



TO: Members of the Legislative Commission on Pensions and Retirement

FROM: Susan Lenczewski, Executive Director

SUBJECT: H.F. 2598 (Freiberg); S.F. 2490 (Jasinski): Annual Payment by the City of Minneapolis to the PERA Police and Fire Plan

DATE: March 19, 2019

The City of Minneapolis makes an annual payment to the Public Employees Police and Fire Retirement Plan (PERA P&F) to amortize unfunded liabilities taken on by PERA P&F when the Minneapolis Police Relief Association and the Minneapolis Firefighters Relief Association were merged into the PERA P&F in 2011. Minnesota Statutes, Section 353.665, Subdivision 8, Paragraph (b), requires the payments, describes how they are to be determined, and provides for adjustment if actuarial assumptions change.

H.F. 2598 (Freiberg); S.F. 2490 (Jasinski) amends Section 353.665 as follows:

Section 1 deletes obsolete language in Subdivision 8, Paragraph (b).

Section 2 adds new Subdivision 8a. Subdivision 8a, Paragraph (a), summarizes the language that had been deleted from Subdivision 8, Paragraph (b), which applied until July 15, 2018.

Subdivision 8a, Paragraph (b) states that the City of Minneapolis shall contribute annually, beginning July 15, 2019, until July 15, 2031, to the PERA Police and Fire Retirement Plan the following amounts to continue paying down the unfunded liabilities:

- \$3,188,735 attributable to the former Minneapolis Firefighters Relief Association; and
- \$4,489,837, attributable to the former Minneapolis Police Relief Association.

The attached memo, dated February 21, 2019, from Doug Anderson, Executive Director of PERA, to the PERA Board of Trustees explains in detail the process that resulted in the dollar amounts set forth in Section 2 of H.F. 2598; S.F. 2490.



PUBLIC EMPLOYEES
RETIREMENT ASSOCIATION

DATE: February 21, 2019
TO: PERA Board of Trustees
FROM: Doug Anderson, Executive Director
SUBJECT: City of Minneapolis Police & Fire Relief Association Annual Contribution Change

The Minneapolis Police Relief Association (MPRA) and the Minneapolis Firefighters' Relief Association (MFRA) merged into the Public Employees Retirement Association Police & Fire Plan (PERA P&F) on December 30, 2011. Neither MPRA nor MFRA were fully funded at the merger date, necessitating a determination of an unfunded liability amount and annual amortization payments to be paid by the City of Minneapolis to PERA.

Minnesota Statutes Section 353.665, Subdivision 8(b), requires that annual contribution rates be revised if the interest rate assumption applicable to the PERA P&F plan is modified and provides some direction for how those amounts are to be recalculated. The 2018 Omnibus Bill included an investment return assumption change from 8 percent to 7.5 percent effective July 1, 2018, triggering a change in the annual contribution amount. However, neither of these statutes is explicitly clear on how the calculation should be performed.

After discussion at the December 13, 2018, PERA Board meeting, the Board directed staff to engage with the City of Minneapolis to determine a mutually agreeable solution that would protect the fund (i.e. the other contributing employers and members) from future contribution increases while also allowing Minneapolis to address their desire for fixed annual contributions.

Staff proposed a statute change to the City that would provide reasonable protection to the fund from downside risk and provide the City with fixed annual contributions from 2019 through 2031. The statute change, if enacted by the Legislature, would result in annual contributions of \$4,489,837 from Minneapolis for the MPRA and \$3,188,735 for the MFRA. The contributions would be payable each July 15 from 2019 through 2031.

These amounts are less than previous contribution levels of \$8,890,272 for MPRA and \$4,757,457 for MFRA; but more than the \$778,051 and \$685,105 amounts that would otherwise be charged to Minneapolis from 2019 until the next change in assumption. The lower results reflect actual earnings since the merger that are higher than what was expected. The fixed amounts would not be subject to change between 2019 and 2031. PERA would assume all investment, mortality, and other risks. The City would have the certainty of known contributions for a finite period of time.

The fixed amounts were determined using assumed liabilities and asset values as of July 1, 2019. The assets reflect the actual initial transferred amounts on December 30, 2011, actual City contributions made to date, estimated benefit payments through June 30, 2019, actual investment returns from the merger date to June 30, 2018, and an assumed investment return of 7.5 percent in fiscal year 2019.

The July 1, 2019, liability estimate is based on the projected stream of future benefit payments discounted at the rate of 5.85 percent. The 5.85 percent rate was obtained from a letter dated September 17, 2018, from GRS to PERA. Over a 20 year period, GRS estimates that there is a 60 percent likelihood that actual investment returns will exceed 5.85 percent and a 40 percent likelihood that actual returns are less than 5.85 percent. The difference between the assumed liability and assumed assets as of July 1, 2019 are amortized over the 13 year period from 2019 to 2031 at 5.85 percent to get the fixed annual contribution amount.

By valuing the liabilities and annual contributions at a more conservative rate than the current long-term assumption, the likelihood that the fund will realize a positive outcome is increased relative to making no change to the statutes. The City would pay a premium to eliminate the future possibility of contribution increases during the remaining payment period due to a rate of return assumption change. Both the fund and the City would gain a more certain outcome prospectively.

PERA staff believes that the City is amenable to the proposed solution. The calculations were performed by PERA staff, but were validated by GRS (see February 7, 2019 letter).

Staff Recommendation

PERA's staff recommends seeking a change in statute to set the annual contribution requirements from the City of Minneapolis at \$4,489,837 for the Minneapolis Police Relief Association and \$3,188,735 for the Minneapolis Fire Relief Association. The amounts would be due each July 15 from 2019 through 2031 and would not be subject to future changes.

September 17, 2018

Mr. Doug Anderson, Executive Director
Public Employees Retirement Association
of Minnesota
60 Empire Drive, Suite 200
St. Paul, MN 55103

Re: 2018 Valuation Interest Rate Assumption

Dear Doug:

We are pleased to present our review of the long-term rate of investment return and inflation assumptions for the Public Employees Retirement Association of Minnesota. The purpose of this report is to comply with Actuarial Standards of Practice and to assist PERA in the selection of appropriate assumptions for funding purposes and Governmental Accounting Standards Board (GASB) Statements Nos. 67 and 68 reporting. This report should not be relied upon for any purpose other than the purpose described herein.

Background

In a 2017 analysis of long-term rate of investment return and inflation assumptions, GRS suggested that an investment return assumption in the range of 6.85% to 7.68% would be reasonable. This report also concluded that the probability of exceeding a 7.5% assumption over 20 years was only 41%. Please see the letter, *2017 Valuation Interest Rate Assumption*, dated September 11, 2017 for additional information.

The assumed rate, which is mandated by Minnesota Statutes, was changed from 8.0% to 7.5% during the 2018 legislative session. This rate was at the upper end of the reasonable range at that time.

Professional standards require GRS to evaluate this assumption each year. If an assumption is deemed unreasonable based on current information, we will have to “qualify” the work that we do for PERA.

If 7.5% is deemed unreasonable, we will still comply with statutes and produce the valuation based upon 7.5%, but Actuarial Standards will require us to include a statement indicating that “the prescribed assumption significantly conflicts with what, in our professional judgment, would be reasonable”.

On the following pages, we present information that leads us to conclude that 7.5% is within the reasonable range for the 2018 valuations, but cautions PERA that declining capital market and inflation expectations may result in 7.50% being deemed unreasonable for future valuations.

The next experience study for this plan will be completed before June 30, 2019.

Inflation

The long-term inflation assumption is a building block for the remaining economic assumptions. The inflation assumption was changed from 2.75% to 2.50%, effective for the actuarial valuations as of July 1, 2018.

Most of the investment consulting firms, in setting their capital market assumptions, currently assume that inflation will be less than 2.50%. We examined the capital market assumption sets for twelve investment consulting firms. The average assumption for inflation was 2.20%, with a range of 1.95% to 2.50%. However, the investment consulting firms typically set their assumptions based on a shorter time horizon, while actuaries must make much longer projections.

The 2018 Social Security Trustees report uses 2.6% as the long-range intermediate price inflation assumption. The low-cost assumption is 3.2%, and the high-cost assumption is 2.0%. (The Social Security program benefits from high inflation through faster earnings and revenue growth.) The long-term intermediate assumption has decreased slightly since 2013, from 2.8% to 2.6%.

Treasury Inflation Protected Securities (TIPS) are government bonds which are adjusted upward or downward for actual changes in inflation. Real yields on TIPS at "constant maturity" are interpolated by the U.S. Treasury from Treasury's daily real yield curve. The spread between yield curve rates and real yield curve rates gives insight into market expectations for inflation. As of June 30, 2014, the spread on a 30-year basis was approximately 2.4%. As of the date of this report, the spread on a 30-year basis was approximately 2.1%.

GRS believes the 2.50% inflation assumption is within the reasonable range for valuations as of July 1, 2018, but cautions PERA that declining inflation expectations may result in 2.50% being deemed unreasonable for future valuations.

Long-Term Rate of Return on Investments

The relevant Actuarial Standard of Practice (ASOP) for economic assumption setting is ASOP No. 27, Selection of Economic Assumptions for Measuring Pension Obligations. Under ASOP No. 27, an assumed rate of return is reasonable if it meets the following criteria:

- It is appropriate for the purpose of the measurement,
- It reflects the actuary's professional judgment,
- It takes into account historical and current economic data that is relevant as of the measurement date,
- It reflects the actuary's estimate of future experiences, observations of estimates inherent in market data, or a combination thereof, and
- It has no significant bias (i.e., it is not significantly optimistic or pessimistic), except when provisions for adverse deviation or other factors are included.



For purposes of budgeting contributions as a level percentage of payroll, the assumed rate of investment return is used as the discount rate to determine the present value of the System's pension obligations. It is important to note that an actuarial investment return assumption based on expected future experience is a single estimate for all years and therefore implicitly assumes that returns above and below expectations will "average out" over time. In other words, the expected risk premium is reflected in the assumed rate of investment return in advance of being earned, while the investment risk is not reflected until actual experience emerges with each valuation.

The review of the investment return assumption in this report is based on forward-looking measures of likely investment return outcomes for the asset classes in the current investment policy. For purposes of this analysis, we have analyzed the System's investment policy with the capital market assumptions from twelve nationally recognized investment consultants.

Our analysis is based on the GRS Capital Market Assumption Modeler (CMAM). Because GRS is a benefits consulting firm and does not develop or maintain its own capital market expectations, we request and monitor forward-looking expectations developed by several major investment consulting firms. We update our CMAM on an annual basis. The capital market assumptions in the 2018 CMAM are from the following investment consultants (in alphabetical order): Aon Hewitt, BNY Mellon, Callan, JPMorgan, Marquette Associates, Mercer, NEPC, PCA, RVK, Summit Strategies, Voya and Wilshire. We believe the benefit of performing this analysis using multiple investment consulting firms is to recognize the uncertain nature of the items affecting the selection of the investment return assumption while not giving undue weight to the opinion of any single firm.

In the following charts, all returns are net of investment expenses and have no assumption for excess manager performance (alpha).

Many of the investment consultants forecast relatively low returns for the next 10 or so years, followed by higher returns. Keep in mind that the short-term does matter. Any decision made today will be judged in the context of the current environment for many future years. Investment returns realized in the short term have a significant bearing on the long-term average return. A significant portion of liabilities will actually be paid out over the next ten years. Once the money is paid out, it will not be available to participate in the better returns that consultants predict for the longer term future.

For purposes of this analysis, we have reviewed the following asset mix based on the Minnesota State Board of Investment (SBI) Combined Funds Policy Target in the SBI's Performance Report as of June 30, 2018:

Asset Class	Asset Allocation
Public Equity	49%
Fixed Income	16
Private Markets	25
Treasuries	8
Cash	2

We observed that the Policy Target has changed during the last year, with increased allocations to Private Markets and Treasuries.

The arithmetic expected return developed from this asset allocation is shown in the table below. The CMAM begins with the nominal expected return from each consultant (column 2), takes out each consultant's price inflation assumption (column 3) to arrive at the real return (column 4). We then incorporate the current price inflation assumption of 2.50% (column 5) to get the adjusted nominal return (column 6). Since administrative expenses paid out of trust assets are reflected in the employer contributions and active management fees are assumed to equal excess manager performance (alpha), no expenses (column 7) are netted out of the return. The final arithmetic expected return is shown in column 8. Note that the arithmetic return is in general higher than the median return due to compounding effect of random returns. In general, the difference between the arithmetic and median return will be larger for larger standard deviation of returns. We have shown the standard deviation of returns as the investment risk in column 9.

ASOP No. 27 acknowledges that for any given economic assumption, there is a reasonable range of opinions on that assumption. This is evident from the summaries we show from our CMAM.

Investment Consultant	Investment Consultant Expected Nominal Return	Investment Consultant Inflation Assumption	Expected Real Return (2)-(3)	Actuary Inflation Assumption	Expected Nominal Return (4)+(5)	Investment Expenses	Expected Nominal Return Net of Expenses (6)-(7)	Standard Deviation of Expected Return (1-Year)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	6.22%	2.20%	4.02%	2.50%	6.52%	0.00%	6.52%	11.87%
2	7.11%	2.50%	4.61%	2.50%	7.11%	0.00%	7.11%	15.00%
3	6.87%	2.26%	4.61%	2.50%	7.11%	0.00%	7.11%	12.96%
4	6.83%	2.21%	4.62%	2.50%	7.12%	0.00%	7.12%	15.43%
5	7.27%	2.50%	4.77%	2.50%	7.27%	0.00%	7.27%	14.43%
6	6.88%	2.00%	4.88%	2.50%	7.38%	0.00%	7.38%	13.16%
7	7.00%	2.00%	5.00%	2.50%	7.50%	0.00%	7.50%	12.53%
8	7.29%	2.25%	5.04%	2.50%	7.54%	0.00%	7.54%	15.38%
9	7.56%	2.31%	5.26%	2.50%	7.76%	0.00%	7.76%	14.29%
10	7.93%	2.26%	5.67%	2.50%	8.17%	0.00%	8.17%	17.85%
11	7.81%	1.95%	5.86%	2.50%	8.36%	0.00%	8.36%	14.85%
12	8.39%	2.00%	6.39%	2.50%	8.89%	0.00%	8.89%	11.53%
Average	7.26%	2.20%	5.06%	2.50%	7.56%	0.00%	7.56%	14.11%

The average expected nominal return from column 8 is 7.56%. This is the average arithmetic rate of return. Note that the arithmetic rate of return represents the average future expected return which is higher than the median future expected. Setting the valuation assumption at the arithmetic expected return means that over time the average accumulated assets are expected to grow at this rate. From the perspective of the Actuarial Standards of Practice, this may be considered a reasonable assumption. However, while the expected rate of return in any given year is 7.56%, the expected return over the long-term is less than 7.56%. Adjusting to the median return (as we do below) is also a reasonable assumption.

Next we compare the probabilities of achieving returns over a 20-year horizon. We compute the 40th, 50th, and 60th percentiles of returns as well as the probability of achieving the current assumption of 7.50% over a 20-year horizon. Note that the investment horizon for most of the capital market assumption sets is between 5 and 10 years. For purposes of this analysis, no adjustment has been made to return expectations for 20 years. This implies that the second 10 years are expected to have the same distribution of returns as the first 10 years. A different assumption would result in a different distribution of returns¹.

¹ We requested capital market assumptions over a longer horizon from each of the twelve investment consultants. Three of the investment consultants provided capital market assumptions over a period of 20 or 30 years, the other nine did not provide assumptions over a period longer than 10 years. Each of the three that provided assumptions over a longer horizon had different expectations after the first 10 years. However, two of those three indicated that return expectations after the 10th year were set based on historical return experience, as opposed to a market-based or forward-looking methodology that is predominately used in the development of the 10-year expectations. The third investment consultant did not describe a difference in methodology for the longer horizon.

Investment Consultant	Distribution of 20-Year Average Geometric Net Nominal Return			Probability of Exceeding 7.50%
	40th	50th	60th	
(1)	(2)	(3)	(4)	(5)
1	5.20%	5.86%	6.53%	26.86%
2	5.25%	6.08%	6.92%	33.47%
3	5.62%	6.34%	7.07%	34.36%
4	5.17%	6.03%	6.89%	33.33%
5	5.51%	6.31%	7.12%	35.50%
6	5.85%	6.59%	7.33%	37.74%
7	6.08%	6.78%	7.49%	39.81%
8	5.61%	6.46%	7.32%	38.00%
9	6.03%	6.82%	7.62%	41.51%
10	5.74%	6.72%	7.72%	42.16%
11	6.53%	7.35%	8.18%	48.19%
12	7.63%	8.28%	8.93%	62.03%
Average	5.85%	6.64%	7.43%	39.42%

The 50th percentile return is also related to the geometric average return. The geometric average of a sequence of returns over a number of years is the compound average of those returns over the number of years compounded. As the number of years in the geometric average increase and if the distributions of returns each year are independent and identically distributed, then the geometric average will converge to the median return. The median return is a reasonable rate of return for purposes of the valuation. The average of 50th percentile returns is 6.64% per year. From an actuarial perspective, 6.64% is the preferred assumption.

Column 5 of table 2 shows the estimated probability of achieving this 7.50% assumed rate of return over a 20-year period. The average probability of achieving 7.50% over 20 years is 39%.

Last year, we developed a revised model that excluded capital market assumptions applying to time horizons of less than 10 years. We determined that taking a similar approach this year would produce results that are not materially different than the results presented herein.

Nothing in this report should be construed as GRS giving investment advice.

Comments and Recommendations

We recommend that PERA consider an investment return assumption in the range of 6.64% to 7.56%. Based on the data reviewed, we are comfortable supporting a 7.5% discount rate, but PERA should note that the selection of an investment return assumption at the upper end of this range results in a higher risk of increased actuarial contributions in the future, as the rate must be reviewed each year for reasonability based on actuarial standards. A rate near the bottom of the range, such as 7.0%, would be more likely to be sustainable for a longer period.

Brian B. Murphy and Bonita J. Wurst are independent of the plan sponsor and are Members of the American Academy of Actuaries who meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. In addition, Mr. Murphy meets the requirements of “approved actuary” under Minnesota Statutes 356.215, Subdivision 1, Paragraph (c).

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge and belief, the information contained in this report was performed in accordance with the requirements of Minnesota Statutes 356.215, and the requirements of the Standards of Actuarial Work established by the Legislative Commission on Pensions and Retirements. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

Respectfully submitted,



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



Brian B. Murphy, FSA, EA, FCA, MAAA
Senior Consultant

BJW/BBM:sc





Date: February 7, 2019

To: Doug Anderson, PERA Executive Director

From: Bonnie Wurst, Senior Consultant

Re: **City of Minneapolis MPRA and MFRA Contributions**

Thank you for providing your calculation of Minneapolis Police Relief Association (MPRA) and Minneapolis Fire Relief Association (MFRA) updated contributions. The MPRA and MFRA merged into the Police and Fire Plan (P&F) on December 30, 2011. The City of Minneapolis has been making annual contributions to the P&F since the merger. Pending legislation, contribution amounts are expected to be updated effective July 15, 2019.

You asked us to review and validate your calculation of contributions based on the following assumptions and methodology:

- Discount rate of 5.85% (selected by PERA based on GRS' letter dated October 3, 2018)
- Future MPRA and MFRA benefit payments provided to PERA by GRS in December 2018 based on the P&F funding valuation as of July 1, 2018
- The present value of benefits as of July 1, 2019, determined by discounting future benefit payments at the assumed discount rate
- Estimated assets based on the initial assets at the time of merger, actual contributions, MPRA and MFRA benefit payments from GRS' 2012-2017 valuation reports, actual P&F investment returns through June 30, 2018, assuming 7.5% investment return for the fiscal year ending June 30, 2019
- Contributions determined as the annual payment required to amortize the unfunded liability (determined as the difference between the present value of benefits and estimated assets as of July 1, 2019) over 13 years, assuming 5.85% interest, with the first payment July 15, 2019

As previously noted, we are unable to confirm the 7.1% rate of return on assets for the first 6 months after merger. Otherwise, we reviewed the inputs and calculations and did not find any issue that would result in a significant difference in your calculated contribution amounts of \$4,489,837 for MPRA and \$3,188,735 for MFRA.

Feel free to call if you would like to discuss. Thank you.

Bonita J. Wurst is a member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

This communication shall not be construed to provide tax advice, legal advice or investment advice.