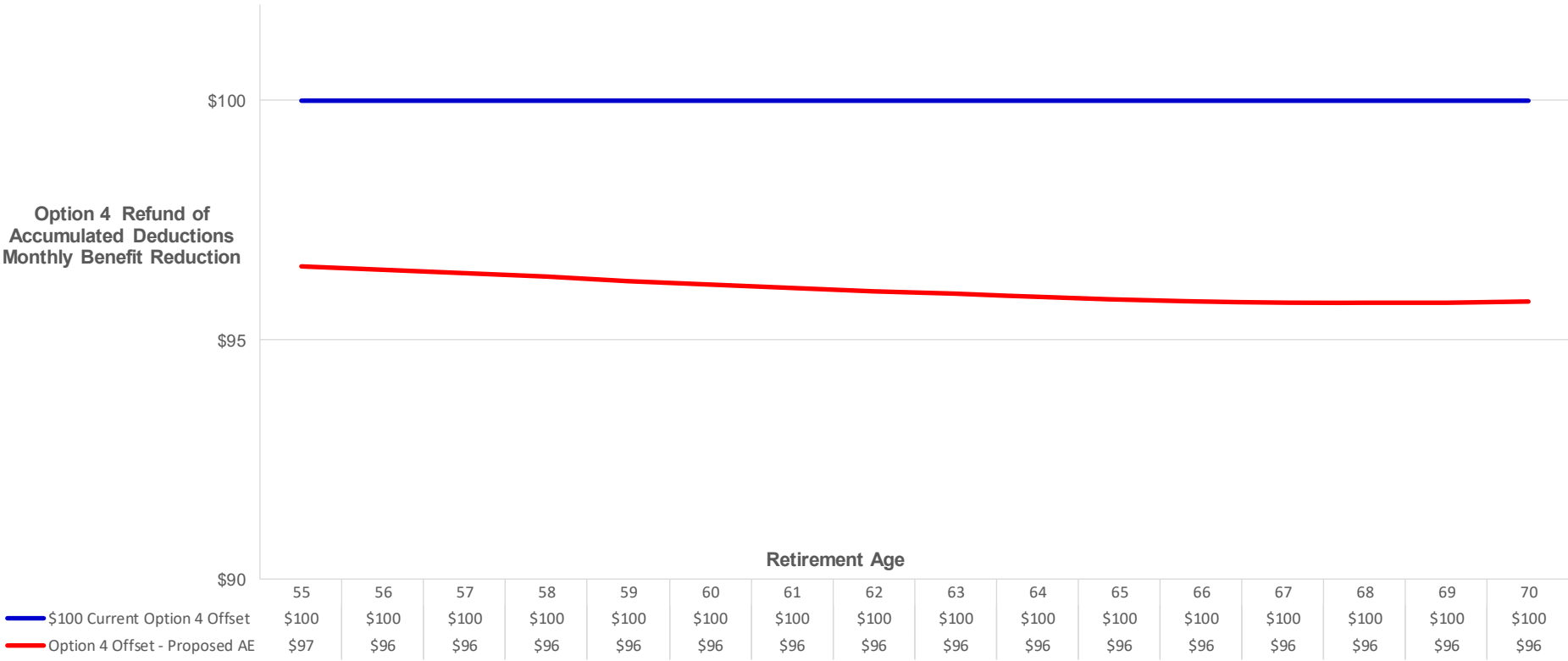
- **Death benefit options (Options 1, 2, 3)**
 - Board approved valuation assumption for active member optional form election at retirement
 - 45% will elect MSLA
 - 25% will elect Option 1
 - 20% will elect Option 2 (assuming males are 3 years older than females)
 - 10% will elect Option 3 (assuming males are 3 years older than females)
 - 0% will elect Option 4 annuity
 - Actuarial gain is generally realized when member chooses death benefit option because true actuarial equivalent benefits are usually greater than benefits produced by current factors
 - Updating the factor basis produce greater Option 1, 2 and 3 benefits than the current factor basis

Option 4 – Refund of Accumulated Deductions

- **A member may elect an Option 4 Partial Lump Sum where the member receives a lump sum that is less than or equal to the member's Accumulated Deductions at retirement**
- **Maximum Option benefit is reduced by an annuity actuarial equivalent of the Accumulated Deductions received as a lump sum**
 - Based on the Board approved mortality table and the statutory interest rate
 - Class T-C and T-D members: 4% interest rate
 - Class T-E, T-F, T-G and T-H members: the assumed long-term return on System assets as adopted by the Board
- **Residual benefit may be paid as a single life annuity to the member, or in an actuarially equivalent form of payment that provides a reduced life annuity to the member plus certain post-retirement death or survivor benefits**

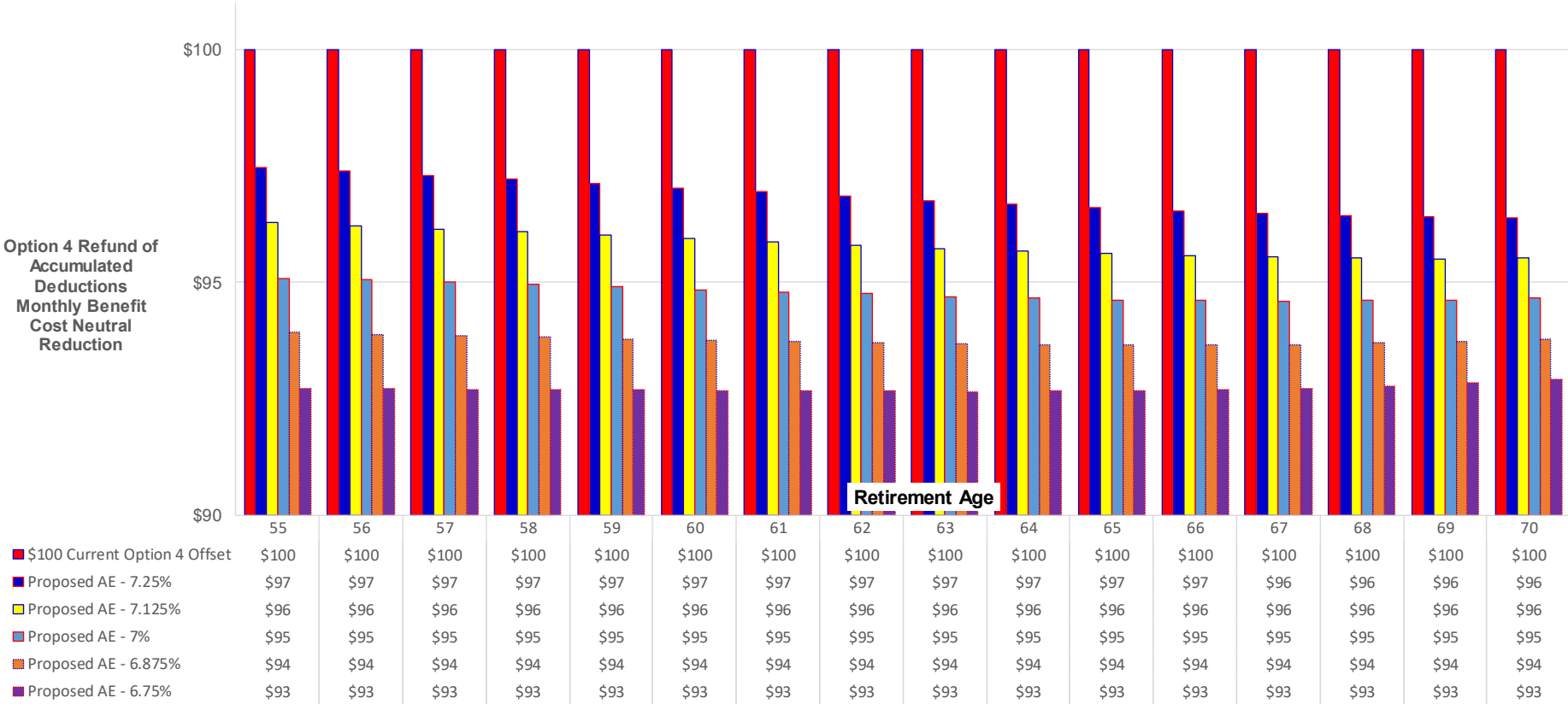
Option 4 – Refund of Accumulated Deductions: Class T-C and T-D

Maximum Option Reduction at Retirement Due to Option 4 Refund of Accumulated Deductions



Option 4 – Refund of Accumulated Deductions: Class T-E, T-F, T-G and T-H

Maximum Option Cost Neutral Reduction at Retirement Due to Option 4 Refund of Accumulated Deductions



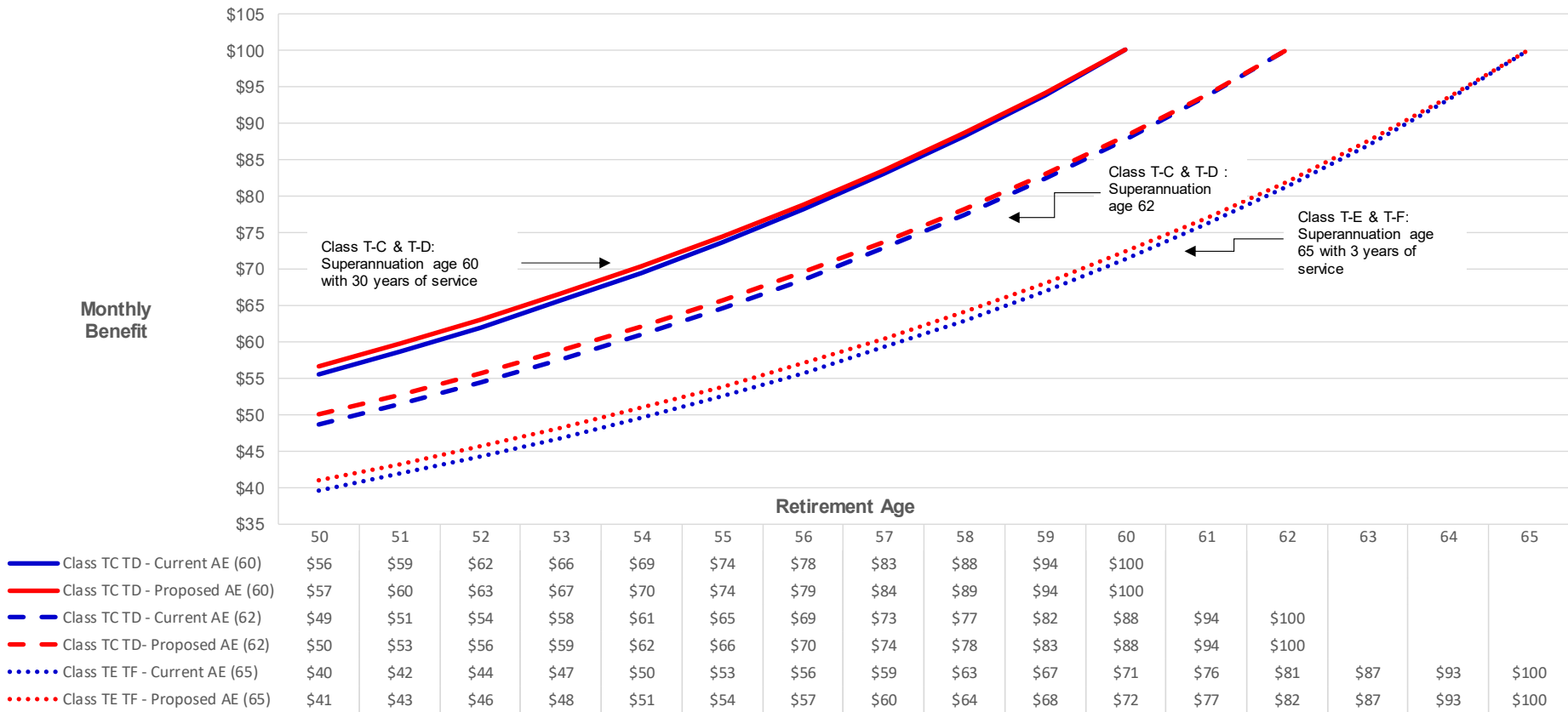
Cost of Changing Option Factors

- **Refund of accumulated deductions - Option 4**

- Board approved valuation assumption for active member optional form election at retirement
 - Assume 75% of all eligible Class T-C and Class T-D retirements will elect an Option 4 - withdrawing all accumulated deductions
 - Assume 50% of all eligible Class T-E, Class T-F, Class T-G and Class T-H retirements will elect an Option 4 - withdrawing all accumulated deductions
- Any change in the factor basis would be recognized immediately in the valuation and be reflected in the employer rate
- Interest rate has a greater effect on Option 4 factors than mortality
 - Class T-C and Class T-D factors: 4% interest rate produce benefits that are substantially greater than those produced by factors valued using assumed long-term return on System assets
 - Class T-E, Class T-F, Class T-G and Class T-H factors: valued using assumed long-term return on System assets which produce benefits that are cost neutral to the System
- Updating the factor basis produces lesser offset/greater residual benefits than the current factor basis

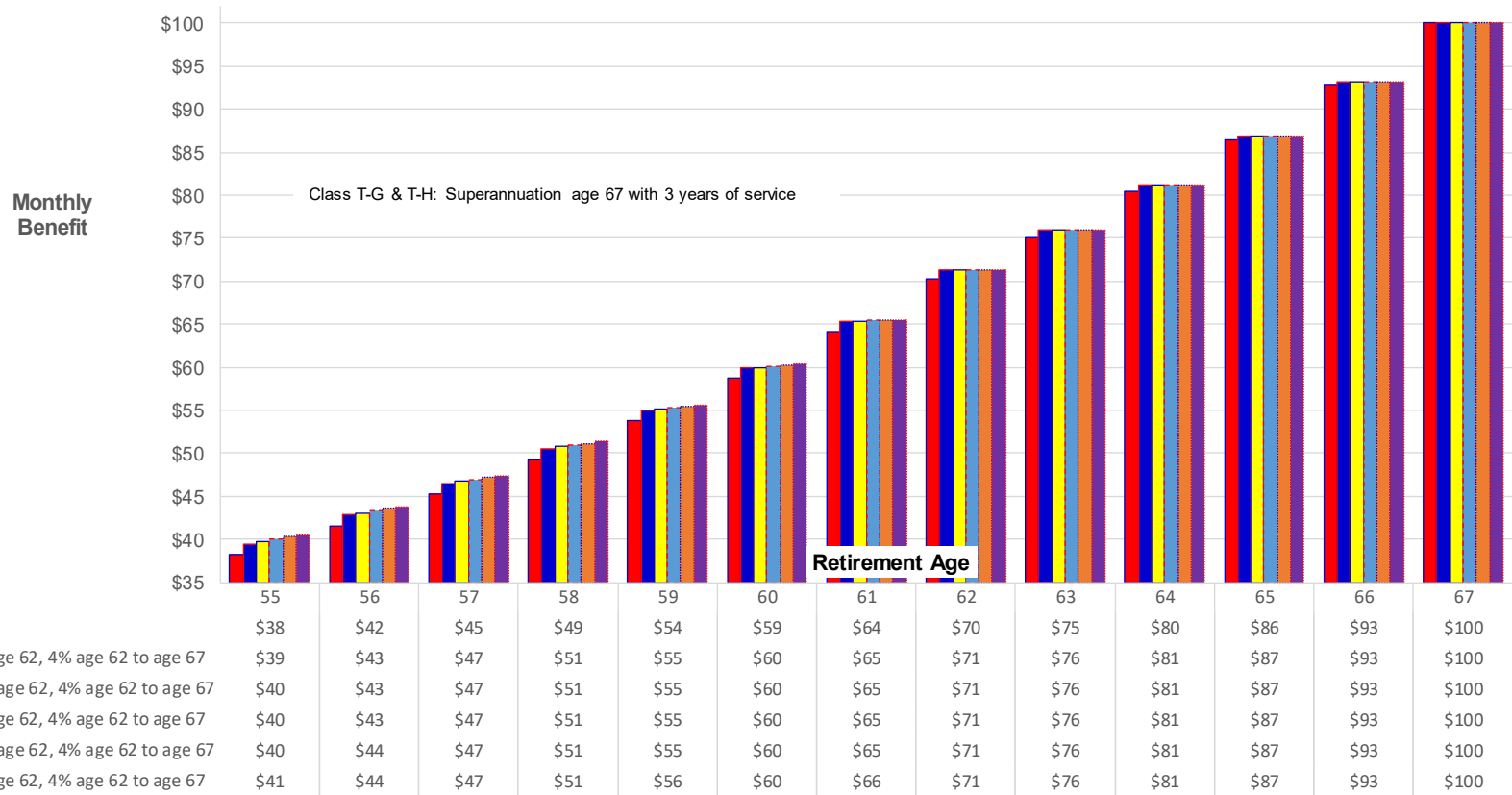
Early Commencement Withdrawal Annuity: Class T-C, T-D, T-E and T-F

Early Commencement of a \$100 Maximum Option Monthly Withdrawal Annuity Benefit



Early Commencement Withdrawal Annuity: Class T-G and T-H

Early Commencement of a \$100 Maximum Option Monthly Withdrawal Annuity Benefit



Cost of Changing Actuarial Early Retirement Factors

- **Early retirement reductions**

- Prospective early retirement reductions are included in the active member valuation. Any change in the factor basis would be recognized immediately in the valuation and be reflected in the employer rate
- Interest rate has a greater effect on the early retirement factors than mortality
- Updating the factor basis produces slightly better benefits than the current factor basis at younger retirement ages and similar benefits at later retirement ages

Cost Impact of Demographic Assumption Changes

Item	June 30, 2020 Actuarial Valuation				
	Unfunded Accrued Liability ¹	Funded Ratio ¹	Normal Cost Rate	Employer Pension Rate ²	Employer Pension Contribution ^{2,3}
BEFORE CHANGES	\$44,034 Mil	59.2%	7.20%	33.99%	\$4,857 Mil
Demographic Assumptions⁴					
1. Non-mortality assumptions (approved by the Board March 4)	(926)	0.5	(0.92)	(1.37)	(196)
2. Mortality assumptions (approved by the Board June 10)	1,283	(0.7)	0.11	0.74	106
3. Administrative Option Factors	771	(0.4)	0.21	0.59	84
TOTAL DEMOGRAPHIC CHANGES	\$ 1,128 Mil	(0.6)%	(0.60)%	(0.04)%	\$ (6) Mil
AFTER REFLECTING CHANGES	\$45,162 Mil	58.6%	6.60%	33.95%	\$ 4,851 Mil

1. Actuarial value of assets basis.

2. Without regard to the Act 5 DC contribution and Premium Assistance.

3. Based on the fiscal year 2022 appropriation pay of \$14,289,000,000.

4. The cost effect of each proposed assumption is subject to change depending on the sequence of recognized assumptions.

In addition, the changes in demographic assumptions would decrease the Premium Assistance contribution rate for fiscal year 2021/2022 from 0.80% to 0.78%.

Recommendation

- **Implement changes effective July 1, 2022, if administratively possible**

PSERB Resolution 2021- _____
Re: Five-Year Actuarial Experience Review – July 1, 2015 to June 30, 2020 – Administrative Option Factors
August 5, 2021

RESOLVED, that the Budget/Finance Committee of the Public School Employees' Retirement Board (the "Board") hereby recommends the Board to accept the Update of Administrative Option Factors presentation prepared by Buck, and further recommends to adopt the Administrative Option Factors as more specifically set forth in the presentation.

The adopted Administrative Option Factors are to be effective July 1, 2022, if administratively possible, and first reflected in the June 30, 2021 actuarial valuation.



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