The Bismarck Police Employees’ Pension Plan

Actuarial Valuation

January 1, 2023

Gallagher

Insurance | Risk Management | Consulting

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January 1, 2023 through December 31, 2023

In our opinion, the following report presents fairly the actuarial position of the City of Bismarck Police Employees’ Pension Plan (the “Plan”). The purpose of this report is to develop a funding recommendation. Determinations for other purposes may be different; the results in this report should not be used for other purposes.

Our Actuarial Valuation has been conducted with reliance upon participant information and financial information provided to us by City of Bismarck (the “City”). We have reviewed the data provided to us for general reasonableness but did not audit the data. The accuracy of the information in this report is dependent on the quality and completeness of the data provided to us. Each assumption not specified by statute or regulations is reasonable taking into account the experience of the Plan, Plan-specific features, the purpose of the measurement and reasonable expectations.

The actuarial assumptions used in this report were selected by City of Bismarck, with the agreement of Gallagher Benefit Services, Inc. In our opinion, the actuarial assumptions used (a) each, and in the aggregate, are reasonably related to the experience of the Plan and to reasonable expectations, and (b) in the aggregate, represent our best estimate of anticipated experience under the Plan. Liabilities shown in this report were determined using actuarial valuation software designed for the specific purpose of modeling pension plan liabilities and costs. In our opinion, except as stated elsewhere in this report, the software is appropriate and produces reasonable results for this purpose.

The interest rate assumption was updated effective with this valuation. There were no other assumption changes from the previous measurement. There were no other changes in Plan provisions, cost allocation procedures, contribution allocation procedures, or methods from the January 1, 2022 Actuarial Valuation. There were no adjustments of prior measurements or use of approximations which would materially impact the results. The accrued benefits valued in this report reflect the benefit attribution pattern described by the plan provisions. The value of vested benefits shown in this report includes those benefit types that are protected under IRC Section 411(d)(6).

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 this engagement, we did not complete an analysis of the potential range of such future measurements.

No funded status measure presented herein is intended to assess the sufficiency of plan assets to cover the estimated cost of settling the plan’s benefit obligations.

To the best of our knowledge, the information contained in this report is complete, accurate and in accordance with generally accepted actuarial principles as recommended by the American Academy of Actuaries. The actuary indicated below is an Enrolled Actuary and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report.

Edwin L. McNamara, EA, FSPA, MAAA, FRM, CFA
Enrollment Number 23-06568

April 2023

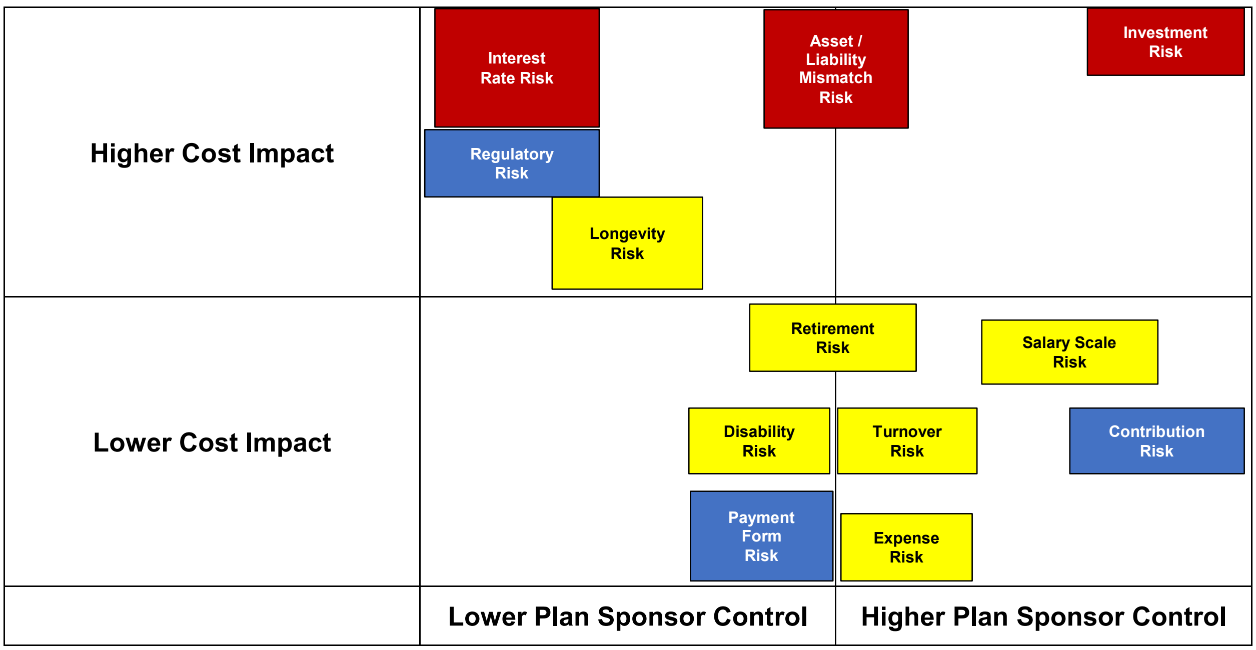
Risk Assessment

January 1, 2023

All intended users of this actuarial valuation report should understand that there exist many risks that can or will significantly impact the plan's future financial condition. This section assesses the risk that future measurements deviate from expected future measurements. This is not intended to be a comprehensive risk analysis, but rather, an overview of the nature and magnitude of various risks.

Nature of Pension Risk

Pension plans are exposed to numerous risks. The following table summarizes many of the most important risks. Items highlighted in red and yellow are discussed in greater detail.



Sensitivity Analysis

The red factors above represent the most significant risks to the Plan:

1. Interest Rate Risk: risk that interest rates will be different than expected
2. Investment Risk: risk that investment returns will be different than expected
3. Asset/Liability Mismatch Risk: risk that changes in asset values are not matched by changes in the value of liabilities

Historical Information

The risk factors highlighted in yellow are assumptions which we routinely review as part of our annual gain/loss analysis for the Plan. The average impact of each of these assumptions on Plan liabilities has not been significant.

Risk Assessment

January 1, 2023

We estimated the impact of items 1 and 2 above on the Plan's funded status. Our estimates are based on the different interest rates used for minimum funding purposes as well as the impact of a 1% decrease in the funding interest rate and a 10% decrease in Plan asset values.

	Baseline	Interest Rate	Baseline w/ 10% Asset Loss
Market Value of Assets	$ 47,847,591	$ 47,847,591	$ 43,062,832
Liabilities	$ 60,289,525	$ 68,527,229	$ 60,289,525
Funded Ratio	79%	70%	71%
Interest Rate	7.25%	6.25%	7.25%

The interest rate sensitivity is shown comparing the funding baseline and a 1.00% decrease in the discount rate. The discount rate change of 1.00% changed the liabilities by 13.7%.

Historical Information

The risk factors highlighted in yellow on the previous page are assumptions which we routinely review as part of our annual gain/loss analysis for the Plan. The average impact of each of these assumptions on Plan liabilities has not been significant.

Maturity Measures

Pension plan maturity provides another way to assess risk. Shown below are certain maturity measures for the plan and a high level explanation of each measure.

	1/1/2022	1/1/2023
Retiree liability / Total funding liability	52.46%	52.48%
Market value of assets / Payroll	587.42%	530.37%
Benefit payments / Market value of assets	5.57%	6.32%
Employer Contributions / Benefit payments	44.38%	48.32%

Retiree liability / Total funding liability: Illustrates the maturity of the plan, with a higher percentage indicating greater risk.

Market value of assets / Payroll: Indicates the size of the plan in relation to the size of the workforce. A larger percentage shows that the plan is a more significant component of the organization, and consequently any contribution volatility could be more noticeable.

Benefit payments / Market value of assets: This cash flow indicator illustrates the portion of plan assets used each year to pay benefits.

Employer contributions / Benefit payments: This net cash flow figure illustrates how much is being contributed to the plan compared to how much is being paid to participants.

This is not intended to be a comprehensive risk analysis, but rather, an overview of the nature and magnitude of various risks faced by the Plan. We are available to complete a more in-depth review if the City of Bismarck decides that additional detail is warranted.

Commentary

In this report we present the results of the January 1, 2023 Actuarial Valuation of the Bismarck Police Employees’ Pension Plan. The interest rate assumption was changed from 7.50% to 7.25% since the prior valuation. There were no other changes in actuarial assumptions or plan provisions since the January 1, 2022 report.

Actuarially Determined Contribution (ADC)
The annual contribution developed under the Entry Age Normal Level Percentage of Pay actuarial cost method is $1,452,518 (16.2% of covered payroll) for the 2023 plan year. The calculation of this contribution is illustrated in Exhibit 12.

City’s Contribution Policy
The City commission has approved that the City contribution will be 14.53% of salary. The expected contribution for 2023 on this basis is $1,310,842.

Contribution Requirements
The valuation results are shown on page 5 in a comparison between 2022 and 2023. As of January 1, 2022, the Unfunded Actuarial Accrued Liability (UAAL) was $1,264,964 and an ADC of $565,831 in 2022.

As of January 1, 2023, the Unfunded Actuarial Accrued Liability is $12,441,934 and the ADC is $1,452,518.

The most significant reason for the increased UAAL is an asset return of -10.1% during 2022 compared to an expected return of 7.50%. Please see Exhibit 10 for a further breakdown.

Funding Ratio
Plan assets cover 93% of the Present Value of Accumulated Plan Benefits. More detail is contained in Exhibit 14. The Present Value of Accumulated Plan Benefits is the value of benefits based only on salaries and service as of the valuation date and does not reflect the value of any future benefit accruals.

Executive Summary

January 1, 2022 and January 1, 2023

The following table highlights the changes since the last Actuarial Valuation:

		1/1/2022		1/1/2023
1. Number of Participants				
(a) Active		135		136
(b) Terminated vested		25		24
(c) Retired		87		92
(d) Total Participants		247		252
2. Annual covered salaries for valuation year	$	9,184,417	$	9,021,623
3. Actuarial Accrued Liability				
(a) Active	$	24,180,341	$	26,341,606
(b) Terminated vested participants		2,071,255		2,310,935
(c) Retired Participants		28,964,664		31,636,984
(d) Total Actuarial Accrued Liability = (a)+(b)+(c)	$	55,216,260	$	60,289,525
4. Actuarial Value of Plan Assets		53,951,296		47,847,591
5. Unfunded Actuarial Accrued Liability (3)(d) - 4	$	1,264,964		12,441,934
6. Expected 2022/2023 annual financial support by City[1]	$	1,334,496	$	1,310,842
7. Actuarially Determined Contribution (ADC)[2]	$	565,831	$	1,452,518
8. Amortization period for actuarially determined contribution		17 years		16 years
9. Interest Rate		7.50%		7.25%

1 Police contributions based on a percent of payroll. For 2022 and 2023 the expected contribution is based on 14.53% of payroll.

2 ADC based on normal cost plus amortization with interest to the middle of the year. The amortization period is in 8. and is increasing due to total salary growth at the rate of 3.25% annually.

Input Information

City of Bismarck

Exhibit 1

Summary of Plan Provisions

The following summary has been prepared for valuation purposes only. It outlines the Provisions found in Chapter 9-08 (Police Pension) necessary to perform the Actuarial Valuation, as interpreted by Gallagher Benefit Services Inc.

Definitions	
Actuarial Equivalence Factors	In calculating the actuarial equivalence of one form of benefit to another, the interest rate to be used shall be 7.0% and the mortality table to be used shall be the “applicable mortality table” as defined by Section 417(e)(3) of the Code (9-08-10).
Average Basic Monthly Compensation	The average of the monthly base compensation of a Participant over the highest 36 month period of employment. Monthly base compensation excludes overtime, bonuses, severance payments, and other remuneration in excess of base compensation (9-08-15(1)).
Effective Date of the Plan	January 1, 1972.
Early Retirement Date	Participants who have completed 60 consecutive months of contributing service and have attained age 48 are eligible for a monthly pension benefit (9-08-15(2)).
Membership Fee	Every full-time employee of the City of Bismarck except police officers and fire fighters shall be assessed and required to pay an amount of 9.4% of their basic salary (changed from 6.0% for years prior to 1/1/2005) (9-08-01).
Normal Form of Benefit	Married Participants receive a Joint & Two-Thirds to Survivor annuity. Single Participants receive a Life Only annuity.
Normal Retirement Date	Participants who have attained age 55 are eligible for a monthly pension benefit (9-08-15(1)).
Plan Year	January 1st through December 31st (9-08-08).
Recognized Service	Full and fractional years of contributing service during which the employee contributed to the fund (9-08-23). Military service will be included as part of the period of service with the City provided that the period does not exceed 5 years and the employee pays into the fund 9.4% of the lesser of the last full year’s police salary or military salary for each year of military service (changed from 6.0% for years prior to 1/1/2005) (9-08-05).

Exhibit 1

Summary of Plan Provisions

Plan Provisions	
Eligibility	Every full-time police employee shall be included (changed from all full-time police employees after thirty days of service effective May 10, 2005) (9-08-11).
Normal Retirement Benefit	Participants serving until the Normal Retirement Date are eligible for a monthly pension benefit computed by multiplying his or her highest 36 months of Average Basic Monthly Compensation times 2.5% times his or her number of full and fractional years of Recognized Service (changed from 2.0% effective January 1, 2005). The monthly pension benefit payable shall not exceed 90% of Average Basic Monthly Compensation (9-08-15(1)).
Early Retirement Benefit	The monthly pension benefit shall be equal to the Normal Retirement Benefit actuarially reduced for payments commencing prior to age 55 (9-08-15(2)). The reduction factors are as follows:

Age	Factor	Age	Factor
48	.6070	52	.8004
49	.6492	53	.8607
50	.6952	54	.9270
51	.7455	55	1.000

Termination Benefit	After 60 consecutive months of contributing service and termination of employment, a Participant may elect a deferred retirement benefit to commence at an elected age 48 to 55. The Participant's deferred benefit shall equal the Normal Retirement Benefit (based on service and compensation to the date of termination) actuarially reduced for early commencement (9-08-15(3)).
Death Benefit	The surviving spouse (while unmarried) receives 2/3 of the actuarially reduced pension to which the Participant would have been entitled, but not less than $100 per month provided the Participant served at least 60 consecutive months of contributing service (9-08-15(4)). The surviving spouse has the option to elect a refund of contributions in lieu of the above-mentioned benefit (9-08-15(5)). If there is no surviving spouse, the Participant's contributions are paid to the Participant's estate (9-08-15(6)).
Refund of Contributions	Any Participant who has contributed to the plan and terminates employment before being entitled to a pension shall be entitled to a refund of all contributions made by him to the pension system with accumulated interest. Interest of 5% per year will be credited on such contributions made after July 1, 1972. Interest of 2.5% per year will be credited on such contributions made prior to July 1, 1972. Any Participant electing a refund of contributions forfeits all rights to any other form of benefit under this plan (9-08-14).
Cost of Living Adjustments	Persons receiving pension payments shall be eligible for cost of living adjustments in an amount determined by the Board of Trustees. The adjustment may not exceed the lesser of the City employees' salary adjustment or 3% (9-08-16).

Exhibit 2
Census Summary and Reconciliation

	1/1/2022	1/1/2023
Active Participants		
• Number of Participants		
- Fully Vested	98	104
- Non-vested	37	32
- Total	135	136
• Average Age	39.2	39.1
• Average Service	11.5	11.5
• Average Salary	$ 65,891	$ 66,502
Terminated Vested Participants		
• Number of Participants	25	24
• Average Age	44.9	44.6
• Average monthly benefit at Normal Retirement	$ 981	$ 1,103
Retired Participants		
• Number of Participants	87	92
• Average age	68.7	69.1
• Average monthly benefit	$ 2,673	$ 2,708

Exhibit 3

Participant Reconciliation

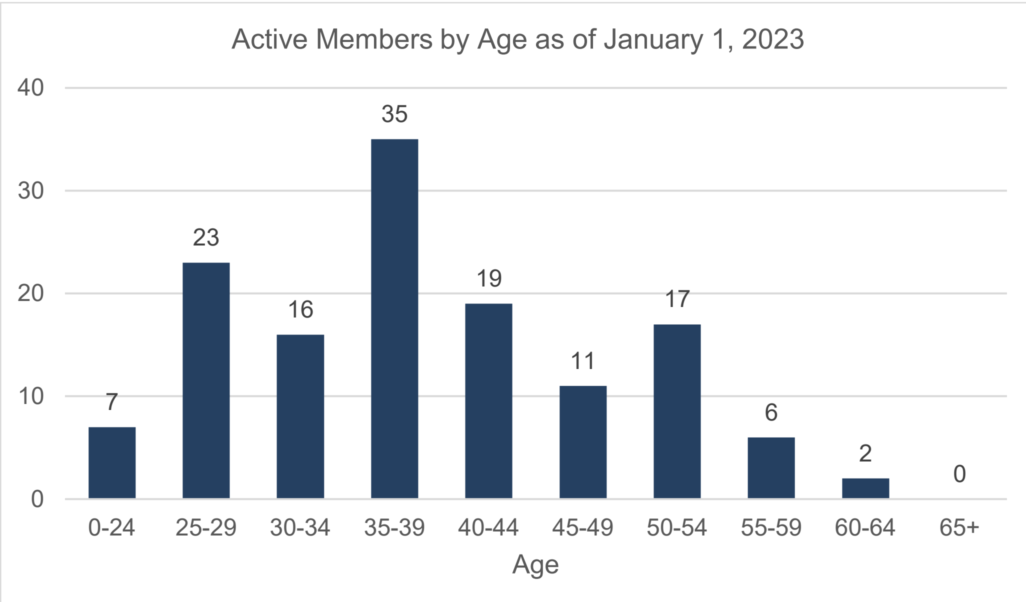
The following information provides the reconciliation from January 1, 2022 to January 1, 2023 of Plan Participants.

	Actives	Terminated Vested	Retired	Disabled	Beneficiary	Total
1/1/2022 Participants	**135**	**25**	**71**	**3**	**13**	**247**
New Participants	10	-	-	-	-	10
Rehired	-	-	-	-	-	-
Terminated vested	(2)	2	-	-	-	-
Terminated non-vested	(3)	-	-	-	-	(3)
Retired	(3)	(2)	5	-	-	-
Disabled	-	-	-	-	-	-
Died with Beneficiary	-	-	(1)	-	1	-
Died without Beneficiary	-	-	-	-	-	-
Benefit stopped	-	-	-	-	-	-
Paid-out lump sum	(1)	(1)	-	-	-	(2)
Data adjustments	-	-	-	-	-	-
1/1/2022 Participants	**136**	**24**	**75**	**3**	**14**	**252**

During 2022 the total Participant count increased by 5 due to 10 new participants offset by 3 participants that terminated employment non-vested, and 2 that received a paid-out lump sum.

Exhibit 4

Active Participant Data



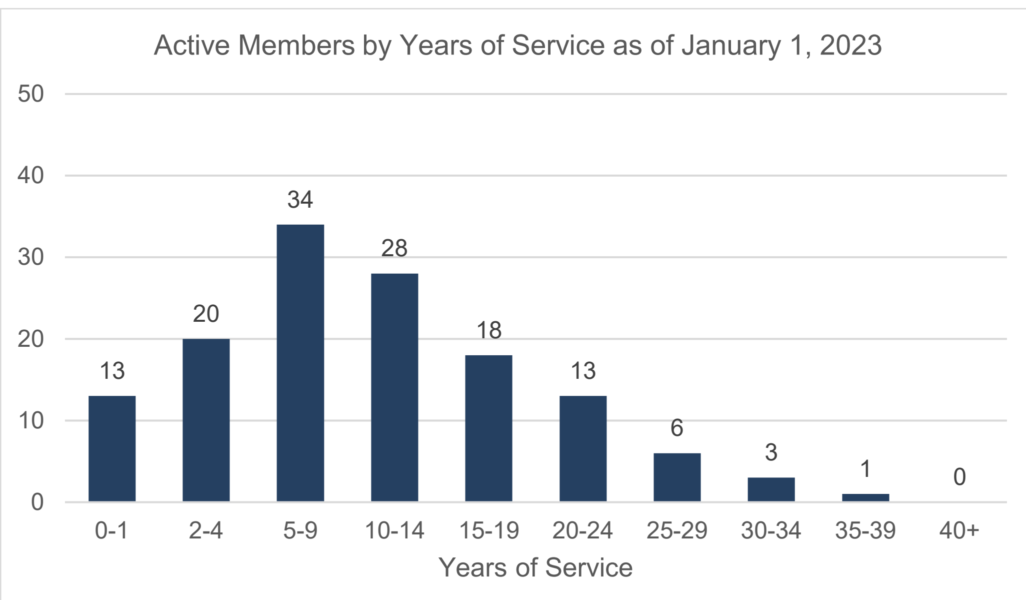


Exhibit 5

Retired Participant Data

Retirees include in-service retirements, disability retirements and beneficiaries with survivor benefits.

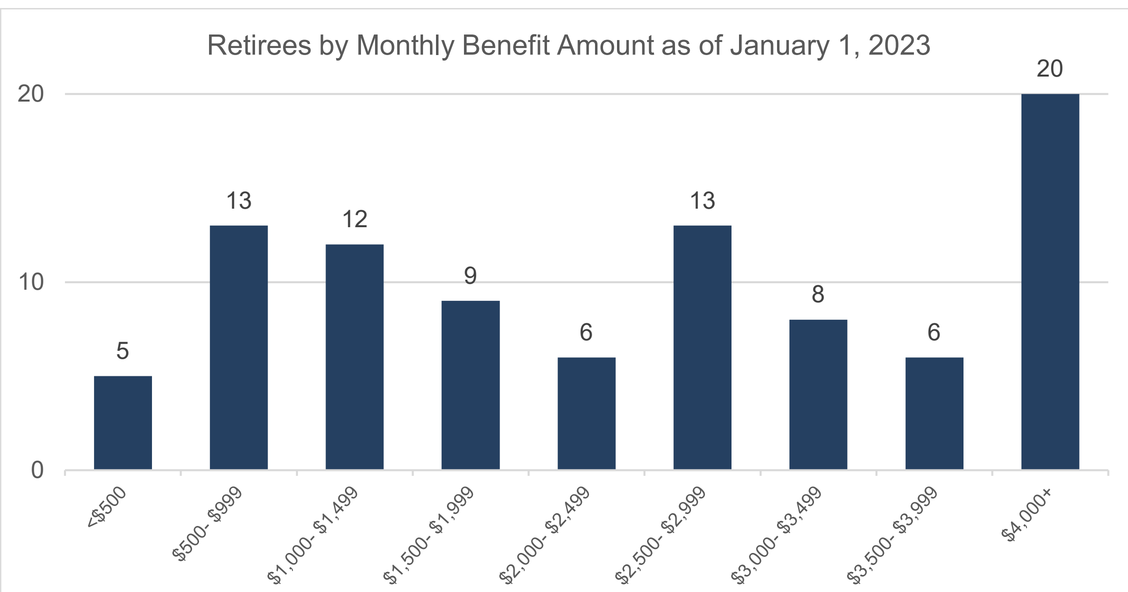
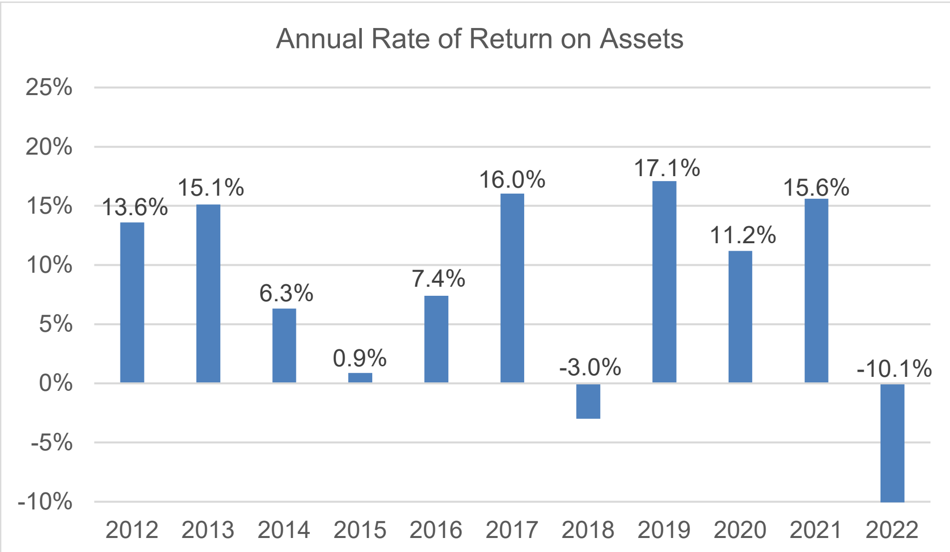


Exhibit 6
Reconciliation of Assets

1. Beginning Balance as of January 1, 2022		$ 53,951,296
2. Revenue		
(a) Employer's contributions	1,461,898	
(b) Employee's contributions	892,212	
(c) Investment income (loss)	(5,271,414)	
(d) Total Revenue		$ (2,917,304)
3. Expenditure		
(a) Pension Benefit Payments	$ 2,866,713	
(b) Professional & Legal Fees	314	
(c) Management Consulting	14,650	
(d) Administration Fees	26,745	
(e) Investment Expense	118,160	
(f) Security Lending Expense	490	
(g) Pension Refunds	158,783	
(h) Postage	546	
(i) Total Expenditure		$ 3,186,401
4. Net Income (Loss)		$ (6,103,705)
5. Ending Balance as of December 31, 2022		$ 47,847,591

Total assets decreased by $6,103,705 during 2022. This decrease was from an investment income loss of $5,271,414 combined with a negative net cash flow (total contributions less expenditures) of ($832,291). Some components were rounded up or down to ensure that the totals would add correctly. The rate of return on plan assets was -10.1%.

Exhibit 7
Historical Asset Information



Rates of return are determined after expenses.

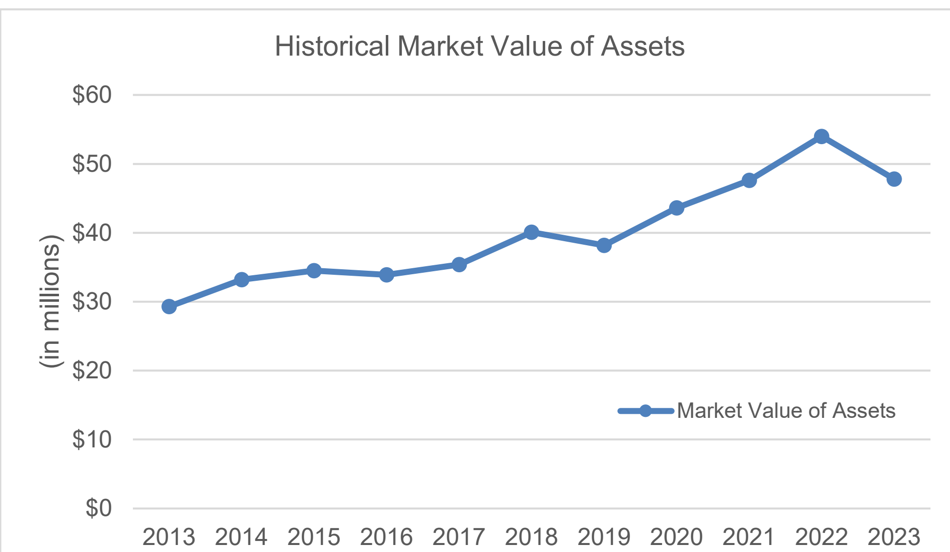


Exhibit 8

Actuarial Assumptions, Methods, and Models

Economic Assumptions

Investment Return: The Fund is assumed to earn 7.25% per year, net of investment expenses (*previously, 7.50%)*.

Salary Scale: Active Participant Salaries are assumed to increase at 3.25% per year.

Demographic Assumptions

Retirement

	Rate of Retirement (per 1,000)	
Age	**Male**	**Female**
55-61	200	200
62	400	400
63	600	600
64	800	800
65+	1,000	1,000

Mortality: PubS-2010 Public Safety Employees Amount Weighted Mortality Tables with Projection Scale MP-2020

Withdrawal

	Rate of Withdrawal (per 1,000)	
Age	**Male**	**Female**
25	100	100
30	60	80
35	30	80
40	30	40
45	30	40
50	0	0
55	0	0

Spouse Age: Male Participants are assumed to be 3 years older than female spouses. Female Participants are assumed to be 3 years younger than male spouses

Marriage Rate: 85% of Participants are assumed to be married

Form of Benefit: Married Participants receive their benefit in the form of a Joint and Two Thirds to Survivor annuity. Single Participants receive their benefit in the form of a Life Only annuity

Expenses: Plan expenses are assumed to be 3.0% higher than the prior year

Exhibit 8

Actuarial Assumptions, Methods, and Models

Assumptions Rationale

Interest rate	The interest rate assumption is based on the expected investment return, net of expenses, provided by the City of Bismarck. We believe this is reasonable based on the results of Gallagher's assumed rate of return model using the Plan's current asset allocation.
Compensation increases	The compensation increase assumption is based on a review in 2021 of 1/1/2019 – 12/31/2020 salaries. The plan has not had large gains or losses due to this assumption since the review.
Mortality	The mortality assumption is based on a recent standard table available for public safety plans since the plan does not have credible experience to determine a plan-specific assumption.
Retirement	Active participant retirement rates are based on plan experience between 1/1/05 and 12/31/11. The plan has not had large gains or losses due to this assumption in the last several years.
Disability	The disability assumption is based on a standard table since the plan does not have credible experience to determine a plan-specific assumption.

Methods

Funding Method	The contribution requirement is determined using the Entry Age Normal Level Percent of Pay actuarial cost method.
Actuarial Asset Value	The Actuarial Value of Assets is equal to the Market Value of Assets reserved for employee pension benefits.
Expenses	Plan expenses are assumed to be 3.0% higher than the prior year and are added to the actuarially determined contribution.
Amortization method	Actuarial Determined Contribution - Level percent of payroll using a 3.25% total payroll growth assumption.
Amortization period	30 year closed period (16 years remain as of 1/1/23)

Exhibit 8

Actuarial Assumptions, Methods, and Models

Models

Published demographic tables	The demographic tables described above are standard published tables developed by organizations with the required expertise
Actuarial Valuation System	Liabilities shown in this report were determined using actuarial valuation software designed by Winklevoss Technologies. This software is designed for the specific purpose of modeling pension plan liabilities and costs and is the standard pension valuation software used by Gallagher Benefit Services, Inc. The results in this report are based on various inputs into the software model, including the plan provisions and assumptions shown in this report, and demographic and financial information provided by the City of Bismarck. While the results have been tested and reviewed for overall accuracy and consistency, we have relied upon the validity of the underlying software coding in preparing this report.

Contribution Information

City of Bismarck

Exhibit 9

Development of Unfunded Actuarial Accrued Liability

		1/1/2022		1/1/2023
1. Actuarial Accrued Liability				
(a) Participants receiving benefits	$	28,964,664	$	31,008,086
(b) Terminated vested participants		2,071,255		2,219,339
(c) Active Participants		24,180,341		25,242,006
(d) Total Participants = (a)+(b)+(c)	$	55,216,260	$	58,469,431
2. Adjustments for cost of living adjustments	$	-	$	-
3. Adjustments for assumption changes	$	-	$	1,820,094
4. Actuarial Accrued Liability after adjustments = (1)(d)+(2)+(3), not less than zero	**$**	**55,216,260**	**$**	**60,289,525**
5. Actuarial Value of Assets as of end of year		53,951,296		47,847,591
6. Unfunded Actuarial Accrued Liability = (4) - (5)	$	1,264,964	$	12,441,934

Under the Entry Age Normal actuarial cost method, the Unfunded Actuarial Accrued Liability is recalculated each year. The Actuarial Accrued Liability is valued using Participant data, Plan Provisions and assumptions as of the valuation date. Past demographic or economic experience different than assumed is called an actuarial gain or loss and is reflected in the Unfunded Actuarial Accrued Liability. A breakdown of actuarial gains and losses from the past year is shown on the next page.

Exhibit 10

Development of Actuarial (Gain)/Loss

Development of Liability (Gain) or Loss

Actual Actuarial Liability as of January 1, 2022		$ 55,216,260
Expected changes		
Normal Cost	1,119,130	
Interest at 7.50%	4,225,154	
Cost of living adjustment	-	
Benefit payments with interest to year-end	(3,138,952)	
Total expected changes		2,205,332
Expected Actuarial Liability as of January 1, 2023		$ 57,421,592
Actual Actuarial Liability as of January 1, 2023		$ 60,289,525
Actuarial Liability (gain) or loss as of January 1, 2023		$ 2,867,933

Breakdown of Actuarial Liability (gain) or loss by source	
Participant experience different than assumed for death, retirement, termination, disability and other amounts	796,844
Inactive mortality	(59,142)
Salary increases different than expected	310,137
New entrants	-
Assumption changes	1,820,094
Actuarial Liability (gain) or loss	$ 2,867,933

Development of Asset (Gain) or Loss	
Market Value of Assets as of January 1, 2022	$ 53,951,296
Interest at 7.50%	4,046,347
Actual contributions with interest to year-end	2,442,389
Actual benefit payments with interest to year-end	(3,138,952)
Actual expenses with interest to year-end	(44,348)
Expected value of assets as of January 1, 2023	$ 57,256,732
Actual value of assets as of January 1, 2023	47,847,591
Asset (gain) or loss	$ 9,409,141

A (gain)/loss occurs when actual demographic or economic experience is different from the valuation assumptions. For example, if salary increases are greater (lower) than expected the liability will go up (down). During 2022, the plan had an actuarial liability loss of $2,867,933 and an asset loss of $9,409,141 resulted in an increase in UAAL of $12,277,074.

Exhibit 11

Actuarially Determined Amortization Schedule

Year	Unfunded Liability at Beginning of Year	Annual Amortization Payment	Unfunded Liability at End of Year
2023	$ 12,441,934	$ 1,018,419	$ 12,251,720
2024	12,251,720	1,051,518	12,012,217
2025	12,012,217	1,085,692	11,718,698
2026	11,718,698	1,120,977	11,366,056
2027	11,366,056	1,157,409	10,948,774
2028	10,948,774	1,195,025	10,460,896
2029	10,460,896	1,233,863	9,895,993
2030	9,895,993	1,273,964	9,247,126
2031	9,247,126	1,315,368	8,506,810
2032	8,506,810	1,358,117	7,666,973
2033	7,666,973	1,402,256	6,718,909
2034	6,718,909	1,447,829	5,653,233
2035	5,653,233	1,494,883	4,459,830
2036	4,459,830	1,543,467	3,127,799
2037	3,127,799	1,593,630	1,645,396
2038	1,645,396	1,645,396	-

The Annual Amortization Payment is determined by amortizing the Unfunded Actuarial Accrued Liability (UAAL) over 16 years as a level percentage of total payroll. Total payroll is assumed to increase at 3.25% per year.

The City commission has approved that the City contribution will be 14.53% of salary. Please see Exhibit 13 for more details.

The Unfunded Actuarial Accrued Liability is amortized over a fixed period of time. The amortization period was reset at 30 years as of January 1, 2009. Therefore, there are 16 years remaining in the amortization period. The resulting amortization payment is a component of the actuarially determined contribution.

The Unfunded Actuarial Accrued Liability is scheduled to be reduced to $0 over the amortization period. However, this schedule is met only if all assumptions are met and the actual employer contribution equals the actuarially determined contribution each year. If assumptions are not met, an actuarial gain or loss will either decrease or increase the UAAL. Also, if the employer contribution exceeds the actuarially determined contribution, the UAAL will be reduced more rapidly. Alternatively, if the employer contribution is less than the actuarially determined contribution, the UAAL will reduce more slowly or even increase.

Exhibit 12

Development of Actuarially Determined Contribution

Actuarially Determined Contribution (Dollar Amounts)

		2022		2023
1. Total Normal Cost	$	1,119,130	$	1,187,293
2. Expected Administrative Expenses		188,814		44,027
3. Expected employee contribution		(863,335)		(848,033)
4. City Normal Cost	$	444,609	$	383,287
5. Amortization of Unfunded Actuarial Accrued Liability		100,770		1,018,419
6. Total annual determined contribution	$	545,379	$	1,401,706
7. Interest to mid-year at 7.50% for 2022 and 7.25% for 2023		20,452		50,812
8. Determined contribution, mid-year = (6)+(7)	$	565,831	$	1,452,518

Actuarially Determined Contribution (As a Percent of Payroll)

	2022	2023
1. Total Normal Cost	12.2%	13.2%
2. Expected Administrative Expenses	2.1%	0.5%
3. Expected employee contribution	-9.4%	-9.4%
4. City Normal Cost	4.9%	4.3%
5. Amortization of Unfunded Actuarial Accrued Liability	1.1%	11.3%
6. Total Actuarially determined contribution	6.0%	15.6%
7. Interest to mid-year at 7.50% for 2022 and 7.25% for 2023	0.2%	0.6%
8. Determined contribution, mid-year = (6)+(7)	6.2%	16.2%

Exhibit 13

14.53% of Payroll Funding Amortization Schedule

Year	Unfunded Liability B.O.Y.	Amortization Payment E.O.Y.	Unfunded Liability E.O.Y.
2023	$12,441,934	$1,087,811	$12,256,163
2024	$12,256,163	$1,096,527	$12,048,208
2025	$12,048,208	$1,107,563	$11,814,140
2026	$11,814,140	$1,118,707	$11,551,958
2027	$11,551,958	$1,127,669	$11,261,806
2028	$11,261,806	$1,134,402	$10,943,885
2029	$10,943,885	$1,134,636	$10,602,681
2030	$10,602,681	$1,136,477	$10,234,898
2031	$10,234,898	$1,142,700	$9,834,228
2032	$9,834,228	$1,148,569	$9,398,641
2033	$9,398,641	$1,156,112	$8,923,930
2034	$8,923,930	$1,159,976	$8,410,939
2035	$8,410,939	$1,164,977	$7,855,755
2036	$7,855,755	$1,164,501	$7,260,796
2037	$7,260,796	$1,162,617	$6,624,587
2038	$6,624,587	$1,159,031	$5,945,839
2039	$5,945,839	$1,159,130	$5,217,782
2040	$5,217,782	$1,154,500	$4,441,571
2041	$4,441,571	$1,144,771	$3,618,814
2042	$3,618,814	$1,133,011	$2,748,167
2043	$2,748,167	$1,120,425	$1,826,984
2044	$1,826,984	$1,106,313	$853,127
2045	$853,127	$853,127	$0

The City commission has approved that the City contribution will be 14.53% of salary. The expected contribution for 2023 on this basis is $1,310,842. The Annual Amortization Payment shown above represents the total expected City contribution available to reduce the UAAL at the end of that year after a reduction for payment of the annual City normal cost.

As shown above, a City contribution of 14.53% of salary per year will amortize the UAAL over 23 years.

Accounting Information

City of Bismarck

Exhibit 14

Statement of Accumulated Plan Benefits

A measure of the degree of progress made in funding any plan is a comparison between the Accumulated Benefit Liability and the assets accumulated to date. The Accumulated Benefit Liability measures the present value of future benefit payments. However, benefit payments are based only on service and salaries earned as of the valuation date. This liability amount is less than the Actuarial Accrued Liability used to determine the actuarial determined contribution, because the AAL anticipates future salary increases for active participants. The liabilities are determined using the regular valuation assumptions. The table below shows the actuarial present value of the Accumulated Benefit Liability.

Actuarial Present Value of Accumulated Plan Benefits (PVAB)

	1/1/2022	1/1/2023
Vested Benefits		
Participants currently receiving payments	$ 28,964,664	$ 31,636,984
Other Participants	18,044,016	19,579,974
Total Vested accrued benefits	$ 47,008,680	$ 51,216,958
Non-Vested accrued benefits	34,338	63,461
Total accrued benefits	$ 47,043,018	$ 51,280,419

Statement of Changes in Accumulated Plan Benefits

Beginning value, January 1, 2022		$ 47,043,018
Increases (Decreases)		
Benefits earned	$	1,610,971
Cost of living adjustment		0
Change in actuarial assumptions		1,457,660
Experience (gain)/loss		658,673
Increase for interest due to decrease in discount period		3,535,593
Benefits paid		(3,025,496)
Net increase (decrease)	$	4,237,401
Ending value, January 1, 2023		$ 51,280,419

The ratio of assets to the above liabilities (known as the Funding Ratio) represents the degree to which Accumulated Benefit liability has been funded. As of January 1, 2023, the Market Value of Assets was $47,847,591. The table below outlines the funding ratios.

Funding Ratio (Assets/PVAB)	
Vested accrued benefits	93%
Total accrued benefits	93%