

**MINUTES OF THE
WV CONSOLIDATED PUBLIC RETIREMENT BOARD
ACTUARIAL ASSUMPTIONS REVIEW COMMITTEE
MEETING OF JANUARY 25, 2022**

A meeting of the West Virginia Consolidated Public Retirement Board's Actuarial Assumptions Review Committee was held on Tuesday, January 25, 2022. The meeting was called to order by Mike McKown, Chair, at 10:05 a.m.

Due Notice had been published.

Roll Call:

Committee Members present:

Mike McKown, Chair (*in person*)
Garner Marks, *representing Governor Jim Justice (via telephone)* (joined at 10:11 a.m.)
Sarah Canterbury, Esquire, *representing State Treasurer Riley Moore (via telephone)*
Bill Barker (*via telephone*) (joined at 10:15 a.m.)
Jeff Vallet (*via telephone*)

Committee Members absent:

None

A quorum was present.

Others present:

Jeff Fleck, CPRB Executive Director
Terasa Miller, Deputy Director
Nancy Butcher, CPRB Executive Assistant
Ken Woodson, CPRB Actuary
Haley Perry, CPRB Actuarial Assistant
Craig Slaughter, WV IMB Executive Director (*via telephone*)
David Driscoll, Buck Consulting (*via telephone*)

Item #2 Approval of August 31, 2021 Minutes

Mr. Vallet made a motion to approve the August 31, 2021 meeting minutes. The motion was seconded by Ms. Canterbury. The motion was adopted.

Executive Session

Chairman McKown said that he would entertain a motion to go into Executive Session to discuss a legal matter.

Mr. Vallet made a motion to go into Executive Session to discuss a legal matter as provided in W. Va. Code §6-9A-4. Ms. Canterbury seconded the motion. The motion was adopted.

The Committee went into Executive Session at 10:06 a.m.

Chairman McKown reconvened the Public Session of the January 25, 2022 meeting of the CPRB Actuarial Assumptions Review Committee from Executive Session at 10:30 a.m. He announced that the Committee was in Executive Session to discuss a legal matter as allowed by West Virginia Code §6-9A-4 and that no decisions were made during Executive Session.

Item #3 Actuarial Equivalence for All Defined Benefit Plans – Ken Woodson

Chair McKown recognized Ken Woodson, CPRB Actuary, to review the Actuarial Equivalence for the Nine Defined Benefit Plans Administered by the CPRB. Mr. Woodson explained that each of the nine defined benefit plans administered by the CPRB requires that the Board adopt actuarial assumptions for the daily administration of each plan at its first meeting of each calendar year. He added that the actuarial assumptions for the daily administration of the plans impact individual benefit calculations upon member retirement and they define the actuarial factors that are required to determine the adjustment to the regular retirement benefit due to the early retirement of a member, or for optional payment forms that are available, for example, different Joint & Survivor options.

Mr. Woodson went on to say that there had been no changes in state code, federal law, nor plan amendments that would require any change in actuarial factors or their underlying assumptions. He added that the actuarial assumptions for administrative factors were modified in 2005 for PERS, in 2006 for State Police Plan B and actuarial assumptions for administration were established for EMSRS in 2009, for MPFRS in 2013 and for NRPORS in 2020. He also said actuarial reduction factors for early retirement and converting the normal form of payment into an optional form of payment requires an interest rate assumption, mortality assumption, an assumption regarding mortality improvements into the future and a percent male and female to blend the actuarial reduction factors according to gender. He went on to say that if the new reduction factors are approved by the CPRB Board, the CPRB Board Actuary

recommends that the new reduction factors apply to retirements, effective July 1, 2022.

PERS Reduction Factors for Optional Forms of Payment

Mr. Woodson said that based on the 2019 PERS Experience Study, he recommended updating the PERS actuarial equivalent assumptions for converting optional forms of payment for healthy retirees to the Pub-2010 retiree tables, headcount weighted, below median mortality tables for members and the Pub-2010 contingent survivor tables, headcount weighted, below median mortality tables for beneficiaries. He added that the mortality tables were scaled to approximate the mortality experience from the 2019 PERS Experience Study and for mortality improvements into the future, the MP-2018 projection scales, projected generationally, with a valuation date of July 1, 2026, was recommended. He went on to say that the recommended interest rate was the current interest rate used to value the PERS funding liability, namely, 7.25%.

He also recommended updating the PERS actuarial equivalent assumptions for converting optional forms of payment for disabled retirees to the Pub-2010 disabled retiree tables, headcount weighted mortality tables for members and the Pub-2010 contingent survivor tables, headcount weighed, below median mortality tables for beneficiaries and for mortality improvements into the future, the MP-2018 projection scales, projected generationally, with a valuation date of July 1, 2026 was recommended as well as recommending the current interest rate used to value the PERS funding liability of 7.25%.

Mr. Woodson also recommended, based on the 2019 PERS Experience Study, updating the PERS actuarial equivalent assumptions for early retirement reduction factors to the Pub-2010 retiree tables, headcount weighted, below median mortality tables scaled to approximate the mortality experience from the 2019 PERS Experience Study and for mortality improvements into the future, the MP-2018 projection scales, projected generationally, with the valuation date of July 1, 2026 was recommended as well as recommending the current interest rate used to value the PERS funding liability of 7.25%.

Mr. Vallet made a motion to adopt the recommendation of the Actuary as contained on pages 11-13 regarding the Public Employees Retirement System

(attached to and made a part of these minutes) of the Actuarial Equivalence for the Nine Defined Benefit Plans Administered by the CPRB. Mr. Barker seconded the motion. The motion was adopted.

TRS Reduction Factors for Optional Forms of Payment

Mr. Woodson said that based on the 2020 TRS Experience Study, he recommended updating the TRS actuarial equivalent assumptions for converting optional forms of payment for healthy retirees to the Pub-2010 retiree tables, headcount weighted, median mortality tables for members and the Pub-2010 contingent survivor tables, headcount weighted, median mortality tables for beneficiaries. He added that the mortality tables are scaled to approximate the mortality experience from the 2020 TRS Experience Study and for mortality improvements into the future, the MP-2019 projection scales, projected generationally, with a valuation date of July 1, 2026, was recommended. He went on to say that the recommended interest rate was the current interest rate used to value the TRS funding liability, namely, 6.50%.

He also recommended updating the TRS actuarial equivalent assumptions for converting optional forms of payment for disabled retirees to the Pub-2010 disabled retiree tables, headcount weighted, median mortality tables for members and the Pub-2010 contingent survivor tables, headcount weighed, median mortality tables for beneficiaries and for mortality improvements into the future, the MP-2019 projection scales, projected generationally, with a valuation date of July 1, 2026 was recommended as well as recommending the current interest rate used to value the TRS funding liability of 6.50%.

Mr. Woodson also recommended, based on the 2020 TRS Experience Study updating the TRS actuarial equivalent assumptions for early retirement reduction factors to the Pub-2010 retiree tables, headcount weighted, median mortality tables for members and the Pub-2010 contingent survivor tables, headcount weighted, median mortality tables for beneficiaries scaled to approximate the mortality experience from the 2020 TRS Experience Study and for mortality improvements into the future, the MP-2019 projection scales, projected generationally, with the valuation date of July 1, 2026 was recommended as well as recommending an interest rate of 7.00%, which is unchanged.

Mr. Vallet made a motion to adopt the recommendation of the Actuary as contained on pages 21-23 regarding the Teachers' Retirement System (attached to and made a part of these minutes) of the Actuarial Equivalence for the Nine Defined Benefit Plans Administered by the CPRB. Mr. Barker seconded the motion. The motion was adopted.

State Police Plan A

Mr. Woodson recommended no changes to the State Police Plan A.

Mr. Barker made a motion that the no changes be made to the actuarial assumptions for State Police Plan A. Mr. Vallet seconded the motion. The motion was adopted.

State Police Plan B Reduction Factors for Optional Forms of Payment

Mr. Woodson said that based on the 2021 Uniformed Services Experience Study, he recommended updating the Plan B actuarial equivalent assumptions for converting optional forms of payment for healthy retirees to the Pub-2010 Safety retiree tables, amount weighted, median mortality tables for members and the Pub-2010 contingent survivor tables, amount weighted, median mortality tables for beneficiaries. He added that the mortality tables are scaled to approximate the mortality experience from the 2021 Uniformed Services Experience Study and for mortality improvements into the future, the MP-2020 projection scales, projected generationally, with a valuation date of July 1, 2026, was recommended. He went on to say that the recommended interest rate was the current interest rate used to value the Plan B funding liability, namely, 7.25%.

He also recommended updating the Plan B actuarial equivalent assumptions for converting optional forms of payment for disabled retirees to the Pub-2010 disabled retiree tables, amount weighted, mortality tables for members and the Pub-2010 contingent survivor tables, amount weighed, median mortality tables for beneficiaries and for mortality improvements into the future, the MP-2020 projection scales, projected generationally, with a valuation date of July 1, 2026 was recommended as well as recommending the current interest rate used to value the Plan B funding liability of 7.25%.

Mr. Woodson also recommended, based on the 2021 Uniformed Services Experience Study updating the Plan B actuarial equivalent assumptions for early retirement reduction factors to the Pub-2010 retiree tables, amount weighted, median mortality tables for members and the Pub-2010 contingent survivor tables, amount weighted, median mortality tables for beneficiaries scaled to approximate the mortality experience from the 2021 Uniformed Services Experience Study and for mortality improvements into the future, the MP-2020 projection scales, projected generationally, with the valuation date of July 1, 2026 was recommended as well as recommending an interest rate of 7.25%, which is unchanged.

Mr. Vallet made a motion to adopt the recommendation of the Actuary as contained on pages 29-30 regarding the State Police Plan B (attached to and made a part of these minutes) of the Actuarial Equivalence for the Nine Defined Benefit Plans Administered by the CPRB . Mr. Barker seconded the motion. The motion was adopted.

Judges Retirement System – JRS

Mr. Woodson recommended no changes to the Judges Retirement System.

Mr. Barker made a motion that the no changes be made to the actuarial assumptions for Judges Retirement System. Mr. Vallet seconded the motion. The motion was adopted.

DSRS Reduction Factors for Optional Forms of Payment

Mr. Woodson said that based on the 2021 Uniformed Services Experience Study, he recommended updating the DSRS actuarial equivalent assumptions for converting optional forms of payment for healthy retirees to the Pub-2010 retiree tables, amount weighted, median mortality tables for members and the Pub-2010 contingent survivor tables, amount weighted, median mortality tables for beneficiaries. He added that the mortality tables are scaled to approximate the mortality experience from the 2021 Uniformed Services Experience Study and for mortality improvements into the future, the MP-2020 projection scales, projected generationally, with a valuation date of July 1, 2026, was recommended. He went on to say that the recommended interest rate was the current interest rate used to value the DSRS funding liability, namely, 7.25%.

He also recommended updating the DSRS actuarial equivalent assumptions for converting optional forms of payment for disabled retirees to the Pub-2010 Safety disabled retiree tables, amount weighted, mortality tables for members and the Pub-2010 contingent survivor tables, amount weighed, median mortality tables for beneficiaries and for mortality improvements into the future, the MP-2020 projection scales, projected generationally, with a valuation date of July 1, 2026 was recommended as well as recommending the current interest rate used to value the DSRS funding liability of 7.25%.

Mr. Woodson also recommended, based on the 2021 Uniformed Services Experience Study updating the DSRS actuarial equivalent assumptions for early retirement reduction factors to the Pub-2010 Safety retiree tables, amount weighted, median mortality tables for members and the Pub-2010 contingent survivor tables, amount weighted, median mortality tables for beneficiaries scaled to approximate the mortality experience from the 2021 Uniformed Services Experience Study and for mortality improvements into the future, the MP-2020 projection scales, projected generationally, with the valuation date of July 1, 2026 was recommended as well as recommending an interest rate of 7.25%, which is unchanged.

Mr. Vallet made a motion to adopt the recommendation of the Actuary as contained on pages 39-41 regarding the Deputy Sheriffs' Retirement System (attached to and made a part of these minutes) of the Actuarial Equivalence for the Nine Defined Benefit Plans Administered by the CPRB . Mr. Barker seconded the motion. The motion was adopted.

EMSRS Reduction Factors for Optional Forms of Payment

Mr. Woodson said that based on the 2021 Uniformed Services Experience Study, he recommended updating the EMSRS actuarial equivalent assumptions for converting optional forms of payment for healthy retirees to the Pub-2010 retiree tables, amount weighted, median mortality tables for members and the Pub-2010 contingent survivor tables, amount weighted, median mortality tables for beneficiaries. He added that the mortality tables are scaled to approximate the mortality experience from the 2021 Uniformed Services Experience Study and for mortality improvements into the future, the MP-2020 projection scales, projected generationally, with a valuation date of July 1, 2026, was recommended. He went on to say that the

recommended interest rate was the current interest rate used to value the EMSRS funding liability, namely, 7.25%.

He also recommended updating the EMSRS actuarial equivalent assumptions for converting optional forms of payment for disabled retirees to the Pub-2010 Safety disabled retiree tables, amount weighted, mortality tables for members and the Pub-2010 contingent survivor tables, amount weighed, median mortality tables for beneficiaries and for mortality improvements into the future, the MP-2020 projection scales, projected generationally, with a valuation date of July 1, 2026 was recommended as well as recommending the current interest rate used to value the EMSRS funding liability of 7.25%.

Mr. Woodson also recommended, based on the 2021 Uniformed Services Experience Study updating the EMSRS actuarial equivalent assumptions for early retirement reduction factors to the Pub-2010 Safety retiree tables, amount weighted, median mortality tables for members and the Pub-2010 contingent survivor tables, amount weighted, median mortality tables for beneficiaries scaled to approximate the mortality experience from the 2021 Uniformed Services Experience Study and for mortality improvements into the future, the MP-2020 projection scales, projected generationally, with the valuation date of July 1, 2026 was recommended as well as recommending an interest rate of 7.25%, which is unchanged.

Mr. Barker made a motion to adopt the recommendation of the Actuary as contained on pages 48-50 regarding the Emergency Medical Services Retirement System (attached to and made a part of these minutes) of the Actuarial Equivalence for the Nine Defined Benefit Plans Administered by the CPRB . Ms. Canterbury seconded the motion. The motion was adopted.

MPFRS Reduction Factors for Optional Forms of Payment

Mr. Woodson said that based on the 2021 Uniformed Services Experience Study, he recommended updating the MPFRS actuarial equivalent assumptions for converting optional forms of payment for healthy retirees to the Pub-2010 retiree tables, amount weighted, median mortality tables for members and the Pub-2010 contingent survivor tables, amount weighted, median mortality tables for beneficiaries. He added that the mortality tables are scaled to approximate the mortality experience from the 2021 Uniformed Services Experience Study and for mortality improvements

into the future, the MP-2020 projection scales, projected generationally, with a valuation date of July 1, 2026, was recommended. He went on to say that the recommended interest rate was the current interest rate used to value the MPFRS funding liability, namely, 7.25%.

He also recommended updating the MPFRS actuarial equivalent assumptions for converting optional forms of payment for disabled retirees to the Pub-2010 Safety disabled retiree tables, amount weighted, mortality tables for members and the Pub-2010 contingent survivor tables, amount weighed, median mortality tables for beneficiaries and for mortality improvements into the future, the MP-2020 projection scales, projected generationally, with a valuation date of July 1, 2026 was recommended as well as recommending the current interest rate used to value the MPFRS funding liability of 7.25%.

Mr. Barker made a motion to adopt the recommendation of the Actuary as contained on pages 54-55 regarding the Municipal Police and Firefighters Retirement System (attached to and made a part of these minutes) the Actuarial Equivalence for the Nine Defined Benefit Plans Administered by the CPRB . Mr. Marks seconded the motion. The motion was adopted.

NRPORS Reduction Factors for Optional Forms of Payment

Mr. Woodson said that based on the 2021 Uniformed Services Experience Study, he recommended updating the NRPORS actuarial equivalent assumptions for converting optional forms of payment for healthy retirees to the Pub-2010 retiree tables, amount weighted, median mortality tables for members and the Pub-2010 contingent survivor tables, amount weighted, median mortality tables for beneficiaries. He added that the mortality tables are scaled to approximate the mortality experience from the 2021 Uniformed Services Experience Study and for mortality improvements into the future, the MP-2020 projection scales, projected generationally, with a valuation date of July 1, 2026, was recommended. He went on to say that the recommended interest rate was the current interest rate used to value the NRPORS funding liability, namely, 7.25%.

He also recommended updating the NRPORS actuarial equivalent assumptions for converting optional forms of payment for disabled retirees to the Pub-2010 Safety disabled retiree tables, amount weighted, mortality tables for members and the Pub-

2010 contingent survivor tables, amount weighed, median mortality tables for beneficiaries and for mortality improvements into the future, the MP-2020 projection scales, projected generationally, with a valuation date of July 1, 2026 was recommended as well as recommending the current interest rate used to value the NRPORS funding liability of 7.25%.

Mr. Barker made a motion to adopt the recommendation of the Actuary as contained on pages 59-60 regarding the Natural Resources Police Officers Retirement System (attached to and made a part of these minutes) the Actuarial Equivalence for the Nine Defined Benefit Plans Administered by the CPRB . Ms. Canterbury seconded the motion. The motion was adopted.

Item #4: Old Business

Mr. McKown inquired as to old business to come before the committee. None was heard.


Item #5: New Business

Mr. McKown inquired as to new business to come before the committee. None was heard.

Adjournment

There being no further business to come before the committee, the meeting adjourned at 12:07 p.m.

Respectfully submitted,


Mike McKown, Chair


Jeffrey E. Fleck, Executive Director

Estimated PERS Financial impact as of July 1, 2021

The PERS actuarial funding valuation, as of July 1, 2021, uses the assumptions from the 2019 PERS Experience Study and essentially has the proposed PERS actuarial reduction factors build into the valuation for active members, except separate factors are used for males and females, whereas the proposed actuarial reduction factors for administration are blended to obtain unisex tables.

If the PERS actuarial funding valuation, as of July 1, 2021, used the current actuarial reduction factors for administration to convert optional forms of payment and early retirement reduction factors to convert to early retirement benefits, then based on the actual distribution of optional forms of payment for current PERS retirees, the PERS liability would decrease by approximately \$30 million.

Summary of the Recommended Actuarial Equivalence Assumptions for PERS

1. Interest Rate Assumption
 - a. Recommended: 7.25% applied to all calculations
 - b. Prior: 7.50% applied to all calculations
2. Healthy Retirees Mortality Assumption.
 - i. Recommended:
 - a. Retiree Males: 108% of the Pub-2010 General Retiree Male Table, headcount weighted, below median and projected generationally with MP-2018 using a valuation date of July 1, 2026.
 - b. Retiree Females: 122% of the Pub-2010 General Female Retiree Table, headcount weighted, below median and projected generationally with MP-2018 using a valuation date of July 1, 2026.Unisex Table: Blend Factors 60% Male and 40% Female
 - ii. Prior:
 - a. 1971 Group Annuity Mortality Table for males and females, no future mortality projection.Unisex Table: Blend Mortality Rates 50% Male and 50% Female

3. Disabled Retirees Mortality Assumption.

i. Recommended:

- a. Disabled Males: 118% of the Pub-2010 General/Teachers Disabled Male Table, headcount weighted and projected generationally with MP-2018 using a valuation date of July 1, 2026.**
- b. Disabled Females: 117% of the Pub-2010 General/Teachers Disabled Female Table, headcount weighted and projected generationally with MP-2018 using a valuation date of July 1, 2026.**

Unisex Table: Blend Factors 60% Male and 40% Female

ii. Prior:

- a. Disabled Males: 1971 Group Annuity Mortality Table Set Forward 8-years, no future mortality projection.**
- b. Disabled Females: IRS Revenue Ruling 96-7, post 1994 disabilities under Social Security 1971 Group Annuity Mortality Table Set Forward 8-years, no future mortality projection.**

Unisex Table: Blended Mortality Rates 50% Male and 50% Female

4. Contingent Survivor Mortality Assumption.

i. Recommended:

- a. Beneficiary Males: 112% of the Pub-2010 Contingent Survivor Male Table, headcount weighted, below median and projected generationally with MP-2018 using a valuation date of July 1, 2026.**
- b. Beneficiary Females: 115% of the Pub-2010 Contingent Survivor Female Table, headcount weighted, below median and projected generationally with MP-2018 using a valuation date of July 1, 2026.**

ii. Prior:

- a. 1971 Group Annuity Mortality Table for males and females, no future mortality projection.**

5. Early Retirement Reduction Assumption.

i. Recommended Mortality:

- a. Retiree Males: 108% of the Pub-2010 General Retiree Male Table, headcount weighted, below median and projected generationally with MP-2018 using a valuation date of July 1, 2026.**
- b. Retiree Females: 122% of the Pub-2010 General Female Retiree Table, headcount weighted, below median and projected generationally with MP-2018 using a valuation date of July 1, 2026.**

Unisex Table: Blend Factors 50% Male and 50% Female

ii. Prior Mortality:

1971 Group Annuity Mortality Table for males and females, no future mortality projection.

Unisex Table: Blend Mortality Rates 50% Male and 50% Female

- iii. Rate interpolated to number of months early on a linear basis from the annual reduction rate.**

6. Member and Beneficiary Ages for Option Calculations.

- i. **Recommended: Member's age determined as age nearest birthday on the calculation date. Beneficiary's age determined by calculating the difference between the birthdates of the member and beneficiary and rounding to nearest whole year. (This methodology assures a smooth determination of option factors.)**
- ii. **Prior: Member's age determined as age nearest birthday on the calculation date. Beneficiary's age determined by calculating the difference between the birthdates of the member and beneficiary and rounding to nearest whole year. (This methodology assures a smooth determination of option factors.)**

TRS Reduction Factors for Optional Forms of Payment for Healthy Retirees

Currently for healthy retirees, when a member retires, they have the option to convert the normal form of retirement into optional forms of payment. The following optional forms of payment are available:

- Joint and Survivor 50% Annuity reduced on the member death
- Joint and Survivor 100% Annuity reduced on the member death
- 10-Year Certain and Life Annuity

The current actuarial equivalent assumptions for converting optional forms of payment for healthy TRS retirees uses the Teachers 1987 mortality table projected to 1991 using scale H, with a 6.50% interest rate and male and female mortality rates are blended 79% male and 21% female to generate unisex Joint and Survivor 50% conversion table, blended 83% male and 17% female to generate unisex Joint and Survivor 100% conversion table, and blended 38% male and 62% female to generate unisex 10-Year Certain and Life conversion table.

* Based on the 2020 TRS Experience Study, the CPRB Board Actuary recommends updating the TRS actuarial equivalent assumptions for converting optional forms of payment for healthy retirees to the Pub-2010 retiree tables, headcount weighted, median mortality tables for members and the Pub-2010 contingent survivor tables, headcount weighted, median mortality tables for beneficiaries. The mortality tables are scaled to approximate the mortality experience from the 2020 TRS Experience Study. For mortality improvements into the future, the MP-2019 projection scales, projected generationally, with a valuation date of July 1, 2026, is recommended. The recommended interest rate is 6.50%, unchanged from the current assumption. To obtain unisex conversion tables, the CPRB Board Actuary recommends blending the male and female reduction factors according to Table 8 below.

Estimated TRS Financial impact as of July 1, 2021

The TRS actuarial funding valuation, as of July 1, 2021, uses the assumptions from the 2020 TRS Experience Study and essentially has the proposed TRS actuarial reduction factors build into the valuation for active members, except separate factors are used for males and females, whereas the proposed actuarial reduction factors for administration are blended to obtain unisex tables.

If the TRS actuarial funding valuation, as of July 1, 2021, used the current actuarial reduction factors for administration to convert optional forms of payment and early retirement reduction factors to convert to early retirement benefits, then based on the actual distribution of optional forms of payment for current TRS retirees, the TRS liability would decrease by approximately \$52 million.

Summary of the Recommended Actuarial Equivalence Assumptions for TRS

1. Interest Rate Assumption
 - a. Recommended: 6.50% for optional forms of payment reduction factors and 7.0% for early retirement reduction factors.
 - b. Prior: 6.50% for optional forms of payment reduction factors and 7.0% for early retirement reduction factors.
2. Healthy Retirees Mortality Assumption.
 - a. Recommended:
 - i. Retiree Males: 100% of the Pub-2010 General Retiree Male Table, headcount weighted, median and projected generationally with MP-2019 using a valuation date of July 1, 2026.
 - ii. Retiree Females: 112% of the Pub-2010 General Female Retiree Table, headcount weighted, median and projected generationally with MP-2019 using a valuation date of July 1, 2026.Unisex Table: Blend Factors 60% Male and 40% Female for Joint Survivor Annuities; Blended Factors 40% Male and 60% Female for 10-Year Certain and Life Annuity.
 - b. Prior:
 - i. Teachers 1987 mortality table projected to 1991 using scale H
Unisex Table: 79% male and 21% female to generate unisex Joint and Survivor 50% conversion table, blended 83% male and 17% female to generate unisex Joint and Survivor 100% conversion table, and blended 38% male and 62% female to generate unisex 10-Year Certain and Life conversion table.

3. Disabled Retirees Mortality Assumption.

a. Recommended:

- i. Disabled Males: 107% of the Pub-2010 General/Teachers Disabled Male Table, headcount weighted and projected generationally with MP-2019 using a valuation date of July 1, 2026.**
- ii. Disabled Females: 113% of the Pub-2010 General/Teachers Disabled Female Table, headcount weighted and projected generationally with MP-2019 using a valuation date of July 1, 2026.**

Unisex Table: Blend Factors 60% Male and 40% Female for Joint Survivor Annuities; Blended Factors 40% Male and 60% Female for 10-Year Certain and Life Annuity.

b. Prior:

- i. Teachers 1987 mortality table set forward 10 years and projected to 1991 using scale H**
Unisex Table: 79% male and 21% female to generate unisex Joint and Survivor 50% conversion table, blended 83% male and 17% female to generate unisex Joint and Survivor 100% conversion table, and blended 38% male and 62% female to generate the unisex 10-Year Certain and Life conversion table.

4. Contingent Survivor Mortality Assumption.

a. Recommended:

- i. Beneficiary Males: 101% of the Pub-2010 Contingent Survivor Male Table, headcount weighted, median and projected generationally with MP-2019 using a valuation date of July 1, 2026.**
- ii. Beneficiary Females: 113% of the Pub-2010 Contingent Survivor Female Table, headcount weighted, median and projected generationally with MP-2019 using a valuation date of July 1, 2026.**

b. Prior:

- i. Teachers 1987 mortality table projected to 1991 using scale H**

5. Early Retirement Reduction Assumption.

a. Recommended Mortality:

- i. Retiree Males: 100% of the Pub-2010 General Retiree Male Table, headcount weighted, median and projected generationally with MP-2019 using a valuation date of July 1, 2026.**
- ii. Retiree Females: 112% of the Pub-2010 General Female Retiree Table, headcount weighted, median and projected generationally with MP-2019 using a valuation date of July 1, 2026.**

Unisex Table: Blend Factors 40% Male and 60% Female

b. Prior Mortality:

- i. Teachers 1987 mortality table projected to 1991 using scale H**
Unisex Table: Blend Mortality Rates 46% Male and 54% Female

- c. Rate interpolated to number of months early on a linear basis from the annual reduction rate.**

6. Member and Beneficiary Ages for Option Calculations.

- a. Recommended: Member's age determined as age nearest birthday on the calculation date. Beneficiary's age determined by calculating the difference between the birthdates of the member and beneficiary and rounding to nearest whole year. (This methodology assures a smooth determination of option factors.)
- b. Prior: Member's age determined as age nearest birthday on the calculation date. Beneficiary's age determined by calculating the difference between the birthdates of the member and beneficiary and rounding to nearest whole year. (This methodology assures a smooth determination of option factors.)

Plan B Reduction Factors for Optional Forms of Payment for Healthy Retirees

Currently for healthy retirees, when a member retires, they have the option to convert the normal form of retirement into an optional form of payment. The following optional forms of payment are available:

- Joint and Survivor 50% Annuity reduced on the member death (only available for deferred vested participants with at least 10 years of service but less than 20 years of service)
- Joint and Survivor 100% Annuity reduced on the member death

The current actuarial equivalent assumptions for converting optional forms of payment for healthy Plan B retirees uses the 1983 Group Annuity Mortality table for males, without projecting mortality improvements, and a 7.50% interest rate.

✳️Based on the 2021 Uniformed Services Experience Study, the CPRB Board Actuary recommends updating the Plan B actuarial equivalent assumptions for converting optional forms of payment for healthy retirees to the Pub-2010 Safety retiree tables, amount weighted, median mortality tables for members and the Pub-2010 contingent survivor tables, amount weighted, median mortality tables for beneficiaries. The mortality tables are scaled to approximate the mortality experience from the 2021 Uniformed Services Experience Study. For mortality improvements into the future, the MP-2020 projection scales, projected generationally, with a valuation date of July 1, 2026, is recommended. The recommended interest rate is the current interest rate used to value Plan B funding liability, namely, 7.25%. To obtain unisex conversion tables, the CPRB Board Actuary recommends blending the male and female reduction factors according to Table 15 below.

Estimated Plan B Financial impact as of July 1, 2021

The Plan B actuarial funding valuation, as of July 1, 2021, uses the assumptions from the 2021 Uniformed Services Experience Study and essentially has the proposed Plan B actuarial reduction factors build into the valuation for active members, except separate factors are used for males and females, whereas the proposed actuarial reduction factors for administration are blended to obtain unisex tables.

If the Plan B actuarial funding valuation, as of July 1, 2021, used the current actuarial reduction factors for administration to convert optional forms of payment and early retirement reduction factors to convert to early retirement benefits, then based on the actual distribution of optional forms of payment for current Plan B retirees, the Plan B liability would decrease by approximately \$600,000.

Summary of the Recommended Actuarial Equivalence Assumptions for Plan B

1. Interest Rate Assumption
 - a. Recommended: 7.25% applied to all calculations
 - b. Prior: 7.50% applied to all calculations
2. Healthy Retirees Mortality Assumption.
 - a. Recommended:
 - i. Retiree Males: 98% of the Pub-2010 Safety Retiree Male Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.
 - ii. Retiree Females: 99% of the Pub-2010 Safety Female Retiree Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.Unisex Table: Blend Factors 95% Male and 5% Female.
 - b. Prior:
 - i. 1983 Group Annuity Mortality table for males, without projecting mortality improvements.
Unisex Table: 100% male and 0% female.
3. Disabled Retirees Mortality Assumption.
 - a. Recommended:
 - i. Disabled Males: 124% of the Pub-2010 Safety Disabled Male Table, amount weighted and projected generationally with MP-2020 using a valuation date of July 1, 2026.
 - ii. Disabled Females: 100% of the Pub-2010 Safety Disabled Female Table, amount weighted and projected generationally with MP-2020 using a valuation date of July 1, 2026.Unisex Table: Blend Factors 95% Male and 5% Female
 - b. Prior:
 - i. 1983 Group Annuity Mortality table for males, without projecting mortality improvements.

Unisex Table: 100% male and 0% female Unisex Table.

4. Contingent Survivor Mortality Assumption.

a. Recommended:

- i. Beneficiary Males: 111% of the Pub-2010 Contingent Survivor Male Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.
- ii. Beneficiary Females: 109% of the Pub-2010 Contingent Survivor Female Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.

b. Prior:

- i. 1983 Group Annuity Mortality table for males, without projecting mortality improvements.

5. Early Retirement Reduction Assumption.

a. Recommended Mortality:

- i. Retiree Males: 98% of the Pub-2010 Safety Retiree Male Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.
- ii. Retiree Females: 99% of the Pub-2010 Safety Female Retiree Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.

Unisex Table: Blend Factors 95% Male and 5% Female

b. Prior Mortality:

- i. 1983 Group Annuity Mortality table for males, without projecting mortality improvements.

Unisex Table: Blend Mortality Rates 100% Male and 0% Female

c. Rate interpolated to number of months early on a linear basis from the annual reduction rate.

6. Member and Beneficiary Ages for Option Calculations.

- a. Recommended: Member's age determined as age nearest birthday on the calculation date. Beneficiary's age determined by calculating the difference between the birthdates of the member and beneficiary and rounding to nearest whole year. (This methodology assures a smooth determination of option factors.)
- b. Prior: Member's age determined as age nearest birthday on the calculation date. Beneficiary's age determined by calculating the difference between the birthdates of the member and beneficiary and rounding to nearest whole year. (This methodology assures a smooth determination of option factors.)

Estimated DSRS Financial impact as of July 1, 2021

The DSRS actuarial funding valuation, as of July 1, 2021, uses the assumptions from the 2021 Uniformed Services Experience Study and essentially has the proposed DSRS actuarial reduction factors build into the valuation for active members, except separate factors are used for males and females, whereas the proposed actuarial reduction factors for administration are blended to obtain unisex tables.

If the DSRS actuarial funding valuation, as of July 1, 2021, used the current actuarial reduction factors for administration to convert optional forms of payment and early retirement reduction factors to convert to early retirement benefits, then based on the actual distribution of optional forms of payment for current DSRS retirees, the DSRS liability would decrease by approximately \$3.7 million.

Summary of the Recommended Actuarial Equivalence Assumptions for DSRS

1. Interest Rate Assumption
 - a. Recommended: 7.25% applied to all calculations
 - b. Prior: 7.00% applied to all calculations
 2. Healthy Retirees Mortality Assumption.
 - a. Recommended:
 - i. Retiree Males: 98% of the Pub-2010 Safety Retiree Male Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.
 - ii. Retiree Females: 99% of the Pub-2010 Safety Female Retiree Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.
- Unisex Table: Blend Factors 95% Male and 5% Female.
- b. Prior:
 - i. DSRS Unisex Mortality table, without projecting mortality improvements.

3. Disabled Retirees Mortality Assumption.

a. Recommended:

- i. Disabled Males: 124% of the Pub-2010 Safety Disabled Male Table, amount weighted and projected generationally with MP-2020 using a valuation date of July 1, 2026.
- ii. Disabled Females: 100% of the Pub-2010 Safety Disabled Female Table, amount weighted and projected generationally with MP-2020 using a valuation date of July 1, 2026.

Unisex Table: Blend Factors 90% Male and 10% Female

b. Prior:

- i. DSRS Unisex Mortality table, without projecting mortality improvements.

4. Contingent Survivor Mortality Assumption.

a. Recommended:

- i. Beneficiary Males: 111% of the Pub-2010 Contingent Survivor Male Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.
- ii. Beneficiary Females: 109% of the Pub-2010 Contingent Survivor Female Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.

b. Prior:

- i. DSRS Unisex Mortality table, without projecting mortality improvements.

5. Early Retirement Reduction Assumption.

a. Recommended Mortality:

- i. Retiree Males: 98% of the Pub-2010 Safety Retiree Male Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.
- ii. Retiree Females: 99% of the Pub-2010 Safety Female Retiree Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.

Unisex Table: Blend Factors 95% Male and 5% Female

b. Prior Mortality:

- i. DSRS Unisex Mortality table, without projecting mortality improvements.

- c. Using linear interpolation, results in a 6% per year reduction from age 50 or no change compared to the current early retirement reduction factors.

6. Member and Beneficiary Ages for Option Calculations.
 - a. Recommended: Member's age determined as age nearest birthday on the calculation date. Beneficiary's age determined by calculating the difference between the birthdates of the member and beneficiary and rounding to nearest whole year. (This methodology assures a smooth determination of option factors.)
 - b. Prior: Member's age determined as age nearest birthday on the calculation date. Beneficiary's age determined by calculating the difference between the birthdates of the member and beneficiary and rounding to nearest whole year. (This methodology assures a smooth determination of option factors.)

EMSRS Reduction Factors for Optional Forms of Payment for Healthy Retirees

Currently for healthy retirees, when a member retires, they have the option to convert the normal form of retirement into an optional form of payment. The following optional forms of payment are available:

- Joint and Survivor 50% Annuity reduced on the member death
- Joint and Survivor 66.67% Annuity reduced on the member death
- Joint and Survivor 75% Annuity reduced on the member death
- Joint and Survivor 100% Annuity
- 10-Year Certain and Life Annuity

The current actuarial equivalent assumptions for converting optional forms of payment for healthy EMSRS retirees uses the 1983 Group Annuity Mortality tables with blended mortality rates 75% male and 25 female, without projecting mortality improvements, and a 7.50% interest rate.

* Based on the 2021 Uniformed Services Experience Study, the CPRB Board Actuary recommends updating the EMSRS actuarial equivalent assumptions for converting optional forms of payment for healthy retirees to the Pub-2010 Safety retiree tables, amount weighted, median mortality tables for members and the Pub-2010 contingent survivor tables, amount weighted, median mortality tables for beneficiaries. The mortality tables are scaled to approximate the mortality experience from the 2021 Uniformed Services Experience Study. For mortality improvements into the future, the MP-2020 projection scales, projected generationally, with a valuation date of July 1, 2026, is recommended. The recommended interest rate is the current interest rate used to value EMSRS funding liability, namely, 7.25%. To obtain unisex conversion tables, the CPRB Board Actuary recommends blending the male and female reduction factors according to Table 25 below.

Estimated EMSRS Financial impact as of July 1, 2021

The EMSRS actuarial funding valuation, as of July 1, 2021, uses the assumptions from the 2021 Uniformed Services Experience Study and essentially has the proposed EMSRS actuarial reduction factors build into the valuation for active members, except separate factors are used for males and females, whereas the proposed actuarial reduction factors for administration are blended to obtain unisex tables.

If the EMSRS actuarial funding valuation, as of July 1, 2021, used the current actuarial reduction factors for administration to convert optional forms of payment and early retirement reduction factors to convert to early retirement benefits, then based on the actual distribution of optional forms of payment for current EMSRS retirees, the EMSRS liability would decrease by approximately \$700,000.

Summary of the Recommended Actuarial Equivalence Assumptions for EMSRS

1. Interest Rate Assumption
 - a. Recommended: 7.25% applied to all calculations
 - b. Prior: 7.50% applied to all calculations
2. Healthy Retirees Mortality Assumption.
 - a. Recommended:
 - i. Retiree Males: 98% of the Pub-2010 Safety Retiree Male Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.
 - ii. Retiree Females: 99% of the Pub-2010 Safety Female Retiree Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.

Unisex Table: Blend Factors 70% Male and 30% Female.

- b. Prior:

- i. 1983 Group Annuity Mortality tables with blended mortality rates, without projecting mortality improvements

Unisex Table: Blend Factors 75% Male and 25% Female.

3. Disabled Retirees Mortality Assumption.

a. Recommended:

- i. Disabled Males: 124% of the Pub-2010 Safety Disabled Male Table, amount weighted and projected generationally with MP-2020 using a valuation date of July 1, 2026.**
- ii. Disabled Females: 100% of the Pub-2010 Safety Disabled Female Table, amount weighted and projected generationally with MP-2020 using a valuation date of July 1, 2026.**

Unisex Table: Blend Factors 70% Male and 30% Female

b. Prior:

- i. 1983 Group Annuity Mortality tables with blended mortality rates, without projecting mortality improvements.**

Unisex Table: Blend Factors 75% Male and 25% Female

4. Contingent Survivor Mortality Assumption.

a. Recommended:

- i. Beneficiary Males: 111% of the Pub-2010 Contingent Survivor Male Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.**
- ii. Beneficiary Females: 109% of the Pub-2010 Contingent Survivor Female Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.**

b. Prior:

- i. 1983 Group Annuity Mortality tables with blended mortality rates, without projecting mortality improvements.**

5. Early Retirement Reduction Assumption.

a. Recommended Mortality:

- i. Retiree Males: 98% of the Pub-2010 Safety Retiree Male Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.**
- ii. Retiree Females: 99% of the Pub-2010 Safety Female Retiree Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.**

Unisex Table: Blend Factors 70% Male and 30% Female

b. Prior Mortality:

- i. 1983 Group Annuity Mortality tables with blended mortality rates, without projecting mortality improvements.**

Unisex Table: Blend Factors 75% Male and 25% Female

- c. Rate interpolated to number of months early on a linear basis from the annual reduction rate.**

6. Member and Beneficiary Ages for Option Calculations.

- a. Recommended: Member's age determined as age nearest birthday on the calculation date. Beneficiary's age determined by calculating the difference between the birthdates of the member and beneficiary and rounding to nearest whole year. (This methodology assures a smooth determination of option factors.)
- b. Prior: Member's age determined as age nearest birthday on the calculation date. Beneficiary's age determined by calculating the difference between the birthdates of the member and beneficiary and rounding to nearest whole year. (This methodology assures a smooth determination of option factors.)

MPFRS Reduction Factors for Optional Forms of Payment for Healthy Retirees

Currently for healthy retirees, when a member retires, they have the option to convert the normal form of retirement into an optional form of payment. The following optional forms of payment are available:

- Joint and Survivor 50% Annuity reduced on the member death
- Joint and Survivor 66.67% Annuity reduced on the member death
- Joint and Survivor 75% Annuity reduced on the member death
- Joint and Survivor 100% Annuity
- 10-Year Certain and Life Annuity

The current actuarial equivalent assumptions for converting optional forms of payment for healthy MPFRS retirees uses the RP-2000 Healthy Annuitant Male Mortality Table, projected to 2025 using scale BB, and a 7.50% interest rate.

* Based on the 2021 Uniformed Services Experience Study, the CPRB Board Actuary recommends updating the MPFRS actuarial equivalent assumptions for converting optional forms of payment for healthy retirees to the Pub-2010 Safety retiree tables, amount weighted, median mortality tables for members and the Pub-2010 contingent survivor tables, amount weighted, median mortality tables for beneficiaries. The mortality tables are scaled to approximate the mortality experience from the 2021 Uniformed Services Experience Study. For mortality improvements into the future, the MP-2020 projection scales, projected generationally, with a valuation date of July 1, 2026, is recommended. The recommended interest rate is the current interest rate used to value MPFRS funding liability, namely, 7.25%. To obtain unisex conversion tables, the CPRB Board Actuary recommends blending the male and female reduction factors according to Table 30 below.

Summary of the Recommended Actuarial Equivalence Assumptions for MPFRS

1. 1. Interest Rate Assumption
 - a. Recommended: 7.25% applied to all calculations
 - b. Prior: 7.50% applied to all calculations
2. Healthy Retirees Mortality Assumption.
 - a. Recommended:
 - i. Retiree Males: 98% of the Pub-2010 Safety Retiree Male Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.
 - ii. Retiree Females: 99% of the Pub-2010 Safety Female Retiree Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.Unisex Table: Blend Factors 95% Male and 5% Female.
 - b. Prior:
 - i. The RP-2000 Healthy Annuitant Male Mortality Table, projected to 2025 using scale BB.Unisex Table: Blend Factors 100% Male and 0% Female.
3. Disabled Retirees Mortality Assumption.
 - a. Recommended:
 - i. Disabled Males: 124% of the Pub-2010 Safety Disabled Male Table, amount weighted and projected generationally with MP-2020 using a valuation date of July 1, 2026.
 - ii. Disabled Females: 100% of the Pub-2010 Safety Disabled Female Table, amount weighted and projected generationally with MP-2020 using a valuation date of July 1, 2026.Unisex Table: Blend Factors 95% Male and 5% Female
 - b. Prior:
 - i. The RP-2000 Healthy Annuitant Male Mortality Table, projected to 2025 using scale BB.Unisex Table: Blend Factors 100% Male and 0% Female

4. Contingent Survivor Mortality Assumption.
 - a. Recommended:
 - i. Beneficiary Males: 111% of the Pub-2010 Contingent Survivor Male Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.
 - ii. Beneficiary Females: 109% of the Pub-2010 Contingent Survivor Female Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.
 - b. Prior:
 - i. The RP-2000 Healthy Annuitant Male Mortality Table, projected to 2025 using scale BB.
5. Member and Beneficiary Ages for Option Calculations.
 - a. Recommended: Member's age determined as age nearest birthday on the calculation date. Beneficiary's age determined by calculating the difference between the birthdates of the member and beneficiary and rounding to nearest whole year. (This methodology assures a smooth determination of option factors.)
 - b. Prior: Member's age determined as age nearest birthday on the calculation date. Beneficiary's age determined by calculating the difference between the birthdates of the member and beneficiary and rounding to nearest whole year. (This methodology assures a smooth determination of option factors.)

NRPORS Reduction Factors for Optional Forms of Payment for Healthy Retirees

Currently for healthy retirees, when a member retires, they have the option to convert the normal form of retirement into an optional form of payment. The following optional forms of payment are available:

- Joint and Survivor 50% Annuity reduced on the member death
- Joint and Survivor 66.67% Annuity reduced on the member death
- Joint and Survivor 75% Annuity reduced on the member death
- Joint and Survivor 100% Annuity
- 10-Year Certain and Life Annuity
- Social Security Level Income Annuity Option

The current actuarial equivalent assumptions for converting optional forms of payment for healthy NRPORS retirees uses the DSRS Mortality table, without projecting mortality improvements, and a 7.00% interest rate.

Summary of the Recommended Actuarial Equivalence Assumptions for NRPORS

1. 1. Interest Rate Assumption
 - a. Recommended: 7.25% applied to all calculations
 - b. Prior: 7.00% applied to all calculations
2. Healthy Retirees Mortality Assumption.
 - a. Recommended:
 - i. Retiree Males: 98% of the Pub-2010 Safety Retiree Male Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.
 - ii. Retiree Females: 99% of the Pub-2010 Safety Female Retiree Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.Unisex Table: Blend Factors 100% Male and 0% Female.
 - b. Prior:
 - i. DSRS Unisex Mortality table, without projecting mortality improvements.
3. Disabled Retirees Mortality Assumption.
 - a. Recommended:
 - i. Disabled Males: 124% of the Pub-2010 Safety Disabled Male Table, amount weighted and projected generationally with MP-2020 using a valuation date of July 1, 2026.
 - ii. Disabled Females: 100% of the Pub-2010 Safety Disabled Female Table, amount weighted and projected generationally with MP-2020 using a valuation date of July 1, 2026.Unisex Table: Blend Factors 100% Male and 0% Female
 - b. Prior:
 - i. DSRS Unisex Mortality table, without projecting mortality improvements.
4. Contingent Survivor Mortality Assumption.
 - a. Recommended:
 - i. Beneficiary Males: 111% of the Pub-2010 Contingent Survivor Male Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.
 - ii. Beneficiary Females: 109% of the Pub-2010 Contingent Survivor Female Table, amount weighted, median and projected generationally with MP-2020 using a valuation date of July 1, 2026.
 - b. Prior:
 - i. DSRS Unisex Mortality table, without projecting mortality improvements.

5. **Member and Beneficiary Ages for Option Calculations.**
 - a. **Recommended: Member's age determined as age nearest birthday on the calculation date. Beneficiary's age determined by calculating the difference between the birthdates of the member and beneficiary and rounding to nearest whole year. (This methodology assures a smooth determination of option factors.)**
 - b. **Prior: Member's age determined as age nearest birthday on the calculation date. Beneficiary's age determined by calculating the difference between the birthdates of the member and beneficiary and rounding to nearest whole year. (This methodology assures a smooth determination of option factors.)**