



July 15, 2020

Ms. Erin Leonard, Executive Director
Minnesota State Retirement System
60 Empire Drive, Suite 300
Saint Paul, Minnesota 55103

Re: Proposed Assumption Changes – MSRS SPRF

Dear Erin:

Enclosed is a supplemental actuarial valuation showing the estimated impact of changing the actuarial assumptions of the State Patrol Retirement Fund of the Minnesota State Retirement System (MSRS SPRF). Unless noted otherwise and to the best of our knowledge and belief, the calculations were completed in accordance with the requirements of Minnesota Statutes, Section 356.215, and the requirements of the Standards for Actuarial Work established by the Legislative Commission on Pensions and Retirement (LCPR).

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements.

The purpose of this report is to estimate the impact of new actuarial assumptions. This report should not be relied on for any other purpose, is intended for use by the MSRS Board and staff, and may be provided to other parties only in its entirety and only with permission of the Board. GRS is not responsible for unauthorized use of this report. Determinations of the financial results associated with the benefits described in this report in a manner other than the intended purpose may produce significantly different results.

The valuation was based upon information furnished by MSRS, concerning Retirement System benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. The signing actuaries are independent of the plan sponsor.

Please call if you have any questions regarding the calculations enclosed.

Sincerely,

Bonita J. Wurst, ASA, EA, FCA, MAAA

Brian B. Murphy, FSA, EA, FCA, MAAA, PhD

BJW/BBM:sc
Enclosures

Minnesota State Patrol Retirement Fund

Executive Summary

Requested By: Ms. Erin Leonard, Executive Director
Minnesota State Retirement System

Date: July 15, 2020

Submitted By: Bonita J. Wurst, ASA, EA, FCA, MAAA and Brian B. Murphy, FSA, EA, FCA, MAAA, PhD
Gabriel, Roeder, Smith & Company

This report contains an actuarial valuation of proposed changes in actuarial assumptions for the State Patrol Retirement Fund. Please see our report, *State Patrol Retirement Fund 4-Year Experience Study*, dated June 30, 2020, for a full description of the proposed changes.

Bonita J. Wurst and Brian B. Murphy are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

The date of the valuation was June 30, 2019. This means that the results of the supplemental valuations indicate what the June 30, 2019 valuation would have shown if the proposed assumptions had been in effect on that date. Supplemental valuations do **not** predict the result of future actuarial valuations. Rather, supplemental valuations give an indication of the probable long-term cost of the **assumption change only** without comment on the complete end result of the future valuations.

Unless noted otherwise, data, plan provisions and actuarial methods were consistent with those used in the regular actuarial valuation of the MSRS SPRF on the valuation date as prescribed by Minnesota Statutes Section 356.215, the requirements of the Standards for Actuarial Work established by the Legislative Commission on Pensions and Retirement (LCPR) and the Board of Directors for the June 30, 2019 MSRS SPRF Valuation.

This report does not reflect the recent and still developing impact of COVID-19, which is likely to influence demographic experience and economic expectations, at least in the short term. We will continue to monitor these developments and their impact on retirement plans.

Results in this report are shown on an Actuarial Value of Assets (AVA) basis.

Minnesota State Patrol Retirement Fund Calculations as of June 30, 2019

A brief summary of the data, as of June 30, 2019, used in this valuation is presented below:

Active Members			
Number	Projected Annual Earnings	Average in Years	
		Age	Service
943	\$85,543,000	40.7	11.2

Retired Members		Deferred Vested Members		Non-Vested Members	
Number	Average Annual Benefits	Number	Average Annual Benefits*	Number	Average Member Contributions*
1,078	\$55,880	56	\$22,207	31	\$6,605

** Reflects 13% Combined Service Annuity load for Deferred Vested members and 0% Combined Service Annuity load for Non-Vested members.*

Minnesota State Patrol Retirement Fund

Step 1 – Change Mortality Assumptions

Calculations as of June 30, 2019

Recently, the Society of Actuaries published a mortality study that was specific to public sector retirement systems. This is a very comprehensive study and there are numerous mortality tables created for each classification of employee (General members, Public Safety, Teachers, Survivors, Juvenile, headcount-weighted, benefit-weighted, above median income, and below median income). One of the key findings of the study is that there is a high correlation between longevity and income and education. Consistent with the SOA study, SPRF members with higher benefits generally appear to experience longer lifespans, resulting in lower mortality rates.

Fully generational tables, which are utilized for the MSRS valuations, help take into account future improvements in mortality that are expected to occur. The Society of Actuaries updates the projection scale annually and the latest published table is called the MP-2019 Projection Scale.

Present Mortality Assumptions:

- Healthy pre-retirement: RP-2014 employee generational mortality table, adjusted for white collar and mortality improvements using scale MP-2015, from a base year of 2006.
- Healthy post-retirement: RP-2014 healthy annuitant generational mortality table, adjusted for white collar and mortality improvements using scale MP-2015, from a base year of 2006.
- Disabled: RP-2014 healthy annuitant generational mortality table, adjusted for white collar and mortality improvements using scale MP-2015, from a base year of 2006.

Proposed Mortality Assumptions:

- Healthy pre-retirement: Pub-2010 General Employee Mortality Table, projected with mortality improvement scale MP-2019.
- Healthy post-retirement: Pub-2010 General Retired Mortality Table, projected with mortality improvement scale MP-2019.
- Disabled: Pub-2010 General/Teacher Disabled Retiree Mortality Table, projected with mortality improvement scale MP-2019.

Minnesota State Patrol Retirement Fund

Step 1 – Change Mortality Assumptions

Calculations as of June 30, 2019

Actuarial Statement

The financial effect of the proposal is shown below:

	Valuation Baseline	Update Mortality	Change from Baseline
Normal Cost Rate, % of Pay	24.69%	24.41%	-0.28%
Amortization of Unfunded Accrued Liability, % of Pay	15.49%	13.66%	-1.83%
Expenses, % of Pay	0.25%	0.25%	0.00%
Total Required Contribution, % of Pay	40.43%	38.32%	-2.11%
Actuarial Accrued Liability, 000s	\$959,964	\$933,815	\$(26,149)
Funded Ratio, AVA Basis	76.8%	79.0%	2.2%

Minnesota State Patrol Retirement Fund

Step 2 – Change Other Demographic Assumptions

Calculations as of June 30, 2019

Our report, the *Minnesota State Patrol Retirement Fund 4-Year Experience Study*, dated June 30, 2020, contained several recommended changes to demographic assumptions, including changes to retirement, withdrawal and disability rates, and form of payment elections for new retirees.

Present Demographic Assumptions: See the *Minnesota State Retirement System State Patrol Retirement Fund Actuarial Valuation Report as of July 1, 2019*, dated December 5, 2019, for a complete description of the present demographic assumptions.

Proposed Demographic Assumptions: Change demographic assumptions as follows (please see our experience study report noted above for a full description of the proposed assumptions):

- Retirement:
 - Decrease the rate of assumed unreduced retirements (i.e., Normal Retirement) at ages 56, 58 and 59.
 - Decrease rates of assumed early retirements at ages 50, 53 and 54.

- Withdrawal:
 - Proposed rates are service-based.
 - Generally, proposed rates are higher than current rates for members with less than 22 years of service.

- Disability:
 - Increase rates of disability for ages 30-39 and over age 50, lower rates of disability for ages 40-49.
 - Extend the disability incidence assumption to age 60.
 - Proposed rates result in a slight increase in the assumed number of disability retirements.

- Form of Payment:
 - Minor changes to form of payment assumptions.

Minnesota State Patrol Retirement Fund

Step 2 – Change Other Demographic Assumptions

Calculations as of June 30, 2019

Actuarial Statement

The financial effect of the proposal is shown below:

	Valuation Baseline	Updated Mortality & Demographic Assumptions	Change from Baseline
Normal Cost Rate, % of Pay	24.69%	24.15%	-0.54%
Amortization of Unfunded Accrued Liability, % of Pay	15.49%	13.70%	-1.79%
Expenses, % of Pay	0.25%	0.25%	0.00%
Total Required Contribution, % of Pay	40.43%	38.10%	-2.33%
Actuarial Accrued Liability, 000s	\$959,964	\$934,327	\$(25,637)
Funded Ratio, AVA Basis	76.8%	79.0%	2.2%

Minnesota State Patrol Retirement Fund

Step 3 – Change Merit and Seniority / Payroll Growth Increase Assumptions

Calculations as of June 30, 2019

Pay increases granted to active members typically consist of two pieces:

- An across-the-board, economic type of increase granted to most or all members of the group. This increase is typically tied to inflation or cost-of-living changes and is known as the payroll growth assumption, and
- An increase as a result of merit and seniority. This increase is typically related to performance of an individual and includes promotions and increased years of experience.

Our report, the *Minnesota State Patrol Retirement Fund of Minnesota 4-Year Experience Study*, dated June 30, 2020, contained recommended changes to both the payroll growth assumption and merit and seniority increase assumptions:

- Lower the price inflation assumption from 2.50% to 2.25%.
- Maintain the current wage inflation assumption of 0.75%. When combined with the change in price inflation assumption, the assumed growth in payroll is reduced, from 3.25% to 3.00%.
- Change the assumed merit and seniority increase rates, resulting in proposed merit and seniority increases that are approximately 23 basis points lower on average than current rates.
- When combined with the proposed decrease in payroll growth assumption, the result is an overall decrease in gross salary increase rates of approximately 48 basis points.

Present Salary Increase Assumptions: See the *Minnesota State Retirement System State Patrol Retirement Fund Actuarial Valuation Report as of July 1, 2019*, dated December 5, 2019, for a complete description of the present salary scale assumption.

Minnesota State Patrol Retirement Fund
Step 3 – Change Merit and Seniority / Payroll Growth Increase
Assumptions
Calculations as of June 30, 2019

Proposed Salary Increase Assumptions:

Year	Gross Salary %	
	2019 Valuation	Proposed
1	15.25%	12.50%
2	9.25%	8.50%
3	7.75%	7.50%
4	7.25%	7.25%
5	6.75%	7.00%
6	6.25%	6.75%
7	6.00%	6.50%
8	5.75%	5.50%
9	5.50%	5.00%
10	5.25%	4.50%
11	5.00%	4.25%
12	4.75%	4.00%
13	4.50%	4.00%
14	4.25%	4.00%
15	4.25%	4.00%
16	4.25%	3.75%
17	4.00%	3.50%
18	4.00%	3.50%
19	3.75%	3.50%
20	3.75%	3.50%
21	3.65%	3.40%
22	3.55%	3.30%
23	3.45%	3.20%
24	3.35%	3.10%
25+	3.25%	3.00%

Minnesota State Patrol Retirement Fund

Step 3 – Change Merit and Seniority / Payroll Growth Increase

Assumptions

Calculations as of June 30, 2019

Actuarial Statement

The financial effect of the proposal is shown below:

	Valuation Baseline	Updated Mortality, Demographic & Economic Assumptions	Change from Baseline
Normal Cost Rate, % of Pay	24.69%	23.39%	-1.30%
Amortization of Unfunded Accrued Liability, % of Pay	15.49%	13.92%	-1.57%
Expenses, % of Pay	0.25%	0.25%	0.00%
Total Required Contribution, % of Pay	40.43%	37.56%	-2.87%
Actuarial Accrued Liability, 000s	\$959,964	\$931,441	\$(28,523)
Funded Ratio, AVA Basis	76.8%	79.2%	2.4%

Minnesota State Patrol Retirement Fund

Steps 1-3 – All Changes

Calculations as of June 30, 2019

A step-by-step summary of the changes due to the mortality assumption, other demographic assumptions and the economic assumption changes are summarized below:

	Valuation Baseline	Update Mortality	Add Changes to Demographic Assumptions	Add Changes to Economic Assumptions
Normal Cost Rate, % of Pay	24.69%	24.41%	24.15%	23.39%
Amortization of Unfunded Accrued Liability, % of Pay	15.49%	13.66%	13.70%	13.92%
Expenses, % of Pay	0.25%	0.25%	0.25%	0.25%
Total Required Contribution, % of Pay	40.43%	38.32%	38.10%	37.56%
Actuarial Accrued Liability, 000s	\$959,964	\$933,815	\$934,327	\$931,441
Funded Ratio, AVA Basis	76.8%	79.0%	79.0%	79.2%

It is important to remember that the 2019 General Plan experience study showed that the probability of achieving the 7.5% return assumption is less than 50%. Therefore, although the required contribution rate will decrease as a result of this experience study, the impact of lower investment returns should be evaluated before making any changes to the funding policy.

Minnesota State Patrol Retirement Fund Calculations as of June 30, 2019

Comments

Comment 1 — The calculations are based upon assumptions regarding future events, which may or may not materialize. They are also based upon plan provisions that are outlined in this report. If you have reason to believe that the assumptions that were used are unreasonable, that the plan provisions are incorrectly described, that important plan provisions relevant to this proposal are not described, or that conditions have changed since the calculations were made, you should contact the author(s) of this report prior to relying on information in the report.

Comment 2 — If you have reason to believe that the information provided in this report is inaccurate, or is in any way incomplete, or if you need further information in order to make an informed decision on the subject matter of this report, please contact the author(s) of this report prior to making such decision.

Comment 3 — In the event that more than one change is being considered, it is very important to remember that the results of separate actuarial valuations cannot generally be added together to produce a correct estimate of the combined effect of all of the changes. The total can be considerably greater than the sum of the parts due to the interaction of various plan provisions with each other, and with the assumptions that must be used.

Comment 4 — The reader of this report should keep in mind that actuarial calculations are mathematical estimates based on current data and assumptions about future events (which may or may not materialize). Please note that actuarial calculations can and do vary from one valuation year to the next, sometimes significantly if the group valued is very small (less than 30 lives). As a result, the cost impact of a benefit change may fluctuate over time, as the demographics of the group changes.

Comment 5 — Review of the investment return assumption and actuarial methods is outside the scope of this experience study. Please refer to GRS' Minnesota State Employees Retirement Fund experience study dated June 27, 2019. This report concluded that the current investment return assumption was within a reasonable range as of the date of the report, but that a rate near the median, such as 7.0%, would be likely to be sustainable for a longer period. It is important to note that, by lowering the assumed rate of inflation but not the assumed investment return rate, the investment return assumptions are actually more optimistic than before because the assumed real rate of return is higher than previously assumed. The 7.5% investment return assumption is required per Minnesota Statutes. If the investment return assumption is found to be out of compliance with Actuarial Standards, we would be required to issue a qualified report.

Comment 6 — The recommended change to the mortality assumption may result in a change to the plan's actuarially equivalent factors. An update to these factors has not been reflected in this study.

Minnesota State Patrol Retirement Fund Calculations as of June 30, 2019

Comments (concluded)

Comment 7 — We have provided this analysis in the same format as that used when plan or assumption changes are considered by the Trustees. For any legislative proposals, it may be necessary to follow-up with a more in-depth analysis to comply with the Standards for Actuarial Work. We will provide the additional information upon request.

Comment 8 — Please see our report, the *Minnesota State Employees Retirement Fund of Minnesota 4-Year Experience Study*, dated June 27, 2019, for recommended changes to the Standards for Actuarial Work.