

The City of Bismarck Employees' Pension Plan

Actuarial Valuation

January 1, 2021



Gallagher

Insurance | Risk Management | Consulting

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The City of Bismarck Employees' Pension Plan

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The City of Bismarck Employees' Pension Plan

Actuarial Certification

January 1, 2021 through December 31, 2021

This actuarial valuation report measured as of January 1, 2021 for The City of Bismarck Employees' Pension Plan (the "Plan") is intended to comply with the pension funding requirements under ERISA and the Internal Revenue Code as well as the Accounting Standard Codification 960. Determinations for other purposes may be significantly different from those contained in this report; 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. 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. The funding mortality table and accounting mortality improvement scale assumptions were updated effective with this valuation, as well as the assumption for expense loading. Please see Exhibit 8 for information on the updated assumptions.

As of 12/31/2020 the Plan updated the mortality from RP-2014 with mortality improvement Scale MP-2019 to the Pub-2010 with mortality improvement Scale MP-2020. The salary scale was also changes to 3.25%. There were no other changes in Plan provisions, cost allocation procedures, contribution allocation procedures, assumptions or methods from the January 1, 2020 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

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. 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.

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 20-06568



Patrick Koehler, Actuarial Analyst

April 2021

The City of Bismarck Employees' Pension Plan

Risk Assessment

January 1, 2021

This report provides values of Plan liabilities as of the measurement date as well as minimum required contribution amounts for purposes of satisfying ERISA and the Internal Revenue Code. These amounts are estimates based on current data, plan provisions, legal requirements and assumptions regarding future experience. 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.

Higher Cost Impact	Interest Rate Risk	Asset / Liability Mismatch Risk	Investment Risk
	Regulatory Risk		
		Longevity Risk	
Lower Cost Impact		Retirement Risk	Salary Scale Risk
		Disability Risk	Turnover Risk
			Contribution Risk
		Payment Form Risk	Expense Risk
	Lower Plan Sponsor Control	Higher Plan Sponsor Control	

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. Historical valuation results for the Plan are shown in the Historical Valuation Results Exhibit.

The City of Bismarck Employees' Pension Plan

Risk Assessment

January 1, 2021

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.

	Funding Baseline	1% Decrease in Interest Rate	Baseline with 10% Asset Decline
Actuarial Present Value of Assets	\$ 118,296,160	\$ 118,296,160	\$ 106,466,544
Liabilities	\$ 124,726,114	\$ 140,297,878	\$ 124,726,114
Funded Ratio	95%	84%	85%
Interest Rate	7.50%	6.50%	7.50%

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 12.5%.

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.

	1/1/2021	1/1/2020
Retiree liability / Total funding liability	53.83%	45.44%
Market value of assets / Payroll	417.85%	348.74%
Benefit payments / Market value of assets	5.34%	4.99%
Employer Contributions / Benefit payments	48.04%	52.86%

Retiree liability / Total 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.

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.

The City of Bismarck Employees' Pension Plan

Commentary

In this report we present the results of the January 1, 2021 Actuarial Valuation of the City of Bismarck Employees' Pension Plan. Effective with this valuation, the mortality was updated from the fully generational RP-2000 mortality table to the Pub-2010 with mortality improvement Scale MP-2020. There were no other changes in actuarial assumptions or plan provisions since the January 1, 2020 report.

Annual Recommended Contribution

We recommend that the City contribution be at least equal to the annual recommended contribution developed under the Entry Age Normal actuarial cost method. On this basis, a contribution of \$2,541,030 (8.9% of covered payroll) is recommended for the 2021 plan year. The calculation of this contribution is illustrated in Exhibit 12.

Expected City Contribution

The City commission has approved that the City contribution will be 10.4% of salary. The expected contribution for 2021 on this basis is \$2,944,300.

Contribution Requirements

The valuation results are shown on page 5 in a comparison between 2020 and 2021. The 2020 calculation, developed in the first column, shows an UAAL of \$9,940,865 and, with an actual City payment of \$3,034,058 in 2020 and expected payment of \$2,944,300 in 2021 plus future contributions of 10.4% of covered payroll, an amortization period of 18 years.

The calculation for 2021 shows an UAAL of \$6,429,954 and, with an expected City payment of \$2,944,300 for 2021, an infinite amortization period.

The most significant reason for the decreased UAAL is asset returns more than expected (2020 return of 10.86% vs. 7.50% assumption). Please see Exhibit 10 for a further breakdown.

Funding Ratio

Plan assets cover 112% of the Present Value of Accumulated Plan Benefits. More detail is contained in Exhibit 14. Last year plan assets covered 111% of the Present Value of Accumulated Plan Benefits. 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.

GASB No. 67 and No. 68

Gallagher will provide the required information for GASB No. 67 and No. 68 separately.

The City of Bismarck Employees' Pension Plan

Executive Summary

January 1, 2020 and January 1, 2021

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

	1/1/20	1/1/21
1. Number of Participants		
(a) Active	471	469
(b) Terminated vested	67	69
(c) Retired	<u>241</u>	<u>253</u>
(d) Total Participants = (a)+(b)+(c)	779	791
2. Annual covered salaries for Participants under the assumed retirement age	\$ 28,170,781	\$ 28,310,578
3. Actuarial Accrued Liability		
(a) Active Participants	\$ 60,500,694	\$ 60,625,584
(b) Terminated vested Participants	4,342,529	4,177,450
(c) Retired Participants	<u>54,018,742</u>	<u>59,923,080</u>
(d) Total Actuarial Accrued Liability = (a)+(b)+(c)	\$ 118,861,965	\$ 124,726,114
4. Actuarial Value of Assets	\$ <u>108,921,100</u>	\$ <u>118,296,160</u>
5. Unfunded Actuarial Accrued Liability = (3)(d)-(4)	\$ 9,940,865	\$ 6,429,954
6. Actual 2020/Expected 2021 annual financial support by City	\$ 3,034,058	\$ 2,944,300 ¹
7. Annual Recommended Contribution	\$ 3,033,715	\$ 2,541,030
8. Amortization period at expected level of funding	Infinite ²	Infinite ²

¹ Amortization period based on City Contributions of \$2,944,300 in 2021, and increasing due to total salary growth at the rate of 3.0% annually thereafter.

² Amortization period based on Employer contributions of 10.4% of payroll each year. Payroll is projected per the Plan's assumptions and considers new entrants to the plan (keeping a level number of actives) with similar pay, age, etc. as the prior three year's new entrants.

Input Information

The City of Bismarck Employees' Pension Plan

Exhibit 1

Summary of Plan Provisions

The following summary has been prepared for valuation purposes only. It outlines the Provisions found in Chapter 9-07 (City Employees' 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 (9-07-10).
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 (9-07-15(1)).
Effective Date of the Plan	January 1, 1966.
Early Retirement Date	Participants who have completed 60 consecutive months of contributing service and have attained age 50 are eligible for a monthly pension benefit (9-07-15(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 5.0% of their basic salary (9-07-01).
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 62 are eligible for a monthly pension benefit (9-07-15(1)).
Plan Year	January 1st through December 31st (9-07-08).
Recognized Service	Full and fractional years of contributing service during which the employee contributed to the fund (9-07-23). 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 5.0% of the lesser of the last full year's salary paid by the City or military salary for each year of military service (9-07-05).

The City of Bismarck Employees' Pension Plan

Exhibit 1

Summary of Plan Provisions

Plan Provisions

Eligibility	Every full-time employee, other than members of the Police Department who are sworn officers, members of the firefighter's relief association, and employees who perform fire suppression duties. (9-07-11).																																				
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 1.75% times his or her number of full and fractional years of Recognized Service prior to January 1, 2005 plus 2.25% times his or her number of full and fractional years of Recognized Service after December 31, 2004. (9-07-15(1)).																																				
Early Retirement Benefit	The monthly pension benefit shall be equal to the Normal Retirement Benefit actuarially reduced for payments commencing prior to age 62 (9-07-15(2)). The reduction factors are as follows:																																				
	<table border="1"> <thead> <tr> <th>Age</th> <th>Factor</th> <th>Age</th> <th>Factor</th> <th>Age</th> <th>Factor</th> </tr> </thead> <tbody> <tr> <td>50</td> <td>.4287</td> <td>54</td> <td>.5557</td> <td>58</td> <td>.7353</td> </tr> <tr> <td>51</td> <td>.4567</td> <td>55</td> <td>.5947</td> <td>59</td> <td>.7918</td> </tr> <tr> <td>52</td> <td>.4870</td> <td>56</td> <td>.6373</td> <td>60</td> <td>.8542</td> </tr> <tr> <td>53</td> <td>.5199</td> <td>57</td> <td>.6841</td> <td>61</td> <td>.9233</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>62</td> <td>1.000</td> </tr> </tbody> </table>	Age	Factor	Age	Factor	Age	Factor	50	.4287	54	.5557	58	.7353	51	.4567	55	.5947	59	.7918	52	.4870	56	.6373	60	.8542	53	.5199	57	.6841	61	.9233					62	1.000
Age	Factor	Age	Factor	Age	Factor																																
50	.4287	54	.5557	58	.7353																																
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53	.5199	57	.6841	61	.9233																																
				62	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 50 to 62. 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 (9-07-15(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 \$65 per month provided the Participant served at least 60 consecutive months of contributing service (9-07-15(4)). The surviving spouse has the option to elect a refund of contributions in lieu of the above-mentioned benefit (9-07-15(5)). If there is no surviving spouse, the Participant's contributions are paid to the Participant's estate (9-07-15(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 (9-07-14).																																				
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% (9-07-16).																																				

The City of Bismarck Employees' Pension Plan

Exhibit 2

Census Summary and Reconciliation

The following information provides the reconciliation from January 1, 2020 to January 1, 2021 of Plan Participants.

	1/1/20	1/1/21
Active Participants		
• Number of Participants		
– Fully vested	303	311
– Non-vested	<u>168</u>	<u>158</u>
– Total	471	469
• Average age	47.0	46.6
• Average service	11.1	11.0
• Average salary	\$ 57,211	\$ 58,464
Terminated Vested Participants		
• Number of Participants	67	69
• Average age	48.2	48.2
• Average years since termination	6.3	6.6
• Average monthly benefit at Normal Retirement	\$ 890	\$ 870
Retired Participants		
• Number of Participants	241	253
• Average age	73.1	73.0
• Average years since retirement	9.0	8.8
• Average monthly benefit	\$ 1,966	\$ 2,042

The City of Bismarck Employees' Pension Plan

Exhibit 3

Participant and Reconciliation

The following information provides the reconciliation from January 1, 2020 to January 1, 2021 of Plan Participants.

	Active	Terminated Vested	Retired	Disabled	Beneficiary	Total
1/1/2020 Participants	471	67	203	0	38	779
New Participants	40	-	-	-	-	40
Rehired	3	-	-	-	-	3
Terminated vested	(9)	9	-	-	-	-
Terminated non-vested	(20)	-	-	-	-	(20)
Retired	(15)	(5)	20	-	-	-
Disabled	-	-	-	-	-	-
Died with beneficiary	-	-	(1)	-	1	-
Died without beneficiary	(1)	-	(4)	-	(4)	(9)
Benefit stopped	-	-	-	-	-	-
Paid-out lump sum	-	(2)	-	-	-	(2)
Data corrections	-	-	-	-	-	-
1/1/2021 Participants	469	69	218	0	35	791

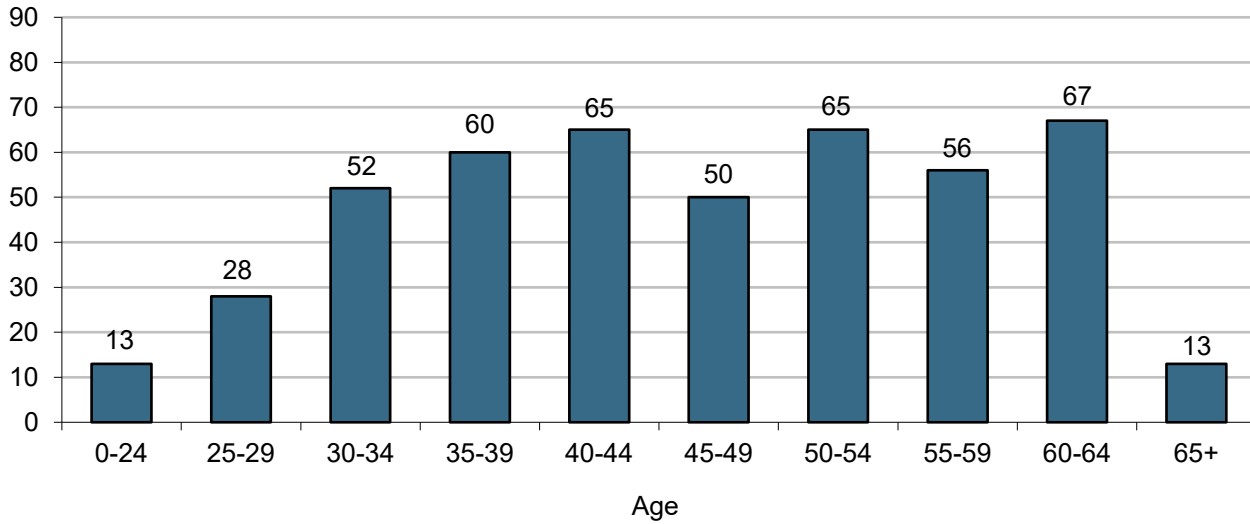
During 2019, the total Participant count increased by 12 due to 43 new Participants offset by 20 Participants that terminated employment and received a return of their employee contributions, 5 Participant deaths with no beneficiary and 1 Participant who died with a beneficiary. There were 20 Participants that retired and 9 Participants that moved from active to terminated vested status.

The City of Bismarck Employees' Pension Plan

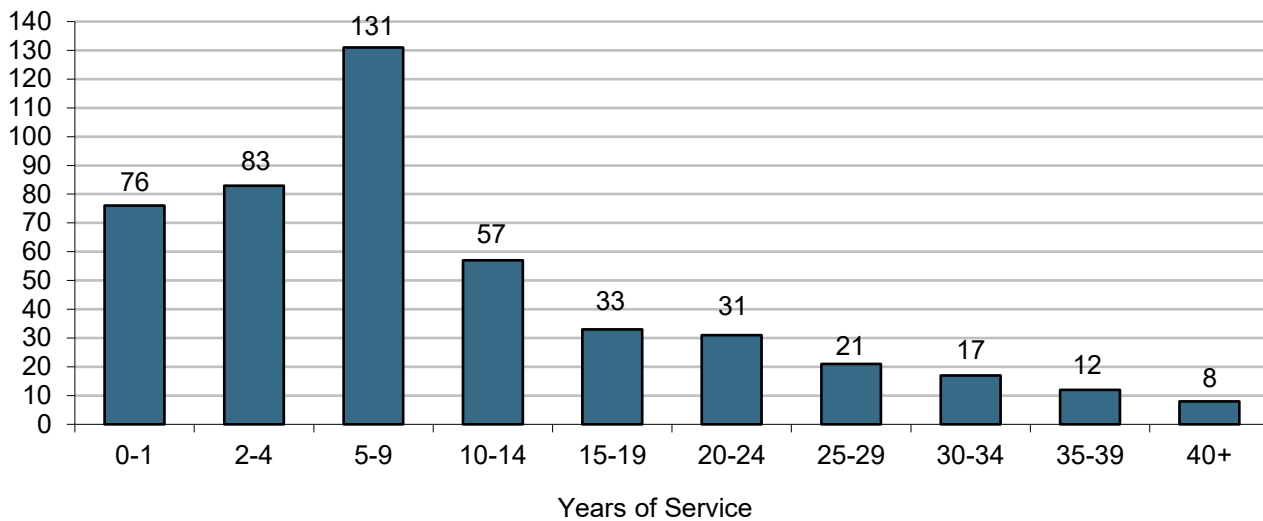
Exhibit 4

Distribution of Active Participants

Active Participants by Age as of January 1, 2021



Active Participants by Years of Service as of January 1, 2021

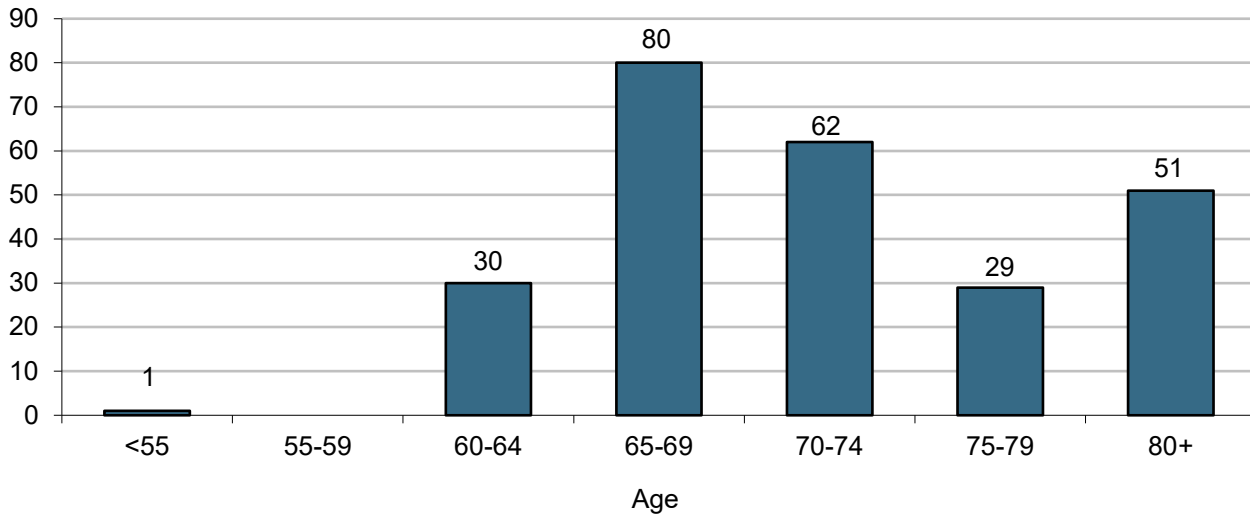


The City of Bismarck Employees' Pension Plan

Exhibit 5

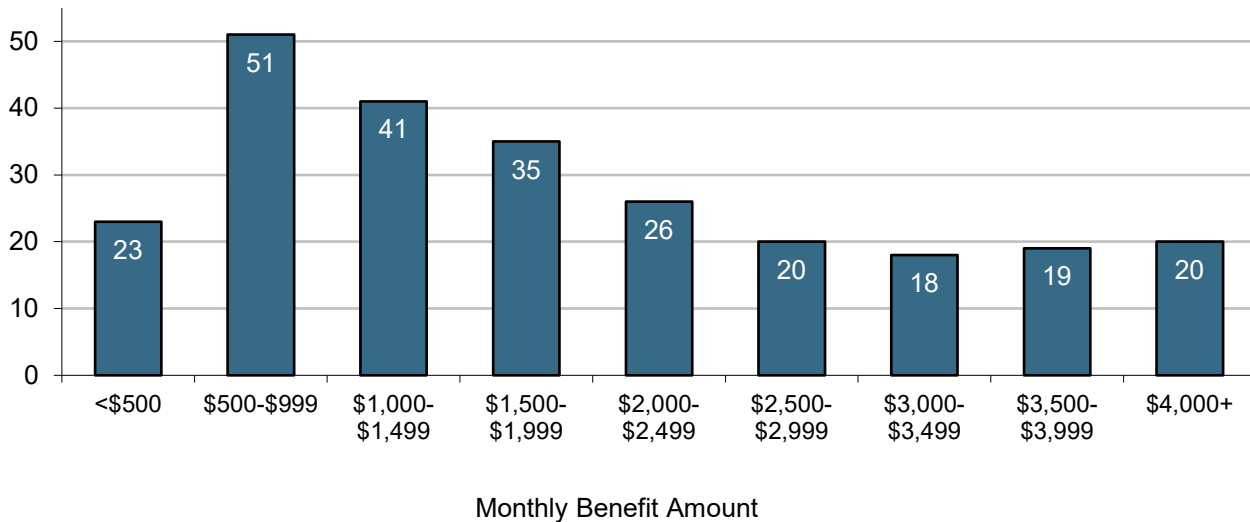
Retired Participant Data

Retirees by Age as of January 1, 2021



Retirees include those on service retirement, disability retirement and beneficiaries with survivor benefits.

Retirees by Monthly Benefit Amount as of January 1, 2021



The City of Bismarck Employees' Pension Plan

Exhibit 6

Reconciliation of Assets

1. Beginning Balance as of January 1, 2020			\$	108,921,100
2. Revenue				
(a) Employer's Contribution				
(i) Park & Rec. Contribution	\$	381,662		
(ii) Department Contribution		<u>2,652,396</u>		
(iii) Total City Contribution	\$	3,034,058		
(b) Employee's Contribution		1,401,930		
(c) Investment Income (Loss)		11,698,867		
(d) Total Revenue			\$	16,134,855
3. Expenditure				
(a) Pension Benefit Payments	\$	6,000,994		
(b) Professional & Legal Fees		547		
(c) Management Consulting		24,570		
(d) Administration Fees		63,064		
(e) Investment Expense		352,261		
(f) Security Lending Expense		1,583		
(g) Pension Refund		314,810		
(h) Postage		1,966		
(i) Total Expenditure			\$	6,759,795
4. Net Income (Loss)			\$	9,375,060
5. Ending Balance as of December 31, 2020			\$	118,296,160

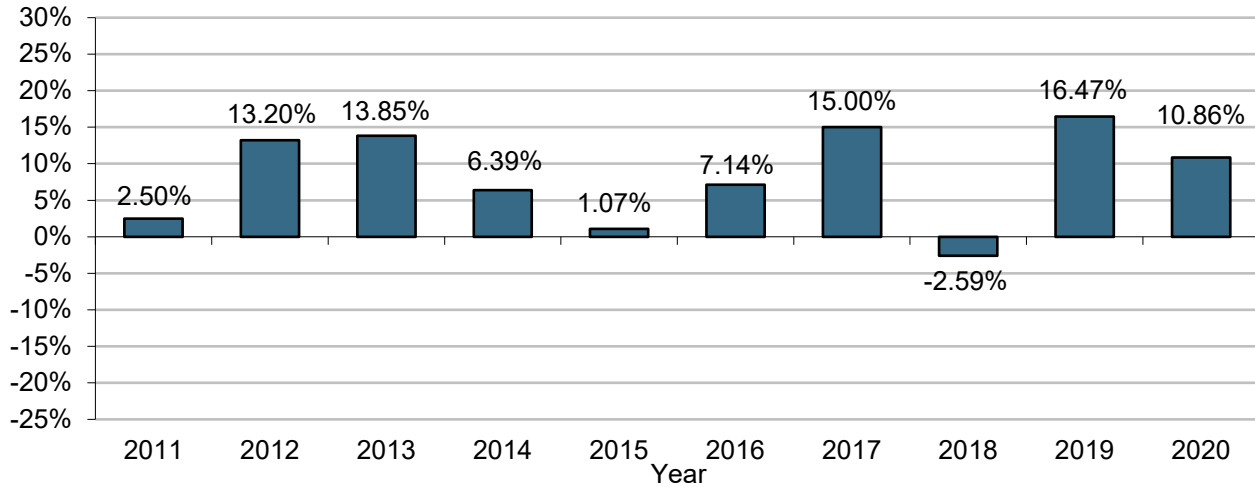
Total assets increased \$9,375,060 during 2020. This increase was from investment gain of \$11,698,867 combined with a negative net cash flow (total contributions less expenditures) of (\$2,323,807). Some components were rounded up or down to ensure that the totals would add correctly. The rate of return on plan assets was 10.86%.

The City of Bismarck Employees' Pension Plan

Exhibit 7

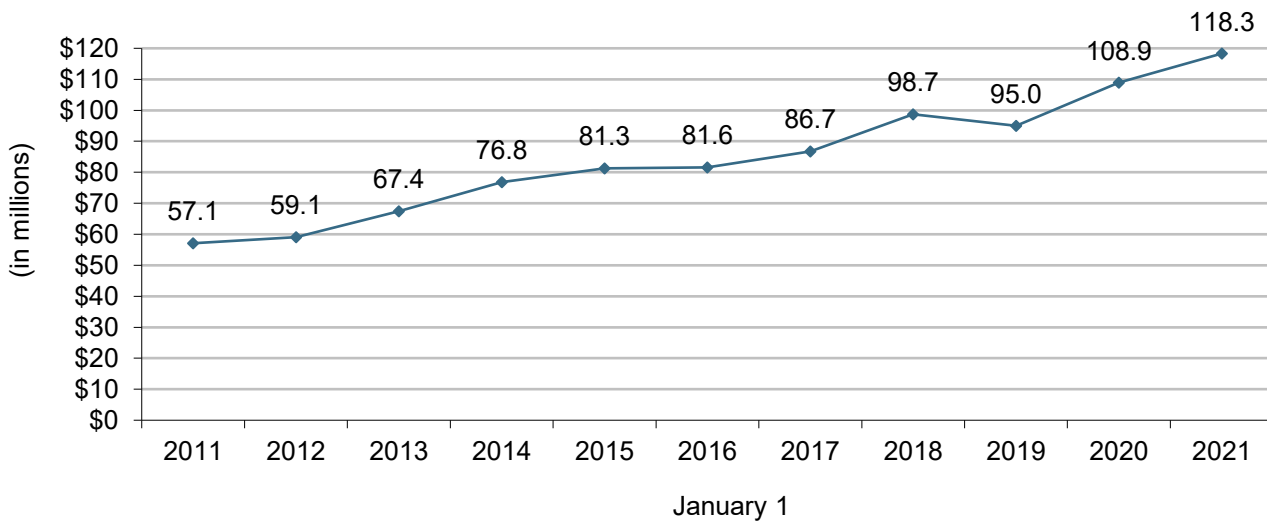
Historical Market Value of Assets and Rates of Return

Annual Rate of Return on Assets



*Rates of return are determined after expenses.

Historical Market Value of Assets



The City of Bismarck Employees' Pension Plan

Exhibit 8

Actuarial Assumptions and Methods

Economic Assumptions

Investment Return	The Fund is assumed to earn 7.5% per year.
Salary Scale	Active Participant Salaries are assumed to increase at 3.25% per year.
Inflation	The amortization of the Unfunded Actuarial Accrued Liability is determined as a level percent of payroll using a 3% total payroll growth assumption.

Demographic Assumptions

Retirement	Active Participant retirement rates are based on plan experience between 1/1/05 and 12/31/11
Mortality	Mortality rates are based on the Pub-2010 Mortality Tables with Projection Scale MP-2020
Disability	None
Withdrawal	Active Participant termination rates are based on plan experience between 1/1/05 and 12/31/11
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

The City of Bismarck Employees' Pension Plan

Exhibit 8

Actuarial Assumptions and Methods

Cost Methods

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.

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 recommended contribution.

Funding Method The contribution requirement is determined using the Entry Age Normal actuarial cost method.

Illustrations

Age	Rate of Withdrawal (per 1,000)		Age	Rate of Retirement (per 1,000)	
	Male	Female		Male	Female
20-24	80	200	62-65	200	200
25-29	80	150	66	400	400
30-34	80	150	67	600	600
35-39	80	80	68	800	800
40-44	25	80	69+	1,000	1,000
45-49	20	60			
50-54	10	30			
55+	0	0			

Age	Rate of Disability (per 1,000)	
	Male	Female
25	0.00	0.00
30	0.00	0.00
35	0.00	0.00
40	0.00	0.00
45	0.00	0.00
50	0.00	0.00
55	0.00	0.00

Actuarial Valuation Modeling Method 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

The City of Bismarck Employees' Pension Plan

Exhibit 9

Development of Unfunded Actuarial Accrued Liability

		1/1/21
1. Actuarial Accrued Liability		
(a) Participants receiving benefits	\$	58,971,882
(b) Terminated vested Participants		4,095,443
(c) Active Participants		<u>61,781,501</u>
(d) Total Participants = (a)+(b)+(c)	\$	124,848,826
2. Adjustment for cost of living adjustments		0
3. Adjustment for assumption changes		<u>(122,712)</u>
4. Actuarial Accrued Liability after adjustments = (1)(d)+(2)+(3), not less than zero	\$	124,726,114
5. Actuarial Value of Assets		<u>118,296,160</u>
6. Unfunded Actuarial Accrued Liability as of January 1, 2021 = (4)-(5)	\$	6,429,954

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.

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 18 years remaining in the amortization period. The resulting amortization payment is a component of the recommended 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 recommended 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 recommended contribution, the UAAL will be reduced more rapidly. Alternatively, if the employer contribution is less than the recommended contribution, the UAAL will reduce more slowly or even increase.

The City of Bismarck Employees' Pension Plan

Exhibit 10

Development of Actuarial (Gain)/Loss

Development of Liability (Gain) or Loss

Actual Actuarial Liability as of January 1, 2020		\$ 118,861,965
Expected changes		
• Normal cost	\$ 3,206,349	
• Interest at 7.5%	9,155,124	
• Cost of living adjustment	0	
• Benefit payments with interest to year end	<u>(6,552,647)</u>	
• Total expected changes		\$ 5,808,826
Expected Actuarial Liability as of January 1, 2021		\$ 124,670,791
Actual Actuarial Liability as of January 1, 2021		124,726,114
Actuarial Liability (gain) or loss		\$ 55,323

Breakdown of Actuarial Liability (gain) or loss by source

• Participant experience different than assumed for death, retirement, termination, disability and other amounts		\$ 60,490
• Inactive mortality		(291,299)
• Salary increases different than expected		408,844
• New entrants		0
• Assumption changes		<u>(122,712)</u>
Actuarial Liability (gain) or loss		\$ 55,323

Development of Asset (Gain) or Loss

Market Value of Assets as of January 1, 2020		\$ 108,921,100
• Interest at 7.5%		8,169,082
• Actual contributions with interest to year-end		4,602,338
• Actual benefit payments with interest to year-end		(6,552,647)
• Actual expenses with interest to year-end		<u>(460,641)</u>
Expected value of assets as of January 1, 2021		\$ 114,679,232
Actual value of assets as of January 1, 2021		118,296,160
Asset (gain) or loss		\$ (3,616,928)

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 2020, an actuarial liability loss of \$55,323 and an asset gain of \$3,616,928 resulted in a decrease in UAAL of \$3,561,605.

The City of Bismarck Employees' Pension Plan

Exhibit 11

Recommended Amortization Schedule

Year	Unfunded Liability at Beginning of Year	Annual Amortization Payment	Unfunded Liability at End of Year
2021	\$ 6,429,954	\$ 501,367	\$ 6,373,231
2022	6,373,231	516,408	6,296,085
2023	6,296,085	531,900	6,196,499
2024	6,196,499	547,857	6,072,290
2025	6,072,290	564,293	5,921,097
2026	5,921,097	581,222	5,740,366
2027	5,740,366	598,659	5,527,335
2028	5,527,335	616,619	5,279,020
2029	5,279,020	635,118	4,992,195
2030	4,992,195	654,172	4,663,375
2031	4,663,375	673,797	4,288,796
2032	4,288,796	694,011	3,864,394
2033	3,864,394	714,831	3,385,780
2034	3,385,780	736,276	2,848,217
2035	2,848,217	758,364	2,246,592
2036	2,246,592	781,115	1,575,388
2037	1,575,388	804,548	828,653
2038	828,653	828,653	-

The Annual Amortization Payment is determined by amortizing the Unfunded Actuarial Accrued Liability (UAAL) over 18 years as a level percentage of total payroll. Total payroll is assumed to increase at 3% per year.

This schedule is in accordance with Governmental Accounting Standards Board No. 27 guidelines. The City commission has approved that the City contribution will be 10.4% of salary. Please see Exhibit 13 for more details.

The City of Bismarck Employees' Pension Plan

Exhibit 12

Development of Annual Recommended Contribution

Annual Recommended Contribution (Dollar Amounts)

	2020		2021	
1. Total Normal Cost	\$	3,206,349	\$	2,899,200
2. Expected Administrative Expenses		378,144		457,311
3. Expected employee contribution		<u>(1,408,539)</u>		<u>(1,415,529)</u>
4. City Normal Cost	\$	2,175,954	\$	1,940,982
5. Amortization of Unfunded Actuarial Accrued Liability		<u>748,109</u>		<u>501,367</u>
6. Total annual recommended contribution	\$	2,924,063	\$	2,442,349
7. Interest to mid-year at 7.5%		<u>109,652</u>		<u>91,588</u>
8. Recommended contribution, mid-year = (6)+(7)	\$	3,033,715	\$	2,533,937

Annual Recommended Contribution (As a Percent of Payroll)

	2020		2021	
1. Total Normal Cost		11.4%		10.2%
2. Expected Administrative Expenses		1.3%		1.6%
3. Expected employee contribution		<u>(5.0%)</u>		<u>(5.0%)</u>
4. City Normal Cost		7.7%		6.8%
5. Amortization of Unfunded Actuarial Accrued Liability		<u>2.6%</u>		<u>1.8%</u>
6. Total annual recommended contribution		10.4%		8.6%
7. Interest to mid-year at 7.5%		<u>0.4%</u>		<u>0.3%</u>
8. Recommended contribution, mid-year = (6)+(7)		10.8%		8.9%

Percent of Payroll results are based on total expected covered payroll of \$28,170,781 in 2020 and \$28,310,578 in 2021. The expected city contribution of 10.4% of covered payroll is more than the 2021 annual recommended contribution of 8.9%.

The City of Bismarck Employees' Pension Plan

Exhibit 13

10.4% of Payroll Funding Amortization Schedule

Year	Unfunded Liability B.O.Y.	Amortization Payment E.O.Y.	Unfunded Liability E.O.Y.
2021	\$ 6,429,954	\$ 487,539	\$ 6,424,662
2022	\$ 6,424,662	\$ 527,827	\$ 6,378,685
2023	\$ 6,378,685	\$ 506,450	\$ 6,350,636
2024	\$ 6,350,636	\$ 484,411	\$ 6,342,523
2025	\$ 6,342,523	\$ 469,085	\$ 6,349,127
2026	\$ 6,349,127	\$ 457,250	\$ 6,368,062
2027	\$ 6,368,062	\$ 435,085	\$ 6,410,582
2028	\$ 6,410,582	\$ 414,626	\$ 6,476,750
2029	\$ 6,476,750	\$ 397,409	\$ 6,565,097
2030	\$ 6,565,097	\$ 385,503	\$ 6,671,976
2031	\$ 6,671,976	\$ 366,846	\$ 6,805,528
2032	\$ 6,805,528	\$ 342,964	\$ 6,972,979
2033	\$ 6,972,979	\$ 327,465	\$ 7,168,487
2034	\$ 7,168,487	\$ 312,478	\$ 7,393,646
2035	\$ 7,393,646	\$ 295,766	\$ 7,652,403
2036	\$ 7,652,403	\$ 275,974	\$ 7,950,359
2037	\$ 7,950,359	\$ 256,305	\$ 8,290,331
2038	\$ 8,290,331	\$ 238,858	\$ 8,673,248
2039	\$ 8,673,248	\$ 224,905	\$ 9,098,837
2040	\$ 9,098,837	\$ 208,253	\$ 9,572,997
2041	\$ 9,572,997	\$ 187,692	\$ 10,103,280
2042	\$ 10,103,280	\$ 165,818	\$ 10,695,208
2043	\$ 10,695,208	\$ 141,854	\$ 11,355,495
2044	\$ 11,355,495	\$ 114,649	\$ 12,092,508
2045	\$ 12,092,508	\$ 83,856	\$ 12,915,590
2046	\$ 12,915,590	\$ 49,680	\$ 13,834,579
2047	\$ 13,834,579	\$ 13,930	\$ 14,858,242
2048	\$ 14,858,242	\$ -	\$ 15,972,610
2049	\$ 15,972,610	\$ -	\$ 17,170,556
2050	\$ 17,170,556	\$ -	\$ 18,458,348

The City commission has approved that the City contribution will be 10.4% of salary. The expected contribution for 2021 on this basis is \$2,944,300. 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 10.4% of salary per year will not amortize the UAAL over 30 years or any other period of time.

The City of Bismarck Employees' Pension Plan

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 annual recommended 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)

	1/1/20	1/1/21
Vested accrued benefits		
• Participants currently receiving payments	\$ 54,018,742	\$ 59,923,080
• Other Participants	<u>44,213,152</u>	<u>45,081,840</u>
Total vested accrued benefits	\$ 98,231,894	\$ 105,004,920
Non-vested accrued benefits	<u>321,948</u>	<u>354,136</u>
Total accrued benefits	\$ 98,553,842	\$ 105,359,056

Statement of Changes in Accumulated Plan Benefits

Beginning value, January 1, 2020	\$ 98,553,842
Increases (Decreases)	
• Benefits earned	\$ 1,948,896
• Cost of living adjustment	0
• Change in actuarial assumptions	1,688,933
• Experience (gain)/loss	7,436,075
• Increase for interest due to decrease in discount period	2,047,114
• Benefits paid	<u>(6,315,804)</u>
• Net increase (decrease)	\$ 6,805,214
Ending Value, January 1, 2021	\$ 105,359,056

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, 2021, the Market Value of Assets was \$118,296,160. The table below outlines the funding ratios.

Funding Ratio (Assets/PVAB)

Vested accrued benefits	112%
Total accrued benefits	112%