

North Dakota

# Highway Patrolmen's Retirement System

Actuarial Valuation as of July 1, 2022



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October 14, 2022

Board Members  
North Dakota Highway Patrolmen's Retirement System  
Bismarck, North Dakota

Members of the Board:

We are pleased to provide our formal annual Actuarial Valuation Report as of July 1, 2022, for the North Dakota Highway Patrolmen's Retirement System ("HPRS"). The actuarial valuation was performed at the request of the Board and is intended for use by the Board and HPRS and those designated by the Board and HPRS. This report may be provided to parties other than the Board and HPRS only in its entirety and only with the permission of the Board and HPRS. GRS is not responsible for unauthorized use of this report.

The purposes of the actuarial valuation are to measure the funding progress of HPRS and to determine the actuarial employer contribution rate for the HPRS for the Plan Year commencing July 1, 2022, and ending on June 30, 2023. This actuarial valuation also provides information required by GASB Statement Nos. 67 and 68. This report should not be relied on for any purpose other than the purposes described herein. Determinations of financial results, associated with the benefits described in this report, for purposes other than those identified above may be significantly different.

The actuarial employer contribution rate in this report is determined using the actuarial assumptions and methods disclosed in Section E of this report. This report includes common risk metrics on page A-5 but does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

This actuarial valuation assumed the continuing ability of the plan sponsor to make the contributions necessary to fund this plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

The actuarial valuation was based upon information furnished by the NDPERS Staff, concerning benefits provided by the North Dakota Highway Patrolmen's Retirement System, financial transactions, plan provisions and census data for active members, terminated members, retirees and beneficiaries as of July 1, 2022. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by the NDPERS Staff.

This report was prepared using actuarial assumptions adopted by the Board as authorized under North Dakota Administrative Code Section 71-05. The investment return assumption was decreased from 7.00 percent to 6.50 percent beginning with the July 1, 2022 actuarial valuation. All other assumptions are unchanged since the last valuation and were based on an experience review for the period from July 1, 2014 to July 1, 2019. The assumptions were adopted for first use commencing with the actuarial valuation

as of July 1, 2020. All actuarial assumptions used in this report are reasonable for the purposes of this actuarial valuation. Additional information about the actuarial assumptions are included in Section E of this report.

The contributions that are made by employers are based on fixed contribution rates that are set by statute (and not based on the actuarially determined rate). The current statutory contribution rate of 20.20 percent is significantly lower than the actuarial contribution rate of 39.35 percent, and is not enough to amortize the unfunded liability over any period of time.

In 2021, Senate Bill 2043 was passed which establishes gradual retirement contribution increases to the HPRS. The statutory employer and employee contributions will each increase by 0.5 percent of pay every year from January 1, 2022 to January 1, 2025, ultimately increasing both by 2.0 percent of pay. There were no other changes in plan provisions since the last actuarial valuation as of July 1, 2021.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents the actuarial position of the North Dakota Highway Patrolmen's Retirement System as of the actuarial valuation date. 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.

This report was prepared using our proprietary valuation model and related software which, in our professional judgment, has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

This report reflects the impact of COVID-19 through June 30, 2022. However, this report does not reflect the longer term and still developing future impact of COVID-19, which is likely to further influence demographic experience and economic expectations. We will continue to monitor these developments and their impact.

Bonita J. Wurst and Abra Hill are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

The signing actuaries are independent of the plan sponsor.



Board Members  
North Dakota Highway Patrolmen's Retirement System  
October 14, 2022  
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Gabriel, Roeder, Smith & Company will be pleased to review this actuarial valuation and report with the Board of Trustees and to answer any questions pertaining to the actuarial valuation.

Respectfully submitted,

Gabriel, Roeder, Smith & Company



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cc: Scott Miller, NDPERS  
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## **SECTION A**

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### **ACTUARIAL VALUATION RESULTS**

# Comments on the Actuarial Valuation

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## Purpose

At your request, we have performed an actuarial valuation of the North Dakota Highway Patrolmen's Retirement System ("HPRS") as of July 1, 2022.

The purposes of this actuarial valuation are as follows:

- To determine the funding status of the System as of the actuarial valuation date;
- To determine the actuarial employer contribution rate for the fiscal year beginning July 1, 2022; and
- To provide other data required by NDPERS.

Pension plan financial reporting under GASB Statement Nos. 67 and 68 is provided in Section D of this report.

## Membership Data

We received the data from the NDPERS Staff. We performed certain checks for reasonableness and found the data to be complete and reliable for actuarial valuation purposes. However, we did not audit the data.

A total of 151 active members were included in the actuarial valuation as of July 1, 2022. Between the 2021 and 2022 actuarial valuations, the number of active employees remained at 151 members. The average annual actuarial valuation pay increased by 6.5 percent, from \$76,266 to \$81,240 between the 2021 and 2022 actuarial valuation. There were 16 active members who were eligible for retirement (normal, early or Rule of 80) as of July 1, 2022.

The number of benefit recipients remained the same since the last actuarial valuation. The average monthly benefit increased, from \$3,589 to \$3,602. During the year ending June 30, 2022, there were two members awarded a benefit.

There were 35 inactive members as of July 1, 2022, who were vested and elected to receive a deferred benefit. The average monthly deferred benefit is \$2,478. There were 20 inactive members as of July 1, 2022, who elected to receive a refund of contributions.

Section C summarizes the membership data.

## Plan Provisions

Section F outlines the principal benefit provisions of the HPRS. Since the June 30, 2020 actuarial valuation, Senate Bill 2043 was passed which establishes gradual retirement contribution increases to the HPRS. The statutory employer and employee contributions will each increase by 0.5 percent of pay every year from January 1, 2022 to January 1, 2025, ultimately increasing both by 2.0 percent of pay.

The Board set the rate at 2.00 percent for the indexing percentage for the year beginning July 1, 2022, applicable to the final average salaries of HPRS deferred vested members.



# Comments on the Actuarial Valuation (Continued)

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## Actuarial Assumptions and Methods

This report was prepared using actuarial assumptions adopted by the Board as authorized under North Dakota Administrative Code Section 71-05. All actuarial assumptions used in this report are reasonable for the purposes of this actuarial valuation.

Most of the actuarial assumptions used in the actuarial valuation as of July 1, 2022 were based on an experience review for the five-year period ending July 1, 2019. The actuarial assumptions were first adopted for use commencing with the actuarial valuation as of July 1, 2020.

Section E outlines the actuarial assumptions and methods used in the actuarial valuation. There was a decrease in the investment return assumption, from 7.00 percent to 6.50 percent, since the previous actuarial valuation.

In a letter dated July 1, 2022, GRS determined that an investment return assumption of 6.50 percent can be deemed reasonable for this valuation. However, we caution that 6.50 percent is really an upper bound. If capital market assumptions remain at the present levels, the 6.50 percent return assumption might not comply with actuarial standards for the July 1, 2023 valuation.

The actuarial assumption for administrative expenses is equal to the prior years' administrative expenses, adjusted for inflation. In total, the administrative expense assumption has increased from \$37,932 to \$67,127.

The actuarial employer contribution rate is calculated using a 20-year open period, level percentage of payroll amortization method. The remaining amortization period will be reset to 20 years in each future actuarial valuation.

## Plan Asset Return

On a market value basis, HPRS assets had an investment return of approximately -6.55 percent (net of investment expenses). On an actuarial value of asset basis, NDPERS assets had an investment return of approximately 6.87 percent on an actuarial value of assets basis, which compares to the prior year assumed rate of return of 7.00 percent.

The actuarial value of assets is currently 104.5 percent of the market value of assets. There are \$4,118,396 in net asset losses currently being deferred that will be phased into the actuarial value of assets over the next four years.

## Gain/Loss Analysis

During the plan year ending July 1, 2022, the unfunded actuarial accrued liability ("UAAL") increased from \$31,925,416 as of July 1, 2021, to \$43,238,171 as of July 1, 2022, which is an increase of \$11,312,755. The key factors contributing to the increase in the UAAL were the change in the investment return assumption, demographic experience, and the difference between the statutory contributions and the actuarially determined contribution rate. The unfunded actuarial accrued liability based on the market value of assets is \$47,356,567.





## Comments on the Actuarial Valuation (Continued)

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### Funded Ratio

The funded ratio measures the portion of the actuarial accrued liability (calculated based on the actuarial assumptions disclosed in this report) that is currently funded. The funded ratio is 69.0 percent on an actuarial value of assets basis and 66.1 percent on a market value of assets basis.

The funded ratio and unfunded actuarial accrued liability are useful for assessing the need for and the amount of future unfunded liability contributions (excludes normal cost contributions). They are not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the System's benefit obligations.

### Employer Contributions

The actuarially determined contribution rate is calculated as the normal cost contribution (to fund benefits accruing during the year) plus a contribution to amortize the unfunded liability. The unfunded liability contribution rate is calculated using a 20-year open period, level percentage of payroll amortization method. The remaining amortization period will be reset to 20 years in each future actuarial valuation. If employers contributed the actuarial contribution rate, the contribution rate would be expected to gradually decrease using a 20-year open amortization period as the funded ratio gradually increased. An open amortization period is expected to gradually improve the funded ratio. However, the funded ratio is not expected to reach 100 percent under this method (assuming no actuarial gains or losses) because the remaining unfunded liability at each future actuarial valuation date is re-amortized over a new 20-year period.

The contributions that are made by employers are based on fixed contribution rates that are set by statute (and not based on the actuarially determined rate). The current statutory contribution rate of 20.20 percent is significantly lower than the actuarial contribution rate of 39.35 percent.

The portion of the statutory contribution that is applied toward the unfunded liability is the statutory contribution rate minus the employer normal cost rate. The unfunded liability contribution rate from the statutory contribution is lower than the rate calculated using the 20-year level percentage of payroll amortization period and is not high enough to amortize the unfunded liability over any period of time based on current statutory contribution rates.

In 2021, Senate Bill 2043 was passed which establishes gradual retirement contribution increases to the HPRS. The statutory employer and employee contributions will each increase by 0.5 percent of pay every year from January 1, 2022 to January 1, 2025, ultimately increasing both by 2.0 percent of pay.

The additional employer and employee contributions will gradually reduce the contribution deficit, but will not eliminate the shortfall completely. We recommend additional increases to the statutory contribution rate such that the unfunded liability is amortized over a period of no longer than 30 years.

## Comments on the Actuarial Valuation (Concluded)

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### Historical Trends

The funded ratio varied during the past 10 years from a low of 68.2 percent in 2013, to a high of 77.4 percent in 2018, to the current funded ratio of 69.0 percent.

# Risk Measures

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## Risks Associated with Measuring the Accrued Liability and Contributions

The determination of the accrued liability and the statutory and actuarially determined contribution requires the use of actuarial assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the actuarial assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the statutory and actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

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 actuarial assumptions; changes in economic or demographic actuarial assumptions due to changing conditions; 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. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. **Investment Risk** – actual investment returns may differ from the expected returns;
2. **Asset/Liability Mismatch** – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. **Contribution Risk** – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll or other relevant contribution base;
4. **Salary and Payroll Risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. **Longevity Risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
6. **Other Demographic Risks** – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.



# Risk Measures

The statutory contribution may be considered as a minimum contribution that complies with State statute. The timely receipt of contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made in accordance with the funding policy do not necessarily guarantee benefit security.

## Plan Maturity Measures

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

	2021	2022
Ratio of the Market Value of Assets to Payroll	8.69	7.53
Ratio of Actuarial Accrued Liability to Payroll	10.71	11.39
Ratio of Actives to Retirees and Beneficiaries	1.12	1.12
Ratio of Non-Investment Cash Flow to Market Value of Assets	-1.70%	-1.30%

### Ratio of Market Value of Assets to Payroll

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

### Ratio of Actuarial Accrued Liability to Payroll

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100 percent is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 2.5 times the payroll, a change in liability 2 percent other than assumed would equal 5 percent of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

### Ratio of Actives to Retirees and Beneficiaries

A young plan with many active members and few retirees will have a high ratio of actives to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

# Risk Measures

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## Ratio of Net Cash Flow to Market Value of Assets

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means benefits and expenses exceed contributions, and existing funds may be used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

## Additional Risk Assessment

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability.

# Summary of Actuarial Valuation Results

	Valuation as of July 1, 2021		Valuation as of July 1, 2022	
	Total	% of Payroll	Total	% of Payroll
<b>Active Members</b>				
Number	151		151	
Average Age	38.0		38.2	
Average Years of Benefit Service	11.1		11.5	
Average Years of Vesting Service	11.9		12.4	
Total Payroll	\$ 11,516,196		\$ 12,267,230	
Projected Annual Compensation	12,191,668		12,978,777	
<b>Inactive Members (Vested and Non-Vested)</b>				
Number	49		55	
Total Annualized Benefits (Vested)	\$ 756,571		\$ 1,040,789	
Total Accumulated Contributions (Non-vested)	\$ 397,501		\$ 342,920	
<b>Retired Members and Beneficiaries</b>				
Number	135		135	
Total Annualized Benefits	\$ 5,814,082		\$ 5,834,859	
Total Membership	335		341	
<b>Actuarial Accrued Liability</b>				
Active Members	\$ 48,507,628		\$ 58,449,807	
Inactive Members (Vested and Non-Vested)	7,411,358		10,961,785	
Retired Members and Beneficiaries	67,452,015		70,269,472	
Total	123,371,001		139,681,064	
Actuarial Value of Assets	\$ 91,445,585		\$ 96,442,893	
Unfunded Actuarial Accrued Liability	\$ 31,925,416		\$ 43,238,171	
Funded Ratio (Actuarial Value of Assets)	74.1%		69.0%	
<b>Annual Gross Normal Cost</b>				
Benefits	\$ 3,280,944	26.91 %	\$ 3,942,919	30.38 %
Expenses of Administration	37,932	0.31 %	67,127	0.52 %
Total	3,318,876	27.22 %	4,010,046	30.90 %
Amortization of Unfunded Liability <sup>1</sup>	\$ 2,223,589	18.24 %	\$ 2,887,495	22.25 %
<b>Annual Contribution Requirement:</b>				
Employer Portion	\$ 3,920,973	32.16 %	\$ 5,106,470	39.35 %
Employee Portion	1,621,492	13.30 %	1,791,071	13.80 %
Total	5,542,465	45.46 %	6,897,541	53.15 %
Actuarial Contribution	\$ 3,920,973	32.16 %	\$ 5,106,470	39.35 %
Statutory Employer Contribution	2,401,759	19.70 %	2,621,713	20.20 %
Statutory Contribution Deficit/(Surplus) <sup>2</sup>	1,519,215	12.46 %	2,484,757	19.15 %
Amortization Period from Statutory Rate (Years) <sup>2</sup>	100+		100+	
<b>Results Based on Market Value of Assets</b>				
Market Value of Assets	\$ 100,075,809		\$ 92,324,497	
Unfunded Actuarial Accrued Liability	\$ 23,295,192		\$ 47,356,567	
Funded Ratio (Market Value of Assets)	81.1%		66.1%	
Total Annual Gross Normal Cost	3,318,876	27.22 %	4,010,046	30.90 %
Amortization of Unfunded Liability <sup>1</sup>	\$ 1,622,498	13.31 %	\$ 3,162,527	24.37 %
<b>Annual Contribution Requirement:</b>				
Employer Portion	\$ 3,319,882	27.23 %	\$ 5,381,502	41.47 %
Employee Portion	1,621,492	13.30 %	1,791,071	13.80 %
Total	4,941,374	40.53 %	7,172,573	55.27 %
Actuarial Contribution	\$ 3,319,882	27.23 %	\$ 5,381,502	41.47 %
Statutory Employer Contribution	2,401,759	19.70 %	2,621,713	20.20 %
Statutory Contribution Deficit/(Surplus) <sup>2</sup>	918,123	7.53 %	2,759,789	21.27 %
Amortization Period from Statutory Rate (Years) <sup>2</sup>	100+		100+	

<sup>1</sup> Amortization as a level percentage of payroll over a 20-year open period. Total payroll assumed to increase by 3.50%.

<sup>2</sup> Contribution deficits and amortization periods do not reflect the future statutory contribution increases of 3.0% of pay.



# Actuarial Valuation Results

## Gain/Loss Analysis

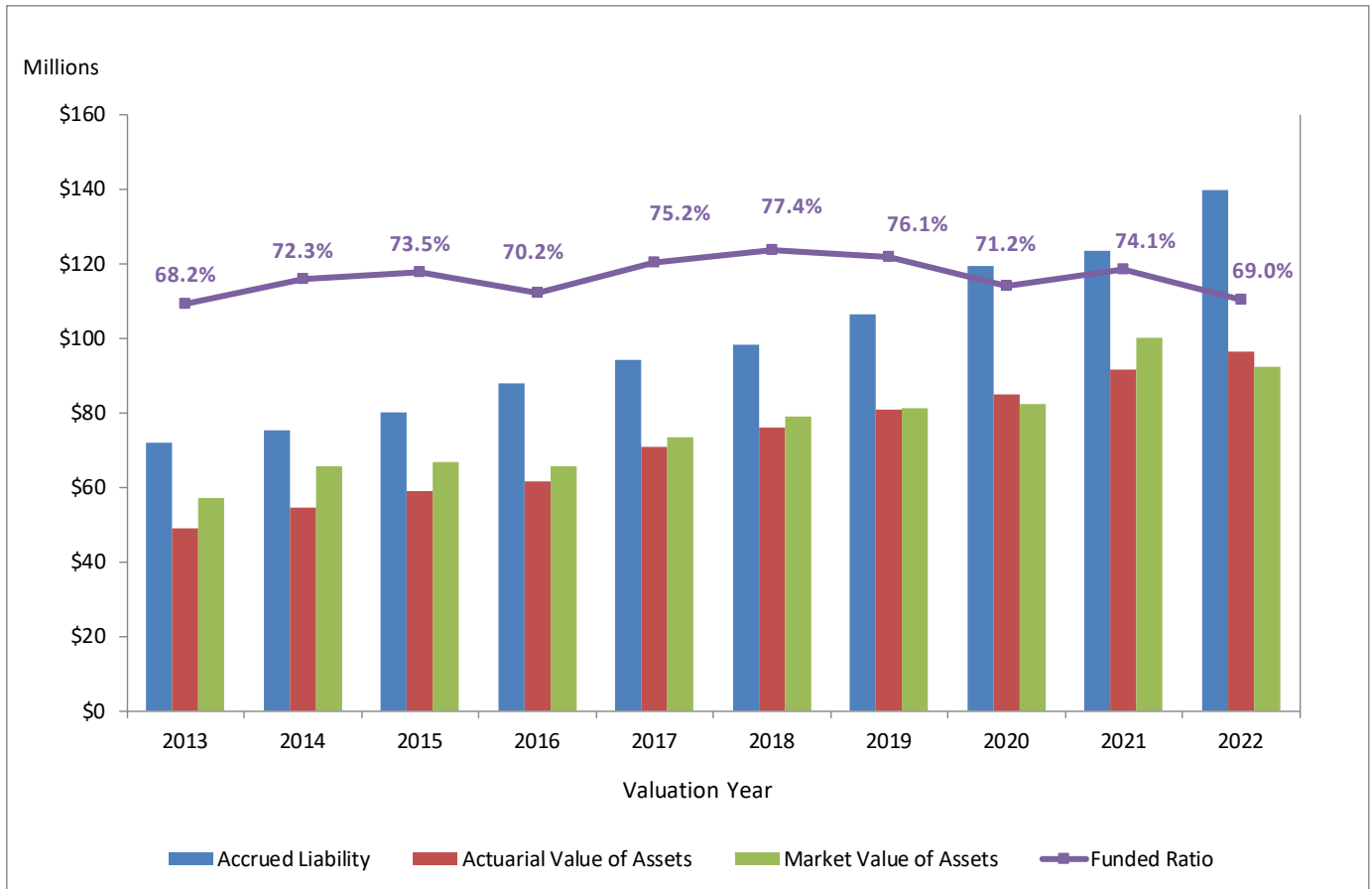
Unfunded liability at previous valuation	\$ 31,925,416
<u>Expected unfunded liability at current valuation</u>	
Normal cost for plan year	3,318,876
Interest on unfunded liability and normal cost	2,348,975
Contributions using actuarial rate with interest to current valuation date	<u>5,733,171</u>
Total expected change in unfunded liability at current valuation	(65,320)
Total expected unfunded liability at current valuation	31,860,096
Change due to:	
Amount of contributions (statutory vs actuarial contributions)	1,065,379
Amount of administrative expenses	28,672
Recognition of asset (gains)/losses	119,830
Salary experience	1,258,266
Retirement experience	407,995
Withdrawal experience	(197,484)
Disability experience	(11,287)
Death in Service experience	21,570
Death After Retirement experience	68,558
New entrants	123,171
Data changes and other experience	8,506
Change in actuarial assumptions	8,484,899
Changes in plan provisions	-
Total change	<u>11,378,075</u>
Unfunded liability at current valuation	\$ 43,238,171

FY 2022 Actuarial Employer Contribution Rate	32.16%
Expected FY 2023 Employer Contribution Rate	31.00%
Expected FY 2023 Employer Contribution Rate with New Pay Base	30.57%
Impact due to New Pay Base	-0.43%
Change due to:	
Amount of contributions (statutory vs actuarial contributions)	0.58%
Amount of administrative expenses	0.23%
Recognition of asset (gains)/losses	0.06%
Salary experience	0.67%
Retirement experience	0.22%
Withdrawal experience	-0.10%
Disability experience	-0.01%
Death in Service experience	0.01%
Death After Retirement experience	0.04%
New entrants	0.07%
Data changes and other experience	0.02%
Change in actuarial assumptions	6.99%
Changes in plan provisions	<u>0.00%</u>
Total change	8.78%
FY 2023 Actuarial Employer Contribution Rate	39.35%
FY 2023 Statutory Contribution Rate	20.20%

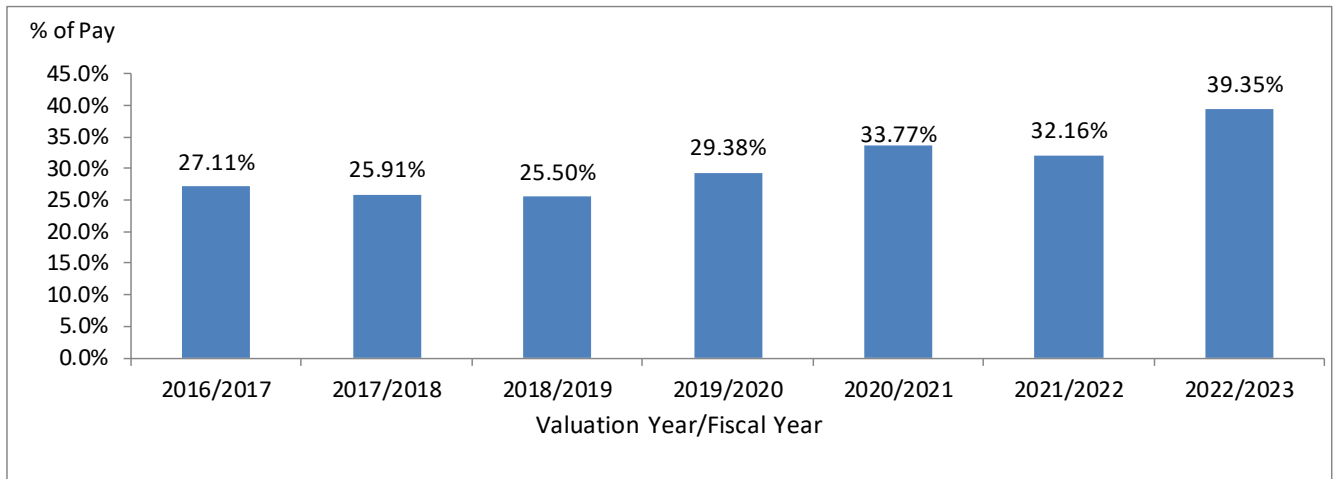


# Historical Trends of Funded Ratio and Employer Contributions

## Funded Ratio History



## Actuarial Employer Contribution Rate History





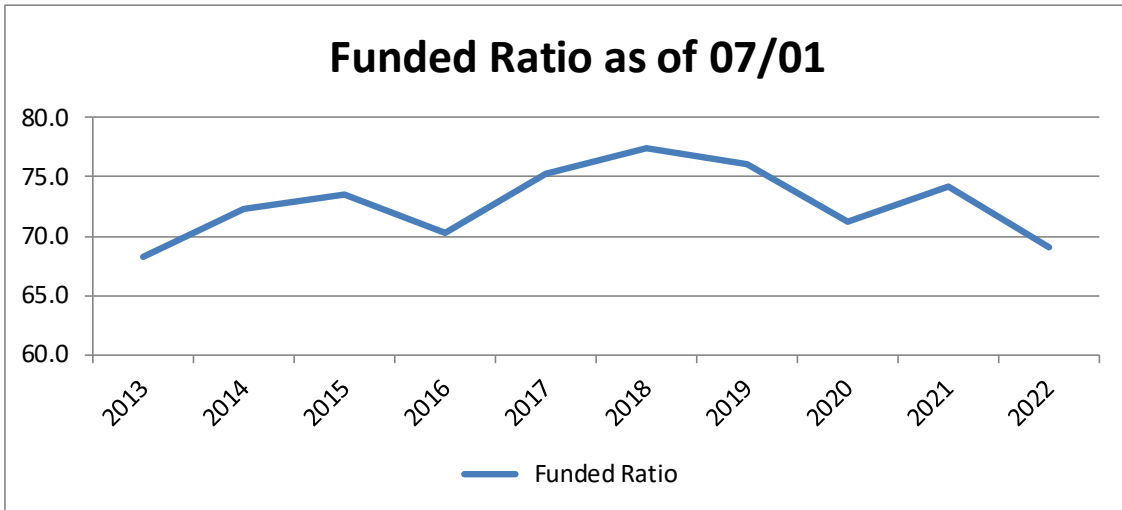
## Actuarial Valuation Results Solvency Test (\$ in Millions)

Valuation Date 6/30	Total Actuarial Accrued Liability	(1)	(2)	(3)	Actuarial Value of Assets	Portion (%) of Present Value Covered By Assets		
		Active Member Contributions	Retirees, Term Vested and Beneficiaries	Active Members (Employer Financed Portion)		(1)	(2)	(3)
2013	\$ 71.9	\$ 13.5	\$ 40.5	\$ 17.9	\$ 49.0	100%	88%	0%
2014	75.5	14.8	41.9	18.8	54.6	100%	95%	0%
2015	80.1	12.3	54.1	13.7	58.9	100%	86%	0%
2016	87.9	14.3	53.9	19.7	61.7	100%	88%	0%
2017	94.0	16.0	57.3	20.7	70.7	100%	95%	0%
2018	98.4	17.4	60.1	20.8	76.1	100%	98%	0%
2019	106.3	18.2	66.3	21.8	80.9	100%	95%	0%
2020	119.3	19.5	72.6	27.2	84.9	100%	90%	0%
2021	123.4	20.7	74.9	27.8	91.4	100%	95%	0%
2022	139.7	22.5	81.2	36.0	96.4	100%	91%	0%



## Funded Ratio History

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)
7/1/2013	\$ 49,039,331	\$ 71,892,312	\$ 22,852,981	68.2
7/1/2014	54,563,383	75,464,668	20,901,285	72.3
7/1/2015	58,875,531	80,112,217	21,236,686	73.5
7/1/2016	61,733,910	87,921,960	26,188,050	70.2
7/1/2017	70,722,302	94,047,078	23,324,776	75.2
7/1/2018	76,107,932	98,385,960	22,278,028	77.4
7/1/2019	80,902,296	106,315,030	25,412,734	76.1
7/1/2020	84,875,194	119,283,896	34,408,702	71.2
7/1/2021	91,445,585	123,371,001	31,925,416	74.1
7/1/2022	96,442,893	139,681,064	43,238,171	69.0



## Schedule of Funding Progress

Valuation Year	Actuarial Accrued Liabilities	Valuation Assets (AVA)	Unfunded Actuarial Accrued Liabilities	Ratio of Assets to AAL	Active Member Payroll	UAAL as Percent of Active Member Payroll
2013 <sup>1</sup>	\$ 71,892,312	\$ 49,039,331	\$ 22,852,981	68.2%	\$ 8,167,000	279.8%
2014	75,464,668	54,563,383	20,901,285	72.3%	9,348,386	223.6%
2015	80,112,217	58,875,531	21,236,686	73.5%	10,145,713	209.3%
2016	87,921,960	61,733,910	26,188,050	70.2%	10,526,791	248.8%
2017	94,047,078	70,722,302	23,324,776	75.2%	10,629,403	219.4%
2018	98,385,960	76,107,932	22,278,028	77.4%	10,737,297	207.5%
2019	106,315,030	80,902,296	25,412,734	76.1%	10,354,210	245.4%
2020	119,283,896	84,875,194	34,408,702	71.2%	11,409,711	301.6%
2021	123,371,001	91,445,585	31,925,416	74.1%	11,516,196	277.2%
2022	139,681,064	96,442,893	43,238,171	69.0%	12,267,230	352.5%

<sup>1</sup> The active member payroll is approximated based on figures from the NDPERS Comprehensive Annual Financial Report.

## **SECTION B**

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### **ASSET EXHIBITS**

## Statement of Fiduciary Net Position

	Fiscal Year Ending	
	June 30, 2021	June 30, 2022
<b>Assets</b>		
Cash	\$ -	\$ -
Receivables		
Contribution receivable	4,300	730,304
Interest receivable	214,366	214,063
Due from other fiduciary funds	-	-
Due from Uniform Group Insurance Plan	-	-
Due from other state agencies	-	-
Total receivables	<u>218,666</u>	<u>944,367</u>
Investments		
External Investment Pool	99,855,106	91,378,024
Equities	-	-
Fixed income	-	-
Real estate	-	-
Annuities	-	-
Alternative investments	-	-
Invested cash	-	-
Total Investments	<u>99,855,106</u>	<u>91,378,024</u>
Prepaid expenses	-	-
Invested Securities Lending Collateral	415,066	589,333
Capital assets (net of depreciation/amortization)	2,037	2,106
Total assets	<u>100,490,875</u>	<u>92,913,830</u>
<b>Liabilities</b>		
Salaries payable	-	-
Accounts payable	-	-
Due to other fiduciary funds	-	-
Due to Uniform Group Insurance Plan	-	-
Securities Lending Collateral	415,066	589,333
Due to other state agencies	-	-
Accrued compensated absences	-	-
Total liabilities	<u>415,066</u>	<u>589,333</u>
<b>Net position restricted for pensions</b>	<u>\$ 100,075,809</u>	<u>\$ 92,324,497</u>



## Statement of Changes in Fiduciary Net Position

	Fiscal Year Ending	
	June 30, 2021	June 30, 2022
<b>Additions</b>		
Contributions:		
From employer	\$ 2,293,404	\$ 2,686,795
From employee	1,548,335	1,825,729
Transfer from general fund	-	-
Transfers from other plans	-	-
Total contributions	<u>3,841,739</u>	<u>4,512,524</u>
Investment income:		
Net change in fair value of investments	18,448,605	(8,022,147)
Interest and dividends	1,427,901	1,747,872
Less investment expense	<u>(244,020)</u>	<u>(239,010)</u>
Net investment income	19,632,486	(6,513,285)
Securities Lending Income	5,355	3,314
Repurchase service credit	400,751	159,747
Miscellaneous income	<u>(11)</u>	<u>62</u>
Total additions	<u>23,880,320</u>	<u>(1,837,638)</u>
<b>Deductions</b>		
Benefits paid to participants	5,780,173	5,840,127
Refunds	171,704	7,897
Transfers to other plans	-	-
	<u>5,951,877</u>	<u>5,848,024</u>
Administrative expenses	<u>37,097</u>	<u>65,650</u>
Total deductions	<u>5,988,974</u>	<u>5,913,674</u>
Change in net position	17,891,346	(7,751,312)
<b>Net position restricted for pensions</b>		
Beginning of year	<u>82,184,463</u>	<u>100,075,809</u>
End of year	<u>\$ 100,075,809</u>	<u>\$ 92,324,497</u>



## Development of Actuarial Value of Assets

Fiscal Year Ending	2021	2022	2023	2024	2025	2026
Beginning of Year:						
(1) Market Value of Assets	\$ 82,184,463	\$ 100,075,809				
(2) Actuarial Value of Assets <sup>1</sup>	84,875,194	91,445,585				
End of Year:						
(3) Market Value of Assets	100,075,809	92,324,497				
(4a) Contributions (Incl. repurchase svc credit)	4,242,479	4,672,333				
(4b) Net Disbursements	5,988,974	5,913,674				
(5) Total Investment Income	19,637,841	(6,509,971)				
=(3)-(1)-(4a)+(4b)						
(6) Projected Rate of Return	7.00%	7.00%				
(7) Projected Investment Income						
=(1)x(6)+[(1+(6)) <sup>5</sup> -1]x(4a-4b)	5,692,819	6,962,595				
(8) Asset Adjustment	-	-				
(9) Investment Income in Excess of Projected Income	13,945,022	(13,472,566)				
(10) Excess Investment Income Recognized This Year (5-year recognition)						
(10a) From This Year	\$ 2,789,004	\$ (2,694,513)				
(10b) From One Year Ago	(673,778)	2,789,004	\$ (2,694,513)			
(10c) From Two Years Ago	(359,800)	(673,778)	2,789,004	\$ (2,694,513)		
(10d) From Three Years Ago	215,139	(359,800)	(673,778)	2,789,004	\$ (2,694,513)	
(10e) From Four Years Ago	653,502	215,141	(359,802)	(673,777)	2,789,006	\$ (2,694,514)
(10f) Total Recognized Investment Gain/(Loss)	2,624,067	(723,946)	(939,089)	(579,286)	94,493	(2,694,514)
(11) Change in Actuarial Value of Assets						
=(4a)-(4b)+(7)+(8)+(10f)	6,570,391	4,997,308				
End of Year:						
<b>(3) Market Value of Assets</b>	<b>\$ 100,075,809</b>	<b>\$ 92,324,497</b>				
<b>(12) Final Actuarial Value of Assets as of 6/30 = (2)+(11)</b>	<b>\$ 91,445,585</b>	<b>\$ 96,442,893</b>				
(13) Difference Between Market & Actuarial Values	8,630,224	(4,118,396)				
(14) Estimated Market Value Rate of Return on Total Plan Assets	24.15%	(6.55)%				
(15) Actuarial Value Rate of Return	9.90%	6.87%				
(16) Ratio of Actuarial Value to Market Value	91.4%	104.5%				

<sup>1</sup>Asset gains and losses in FY 2016 and prior were fully recognized as of July 1, 2017, and subsequent asset gains/losses will be smoothed in over a five-year period.



## Changes in Actuarial Value of Assets

Date	Employer Contributions	Member Contributions**	Administrative Expenses	Benefit Payments and Refunds	Investment Income	Actuarial Value of Assets at End of Year	Market Value of Assets at End of Year
7/1/2013	\$ 1,586,186	\$ 1,161,784	\$ (29,237)	\$ (3,772,316)	\$ 1,998,705	\$ 49,039,331	\$ 57,044,084
7/1/2014	1,864,632	1,330,938	(27,983)	(3,787,735)	6,144,200	54,563,383	65,666,865
7/1/2015	2,002,291	1,448,227	(30,925)	(4,745,510)	5,638,065	58,875,531	66,675,728
7/1/2016	2,127,355	1,436,236	(31,450)	(4,713,495)	4,039,733	61,733,910	65,811,337
7/1/2017*	2,155,944	1,711,155	(30,195)	(4,806,319)	5,880,380	70,722,302	73,336,316
7/1/2018	2,152,970	1,734,919	(30,353)	(4,981,377)	6,509,471	76,107,932	78,929,000
7/1/2019	2,090,886	1,579,402	(43,555)	(5,391,115)	6,558,746	80,902,296	81,415,519
7/1/2020	2,176,902	1,675,127	(45,870)	(5,704,586)	5,871,325	84,875,194	82,184,463
7/1/2021	2,293,404	1,949,075	(37,097)	(5,951,877)	8,316,886	91,445,585	100,075,809
7/1/2022	2,686,795	1,985,538	(65,650)	(5,848,024)	6,238,649	96,442,893	92,324,497
10-Year Total	21,137,365	16,012,401	(372,315)	(49,702,354)	57,196,160		

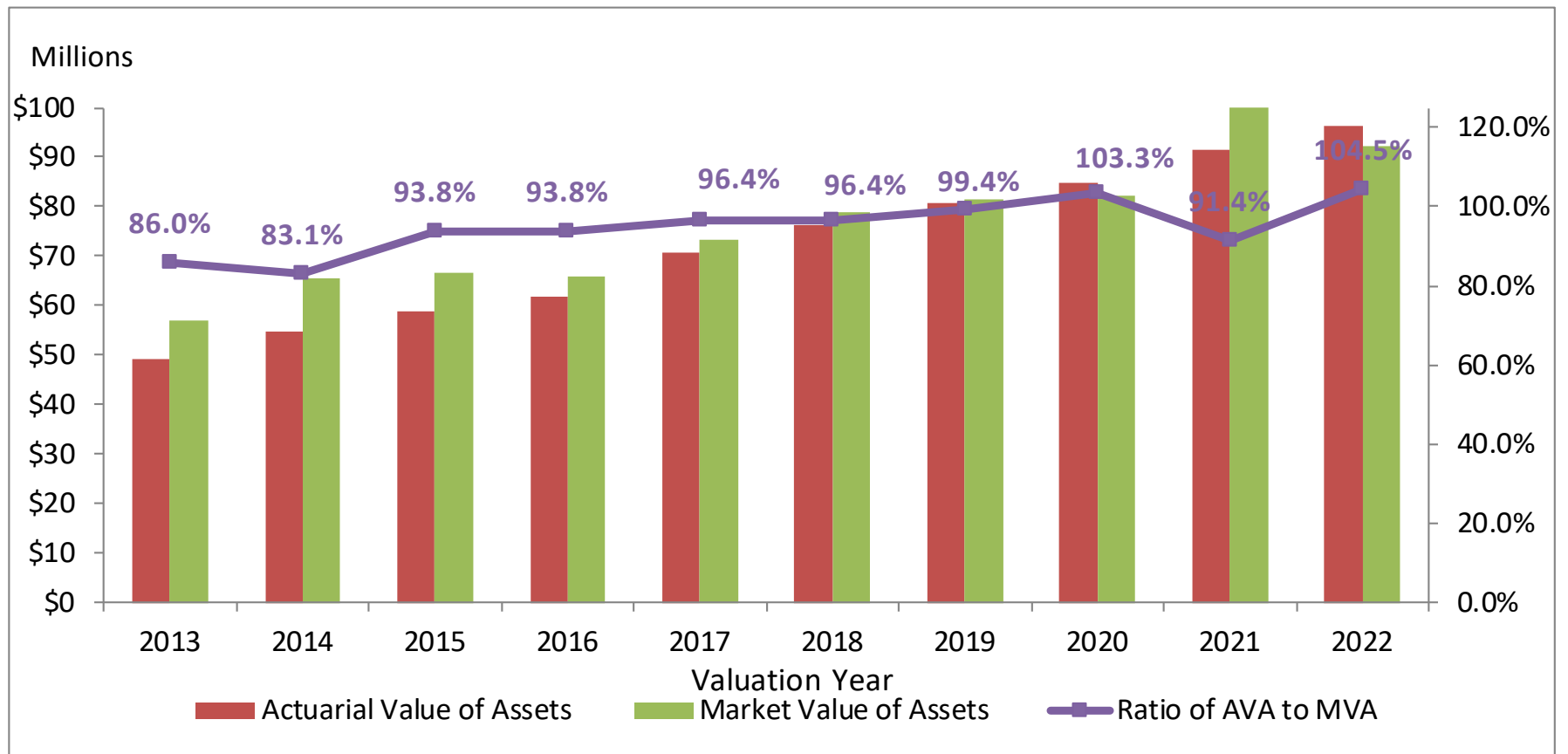
\* Asset gains and losses in FY 2016 and prior were fully recognized as of July 1, 2017, and subsequent asset gains/losses will be smoothed in over a five-year period. The recognition of prior year net deferred asset gains as of July 1, 2017, is not included as investment income.

\*\* Member Contributions include repurchased service credit and miscellaneous income.



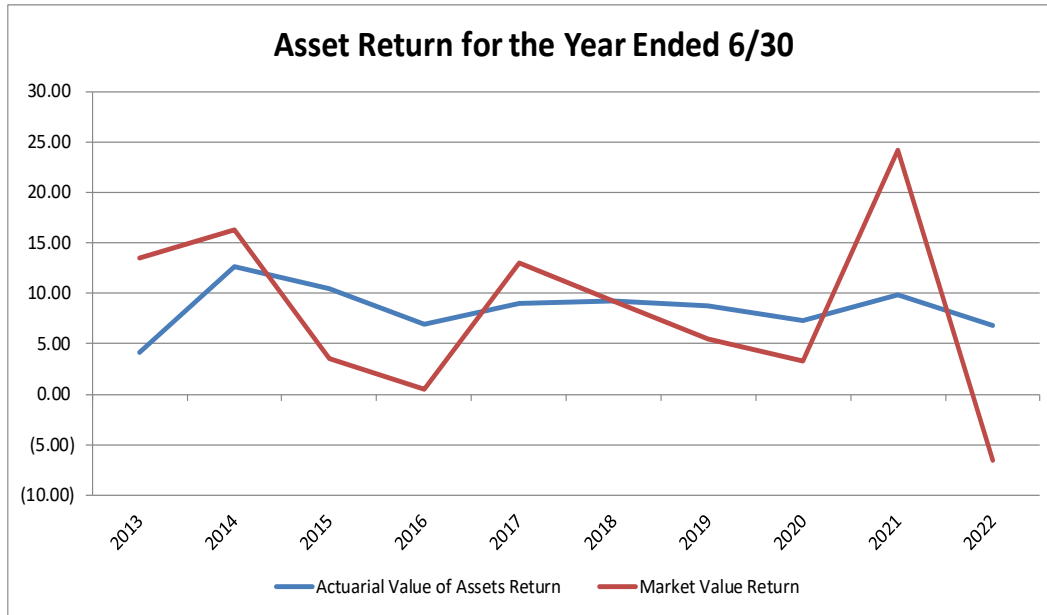


## Historical Comparison of Actuarial Value of Assets to Market Value of Assets



# Historical Comparison of Total Investment Income

Actuarial Valuation Date	Non-Investment Income Amount	Total Investment Income (Actuarial Assets Basis)			Total Investment Income (Market Assets Basis)		
		Amount	Return	Actuarial Value of Assets	Amount	Return	Market Value of Assets
7/1/2013	\$ (1,053,583)	\$ 1,998,705	4.20	\$ 49,039,331	\$ 6,854,552	13.52	\$ 57,044,084
7/1/2014	(620,148)	6,144,200	12.61	54,563,383	9,242,929	16.29	65,666,865
7/1/2015	(1,325,917)	5,638,065	10.46	58,875,531	2,334,780	3.59	66,675,728
7/1/2016	(1,181,354)	4,039,733	6.93	61,733,910	316,963	0.48	65,811,337
7/1/2017	(969,415)	5,880,380	9.00	70,722,302	8,494,394	13.00	73,336,316
7/1/2018	(1,123,841)	6,509,471	9.28	76,107,932	6,716,525	9.23	78,929,000
7/1/2019	(1,764,382)	6,558,746	8.72	80,902,296	4,250,901	5.45	81,415,519
7/1/2020	(1,898,427)	5,871,325	7.34	84,875,194	2,667,371	3.31	82,184,463
7/1/2021	(1,746,495)	8,316,886	9.90	91,445,585	19,637,841	24.15	100,075,809
7/1/2022	(1,241,341)	6,238,649	6.87	96,442,893	(6,509,971)	(6.55)	92,324,497
10-Year Total	(12,924,903)	57,196,160	8.53		54,006,285	8.25	



## SECTION C

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### MEMBERSHIP DATA

## Summary of Participant Data (July 1, 2021 and July 1, 2022)

	Actives	Retirees	Alternate Payees	Disabled	Beneficiaries	Deferred Vested	Inactive Members	Totals
<b>Total Participants as of July 1, 2021:</b>	<b>151</b>	<b>106</b>	<b>6</b>	<b>2</b>	<b>21</b>	<b>28</b>	<b>21</b>	<b>335</b>
New Entrants and Rehires	7						1	<b>8</b>
Net Transfers								<b>0</b>
Data Corrections/Other Changes								<b>0</b>
Vested Terminations	(6)					6		<b>0</b>
Non-Vested Terminations						2	(2)	<b>0</b>
Disabled								<b>0</b>
Retirements		3		(2)		(1)		<b>0</b>
Deaths with Beneficiary								<b>0</b>
Deaths w/o Beneficiary	(1)	(1)			(1)			<b>(3)</b>
New Former Spouse					1			<b>1</b>
Expired Annuity or Stop Payment								<b>0</b>
Continuing	144	105	6	0	20	27	19	<b>321</b>
Net Changes	0	2	0	(2)	0	7	(1)	<b>6</b>
<b>Total Participants as of July 1, 2022:</b>	<b>151</b>	<b>108</b>	<b>6</b>	<b>0</b>	<b>21</b>	<b>35</b>	<b>20</b>	<b>341</b>



## Summary of Participant Data (July 1, 2021 and July 1, 2022) (Concluded)

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	Valuation as of July 1, 2021	Valuation as of July 1, 2022
<b>Active Members</b>		
Number	151	151
Average Age	38.0	38.2
Average Benefit Service	11.1	11.5
Average Vesting Service	11.9	12.4
Total Payroll	\$ 11,516,196	\$ 12,267,230
<b>Inactive Members<sup>1</sup></b>		
Number	28	35
Total Monthly Benefits	\$ 63,048	\$ 86,732
<b>Inactive Members Elected Refunds<sup>1</sup></b>		
Number	21	20
Total Account Balance	\$ 397,501	\$ 342,920
<b>Disabled Members</b>		
Number	2	-
Total Monthly Benefits	\$ 4,326	\$ -
<b>Retired Members</b>		
Number	106	108
Total Monthly Benefits	\$ 440,312	\$ 445,288
<b>Beneficiaries</b>		
Number	21	21
Total Monthly Benefits	\$ 34,073	\$ 35,155
<b>QDROs (Alternate Payees)</b>		
Number	6	6
Total Monthly Benefits	\$ 5,795	\$ 5,795
<b>Total Membership</b>	<b>335</b>	<b>341</b>

<sup>1</sup> Includes Transfers.



# Age/Service/Salary as of July 1, 2022

Current Age	Vesting Service as of Valuation Date								Totals	Valuation Payroll	Contribution	
	Under 5	5-9	10-14	15-19	20-24	25-29	30-34	35 and Over			Account Balance	
Under 20	-	-	-	-	-	-	-	-	0	\$ -	\$ -	-
20-24	4	-	-	-	-	-	-	-	4	260,307		49,207
25-29	15	8	-	-	-	-	-	-	23	1,591,082		817,813
30-34	5	21	10	-	-	-	-	-	36	2,775,989		2,859,394
35-39	1	7	17	4	-	-	-	-	29	2,365,327		3,828,109
40-44	-	2	3	13	5	-	-	-	23	2,002,817		4,839,992
45-49	1	-	1	7	7	3	-	-	19	1,753,190		5,214,615
50-54	-	1	3	2	3	7	-	-	16	1,437,050		4,656,518
55-59	-	-	-	1	-	-	-	-	1	81,468		214,437
60-64	-	-	-	-	-	-	-	-	0	-		-
65-69	-	-	-	-	-	-	-	-	0	-		-
70-74	-	-	-	-	-	-	-	-	0	-		-
75 and Over	-	-	-	-	-	-	-	-	0	-		-
<b>Total</b>	<b>26</b>	<b>39</b>	<b>34</b>	<b>27</b>	<b>15</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>151</b>	<b>\$ 12,267,230</b>	<b>\$</b>	<b>22,480,085</b>

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Previous Valuation	Current Valuation	Change
Average Age: 38.0	Average Age: 38.2	0.2
Average Vesting Service: 11.9	Average Vesting Service: 12.4	0.5
Average Annual Pay: \$76,266	Average Annual Pay: \$81,240	\$4,974
Average Account Balance: \$136,875	Average Account Balance: \$148,875	\$12,000
Vested Participants 73	Vested Participants 70	(3)
Nonvested Participants 78	Nonvested Participants 81	3
Total Participants 151	Total Participants 151	0

Current Age	Annualized Salary as of Valuation Date										Totals
	Less Than \$20,000	\$20,000-\$29,999	\$30,000-\$39,999	\$40,000-\$49,999	\$50,000-\$59,999	\$60,000-\$69,999	\$70,000-\$79,999	\$80,000-\$89,999	\$90,000-\$99,999	\$100,000 & Over	
Under 20	-	-	-	-	-	-	-	-	-	-	0
20-24	-	-	-	-	-	4	-	-	-	-	4
25-29	-	-	-	-	-	15	7	1	-	-	23
30-34	-	-	-	-	-	5	22	9	-	-	36
35-39	-	-	-	-	-	1	13	10	5	-	29
40-44	-	-	-	-	-	-	12	3	5	3	23
45-49	-	-	-	-	-	1	4	5	5	4	19
50-54	-	-	-	-	-	-	5	4	4	3	16
55-59	-	-	-	-	-	-	-	1	-	-	1
60-64	-	-	-	-	-	-	-	-	-	-	0
65-69	-	-	-	-	-	-	-	-	-	-	0
70-74	-	-	-	-	-	-	-	-	-	-	0
75 and Over	-	-	-	-	-	-	-	-	-	-	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>63</b>	<b>33</b>	<b>19</b>	<b>10</b>	<b>151</b>



## Historical Schedule of Active Member Data through July 1, 2022

Valuation Date 7/1	Number	Annual Payroll (\$ in Millions)	Average Annual Pay <sup>1</sup>	% Increase in Avg Pay
2013	149	\$ 9.3	\$ 62,741	11.4%
2014	156	10.1	65,037	3.7%
2015	161	10.8	66,921	2.9%
2016	156	10.5	67,479	0.8%
2017	151	10.6	70,393	4.3%
2018	154	10.7	69,723	(1.0)%
2019	144	10.4	71,904	3.1%
2020	154	11.4	74,089	3.0%
2021	151	11.5	76,266	2.9%
2022	151	12.3	81,240	6.5%

<sup>1</sup> Prior to the actuarial valuation as of July 1, 2017, annual payroll and average annual pay were based on projected annual compensation for the upcoming year. Beginning with the actuarial valuation as of July 1, 2016, annual payroll and average annual pay are based on annualized payroll as of the actuarial valuation date. Results prior to 2016 provided by NDPERS prior actuary.

## Summary of Active Member Data as of July 1, 2022

<b>Active Members</b>	
<b>Eligible For:</b>	<b>Total</b>
Retirement	
Normal	1
Rule of 80	0
Early Retirement	<u>15</u>
Total Retirement	16
Deferred Retirement	<u>54</u>
Total Vested	70
Non-Vested	81
<b>Grand Total</b>	<b>151</b>

<b>Highway Patrol</b>				
		<b>Age 55</b>	<b>Rule of 80</b>	<b>Total</b>
Currently Eligible as of:	June 30, 2022	1	0	1
Newly Eligible as of:	June 30, 2023	0	6	6
	June 30, 2024	0	1	1
	June 30, 2025	2	4	6
	June 30, 2026	3	0	3
	June 30, 2027	0	0	0
<b>Grand Total</b>		<b>6</b>	<b>11</b>	<b>17</b>



## Schedule of Members in Pay Status as of July 1, 2022

Monthly Amount	Normal	Early	Disability	Service*	Beneficiary**	Total
Under \$200	1	0	0	0	0	1
\$200 - \$400	0	0	0	0	2	2
\$400 - \$600	0	0	0	0	0	0
\$600 - \$800	0	0	0	0	1	1
\$800 - \$1,000	1	0	0	0	2	3
\$1,000 - \$1,200	1	0	0	0	4	5
\$1,200 - \$1,400	1	0	0	1	7	9
\$1,400 - \$1,600	0	1	0	0	3	4
\$1,600 - \$1,800	0	0	0	0	2	2
\$1,800 - \$2,000	0	0	0	0	1	1
\$2,000 - \$2,200	1	2	0	1	1	5
\$2,200 - \$2,400	4	1	0	0	0	5
\$2,400 - \$2,600	2	0	0	4	2	8
\$2,600 - \$2,800	0	0	0	5	0	5
\$2,800 - \$3,000	0	0	0	5	0	5
\$3,000 - \$3,200	1	0	0	7	0	8
\$3,200 - \$3,400	1	1	0	1	0	3
\$3,400 - \$3,600	1	0	0	6	1	8
\$3,600 - \$3,800	3	1	0	2	0	6
\$3,800 - \$4,000	0	1	0	2	0	3
\$4,000 - \$4,200	0	0	0	1	1	2
\$4,200 - \$4,400	0	0	0	5	0	5
\$4,400 - \$4,600	1	0	0	4	0	5
\$4,600 - \$4,800	1	0	0	4	0	5
\$4,800 - \$5,000	0	0	0	2	0	2
\$5,000 and Over	4	0	0	28	0	32
<b>Total</b>	<b>23</b>	<b>7</b>	<b>0</b>	<b>78</b>	<b>27</b>	<b>135</b>
Payment Option	Normal	Early	Disability	Service*	Beneficiary**	Total
Life	0	0	0	1	4	5
Level Social Security Payment	0	0	0	0	0	0
Joint & 100% Survivor	12	2	0	50	3	67
Joint & 50% Survivor	11	5	0	27	20	63
5 Year C & L	0	0	0	0	0	0
10 Year C & L	0	0	0	0	0	0
<b>Total</b>	<b>23</b>	<b>7</b>	<b>0</b>	<b>78</b>	<b>27</b>	<b>135</b>
Age	Normal	Early	Disability	Service*	Beneficiary**	Total
Under 50	0	0	0	0	0	0
50 - 54	0	0	0	9	1	10
55 - 59	2	6	0	14	1	23
60 - 64	6	0	0	13	0	19
65 - 69	3	0	0	18	3	24
70 - 74	3	0	0	11	7	21
75 - 79	0	0	0	11	4	15
80 - 84	1	1	0	2	7	11
85 - 89	5	0	0	0	3	8
90 and Over	3	0	0	0	1	4
<b>Total</b>	<b>23</b>	<b>7</b>	<b>0</b>	<b>78</b>	<b>27</b>	<b>135</b>

	Previous Valuation	Current Valuation	Change
Average Age	68.2	69.1	0.9
Average Monthly Benefit	\$3,589	\$3,602	\$13
Total Members in Pay Status	135	135	0

\* Includes Rule of 80.

\*\* Includes alternate payees.



## Schedule of New Pensions Awarded during the Year as of July 1, 2022

Monthly Amount	Normal	Early	Disability	Service*	Beneficiary**	Total
Under \$200	0	0	0	0	0	0
\$200 - \$400	0	0	0	0	0	0
\$400 - \$600	0	0	0	0	0	0
\$600 - \$800	0	0	0	0	0	0
\$800 - \$1,000	0	0	0	0	0	0
\$1,000 - \$1,200	0	0	0	0	0	0
\$1,200 - \$1,400	0	0	0	0	0	0
\$1,400 - \$1,600	0	0	0	0	0	0
\$1,600 - \$1,800	0	0	0	0	0	0
\$1,800 - \$2,000	0	0	0	0	1	1
\$2,000 - \$2,200	0	0	0	0	0	0
\$2,200 - \$2,400	0	0	0	0	0	0
\$2,400 - \$2,600	0	0	0	0	0	0
\$2,600 - \$2,800	0	0	0	0	0	0
\$2,800 - \$3,000	0	0	0	0	0	0
\$3,000 - \$3,200	0	0	0	0	0	0
\$3,200 - \$3,400	0	0	0	0	0	0
\$3,400 - \$3,600	0	0	0	0	0	0
\$3,600 - \$3,800	1	0	0	0	0	1
\$3,800 - \$4,000	0	0	0	0	0	0
\$4,000 - \$4,200	0	0	0	0	0	0
\$4,200 - \$4,400	0	0	0	0	0	0
\$4,400 - \$4,600	0	0	0	0	0	0
\$4,600 - \$4,800	0	0	0	0	0	0
\$4,800 - \$5,000	0	0	0	0	0	0
\$5,000 and Over	0	0	0	0	0	0
<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>
Payment Option	Normal	Early	Disability	Service*	Beneficiary**	Total
Life	0	0	0	0	0	0
Level Social Security Payment	0	0	0	0	0	0
Joint & 100% Survivor	1	0	0	0	0	1
Joint & 50% Survivor	0	0	0	0	1	1
5 Year C & L	0	0	0	0	0	0
10 Year C & L	0	0	0	0	0	0
<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>
Age	Normal	Early	Disability	Service*	Beneficiary**	Total
Under 50	0	0	0	0	0	0
50 - 54	0	0	0	0	0	0
55 - 59	1	0	0	0	0	1
60 - 64	0	0	0	0	0	0
65 - 69	0	0	0	0	0	0
70 - 74	0	0	0	0	1	1
75 - 79	0	0	0	0	0	0
80 - 84	0	0	0	0	0	0
85 - 89	0	0	0	0	0	0
90 and Over	0	0	0	0	0	0
<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>

	Previous Valuation	Current Valuation
New Pensions Awarded	4	2
Average Age	58.1	63.9
Average Monthly Benefit	\$5,271	\$2,833

\*Includes Rule of 80.

\*\*Includes alternate payees.



## Schedule of Average Benefit Payments

		Years of Vesting Service						
		<10	10-14	15-19	20-24	25-29	>=30	Total
2018	Number of Retirees	0	2	4	5	65	20	96
	Average Monthly Benefit	\$0	\$1,481	\$2,388	\$2,923	\$3,862	\$4,366	\$3,807
	Average Years of Service	0.00	11.75	17.10	22.75	27.89	31.36	27.56
2019	Number of Retirees	1	3	4	6	68	23	105
	Average Monthly Benefit	\$1,456	\$1,765	\$2,388	\$3,351	\$3,917	\$4,854	\$3,947
	Average Years of Service	2.25	11.69	17.10	22.96	27.93	31.33	27.27
2020	Number of Retirees	1	3	4	6	70	23	107
	Average Monthly Benefit	\$1,456	\$1,765	\$2,388	\$3,351	\$4,039	\$4,854	\$4,026
	Average Years of Service	2.25	11.69	17.10	22.96	27.99	31.33	27.32
2021	Number of Retirees	1	3	4	6	72	22	108
	Average Monthly Benefit	\$1,456	\$1,765	\$2,388	\$3,351	\$4,107	\$5,116	\$4,117
	Average Years of Service	2.25	11.69	17.10	22.96	27.97	31.18	27.25
2022	Number of Retirees	0	3	5	6	72	22	108
	Average Monthly Benefit	\$0	\$1,765	\$2,837	\$3,351	\$4,072	\$5,116	\$4,123
	Average Years of Service	0.00	11.69	17.05	22.96	27.94	31.18	27.37

*Includes retired and disabled members.*



## Schedule of Retirees and Beneficiaries Added to and Removed from the Rolls

Year	Beg of Year		Added to Rolls		Removed from Rolls		End of Year Balance		Average Annual Benefit	% Increase in Annual Benefit
	No.	Ann. Benefits*	No.	Ann. Benefits*	No.	Ann. Benefits*	No.**	Ann. Benefits*		
<b>Retirement</b>										
2013	116	\$ 3,694,098	4	\$ 169,974	(4)	\$ (114,418)	116	\$ 3,749,654	\$ 32,325	1.5%
2014	116	3,749,654	2	138,200	(1)	(64,069)	117	3,823,785	32,682	2.0%
2015	117	3,823,785	16	967,969	(5)	(94,620)	128	4,697,134	36,696	22.8%
2016	128	4,697,134	2	68,562	(7)	(179,032)	123	4,586,664	37,290	-2.4%
2017	123	4,586,664	6	172,703	(2)	(26,340)	127	4,733,027	37,268	3.2%
2018	127	4,733,027	4	194,391	(4)	(60,036)	127	4,867,383	38,326	2.8%
2019	127	4,867,383	10	624,714	(1)	(37,177)	136	5,454,919	40,110	12.1%
2020	136	5,454,919	3	235,356	(6)	(62,027)	133	5,628,248	42,318	3.2%
2021	133	5,628,248	4	253,031	(2)	(67,197)	135	5,814,082	43,067	3.3%
2022	135	5,814,082	2	67,993	(2)	(47,216)	135	5,834,859	43,221	0.4%

\* \$ in millions.

\*\* Includes alternate payees.

Results prior to 2016 provided by NDPERS prior actuary.



## SECTION D

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### **GASB STATEMENT NOS. 67 AND 68 SCHEDULES**

# GASB Statement Nos. 67 and 68

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## Discussion

### Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67 establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68 establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain non-actuarial information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

### Financial Statements

GASB Statement No. 68 requires state or local governments to recognize the net pension liability and the pension expense on their financial statements. The net pension liability is the difference between the total pension liability and the plan's fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to the HPRS subsequent to the measurement date of July 1, 2022.

The pension expense recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the liability and investment experience.

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position in accordance with GASB Statement No. 67. The *statement of fiduciary net position* presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The *statement of changes in fiduciary net position* presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.



# GASB Statement Nos. 67 and 68 (Continued)

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## Notes to Financial Statements

GASB Statement No. 68 requires the notes of the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets, and deferred outflows and inflows of resources related to pensions.

GASB Statement Nos. 67 and 68 require the notes of the financial statements for the employers and pension plans to include certain additional information. The list of disclosure items should include:

- A description of benefits provided by the plan;
- The type of employees and number of members covered by the pension plan;
- A description of the plan's funding policy, which includes member and employer contribution requirements;
- The pension plan's investment policies;
- The pension plan's fiduciary net position, net pension liability and the pension plan's fiduciary net position as a percentage of the total pension liability;
- The net pension liability using a discount rate that is 1 percent higher and 1 percent lower than used to calculate the total pension liability and net pension liability for financial reporting purposes;
- Significant actuarial assumptions and methods used to calculate the total pension liability;
- Inputs to the discount rates; and
- Certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with GASB Statement No. 67. This information includes:

- The composition of the pension plan's board and the authority under which benefit terms may be amended;
- A description of how fair value is determined;
- Information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5 percent, receivables and insurance contracts excluded from plan assets; and
- Annual money-weighted rate of return.

## Required Supplementary Information

GASB Statement No. 67 requires a 10-year fiscal history of:

- Sources of changes in the net pension liability;
- Information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll; and
- A comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.



## **GASB Statement Nos. 67 and 68 (Continued)**

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### **Timing of the Actuarial Valuation**

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of July 1, 2022, and a measurement date of July 1, 2022.

### **Single Discount Rate**

Projected benefit payments are required to be discounted to their actuarial present values using a Single Discount Rate that reflects (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits) and (2) a tax-exempt municipal bond rate based on an index of 20-year mixed maturity general obligation bonds with an average Standard & Poor's Corp.'s AA credit rating (which is published by Fidelity) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this actuarial valuation, the expected rate of return on pension plan investments is 6.50 percent; the municipal bond rate is 3.69% (based on the most recent date available on or before the measurement date of the "20-year Municipal GO Index" from Fidelity); and the resulting Single Discount Rate is 5.02 percent.

### **Effective Date and Transition**

GASB Statement Nos. 67 and 68 are effective for fiscal years beginning after June 15, 2013, and June 15, 2014, respectively.





# GASB Statement Nos. 67 and 68 (Continued)

## Executive Summary as of June 30, 2022

Actuarial Valuation Date	7/1/2022
Measurement Date of the Net Pension Liability	7/1/2022
Plan's Fiscal Year Ending Date (Reporting Date) for GASB 67	6/30/2022
Employer's Fiscal Year Ending Date (Reporting Date) for GASB 68	6/30/2023

### Membership

Number of	
- Retirees and Beneficiaries	135
- Inactive, Non-retired Members	55
- Active Members	151
- Total	341
Covered Payroll	\$ 12,267,230

### Net Pension Liability

Total Pension Liability	\$ 170,663,177
Plan Fiduciary Net Position	92,324,497
Net Pension Liability	\$ 78,338,680
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	54.10 %
Net Pension Liability as a Percentage of Covered Payroll	638.60 %

### Development of the Single Discount Rate

Single Discount Rate	5.02 %
Long-Term Expected Rate of Investment Return	6.50 %
Long-Term Municipal Bond Rate*	3.69 %
Last year ending June 30 in the 2022 to 2122 projection period for which projected benefit payments are fully funded	2054

**Total Pension Expense** \$ 13,078,940

### Deferred Outflows and Deferred Inflows of Resources by Source to be recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience	\$ 1,816,557	\$ 1,505,688
Changes in assumptions	62,934,353	37,600,460
Net difference between projected and actual earnings on pension plan investments	4,118,396	-
<b>Total</b>	<b>\$ 68,869,306</b>	<b>\$ 39,106,148</b>

*\*Source: Fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity Index's "20-Year Municipal GO AA Index" as of June 30, 2022. In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax-exempt securities.*



## GASB Statement Nos. 67 and 68 (Continued)

### Pension Expense under GASB Statement No. 68 Total for All Employers Fiscal Year Ended June 30, 2022\*

#### A. Calculation of Total Pension Expense

1. Service Cost	\$	3,280,944
2. Interest on the Total Pension Liability		8,547,642
3. Current-Period Benefit Changes		-
4. Employee Contributions (made negative for addition here)**		(1,985,476)
5. Projected Earnings on Plan Investments (made negative for addition here)		(6,962,595)
6. Pension Plan Administrative Expense		65,650
7. Other Changes in Plan Fiduciary Net Position		(62)
8. Recognition of Outflow (Inflow) of Resources due to Liabilities		9,408,891
9. Recognition of Outflow (Inflow) of Resources due to Assets		723,946
		<hr/>
<b>Total Pension Expense</b>	<b>\$</b>	<b>13,078,940</b>

\*Based on a measurement date of July 1, 2022. Will be used for fiscal year ending June 30, 2023.

\*\*Includes repurchases of service credit.

Differences between expected and actual experience and changes in assumptions are recognized in pension expense using a systematic and rational method over a closed period equal to the average of the expected remaining service lives of all employees who are provided with pensions through the pension plan (active employees and inactive employees) determined as of the beginning of the measurement period.

At the beginning of the current measurement period, the average expected remaining service lives of the 151 active employees in the plan was approximately 11.4939 years. Additionally, the total plan membership (active employees and inactive employees) was 341. As a result, the average of the expected remaining service lives for purposes of recognizing the applicable deferred outflows and inflows of resources established in the current measurement period is 5.0897 years.

Additionally, differences between projected and actual earnings on pension plan investments should be recognized in pension expense using a systematic and rational method over a closed five-year period. For this purpose, the deferred outflows and inflows of resources are recognized in the pension expense as a level dollar amount over the closed period identified above.



## GASB Statement Nos. 67 and 68 (Continued)

### Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods GASB Statement No. 68 – Total For All Employers Fiscal Year Ended June 30, 2022\*

#### A. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows (Inflows) of Resources
1. Differences between expected and actual experience	\$ 1,816,557	\$ 1,505,688	\$ 310,869
2. Assumption Changes	62,934,353	37,600,460	25,333,893
3. Net Difference between projected and actual earnings on pension plan investments	4,118,396	-	4,118,396
<b>4. Total</b>	<b>\$ 68,869,306</b>	<b>\$ 39,106,148</b>	<b>\$ 29,763,158</b>

#### B. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows (Inflows) of Resources
2023	\$ 9,738,928
2024	9,270,689
2025	2,470,774
2026	7,554,698
2027	728,069
Thereafter	-
<b>Total</b>	<b>\$ 29,763,158</b>

\* Based on a measurement date of July 1, 2022. Will be used for fiscal year ending June 30, 2023



# GASB Statement Nos. 67 and 68 (Continued)

## Schedule of Recognition of Changes in Total Net Pension Liability/(Asset) from Current and Prior Reporting Periods

Year Ending June 30	Difference between expected and actual experience	Recognition Period (Years)	Total Deferred (2023-2028)	Increase (Decrease) in Pension Expense Arising from difference between expected and actual experience									
				Recognized in Year Ending June 30									
				2020 & Prior	2021	2022	2023	2024	2025	2026	2027	2028	
2015	984,241	7.3100	-	807,858	134,643	41,740	-	-	-	-	-	-	
2016	39,748	6.6948	-	29,685	5,937	4,126	-	-	-	-	-	-	
2017	21,564	6.3229	1,104	13,640	3,410	3,410	1,104	-	-	-	-	-	
2018	(621,359)	6.2141	(121,399)	(299,976)	(99,992)	(99,992)	(99,992)	(21,407)	-	-	-	-	
2019	(67,748)	5.7642	(20,736)	(23,506)	(11,753)	(11,753)	(11,753)	(8,983)	-	-	-	-	
2020	729,281	5.5247	333,269	132,004	132,004	132,004	132,004	132,004	69,261	-	-	-	
2021	(2,196,613)	5.2736	(1,363,553)	-	(416,530)	(416,530)	(416,530)	(416,530)	(416,530)	(113,963)	-	-	
2022	1,844,603	5.0897	1,482,184	-	-	362,419	362,419	362,419	362,419	362,419	32,508	-	
Total			310,869	659,705	(252,281)	15,424	(32,748)	47,503	15,150	248,456	32,508	-	

Year Ending June 30	Changes in assumptions <sup>1</sup>	Recognition Period (Years)	Total Deferred (2023-2028)	Increase (Decrease) in Pension Expense Arising from changes in assumptions									
				Recognized in Year Ending June 30									
				2020 & Prior	2021	2022	2023	2024	2025	2026	2027	2028	
2015	394,419	7.3100	-	323,736	53,956	16,727	-	-	-	-	-	-	
2016	3,945,801	6.6948	-	2,946,915	589,383	409,503	-	-	-	-	-	-	
2017	1,257,370	6.3229	64,210	795,440	198,860	198,860	64,210	-	-	-	-	-	
2018	-	6.2141	-	-	-	-	-	-	-	-	-	-	
2019	3,042,863	5.7642	931,303	1,055,780	527,890	527,890	527,890	403,413	-	-	-	-	
2020	66,142,608	5.5247	30,226,119	11,972,163	11,972,163	11,972,163	11,972,163	11,972,163	6,281,793	-	-	-	
2021	(60,572,392)	5.2736	(37,600,460)	-	(11,485,966)	(11,485,966)	(11,485,966)	(11,485,966)	(11,485,966)	(3,142,562)	-	-	
2022	39,467,011	5.0897	31,712,721	-	-	7,754,290	7,754,290	7,754,290	7,754,290	7,754,290	695,561	-	
Total			25,333,893	17,094,034	1,856,286	9,393,467	8,832,587	8,643,900	2,550,117	4,611,728	695,561	-	

Year Ending June 30	Difference between projected and actual earnings on pension plan investments	Recognition Period (Years)	Total Deferred (2023-2028)	Increase (Decrease) in Pension Expense Arising from net difference between projected and actual earnings on pension plan investments									
				Recognized in Year Ending June 30									
				2020 & Prior	2021	2022	2023	2024	2025	2026	2027	2028	
2015	2,865,533	5.0000	-	2,865,533	-	-	-	-	-	-	-	-	
2016	4,978,923	5.0000	-	4,978,923	-	-	-	-	-	-	-	-	
2017	(3,267,518)	5.0000	-	(2,614,016)	(653,502)	-	-	-	-	-	-	-	
2018	(1,075,697)	5.0000	-	(645,417)	(215,139)	(215,141)	-	-	-	-	-	-	
2019	1,799,002	5.0000	359,802	719,600	359,800	359,800	359,802	-	-	-	-	-	
2020	3,368,889	5.0000	1,347,555	673,778	673,778	673,778	673,778	673,777	-	-	-	-	
2021	(13,945,022)	5.0000	(8,367,014)	-	(2,789,004)	(2,789,004)	(2,789,004)	(2,789,004)	(2,789,006)	-	-	-	
2022	13,472,566	5.0000	10,778,053	-	-	2,694,513	2,694,513	2,694,513	2,694,513	2,694,514	-	-	
Total			4,118,396	5,978,401	(2,624,067)	723,946	939,089	579,286	(94,493)	2,694,514	-	-	

Year Ending June 30	Total Difference	Recognition Period (Years)	Total Deferred (2023-2028)	Increase (Decrease) in Pension Expense Arising from All Sources									
				Recognized in Year Ending June 30									
				2020 & Prior	2021	2022	2023	2024	2025	2026	2027	2028	
2015	4,244,193	Varies by Type	-	3,997,127	188,599	58,467	-	-	-	-	-	-	
2016	8,964,472	Varies by Type	-	7,955,523	595,320	413,629	-	-	-	-	-	-	
2017	(1,988,584)	Varies by Type	65,314	(1,804,936)	(451,232)	202,270	65,314	-	-	-	-	-	
2018	(1,697,056)	Varies by Type	(121,399)	(945,393)	(315,131)	(315,133)	(99,992)	(21,407)	-	-	-	-	
2019	4,774,117	Varies by Type	1,270,369	1,751,874	875,937	875,937	875,939	394,430	-	-	-	-	
2020	70,240,778	Varies by Type	31,906,943	12,777,945	12,777,945	12,777,945	12,777,945	12,777,944	6,351,054	-	-	-	
2021	(76,714,027)	Varies by Type	(47,331,027)	-	(14,691,500)	(14,691,500)	(14,691,500)	(14,691,500)	(14,691,502)	(3,256,525)	-	-	
2022	54,784,180	Varies by Type	43,972,958	-	-	10,811,222	10,811,222	10,811,222	10,811,222	10,811,223	728,069	-	
Total			29,763,158	23,732,140	(1,020,062)	10,132,837	9,738,928	9,270,689	2,470,774	7,554,698	728,069	-	

<sup>1</sup> For fiscal year ending June 30, 2016, includes difference in liability due to change in actuary and updated assumption to limit projected benefits to the projected Internal Revenue Code Section 415 limit which projects the limit at the actuarial valuation year by the inflation assumption used in the actuarial valuation.

For fiscal year ending June 30, 2017, includes difference in liability due to changes in the investment return assumption, inflation assumption, benefit indexing assumption for inactive vested members and updated assumption to limit projected benefits to the projected Internal Revenue Code Section 415 limit which projects the limit at the actuarial valuation year by the inflation assumption used in the actuarial valuation.

For fiscal year ending June 30, 2019, includes difference in liability due to changes in the investment return assumption.

For fiscal year ending June 30, 2020, includes difference in liability due to changes in the assumptions as a result of the experience study.

For fiscal year ending June 30, 2021, includes difference in liability due to changes in the investment return assumption.

For fiscal year ending June 30, 2022, includes difference in liability due to changes in the investment return assumption.



# GASB Statement Nos. 67 and 68 (Continued)

## Statement of Details of Outflows and Inflows from Current and Prior Reporting Periods

	Outflow of Resources									
	Recognized in Year Ending June 30									
	Total Deferred (2023-2028)	2020 & Prior	2021	2022	2023	2024	2025	2026	2027	2028
Difference between expected and actual experience	\$ 1,816,557	\$ 983,187	\$ 275,994	\$ 543,699	\$ 495,527	\$ 494,423	\$ 431,680	\$ 362,419	\$ 32,508	\$ -
Changes in assumptions	62,934,353	17,094,034	13,342,252	20,879,433	20,318,553	20,129,866	14,036,083	7,754,290	695,561	-
Difference between projected and actual earnings on investments	4,212,889	5,978,401	-	723,946	939,089	579,286	-	2,694,514	-	-
<b>Total</b>	<b>68,963,799</b>	<b>24,055,622</b>	<b>13,618,246</b>	<b>22,147,078</b>	<b>21,753,169</b>	<b>21,203,575</b>	<b>14,467,763</b>	<b>10,811,223</b>	<b>728,069</b>	<b>-</b>

	(Inflows) of Resources									
	Recognized in Year Ending June 30									
	Total Deferred (2023-2028)	2020 & Prior	2021	2022	2023	2024	2025	2026	2027	2028
Difference between expected and actual experience	\$ (1,505,688)	\$ (323,482)	\$ (528,275)	\$ (528,275)	\$ (528,275)	\$ (446,920)	\$ (416,530)	\$ (113,963)	\$ -	\$ -
Changes in assumptions	(37,600,460)	-	(11,485,966)	(11,485,966)	(11,485,966)	(11,485,966)	(11,485,966)	(3,142,562)	-	-
Difference between projected and actual earnings on investments	(94,493)	-	(2,624,067)	-	-	-	(94,493)	-	-	-
<b>Total</b>	<b>(39,200,641)</b>	<b>(323,482)</b>	<b>(14,638,308)</b>	<b>(12,014,241)</b>	<b>(12,014,241)</b>	<b>(11,932,886)</b>	<b>(11,996,989)</b>	<b>(3,256,525)</b>	<b>-</b>	<b>-</b>

	Increase (Decrease) in Pension Expense Arising from Assets and Liabilities									
	Recognized in Year Ending June 30									
	Total Deferred (2023-2028)	2020 & Prior	2021	2022	2023	2024	2025	2026	2027	2028
Total Liabilities	\$ 25,644,762	\$ 17,753,739	\$ 1,604,005	\$ 9,408,891	\$ 8,799,839	\$ 8,691,403	\$ 2,565,267	\$ 4,860,184	\$ 728,069	\$ -
Total Assets	4,118,396	5,978,401	(2,624,067)	723,946	939,089	579,286	(94,493)	2,694,514	-	-
<b>Total</b>	<b>29,763,158</b>	<b>23,732,140</b>	<b>(1,020,062)</b>	<b>10,132,837</b>	<b>9,738,928</b>	<b>9,270,689</b>	<b>2,470,774</b>	<b>7,554,698</b>	<b>728,069</b>	<b>-</b>



## GASB Statement Nos. 67 and 68 (Continued)

### Schedules of Required Supplementary Information Schedule of Net Pension Liability and Related Ratios Multiyear

#### Last 10 Fiscal Years (which may be built prospectively)

FY Ending 30-Jun	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll <sup>1</sup>	Net Pension Liability as a % of Covered Payroll
2015	\$ 75,432,901	\$65,666,865	\$ 9,766,036	87.05%	\$9,348,386	104.47%
2016	80,112,217	66,675,728	13,436,489	83.23%	10,145,713	132.44%
2017	87,921,960	65,811,337	22,110,623	74.85%	10,526,791	210.04%
2018	94,047,078	73,336,316	20,710,762	77.98%	10,629,403	194.84%
2019	98,385,960	78,929,000	19,456,960	80.22%	10,737,297	181.21%
2020	106,315,030	81,415,519	24,899,511	76.58%	10,354,210	240.48%
2021	178,229,354	82,184,463	96,044,891	46.11%	11,409,711	841.78%
2021	123,371,001	100,075,809	23,295,192	81.12%	11,516,196	202.28%
2022	170,663,177	92,324,497	78,338,680	54.10%	12,267,230	638.60%

<sup>1</sup> Prior to the actuarial valuation as of July 1, 2016, covered payroll was based on projected annual compensation. Beginning with the actuarial valuation as of July 1, 2016, covered payroll is based on annualized payroll as of the actuarial valuation date.

### Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

The following presents the net pension liability/(asset) of the HPRS, calculated using the current discount rate of 5.02 percent, as well as what the HPRS's net pension liability/(asset) would be if it were calculated using a discount rate that is 1-percentage point lower (4.02 percent) or is 1-percentage point higher (6.02 percent) than the current rate.

Current Single Discount		
1% Decrease	Rate Assumption	1% Increase
4.02%	5.02%	6.02%
\$ 105,923,042	\$ 78,338,680	\$ 56,286,379



## GASB Statement Nos. 67 and 68 (Continued)

### Schedule of Changes in Net Pension Liability and Related Ratios Current Report Period Fiscal Year Ended June 30, 2022

Fiscal Year Ending June 30,	2022
<b>Total pension liability</b>	
Service cost	\$ 3,280,944
Interest on the total pension liability	8,547,642
Changes of benefit terms	0
Difference between expected and actual experience	1,844,603
Changes of assumptions	39,467,011
Benefit payments and refunds	(5,848,024)
<b>Net change in total pension liability</b>	<b>47,292,176</b>
<b>Total pension liability - beginning</b>	<b>123,371,001</b>
<b>Total pension liability - ending (a)</b>	<b>\$ 170,663,177</b>
<b>Plan fiduciary net position</b>	
Contributions - Employer	\$ 2,686,795
Contributions - Employee	1,825,729
Contributions - Service credit repurchases	159,747
Pension plan net investment income	(6,509,971)
Benefit payments and refunds	(5,848,024)
Pension plan administrative expense	(65,650)
Transfers and Other Income	62
<b>Net change in plan fiduciary net position</b>	<b>(7,751,312)</b>
<b>Plan fiduciary net position - beginning</b>	<b>100,075,809</b>
<b>Plan fiduciary net position - ending (b)</b>	<b>\$ 92,324,497</b>
<b>Net pension liability - ending (a) - (b)</b>	<b>\$ 78,338,680</b>
<b>Plan fiduciary net position as a percentage</b>	
<b>of total pension liability</b>	54.10 %
<b>Covered-employee payroll</b>	\$ 12,267,230
<b>Net pension liability as a percentage</b>	
<b>of covered-employee payroll</b>	638.60 %



# GASB Statement Nos. 67 and 68 (Continued)

## Schedule of Changes in Net Pension Liability and Related Ratios Multiyear

Fiscal Year Ending June 30,	2022	2021	2020	2019	2018	2017	2016	2015	2014
<b>Total pension liability</b>									
Service cost	\$ 3,280,944	\$ 6,693,393	\$ 2,877,493	\$ 2,818,006	\$ 2,738,268	\$ 2,701,326	\$ 2,226,286	\$ 2,038,291	\$ 1,894,183
Interest on the total pension liability	8,547,642	7,304,593	7,869,528	7,527,064	7,203,350	6,951,177	6,311,403	6,007,875	5,750,017
Changes of benefit terms	0	(135,457)	0	0	0	0	0	0	0
Difference between expected and actual experience	1,844,603	(2,196,613)	729,281	(67,748)	(621,359)	21,564	39,748	984,241	(299,964)
Changes of assumptions <sup>1</sup>	39,467,011	(60,572,392)	66,142,608	3,042,863	0	1,257,370	3,945,801	394,419	0
Benefit payments and refunds	(5,848,024)	(5,951,877)	(5,704,586)	(5,391,115)	(4,981,377)	(4,806,319)	(4,713,495)	(4,745,510)	(3,784,735)
<b>Net change in total pension liability</b>	<b>47,292,176</b>	<b>(54,858,353)</b>	<b>71,914,324</b>	<b>7,929,070</b>	<b>4,338,882</b>	<b>6,125,118</b>	<b>7,809,743</b>	<b>4,679,316</b>	<b>3,559,501</b>
<b>Total pension liability - beginning</b>	<b>123,371,001</b>	<b>178,229,354</b>	<b>106,315,030</b>	<b>98,385,960</b>	<b>94,047,078</b>	<b>87,921,960</b>	<b>80,112,217</b>	<b>75,432,901</b>	<b>71,873,400</b>
<b>Total pension liability - ending (a)</b>	<b>\$ 170,663,177</b>	<b>\$ 123,371,001</b>	<b>\$ 178,229,354</b>	<b>\$ 106,315,030</b>	<b>\$ 98,385,960</b>	<b>\$ 94,047,078</b>	<b>\$ 87,921,960</b>	<b>\$ 80,112,217</b>	<b>\$ 75,432,901</b>
<b>Plan fiduciary net position</b>									
Contributions - Employer	\$ 2,686,795	\$ 2,293,404	\$ 2,176,902	\$ 2,090,886	\$ 2,152,970	\$ 2,155,944	\$ 2,127,355	\$ 2,002,291	\$ 1,864,632
Contributions - Employee	1,825,729	1,548,335	1,469,682	1,411,619	1,453,533	1,455,540	1,436,236	1,351,798	1,243,520
Contributions - Service credit repurchases	159,747	400,751	205,461	167,824	281,573	249,436	0	96,429	87,418
Pension plan net investment income	(6,509,971)	19,637,841	2,667,371	4,250,901	6,716,525	8,494,394	309,099	2,334,780	9,239,929
Benefit payments and refunds	(5,848,024)	(5,951,877)	(5,704,586)	(5,391,115)	(4,981,377)	(4,806,319)	(4,713,495)	(4,745,510)	(3,784,735)
Pension plan administrative expense	(65,650)	(37,097)	(45,870)	(43,555)	(30,353)	(30,195)	(31,450)	(30,925)	(27,983)
Transfers and Other Income	62	(11)	(16)	(41)	(187)	6,179	7,864	-	-
<b>Net change in plan fiduciary net position</b>	<b>(7,751,312)</b>	<b>17,891,346</b>	<b>768,944</b>	<b>2,486,519</b>	<b>5,592,684</b>	<b>7,524,979</b>	<b>(864,391)</b>	<b>1,008,863</b>	<b>8,622,781</b>
<b>Plan fiduciary net position - beginning</b>	<b>100,075,809</b>	<b>82,184,463</b>	<b>81,415,519</b>	<b>78,929,000</b>	<b>73,336,316</b>	<b>65,811,337</b>	<b>66,675,728</b>	<b>65,666,865</b>	<b>57,044,084</b>
<b>Plan fiduciary net position - ending (b)</b>	<b>\$ 92,324,497</b>	<b>\$ 100,075,809</b>	<b>\$ 82,184,463</b>	<b>\$ 81,415,519</b>	<b>\$ 78,929,000</b>	<b>\$ 73,336,316</b>	<b>\$ 65,811,337</b>	<b>\$ 66,675,728</b>	<b>\$ 65,666,865</b>
<b>Net pension liability - ending (a) - (b)</b>	<b>\$ 78,338,680</b>	<b>\$ 23,295,192</b>	<b>\$ 96,044,891</b>	<b>\$ 24,899,511</b>	<b>\$ 19,456,960</b>	<b>\$ 20,710,762</b>	<b>\$ 22,110,623</b>	<b>\$ 13,436,489</b>	<b>\$ 9,766,036</b>
<b>Plan fiduciary net position as a percentage</b>									
of total pension liability	54.10 %	81.12 %	46.11 %	76.58 %	80.22 %	77.98 %	74.85 %	83.23 %	87.05 %
<b>Covered-employee payroll<sup>2</sup></b>	<b>\$ 12,267,230</b>	<b>\$ 11,516,196</b>	<b>\$ 11,409,711</b>	<b>\$ 10,354,210</b>	<b>\$ 10,737,297</b>	<b>\$ 10,629,403</b>	<b>\$ 10,526,791</b>	<b>\$ 10,145,713</b>	<b>\$ 9,348,386</b>
<b>Net pension liability as a percentage</b>	<b>638.60 %</b>	<b>202.28 %</b>	<b>841.78 %</b>	<b>240.48 %</b>	<b>181.21 %</b>	<b>194.84 %</b>	<b>210.04 %</b>	<b>132.44 %</b>	<b>104.47 %</b>

<sup>1</sup> For fiscal year ending June 30, 2016, includes difference in liability due to change in actuary and updated assumption to limit projected benefits to the projected Internal Revenue Code Section 415 limit which projects the limit at the actuarial valuation year by the inflation assumption used in the actuarial valuation. For fiscal year ending June 30, 2017, includes difference in liability due to changes in the investment return assumption, inflation assumption, benefit indexing assumption for inactive vested members and updated assumption to limit projected benefits to the projected Internal Revenue Code Section 415 limit which projects the limit at the actuarial valuation year by the inflation assumption used in the actuarial valuation.

For fiscal year ending June 30, 2019, June 30, 2020, June 30, 2021, and June 30, 2022, includes difference in liability due to changes in the investment return assumption.

<sup>2</sup> Prior to the valuation as of July 1, 2016, covered payroll is based on projected annual compensation. Beginning with the valuation as of July 1, 2016, covered payroll is based on annualized payroll as of the valuation date.

10 fiscal years will be built prospectively.

Values prior to fiscal year ending June 30, 2016 were calculated by the prior actuary.





# GASB Statement Nos. 67 and 68 (Continued)

## System Asset Allocation

<u>Asset Class</u>	<u>Target Allocation</u>	<u>Long-Term Expected Real Rate of Return</u>	<u>Allocation-Weighted Long-Term Expected Real Rate of Return</u>
Domestic Equities	30.00 %	5.75 %	1.73 %
International Equities	21.00 %	6.45 %	1.35 %
Private Equity	7.00 %	9.20 %	0.64 %
Global Fixed Income	23.00 %	0.34 %	0.08 %
Global Real Assets	19.00 %	4.35 %	0.83 %
Cash Equivalents	0.00 %	0.00 %	0.00 %
<b>Total</b>	<b>100.00 %</b>		<b>4.63 %</b>

*Asset allocation and long-term expected arithmetic returns were provided by RIO and are net of inflation of 2.25%.*

The discount rate used to measure the total pension liability was 5.02 percent. The projection of cash flows used to determine the discount rate assumed plan member and statutory/Board approved employer contributions will be made at the statutory rates described in this report. For this purpose, only employer contributions that are intended to fund benefits of current plan members and their beneficiaries are included. Projected employer contributions that are intended to fund the service costs of future plan members and their beneficiaries are not included. Based on those assumptions, the Highway Patrol pension plan's fiduciary net position was projected to be depleted by 2054. Therefore, the long-term expected rate of return on pension plan investments could not be applied to all projected benefit payments.



## GASB Statement Nos. 67 and 68 (Continued)

### Schedule of Contributions Multiyear Last 10 Fiscal Years

FY Ending 30-Jun	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll <sup>1</sup>	Actual Contribution as a % of Covered Payroll
2014	\$ 2,347,598	\$ 1,864,632	\$ 482,966	\$ 9,348,386	19.95 %
2015	2,201,479	2,002,291	199,188	10,145,713	19.74 %
2016	2,307,420	2,127,355	180,065	10,526,791	20.21 %
2017	3,060,351	2,155,944	904,407	10,629,403	20.28 %
2018	2,948,756	2,152,970	795,786	10,737,297	20.05 %
2019	2,935,707	2,090,886	844,821	10,354,210	20.19 %
2020	3,256,102	2,176,902	1,079,200	11,409,711	19.08 %
2021	4,081,331	2,293,404	1,787,927	11,516,196	19.91 %
2022	3,920,973	2,686,795	1,234,178	12,267,230	21.90 %

<sup>1</sup> Prior to the actuarial valuation as of July 1, 2016, covered employee payroll was based on projected annual compensation. From the actuarial valuation as of July 1, 2016, covered employee payroll is based on pensionable payroll for membership data used in the actuarial valuation.

10 fiscal years will be built prospectively.

# GASB Statement Nos. 67 and 68 (Continued)

**Valuation Date:** July 1, 2022  
**Notes** The actuarially determined contribution amount is calculated as of June 30, 12 months prior to the end of the fiscal year in which the contributions are reported.

**Methods and Assumptions Used to Determine Actuarially Determined Contribution Rates:**

Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Open Period Assumed annual payroll growth of 3.50%
Remaining Amortization Period	20 years
Asset Valuation Method	5-Year smoothed market
Inflation	2.25%
Salary Increases	Service-based table for members with less than five years of service and age-based table for members with more than five years of service
Investment Rate of Return	7.00%
Retirement Age	Age-based table of rates that are specific to the type of eligibility condition.
Mortality	Pub-2010 Healthy Retiree Mortality table (for General Employees), sex-distinct, with rates multiplied by 103% for males and 101% for females. Pub-2010 Disabled Retiree Mortality table (for General Employees), sex-distinct, with rates multiplied by 117% for males and 112% for females. Pub-2010 Employee Mortality table (for General Employees), sex-distinct, with rates multiplied by 92% for both males and females. Mortality rates are projected from 2010 using the MP-2019 scale.

**Other Information:**

**Notes** There were no benefit changes during the year.  
The economic assumptions were updated beginning with the actuarial valuation as of July 1, 2020 based on a review performed by GRS. The investment return assumption was decreased from 7.50% to 7.00% beginning with the actuarial valuation as of July 1, 2020. All other actuarial assumptions were adopted by the Board based on an experience study covering the period July 1, 2014, through June 30, 2019.  
The employer rate to the System is the current statutory contribution rate of 19.70% of payroll. The statutory employer and employee contributions will each increase by 0.5% of pay every year from January 1, 2022 to January 1, 2025, ultimately increasing both by 2.0% of pay.

**Methods and Assumptions Used to Determine GASB 67/68 Net Pension Liability:**

Actuarial Cost Method	Entry Age Normal
Asset Valuation Method	Plan Fiduciary Net Position (Market value of assets, no asset smoothing)
Inflation	2.25%
Salary Increases	Service-based table for members with less than five years of service and age-based table for members with more than five years of service.
Single Discount Rate	5.02% (Based on investment return assumption of 6.50% and a municipal bond rate of 3.69%)
Retirement Age	Age-based table of rates that are specific to the type of eligibility condition.
Mortality	Pub-2010 Healthy Retiree Mortality table (for General Employees), sex-distinct, with rates multiplied by 103% for males and 101% for females. Pub-2010 Disabled Retiree Mortality table (for General Employees), sex-distinct, with rates multiplied by 117% for males and 112% for females. Pub-2010 Employee Mortality table (for General Employees), sex-distinct, with rates multiplied by 92% for both males and females. Mortality rates are projected from 2010 using the MP-2019 scale.

**Other Information:**

**Notes** The assumptions were updated beginning with the actuarial valuation as of July 1, 2020 based on an experience study covering the period July 1, 2014 through July 1, 2019. The investment return assumption was decreased from 7.00% to 6.50% beginning with the actuarial valuation as of July 1, 2022.  
The employer rate to the System is the current statutory contribution rate of 20.20% of payroll. The statutory employer and employee contributions will each increase by an additional 0.5% of pay every year from January 1, 2023 to January 1, 2025, ultimately increasing both by 1.5% of pay.



## GASB Statement Nos. 67 and 68 (Concluded)

### Schedule of Reconciliation of Net Pension Liability

FY Ending June 30,	Beginning Net Pension Liability (1)	Pension Expense (2)	Employer Contributions (3)	New Net Deferred (Inflows)/Outflows (4)	Recognition of Prior Net Deferred (Inflows)/Outflows (5)	Ending Net Pension Liability (6)=(1)+(2)-(3)+(4)-(5)
2014	\$ 14,829,316	\$ 815,608	\$ 1,864,632	\$ (4,014,256)	\$ -	\$ 9,766,036
2015	9,766,036	1,203,461	2,002,291	3,482,487	(986,796)	13,436,489
2016	13,436,489	3,203,032	2,127,355	7,373,367	(225,090)	22,110,623
2017	22,110,623	3,659,448	2,155,944	(1,537,350)	1,366,015	20,710,762
2018	20,710,762	3,195,876	2,152,970	(1,381,925)	914,783	19,456,960
2019	19,456,960	5,175,123	2,090,886	3,898,180	1,539,866	24,899,511
2020	24,899,511	17,728,227	2,176,902	57,462,833	1,868,778	96,044,891
2021	96,044,891	5,237,670	2,293,404	(62,022,527)	13,671,438	23,295,192
2022	23,295,192	13,078,940	2,686,795	43,972,958	(678,385)	78,338,680

*10 fiscal years will be built prospectively.*

*Values prior to fiscal year ending June 30, 2016 were calculated by the prior actuary.*



## **SECTION E**

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### **ACTUARIAL VALUATION PROCEDURES**

## Actuarial Assumptions in the Actuarial Valuation Process

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**Normal cost and the allocation of benefit values** between service rendered before and after the valuation date were determined using the **Individual Entry Age Normal actuarial cost method** having the following characteristics:

- The normal cost for each individual active member, payable from the date of employment to the date of retirement, is sufficient to accumulate the value of the member's benefit at the time of retirement; and
- Each annual normal cost is a constant percentage of the member's year-by-year projected covered pay.

**Financing of Unfunded Actuarial Accrued Liabilities.** The unfunded actuarial accrued liability is amortized using 20-year open level-percentage of pay amortization of the unfunded liability as of the actuarial valuation date for purposes of calculating the actuarial contribution rate.

**Actuarial Value of Pension Plan Assets.** The calculated value is determined by adjusting the market value of assets to reflect the investment gains and losses (the difference between the actual investment return and the expected investment return) during each of the last five years at the rate of 20 percent per year. This asset smoothing method was adopted by the Board for use beginning with the July 1, 2017 actuarial valuation. Net deferred asset gains attributable to fiscal years 2016 and prior were fully recognized as of July 1, 2017.

**Actuarial Valuation Assumptions.** The contribution and benefit values of the System are calculated by applying actuarial assumptions to the benefit provisions and census information furnished, using the actuarial cost method described above.

The principal areas of financial risk which require assumptions about future experiences are:

- Long-term rates of investment return to be generated by the assets of the Plan;
- Patterns of pay increases to members;
- Rates of mortality among members, retirees and beneficiaries;
- Rates of withdrawal of active members;
- Rates of disability among members; and
- The age patterns of actual retirement.

In an actuarial valuation, the monetary effect of each assumption is calculated for as long as a present covered person survives; a period of time which can be as long as a century.

Actual experience of the Plan will not coincide exactly with assumed experience. Each actuarial valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of adjustments (usually small) to the computed contribution rate.

## Actuarial Assumptions in the Actuarial Valuation Process (Concluded)

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From time-to-time it becomes appropriate to modify one or more of the actuarial assumptions, to reflect experience trends (but not random year-to-year fluctuations). Thus, an experience review of the North Dakota Public Employees' Retirement System for the period July 1, 2014 to July 1, 2019, was performed to compare the demographic and economic experience against the actuarial assumptions used in the actuarial valuations. Most of the actuarial assumptions described in this section were adopted by the Board for use beginning with the July 1, 2020 actuarial valuation.

All actuarial assumptions are expectations of future experience, not current market measures.

The actuarial assumptions were provided by, and are the responsibility of, the NDPERS Board.

# Actuarial Valuation Assumptions

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## Current Actuarial Valuation Assumptions and Methods

**The assumed rate of investment return** used was 6.50 percent, net of expenses, annually. This assumption was adopted by the Board for use beginning with the July 1, 2022 actuarial valuation.

**The assumed rate of price inflation** is 2.25 percent. This assumption was adopted by the Board for use beginning with the July 1, 2020 actuarial valuation.

No Cost of Living Adjustments (COLA) are provided to benefits recipients. Therefore, there is no COLA assumption for this actuarial valuation.

**The rates of annual salary increase** used for individual members are in accordance with the following table. This assumption is used to project a member's current salary to the salaries upon which benefit amounts will be based. This assumption was adopted by the Board for use beginning with the July 1, 2020 actuarial valuation.

<b>Service At Beginning of Year</b>	<b>Increase Rate</b>
0	10.75%
1	8.75%
2	6.75%
<b>Age*</b>	
Under 30	6.75%
30 - 34	6.75%
35 - 39	6.00%
40 - 44	5.50%
45 - 49	4.75%
50 - 54	4.50%
55 - 59	3.75%
60 - 64	3.75%
65 - 69	3.75%
70+	3.75%

*\*Age-based salary increase rates apply for employees with three or more years of service.*

**The assumed rate of total payroll growth** used in amortizing the unfunded liability as a level percentage of pay is 3.50 percent. This assumption was adopted by the Board for use beginning with the July 1, 2020 actuarial valuation.

**The assumed rate of benefit indexing for inactive vested benefits** is 3.00 percent. This assumption was adopted by the Board for use beginning with the July 1, 2017, actuarial valuation.





## Actuarial Valuation Assumptions (Continued)

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### Application of Internal Revenue Code Section 415 Limits

Benefits for future retirees are assumed to be limited by the IRC Section 415 limits.

The limit for retirement ages of 62 and older is \$245,000 in 2022. The limits for retirement ages before age 62 are reduced from age 62 for early commencement using 5.0 percent interest, beginning of month payments, the 2022 Applicable Mortality Table (as published in IRS Notice 2021-61), and assumes forfeitable accrued benefits upon death prior to retirement.

The projected limits are assumed to increase by 2.25 percent annually. This assumption was adopted by the Board for use beginning with the July 1, 2020, actuarial valuation.

**The mortality assumptions** are as follows:

Type	Assumption	Male Scaling Factor	Female Scaling Factor
Post-Retirement Non-Disabled	Pub-2010 Healthy Retiree Mortality Table (for General Employees), sex distinct	103%	101%
Post-Retirement Disabled	Pub-2010 Disabled Retiree Mortality Table (for General Employees), sex distinct	117%	112%
Pre-Retirement	Pub-2010 Employee Mortality Table (for General Employees), sex distinct	92%	92%

Mortality is projected from 2010 with generational mortality improvement using the MP-2019 two-dimensional mortality improvement scales.

Following is a table with the life expectancies by age as of the actuarial valuation date.

## Actuarial Valuation Assumptions (Continued)

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Age	Healthy Mortality		Disabled Mortality	
	Post-Retirement			
	Future Life		Future Life	
	Expectancy (Years) in 2022		Expectancy (Years) in 2022	
	Men	Women	Men	Women
20	67.20	70.66	49.76	54.36
25	61.82	65.26	45.04	49.22
30	56.45	59.86	40.27	44.13
35	51.13	54.49	35.87	39.44
40	45.85	49.15	31.77	35.14
45	40.59	43.82	27.84	31.12
50	35.47	38.62	24.18	27.42
55	30.58	33.64	20.91	24.12
60	25.87	28.76	18.01	21.08
65	21.37	24.01	15.32	18.01
70	17.11	19.46	12.71	14.79
75	13.17	15.18	10.13	11.63
80	9.70	11.34	7.73	8.82
85	6.86	8.10	5.69	6.55
90	4.78	5.62	4.07	4.88
95	3.36	3.92	2.93	3.54
100	2.40	2.75	2.10	2.48
105	1.81	2.01	1.56	1.79

## Actuarial Valuation Assumptions (Continued)

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**Rates of separation from active membership** are represented by the following table (rates do not apply to members eligible to retire and do not include separation on account of death or disability). This assumption measures the probabilities of members terminating employment.

Service Beginning of Year	Service and Age-Based Rates For First Five Years of Service
Year	Rates
0	8.00%
1	8.00%
2	7.00%
3	7.00%
4	6.00%
<b>Age</b>	<b>Rates</b>
Under 35	2.50%
35+	1.25%

*Vested participants who terminate are assumed to elect the option with the greater present value:*

- 1) *A refund of their accumulated contributions with interest or*
- 2) *A deferred benefit.*

Withdrawal rates end upon eligibility for early retirement.

Early retirement eligibility is as follows:  
Age 50 and 10 years of service.

## Actuarial Valuation Assumptions (Continued)

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**Rates of disability:**

Before age 65: Males: 15.00% of OASDI disability incidence rates.  
 Females: 8.50% of OASDI disability incidence rates.  
 Age 65 and later: 0.15% per year.

**Rates of disability** were as follows:

Age	Male	Female
20	0.0090%	0.0051%
25	0.0128%	0.0073%
30	0.0165%	0.0094%
35	0.0221%	0.0125%
40	0.0330%	0.0187%
45	0.0539%	0.0306%
50	0.0909%	0.0515%
55	0.1513%	0.0858%
60	0.2440%	0.1383%
65	0.1500%	0.1500%

**Rates of retirement** for members eligible to retire during the next year were as follows:

Age	Male & Female	
	Rule of 80	Not Rule of 80
50	100.00%	25.00%
51	100.00%	25.00%
52	100.00%	25.00%
53	100.00%	25.00%
54	100.00%	25.00%
55	100.00%	75.00%
56	100.00%	75.00%
57	100.00%	75.00%
58	100.00%	75.00%
59	100.00%	75.00%
60+	100.00%	100.00%

**Assumed Service**

**Credit:**

All active members (full time and part time) are assumed to earn one full year of service for each assumed future year of service.

**Marital Status:**

It is assumed that 100 percent of participants have an eligible spouse at the time of retirement or pre-retirement death. The male spouse is assumed to be three years older than the female spouse.



## Actuarial Valuation Assumptions (Continued)

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Spouses are assumed to be the opposite sex of the employees and retirees. The relatively low rate of same-sex spouses does not have a material actuarial impact on the actuarial valuation results.

**Form of Payment**

**Election**

**Assumption:**

	Form of Payment	Election Percentage
	50% Joint and Survivor	100%

**Benefit Service:**

Exact fractional years of service are used to determine the amount of benefit payable.

**Decrement Timing:**

All decrements are assumed to occur at the middle of the year.

**Decrement Operation:**

Turnover decrements do not operate after the member reaches retirement eligibility (early or normal).

**Eligibility Testing:**

Eligibility for benefits is determined based upon the age nearest birthday and service on the date the decrement is assumed to occur.

**Pay Increase Timing:**

Beginning of (fiscal) year.

**Expenses:**

Assumed administrative expenses were added to the Normal Cost and are based on the prior year's expenses, adjusted for inflation. The assumed amount added to the Normal Cost is:

<b>Expenses</b>		
Assumed FY 2022	\$	37,932
Actual FY 2022		65,650
Assumed FY 2023		67,127

### Changes in Actuarial Valuation Assumptions and Methods since the Previous Actuarial Valuation

The investment return assumption was decreased from 7.00 percent to 6.50 percent. There have been no other changes in actuarial assumptions since the previous actuarial valuation as of June 30, 2021.

## **SECTION F**

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### **BENEFIT PROVISIONS**

# Brief Summary of Plan Provisions as of July 1, 2022

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## **Current Actuarial Valuation Plan Provisions**

This Section summarizes the major benefit provisions of the North Dakota Highway Patrolmen's Retirement System as included in the actuarial valuation. It is not intended to be, nor should it be, interpreted as a complete statement of all plan provisions.

### **1. Normal Service Retirement:**

Eligibility:

Attainment of age 55 with at least 10 years of eligible employment, or at any age with age plus service equal to at least 80 (Rule of 80).

Benefit:

3.60% of final average salary for each of the first 25 years of service plus 1.75 percent of final average salary for service in excess of 25 years.

### **2. Early Retirement:**

Eligibility:

Attainment of age 50 with 10 years of eligible employment.

Benefit:

The Normal Service Retirement benefit as determined above, reduced by one-half of one percent for each month before age 55.

### **3. Disability Benefit:**

Eligibility:

Accumulation of six months of service and inability to engage in substantial gainful activity.

Benefit:

70% of the member's final average salary at disability minus workers' compensation, with a minimum of \$100 per month.



## Brief Summary of Plan Provisions as of July 1, 2022 (Continued)

### 4. Deferred Vested Retirement:

Eligibility:

Ten years of eligible employment.

Benefit:

The Normal Service Retirement benefit is payable at age 55 or the Rule of 80, if earlier. Vested benefits are indexed at a rate set by the Retirement Board based on the increase in final average salary from date of termination to benefit commencement date, as follows:

<u>Year Beginning</u>	<u>Average Annual Increase</u>	<u>Three-Year Average Increase</u>
7/1/1994	3.00%	3.01%
7/1/1995	2.00%	2.86%
7/1/1996	2.00%	2.33%
7/1/1997	3.00%	2.33%
7/1/1998	1.80%	2.27%
7/1/1999	1.26%	2.02%
7/1/2000	2.00%	1.69%
7/1/2001	1.81%	1.69%
7/1/2002	1.73%	1.85%
7/1/2003	0.00%	1.18%
7/1/2004	0.00%	0.58%
7/1/2005	4.00%	1.33%
7/1/2006	4.00%	2.67%
7/1/2007	4.00%	4.00%
7/1/2008	4.00%	4.00%
7/1/2009	5.00%	4.33%
7/1/2010	5.00%	4.67%
7/1/2011	2.00%	4.00%
7/1/2012	2.00%	3.00%
7/1/2013	3.00%	2.33%
7/1/2014	3.00%	2.67%
7/1/2015	3.00%	3.00%
7/1/2016	2.00%	2.67%
7/1/2017	0.00%	1.67%
7/1/2018	0.00%	0.67%
7/1/2019	2.00%	0.67%
7/1/2020	2.50%	1.50%
7/1/2021	1.50%	2.00%
7/1/2022	2.00%	2.00%

Reduced early retirement benefits can be elected upon attainment of age 50.





## Brief Summary of Plan Provisions as of July 1, 2022 (Continued)

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### 5. Pre-Retirement Death Benefits:

#### (a) Eligibility:

Ten years of eligible employment.

Benefit:

One of the following options:

- Lump sum payment of member's accumulated contributions with interest.
- 50 percent of the member's accrued benefit (not reduced on account of age) for the surviving spouse's lifetime.

#### (b) Eligibility:

Less than 10 years of service.

Benefit:

Lump sum payment of member's accumulated contributions with interest.

### 6. Normal and Optional Forms of Payment:

Normal form of payment:

Monthly benefit for life with 50 percent of the benefit continuing for the life of the surviving spouse (if any).

Optional forms of payment:

- 100 percent joint and survivor annuity.
- Twenty-year certain and life annuity.
- Ten-year certain and life annuity.
- A partial lump sum payment in addition to one of the annuity options above.
- An actuarially equivalent graduated benefit option with either a one percent or two percent increase to be applied the first day of January of each year. Not available for disability or early retirements or in combination with a partial lump sum option or a deferred normal retirement option.

## Brief Summary of Plan Provisions as of July 1, 2022 (Continued)

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### 7. **Final Average Salary:**

Average of the highest salary received by the member for any 36 months employed during the last 180 months of employment. For members who terminate after December 31, 2019, final average salary is the higher of the final average salary calculated on December 31, 2019 or the average salary earned in the three highest periods of twelve consecutive months employed during the last 180 months of employment.

### 8. **Contributions:**

Member contributions as a percent of monthly salary: 13.80 percent

Member contributions earn interest at an annual rate equal to 0.5 percent less than the actuarial interest rate assumption.

State contributions as a percent of monthly salary for each participating member: 20.20 percent

The statutory employer and employee contributions will each increase by 0.5 percent of pay every year from January 1, 2022 to January 1, 2025, ultimately increasing both by 2.0 percent of pay.

### **Changes in Plan Provisions Since the Previous Actuarial Valuation**

There have been no changes in plan provisions since the previous actuarial valuation as of June 30, 2021.

## **SECTION G**

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### **CALCULATION OF THE GASB STATEMENT NOS. 67 AND 68 SINGLE DISCOUNT RATE**

## Calculation of the Single Discount Rate

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GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the System to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The current employer and employee fixed rate contributions are assumed to be made in each future year. The Plan Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the assumed actuarial valuation discount rate is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a municipal bond rate is required, as described in the following paragraph.

The Single Discount Rate (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) a tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this actuarial valuation, the expected rate of return on pension plan investments is 6.50 percent; the municipal bond rate is 3.69 percent; and the resulting Single Discount Rate is 5.02 percent.

The tables in this section provide detailed information on the development of the Single Discount Rate for the Highway Patrol plan.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities).

The **Projection of Plan Fiduciary Net Position** table shows the development of expected asset levels in future years.

The **Present Values of Projected Benefit Payments** table shows the development of the Single Discount Rate. It breaks down the benefit payments into present values for funded and unfunded portions and shows the equivalent total at the SDR.



# Projection of Contributions

Year	Projected Contributions from Current Employees	Projected Service Cost and Expense Contributions	Projected UAL Contributions	Projected Total Contributions	Admin Expenses	Total EANC
2023	\$ 1,823,518	\$ 2,182,817	\$ 467,632	\$ 4,473,967	\$ 63,416	\$ 3,942,919
2024	1,839,975	2,053,820	859,036	4,752,831	61,907	3,831,888
2025	1,889,677	1,973,371	976,771	4,839,818	60,348	3,802,700
2026	1,903,900	1,918,478	1,090,036	4,912,413	59,513	3,762,864
2027	1,917,943	1,929,264	1,090,711	4,937,917	58,307	3,788,899
2028	1,906,267	1,919,018	1,150,852	4,976,137	56,806	3,768,479
2029	1,884,371	1,893,707	1,234,020	5,012,097	55,209	3,722,869
2030	1,858,686	1,859,110	1,289,224	5,007,021	54,094	3,663,703
2031	1,857,010	1,853,408	1,317,560	5,027,978	52,992	3,657,426
2032	1,853,452	1,844,559	1,372,322	5,070,333	52,021	3,645,990
2033	1,855,273	1,841,564	1,447,030	5,143,867	49,405	3,647,433
2034	1,775,916	1,760,167	1,586,682	5,122,765	47,292	3,488,792
2035	1,724,251	1,696,194	1,626,926	5,047,372	45,212	3,375,233
2036	1,672,061	1,637,166	1,678,256	4,987,483	42,968	3,266,259
2037	1,609,384	1,568,703	1,747,217	4,925,304	39,898	3,138,189
2038	1,508,531	1,457,531	1,861,426	4,827,488	36,727	2,929,335
2039	1,400,988	1,343,041	1,929,473	4,673,502	33,634	2,710,395
2040	1,296,840	1,224,631	1,988,444	4,509,915	28,738	2,492,732
2041	1,109,025	1,033,309	2,113,209	4,255,543	25,165	2,117,169
2042	979,948	904,493	2,100,684	3,985,125	21,921	1,862,520
2043	863,688	779,656	2,149,754	3,793,098	16,874	1,626,470
2044	666,399	583,505	2,246,899	3,496,803	11,943	1,237,961
2045	473,380	409,963	2,229,027	3,112,371	10,072	873,271
2046	406,558	348,257	2,128,285	2,883,100	7,641	747,174
2047	312,836	257,093	2,177,752	2,747,681	5,237	564,692
2048	217,360	172,042	2,162,505	2,551,908	2,842	386,560
2049	119,404	81,161	2,130,155	2,330,720	1,624	198,941
2050	69,276	44,876	2,021,591	2,135,742	698	113,453
2051	30,229	18,020	1,924,001	1,972,250	-	48,249
2052	-	-	1,846,447	1,846,447	-	-
2053	-	-	1,796,083	1,796,083	-	-
2054	-	-	1,830,237	1,830,237	-	-
2055	-	-	1,899,462	1,899,462	-	-
2056	-	-	1,974,776	1,974,776	-	-
2057	-	-	2,042,180	2,042,180	-	-
2058	-	-	2,103,436	2,103,436	-	-
2059	-	-	2,172,170	2,172,170	-	-
2060	-	-	2,236,624	2,236,624	-	-
2061	-	-	2,283,972	2,283,972	-	-
2062	-	-	2,322,778	2,322,778	-	-
2063	-	-	2,364,768	2,364,768	-	-
2064	-	-	2,418,015	2,418,015	-	-
2065	-	-	2,482,242	2,482,242	-	-
2066	-	-	2,543,646	2,543,646	-	-
2067	-	-	2,618,718	2,618,718	-	-
2068	-	-	2,708,276	2,708,276	-	-
2069	-	-	2,807,668	2,807,668	-	-
2070	-	-	2,932,833	2,932,833	-	-
2071	-	-	3,091,467	3,091,467	-	-
2072	-	-	3,258,377	3,258,377	-	-



# Projection of Plan Fiduciary Net Position

Year	Projected Beginning Plan Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings at 6.500% (e)	Projected Ending Plan Fiduciary Net Position (f)=(a)+(b)-(c)-(d)+(e)
2023	\$ 92,324,497	\$ 4,473,967	\$ 6,312,891	\$ 63,416	\$ 5,940,240	\$ 96,362,397
2024	96,362,397	4,752,831	6,858,239	61,907	6,194,227	100,389,309
2025	100,389,309	4,839,818	7,230,343	60,348	6,446,906	104,385,342
2026	104,385,342	4,912,413	7,564,222	59,513	6,698,316	108,372,336
2027	108,372,336	4,937,917	7,868,272	58,307	6,948,599	112,332,273
2028	112,332,273	4,976,137	8,259,564	56,806	7,194,749	116,186,788
2029	116,186,788	5,012,097	8,710,001	55,209	7,432,085	119,865,761
2030	119,865,761	5,007,021	9,109,191	54,094	7,658,322	123,367,820
2031	123,367,820	5,027,978	9,465,212	52,992	7,875,273	126,752,868
2032	126,752,868	5,070,333	9,788,876	52,021	8,086,334	130,068,638
2033	130,068,638	5,143,867	10,299,181	49,405	8,287,971	133,151,891
2034	133,151,891	5,122,765	10,936,113	47,292	8,467,401	135,758,652
2035	135,758,652	5,047,372	11,480,034	45,212	8,617,096	137,897,873
2036	137,897,873	4,987,483	12,007,723	42,968	8,737,421	139,572,086
2037	139,572,086	4,925,304	12,629,420	39,898	8,824,467	140,652,540
2038	140,652,540	4,827,488	13,292,350	36,727	8,870,463	141,021,414
2039	141,021,414	4,673,502	13,981,896	33,634	8,867,556	140,546,942
2040	140,546,942	4,509,915	14,846,180	28,738	8,803,992	138,985,930
2041	138,985,930	4,255,543	15,738,676	25,165	8,665,954	136,143,587
2042	136,143,587	3,985,125	16,404,505	21,921	8,451,356	132,153,641
2043	132,153,641	3,793,098	17,226,600	16,874	8,159,731	126,862,996
2044	126,862,996	3,496,803	18,183,020	11,943	7,775,925	119,940,760
2045	119,940,760	3,112,371	18,746,911	10,072	7,295,704	111,591,851
2046	111,591,851	2,883,100	19,050,271	7,641	6,736,064	102,153,103
2047	102,153,103	2,747,681	19,396,915	5,237	6,107,202	91,605,834
2048	91,605,834	2,551,908	19,698,897	2,842	5,405,784	79,861,787
2049	79,861,787	2,330,720	19,868,093	1,624	4,629,972	66,952,763
2050	66,952,763	2,135,742	19,862,765	698	3,784,849	53,009,890
2051	53,009,890	1,972,250	19,768,866	0	2,876,358	38,089,633
2052	38,089,633	1,846,447	19,575,339	0	1,908,708	22,269,448
2053	22,269,448	1,796,083	19,307,324	0	887,358	5,645,565
2054	5,645,565	1,830,237	19,028,759	0	0	0
2055	(11,736,148)	1,899,462	18,739,468	0	0	0
2056	(29,877,688)	1,974,776	18,439,324	0	0	0
2057	(48,810,960)	2,042,180	18,128,223	0	0	0
2058	(68,584,282)	2,103,436	17,806,025	0	0	0
2059	(89,247,149)	2,172,170	17,472,583	0	0	0
2060	(110,838,062)	2,236,624	17,127,807	0	0	0
2061	(133,410,064)	2,283,972	16,771,682	0	0	0
2062	(157,032,867)	2,322,778	16,404,334	0	0	0
2063	(181,772,005)	2,364,768	16,025,983	0	0	0
2064	(207,685,400)	2,418,015	15,636,931	0	0	0
2065	(234,826,719)	2,482,242	15,237,520	0	0	0
2066	(263,253,754)	2,543,646	14,828,034	0	0	0
2067	(293,042,593)	2,618,718	14,408,719	0	0	0
2068	(324,257,506)	2,708,276	13,979,825	0	0	0
2069	(356,966,351)	2,807,668	13,541,557	0	0	0
2070	(391,246,413)	2,932,833	13,094,121	0	0	0
2071	(427,163,761)	3,091,467	12,637,689	0	0	0
2072	(464,780,996)	3,258,377	12,172,363	0	0	0



## Projection of Plan Fiduciary Net Position (Continued)

Year	Projected Beginning Plan Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings at 6.500% (e)	Projected Ending Plan Fiduciary Net Position (f)=(a)+(b)-(c)-(d)+(e)
2073	\$ (504,190,890)	\$ 3,422,124	\$ 11,698,284	\$ 0	\$ 0	0
2074	(545,504,198)	3,618,646	11,215,644	0	0	0
2075	(588,801,985)	3,829,198	10,724,642	0	0	0
2076	(634,190,132)	4,003,446	10,225,657	0	0	0
2077	(681,833,740)	4,159,847	9,719,303	0	0	0
2078	(731,890,226)	4,331,109	9,206,339	0	0	0
2079	(784,494,272)	4,506,408	8,687,733	0	0	0
2080	(839,801,478)	4,675,777	8,164,831	0	0	0
2081	(897,989,238)	4,841,885	7,639,320	0	0	0
2082	(959,245,459)	5,017,546	7,113,185	0	0	0
2083	(1,023,759,088)	5,198,843	6,588,832	0	0	0
2084	(1,091,737,881)	5,386,363	6,068,904	0	0	0
2085	(1,163,405,218)	5,581,428	5,556,213	0	0	0
2086	(1,239,000,535)	5,780,339	5,053,862	0	0	0
2087	(1,318,785,854)	5,983,780	4,564,937	0	0	0
2088	(1,403,042,705)	6,193,298	4,092,554	0	0	0
2089	(1,492,072,538)	6,409,943	3,639,906	0	0	0
2090	(1,586,198,607)	6,634,902	3,209,874	0	0	0
2091	(1,685,766,927)	6,871,842	2,805,048	0	0	0
2092	(1,791,144,893)	7,124,896	2,427,646	0	0	0
2093	(1,902,721,804)	7,395,678	2,079,338	0	0	0
2094	(2,020,912,321)	7,685,950	1,761,374	0	0	0
2095	(2,146,157,528)	7,997,417	1,474,457	0	0	0
2096	(2,278,926,149)	8,330,466	1,218,673	0	0	0
2097	(2,419,717,061)	8,685,164	993,635	0	0	0
2098	(2,569,061,101)	9,060,567	798,441	0	0	0
2099	(2,727,523,654)	9,456,557	631,685	0	0	0
2100	(2,895,705,527)	9,871,207	491,544	0	0	0
2101	(3,074,246,683)	10,299,228	375,801	0	0	0
2102	(3,263,831,856)	10,736,375	281,956	0	0	0
2103	(3,465,192,088)	11,181,088	207,363	0	0	0
2104	(3,679,104,816)	11,631,360	149,317	0	0	0
2105	(3,906,397,295)	12,082,980	105,137	0	0	0
2106	(4,147,952,125)	12,535,893	72,284	0	0	0
2107	(4,404,706,714)	12,994,515	48,463	0	0	0
2108	(4,677,652,475)	13,460,541	31,648	0	0	0
2109	(4,967,841,425)	13,933,614	20,098	0	0	0
2110	(5,276,392,530)	14,415,059	12,393	0	0	0
2111	(5,604,494,661)	14,907,242	7,412	0	0	0
2112	(5,953,410,363)	15,412,062	4,297	0	0	0
2113	(6,324,481,401)	15,930,471	2,413	0	0	0
2114	(6,719,135,122)	16,463,910	1,310	0	0	0
2115	(7,138,889,694)	17,014,003	689	0	0	0
2116	(7,585,359,982)	17,582,761	351	0	0	0
2117	(8,060,263,538)	18,172,811	172	0	0	0
2118	(8,565,426,716)	18,786,851	82	0	0	0
2119	(9,102,791,725)	19,427,734	36	0	0	0
2120	(9,674,424,029)	20,098,342	14	0	0	0
2121	(10,282,520,350)	20,801,232	6	0	0	0
2122	(10,929,417,549)	21,538,290	2	0	0	0



# Discount Rate Development

## Present Values of Projected Benefits Ending June 30 for 2023 to 2072

Year	Projected Beginning Plan Fiduciary Net Position	Projected Benefit Payments	Funded Portion of		Unfunded Portion of Projected Benefit Payments	Present Value of Funded Benefit Payments Using Expected Return Rate of 6.50%	Present Value of Unfunded Benefit Payments Using Municipal Bond Rate of 3.69%	Present Value of All Benefit Payments Using Single Discount Rate (SDR) of 5.02%
			Projected Benefit Payments	Projected Benefit Payments		(v)	(vf)	(h)=(c)/(1+SDR)^(a-.5)
(a)	(b)	(c)	(d)	(e)		(f)=(d)*v^(a-.5)	(g)=(e)*vf^(a-.5)	(h)=(c)/(1+SDR)^(a-.5)
2023	\$ 92,324,497	\$ 6,312,891	\$ 6,312,891	\$ 0	\$ 0	\$ 6,117,211	\$ 0	\$ 6,160,289
2024	96,362,397	6,858,239	6,858,239	0	0	6,240,052	0	6,372,811
2025	100,389,309	7,230,343	7,230,343	0	0	6,177,104	0	6,397,686
2026	104,385,342	7,564,222	7,564,222	0	0	6,067,931	0	6,373,440
2027	108,372,336	7,868,272	7,868,272	0	0	5,926,607	0	6,312,983
2028	112,332,273	8,259,564	8,259,564	0	0	5,841,633	0	6,310,416
2029	116,186,788	8,710,001	8,710,001	0	0	5,784,233	0	6,336,723
2030	119,865,761	9,109,191	9,109,191	0	0	5,680,123	0	6,310,618
2031	123,367,820	9,465,212	9,465,212	0	0	5,541,900	0	6,244,074
2032	126,752,868	9,788,876	9,788,876	0	0	5,381,602	0	6,149,165
2033	130,068,638	10,299,181	10,299,181	0	0	5,316,573	0	6,160,722
2034	133,151,891	10,936,113	10,936,113	0	0	5,300,813	0	6,229,275
2035	135,758,652	11,480,034	11,480,034	0	0	5,224,841	0	6,226,777
2036	137,897,873	12,007,723	12,007,723	0	0	5,131,460	0	6,201,924
2037	139,572,086	12,629,420	12,629,420	0	0	5,067,737	0	6,211,475
2038	140,652,540	13,292,350	13,292,350	0	0	5,008,214	0	6,225,278
2039	141,021,414	13,981,896	13,981,896	0	0	4,946,495	0	6,235,462
2040	140,546,942	14,846,180	14,846,180	0	0	4,931,699	0	6,304,678
2041	138,985,930	15,738,676	15,738,676	0	0	4,909,084	0	6,364,466
2042	136,143,587	16,404,505	16,404,505	0	0	4,804,473	0	6,316,879
2043	132,153,641	17,226,600	17,226,600	0	0	4,737,319	0	6,316,618
2044	126,862,996	18,183,020	18,183,020	0	0	4,695,150	0	6,348,873
2045	119,940,760	18,746,911	18,746,911	0	0	4,545,310	0	6,233,127
2046	111,591,851	19,050,271	19,050,271	0	0	4,336,960	0	6,031,468
2047	102,153,103	19,396,915	19,396,915	0	0	4,146,363	0	5,847,903
2048	91,605,834	19,698,897	19,698,897	0	0	3,953,911	0	5,655,291
2049	79,861,787	19,868,093	19,868,093	0	0	3,744,481	0	5,431,439
2050	66,952,763	19,862,765	19,862,765	0	0	3,515,001	0	5,170,637
2051	53,009,890	19,768,866	19,768,866	0	0	3,284,868	0	4,900,402
2052	38,089,633	19,575,339	19,575,339	0	0	3,054,189	0	4,620,669
2053	22,269,448	19,307,324	19,307,324	0	0	2,828,519	0	4,339,735
2054	5,645,565	19,028,759	7,475,802	11,552,957	1,028,360	1,589,207	0	4,072,839
2055	(11,736,148)	18,739,468	0	18,739,468	0	5,771,768	0	3,819,352
2056	(29,877,688)	18,439,324	0	18,439,324	0	5,477,214	0	3,578,681
2057	(48,810,960)	18,128,223	0	18,128,223	0	5,193,176	0	3,350,262
2058	(68,584,282)	17,806,025	0	17,806,025	0	4,919,352	0	3,133,547
2059	(89,247,149)	17,472,583	0	17,472,583	0	4,655,445	0	2,928,006
2060	(110,838,062)	17,127,807	0	17,127,807	0	4,401,178	0	2,733,142
2061	(133,410,064)	16,771,682	0	16,771,682	0	4,156,301	0	2,548,488
2062	(157,032,867)	16,404,334	0	16,404,334	0	3,920,596	0	2,373,615
2063	(181,772,005)	16,025,983	0	16,025,983	0	3,693,867	0	2,208,116
2064	(207,685,400)	15,636,931	0	15,636,931	0	3,475,932	0	2,051,608
2065	(234,826,719)	15,237,520	0	15,237,520	0	3,266,609	0	1,903,719
2066	(263,253,754)	14,828,034	0	14,828,034	0	3,065,699	0	1,764,077
2067	(293,042,593)	14,408,719	0	14,408,719	0	2,872,992	0	1,632,319
2068	(324,257,506)	13,979,825	0	13,979,825	0	2,688,277	0	1,508,089
2069	(356,966,351)	13,541,557	0	13,541,557	0	2,511,331	0	1,391,040
2070	(391,246,413)	13,094,121	0	13,094,121	0	2,341,935	0	1,280,834
2071	(427,163,761)	12,637,689	0	12,637,689	0	2,179,863	0	1,177,145
2072	(464,780,996)	12,172,363	0	12,172,363	0	2,024,882	0	1,079,649





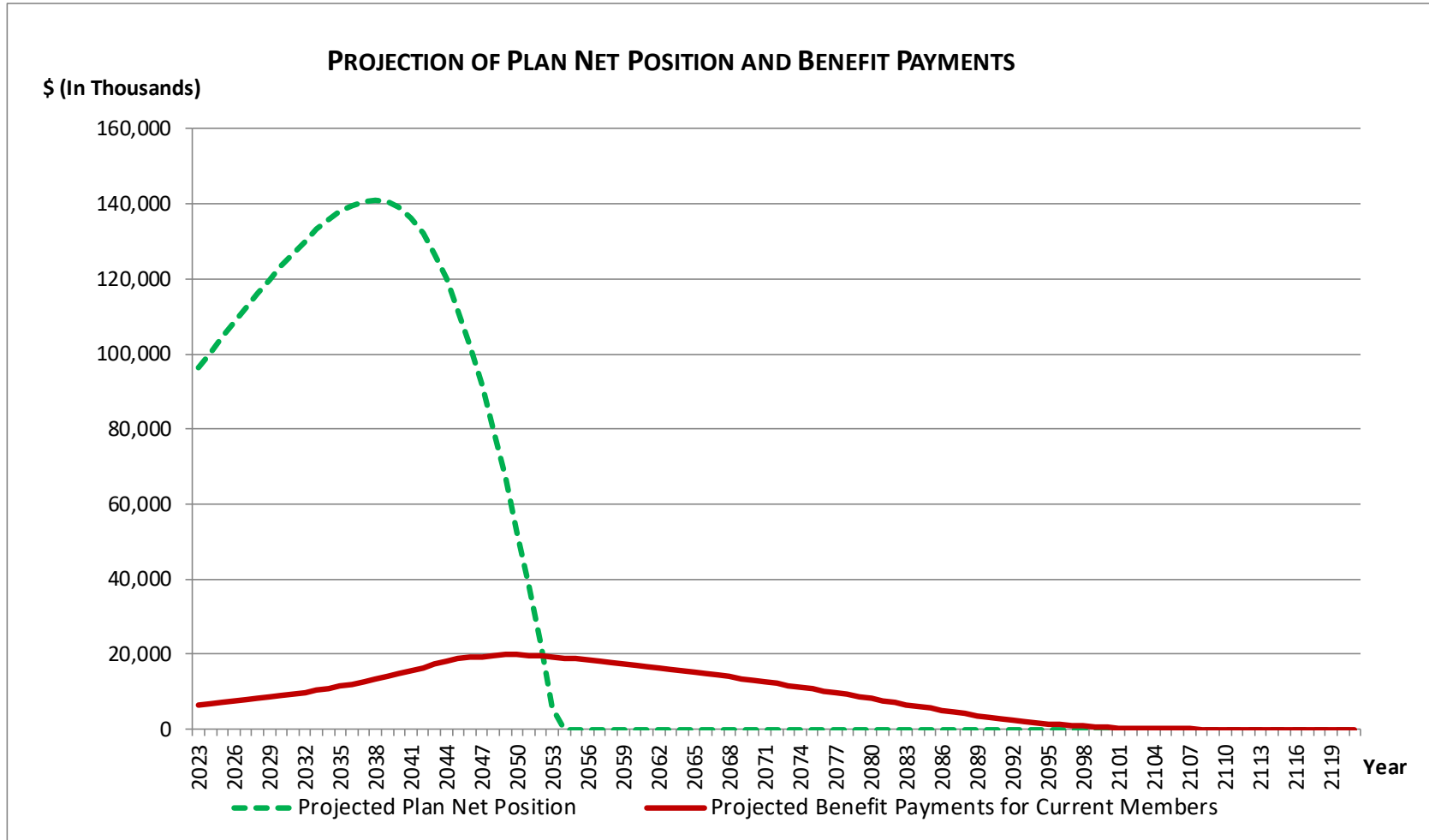
# Discount Rate Development

## Present Values of Projected Benefits Ending June 30 for 2073 to 2122

Year	Projected Beginning Plan Fiduciary Net Position	Projected Benefit Payments	Funded Portion of Projected Benefit Payments	Unfunded Portion of Projected Benefit Payments	Present Value of Funded Benefit Payments Using Expected Return Rate of 6.50%	Present Value of Unfunded Benefit Payments Using Municipal Bond Rate of 3.69%	Present Value of All Benefit Payments Using Single Discount Rate (SDR) of 5.02%
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v <sup>a</sup> ((a)-.5)	(g)=(e)*vf <sup>a</sup> ((a)-.5)	(h)=(c)/(1+SDR) <sup>a</sup> ((a)-.5)
2073	\$ (504,190,890)	\$ 11,698,284	\$ 0	\$ 11,698,284	\$ 0	\$ 1,876,765	\$ 988,042
2074	(545,504,198)	11,215,644	0	11,215,644	0	1,735,302	902,035
2075	(588,801,985)	10,724,642	0	10,724,642	0	1,600,283	821,348
2076	(634,190,132)	10,225,657	0	10,225,657	0	1,471,528	745,730
2077	(681,833,740)	9,719,303	0	9,719,303	0	1,348,887	674,949
2078	(731,890,226)	9,206,339	0	9,206,339	0	1,232,226	608,791
2079	(784,494,272)	8,687,733	0	8,687,733	0	1,121,432	547,058
2080	(839,801,478)	8,164,831	0	8,164,831	0	1,016,429	489,576
2081	(897,989,238)	7,639,320	0	7,639,320	0	917,165	436,187
2082	(959,245,459)	7,113,185	0	7,113,185	0	823,607	386,748
2083	(1,023,759,088)	6,588,832	0	6,588,832	0	735,745	341,128
2084	(1,091,737,881)	6,068,904	0	6,068,904	0	653,571	299,203
2085	(1,163,405,218)	5,556,213	0	5,556,213	0	577,064	260,843
2086	(1,239,000,535)	5,053,862	0	5,053,862	0	506,211	225,928
2087	(1,318,785,854)	4,564,937	0	4,564,937	0	440,967	194,324
2088	(1,403,042,705)	4,092,554	0	4,092,554	0	381,267	165,895
2089	(1,492,072,538)	3,639,906	0	3,639,906	0	327,030	140,499
2090	(1,586,198,607)	3,209,874	0	3,209,874	0	278,131	117,982
2091	(1,685,766,927)	2,805,048	0	2,805,048	0	234,404	98,178
2092	(1,791,144,893)	2,427,646	0	2,427,646	0	195,647	80,911
2093	(1,902,721,804)	2,079,338	0	2,079,338	0	161,613	65,992
2094	(2,020,912,321)	1,761,374	0	1,761,374	0	132,028	53,231
2095	(2,146,157,528)	1,474,457	0	1,474,457	0	106,588	42,432
2096	(2,278,926,149)	1,218,673	0	1,218,673	0	84,962	33,396
2097	(2,419,717,061)	993,635	0	993,635	0	66,808	25,928
2098	(2,569,061,101)	798,441	0	798,441	0	51,774	19,840
2099	(2,727,523,654)	631,685	0	631,685	0	39,503	14,947
2100	(2,895,705,527)	491,544	0	491,544	0	29,645	11,075
2101	(3,074,246,683)	375,801	0	375,801	0	21,858	8,063
2102	(3,263,831,856)	281,956	0	281,956	0	15,816	5,760
2103	(3,465,192,088)	207,363	0	207,363	0	11,218	4,034
2104	(3,679,104,816)	149,317	0	149,317	0	7,790	2,766
2105	(3,906,397,295)	105,137	0	105,137	0	5,290	1,855
2106	(4,147,952,125)	72,284	0	72,284	0	3,508	1,214
2107	(4,404,706,714)	48,463	0	48,463	0	2,268	775
2108	(4,677,652,475)	31,648	0	31,648	0	1,428	482
2109	(4,967,841,425)	20,098	0	20,098	0	875	292
2110	(5,276,392,530)	12,393	0	12,393	0	520	171
2111	(5,604,494,661)	7,412	0	7,412	0	300	97
2112	(5,953,410,363)	4,297	0	4,297	0	168	54
2113	(6,324,481,401)	2,413	0	2,413	0	91	29
2114	(6,719,135,122)	1,310	0	1,310	0	48	15
2115	(7,138,889,694)	689	0	689	0	24	7
2116	(7,585,359,982)	351	0	351	0	12	4
2117	(8,060,263,538)	172	0	172	0	6	2
2118	(8,565,426,716)	82	0	82	0	3	1
2119	(9,102,791,725)	36	0	36	0	1	0
2120	(9,674,424,029)	14	0	14	0	0	0
2121	(10,282,520,350)	6	0	6	0	0	0
2122	(10,929,417,549)	2	0	2	0	0	0
					\$ 153,270,214	\$ 86,423,430	\$ 239,693,644



## Projection of Plan Net Position and Benefit Payments



## **SECTION H**

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### **GLOSSARY OF TERMS**

## Glossary of Terms

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<b><i>Accrued Service</i></b>	Service credited under the system which was rendered before the date of the actuarial valuation.
<b><i>Actuarial Accrued Liability (AAL)</i></b>	The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability."
<b><i>Actuarial Assumptions</i></b>	These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.
<b><i>Actuarial Cost Method</i></b>	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.
<b><i>Actuarial Equivalent</i></b>	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.
<b><i>Actuarial Gain (Loss)</i></b>	The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.
<b><i>Actuarial Present Value (APV)</i></b>	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future payments at predetermined rates of interest and probabilities of payment.
<b><i>Actuarial Present Value of Future Plan Benefits</i></b>	The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.
<b><i>Actuarial Valuation</i></b>	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions.
<b><i>Actuarial Valuation Date</i></b>	The date as of which an actuarial valuation is performed.



## Glossary of Terms

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<b><i>Actuarial Value of Assets (AVA)</i></b>	Smoothed value of assets that recognizes the difference between the expected investment return using the actuarial valuation assumption of 6.50 percent and the actual investment return over a five-year period. Dampens volatility of asset value over time.
<b><i>Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)</i></b>	A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically, the Actuarially Determined Contribution has a normal cost payment and an amortization payment.
<b><i>Amortization Method</i></b>	The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be “open” (meaning, reset each year) or “closed” (the number of years remaining will decline each year).
<b><i>Amortization</i></b>	Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.
<b><i>Amortization Payment</i></b>	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
<b><i>Asset Return</i></b>	The net investment return for the asset divided by the mean asset value. Example: if \$1.00 is invested and yields \$1.08 after a year, the asset return is 8.00 percent.
<b><i>Cost-of-Living Adjustments</i></b>	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
<b><i>Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)</i></b>	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
<b><i>Covered-Employee Payroll</i></b>	The payroll of employees that are provided with pensions through the pension plan.
<b><i>Deferred Inflows and Outflows</i></b>	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.

## Glossary of Terms

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***Deferred Retirement Option Program (DROP)***

A program that permits a plan member to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The plan member continues to provide service to the employer and is paid for the service by the employer after the DROP entry date; however, the pensions that would have been paid to the plan member are credited to an individual member account within the defined benefit pension plan until the end of the DROP period. Other variations for DROP exist and will be more fully detailed in the plan provision section of the valuation report.

***Discount Rate***

For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically:

1. The benefit payments to be made while the pension plan's fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and
2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

***Entry Age Actuarial Cost Method (EAN)***

The EAN is a cost method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit age(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.

***Fiduciary Net Position***

The fiduciary net position is the market value of the assets of the trust dedicated to the defined benefit provisions.

***Funded Ratio***

The actuarial value of assets divided by the actuarial accrued liability. Measures the portion of the actuarial accrued liability that is currently funded.

***GASB***

The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.

***Long-Term Expected Rate of Return***

The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.



## Glossary of Terms

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<b><i>Market Value of Assets (MVA)</i></b>	The value of assets currently held in the trust available to pay for benefits of the Pension Plan. Each of the investments in the trust is valued at market price which is the price at which buyers and sellers trade similar items in the open market.
<b><i>Money-Weighted Rate of Return</i></b>	The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.
<b><i>Multiple-Employer Defined Benefit Pension Plan</i></b>	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
<b><i>Municipal Bond Rate</i></b>	The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.
<b><i>Net Pension Liability (NPL)</i></b>	The NPL is the liability of employers and non-employer contributing entities to plan members for benefits provided through a defined benefit pension plan.
<b><i>Non-Employer Contributing Entities</i></b>	Non-employer contributing entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB accounting statements, plan members are not considered non-employer contributing entities.
<b><i>Normal Cost</i></b>	The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as “current service cost.” Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.
<b><i>Other Postemployment Benefits (OPEB)</i></b>	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other postemployment benefits do not include termination benefits.
<b><i>Real Rate of Return</i></b>	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
<b><i>Service Cost</i></b>	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.

## Glossary of Terms

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### ***Total Pension Expense***

The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year:

1. Service Cost
2. Interest on the Total Pension Liability
3. Current-Period Benefit Changes
4. Employee Contributions (made negative for addition here)
5. Projected Earnings on Plan Investments (made negative for addition here)
6. Pension Plan Administrative Expense
7. Other Changes in Plan Fiduciary Net Position
8. Recognition of Outflow (Inflow) of Resources due to Liabilities
9. Recognition of Outflow (Inflow) of Resources due to Assets

### ***Total Pension Liability (TPL)***

The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.

### ***Unfunded Actuarial Accrued Liability (UAAL)***

The UAAL is the difference between actuarial accrued liability and valuation assets.

### ***Valuation Assets***

The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of GASB Statement Nos. 67 and 68, the valuation assets are equal to the market value of assets.