Public Employees' Retirement System of the State of Nevada

Actuarial Valuation and Review

As of June 30, 2020

Segal

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November 10, 2020

Public Employees' Retirement Board
693 West Nye Lane
Carson City, Nevada 89703

Dear Retirement Board Members:

We are pleased to submit this Actuarial Valuation and Review as of June 30, 2020 for the Public Employees' Retirement System of Nevada (PERS). It summarizes the actuarial data used in the valuation, establishes the actuarially determined contribution requirements for the 2020-2021 plan year and analyzes the preceding year's experience.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Plan. The census and financial information on which our calculations were based was provided by the Retirement Office. That assistance is gratefully acknowledged.

The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and changes in plan provisions or applicable law.

The actuarial calculations were completed under the supervision of Mark Hamwee, FSA, MAAA, Enrolled Actuary. We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the Plan.

We look forward to reviewing this report at your next meeting and to answering any questions.

Sincerely,

Segal

Brad Ramirez, FSA, MAAA, EA Vice President & Consulting Actuary	Mark Hamwee, FSA, MAAA, EA Vice President & Actuary

MAM/jl

Table of Contents

Table of Contents

Section 1: Actuarial Valuation Summary

Purpose and Basis

This report has been prepared by Segal to present a valuation of the Public Employees' Retirement System of the State of Nevada as of June 30, 2020. The valuation was performed to determine whether the assets and contribution rates are sufficient to provide the prescribed benefits. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law. The contribution requirements presented in this report are based on:

- The benefit provisions of the Public Employees' Retirement Act;
- The characteristics of covered active members, inactive vested members, retired members, disabled members, beneficiaries and survivors as of June 30, 2020;
- The assets of the Plan as of June 30, 2020, provided by the Retirement Office;
- Economic assumptions regarding future salary increases and investment earnings adopted by the Board for the June 30, 2020 valuation;
- Other actuarial assumptions regarding member terminations, retirement, death, etc. adopted by the Board for the June 30, 2020 valuation; and
- The funding policy adopted by the Retirement Board.

Valuation Highlights

Pg. 12

1. The ratios of the actuarial value of assets to actuarial accrued liabilities have increased from 74.9% to 75.7% for Regular members and increased from 76.5% to 77.5% for Police/Fire members.

Pg. 28

2. There were actuarial experience gains due to a lower than expected change in the Consumer Price Index (0.65% vs 2.75% expected), which resulted in lower than expected post-retirement benefit increases (PRBIs) for continuing retirees, beneficiaries and survivors over the next several years. These gains amounted to $373 million for Regular members and $113 million for Police/Fire members.

   There were also actuarial experience gains due to individual salary and service increases less than expected for continuing active Regular and Police/Fire members; this amounted to a $25 million gain for Regular members and an $8 million gain for Police/Fire members. The average actual increase for continuing active members during 2019-2020 was 5.1% for Regular members and 5.1% for Police/Fire members.

Pg. 30

3. Actuarially determined contributions may increase or decrease from year to year even if all assumptions are exactly met. For both Regular and Police/Fire members, the actuarially determined contribution rates for 2020 increased from the previous year. Both groups saw an increase due to experience losses, including the smaller than expected payroll growth used to amortize the UAAL and the actuarial experience losses during the year.

Pg. 29

4. The Public Employees' Retirement Act requires an adjustment in the statutory contribution rates on July 1 of each odd-numbered year based on the actuarially determined rates indicated in the actuarial valuation report for the immediately preceding year. Rates are only adjusted upward if the new rates are more than 0.50% higher than the existing rate for Employer-Pay members and if the new rates (for each the employee and the employer) are more than 0.25% higher for Employee/Employer members. Rates are only adjusted downward if the new rates are more than 2.00% lower than the existing rate for Employer-Pay members (and adjusted only by the amount in excess of 2.00%) and if the new rates (for each the employee and the employer) are more than 1.00% lower than the existing rate for Employee/Employer Members (and adjusted only by the amount in excess of 1.00%). Rates for each the employee and the employer are rounded to the nearest 0.25% of payroll. Since the actuarially determined rates from this valuation were not within the ranges previously noted for Regular and Police/Fire members and since this valuation year is an even numbered year, the following adjustments in the statutory contribution rates for Regular and Police/Fire members are required for fiscal years July 1, 2021 through June 30, 2023 as a result of this valuation.

Summary of Contribution Rates

	Regular	Police/Fire
Employer-Pay:[1]		
Statutory Rate for Fiscal Years July 1, 2019 through June 30, 2021 (as determined from the June 30, 2018 valuation)	29.25%	42.50%
Actuarially Determined Contribution Rate per June 30, 2020 Actuarial Valuation	29.84%	43.93%
Statutory Rate for Fiscal Years July 1, 2021 through June 30, 2023 (as determined from the June 30, 2020 valuation)	29.75%	44.00%
Employee/Employer:[2]		
Statutory Rate for Fiscal Years July 1, 2019 through June 30, 2021 (as determined from the June 30, 2018 valuation)	30.50%	44.00%
Actuarially Determined Contribution Rate per June 30, 2020 Actuarial Valuation	31.21%	45.42%
Statutory Rate for Fiscal Years July 1, 2021 through June 30, 2023 (as determined from the June 30, 2020 valuation)	31.00%	45.50%

1 See cost-sharing mechanism in NRS 286.421.

2 See cost-sharing mechanism in NRS 286.410.

Pg. 26

5. The rate of investment return on the market value of assets for 2019-2020 for the PERS Fund was 7.15%, and was 8.47% for the preceding year.

Pg. 25

6. The returns on the actuarial value of assets for 2019-2020 for the PERS Fund were 7.52% for Regular and 7.53% for Police/Fire, which were greater than the investment return assumption of 7.50%. As a result, the PERS Fund experienced investment gains on an actuarial value basis of approximately $5 million for Regular and $3 million for Police/Fire.

Pg. 22

7. As indicated in *Section 2, Subsection B* of this report, the total unrecognized investment gains as of June 30, 2020 were approximately $437 million for Regular and $126 million for Police/Fire, compared to gains of $523 million and $153 million in the previous valuation, respectively. These unrecognized gains will be recognized in the determination of the actuarial value of assets for funding purposes in the next few years and will serve to offset any investment losses that may occur after June 30, 2020. If the System earns the assumed rate of investment return of 7.50% per year (net of investment expenses) on an actuarial value basis, then the deferred gains would be recognized over the next four years as shown in the footnote on page 22.

Pg. 12

8. The June 30, 2020 unrecognized investment gains of $563 million represent about 1.2% of the PERS Fund market value of assets. Unless offset by future investment losses or other unfavorable experience, the recognition of the $563 million market gains is expected to have a small impact on the System's future funded ratio and actuarial contribution requirement. This potential impact may be illustrated as follows:

a. If the deferred gains were recognized immediately in the actuarial value of assets, the funded ratio would increase from 75.7% to 76.6% for Regular members and increase from 77.5% to 78.4% for Police/Fire members.

b. If the deferred gains were recognized immediately in the actuarial value of assets, the actuarially determined contribution rates would decrease as follows:

	2020/2021 Actuarially Determined Contribution Rate	2020/2021 Rate Reflecting Deferred Gains
Regular:		
Employer-Pay	29.84%	29.40%
Employee/Employer-Pay	31.21%	30.77%
Police/Fire:		
Employer-Pay	43.93%	43.34%
Employee/Employer-Pay	45.42%	44.83%

9. The June 30, 2020 valuation reflects benefit adjustments made by the System due to the post-retirement benefit increase (PRBI) audit. We understand that the System is continuing to make benefit adjustments to some retirees and beneficiaries, and any remaining adjustments will be reflected in future actuarial valuations once their amounts are known and reported to us.

10. The payroll growth assumptions are set by the Board and affect the timing of payments toward the unfunded liabilities. Considerations for setting these assumptions include future financial conditions that are difficult for Segal to evaluate. In recent years, payroll growth has been less than assumed. This has the effect of delaying contributions toward the unfunded liabilities and could result in increases to required contributions in future years. We recommend that the Board closely monitor actual payroll growth to verify that the assumptions remain valid.

11. The actuarial valuation report as of June 30, 2020 is based on financial data as of that date. Changes in the value of assets subsequent to that date, to the extent that they exist, are not reflected.

12. In 2009, the Critical Labor Shortage (CLS) program was extended through June 30, 2015 but restrictions on eligible positions were added. This program allows PERS retirees to return to work without facing the usual suspension of retirement benefits. Subsequently, the 2015 “sunset” was removed and the program was made permanent. As of the valuation date, there were a total of 278 retired PERS members currently active and reenrolled in PERS under this provision. This program has a minimal effect on System costs.

Pg. 32

13. Actuarial Standard of Practice No. 51 (ASOP 51) requires actuaries to identify and assess risks that "may reasonably be anticipated to significantly affect the plan's future financial condition". Examples of key risks listed that are particularly relevant to PERS are asset/liability mismatch risk, investment risk, and longevity risk. The standard also requires an actuary to consider if there is any ongoing contribution risk to the plan, however it does not require the actuary to evaluate the particular ability or willingness of contributing entities to make contributions when due, nor does it require the actuary to assess the likelihood or consequences of future changes in applicable law.

    The actuary's assessment can be strictly a qualitative discussion about potential adverse experience and the possible effect on future results, but it may also include quantitative numerical demonstrations where informative. The actuary is also encouraged to consider a recommendation as to whether a more detailed assessment or risk report would be significantly beneficial for the intended user in order to examine particular financial risks. When making that recommendation, the actuary will take into account such factors as the plan's design, risk profile, maturity, size, funded status, asset allocation, cash flow, possible insolvency and current market conditions.

    Since the actuarial valuation results are dependent on a fixed set of assumptions and data as of a specific date, there is risk that emerging results may differ, perhaps significantly, as actual experience is fluid and will not exactly track current assumptions. This potential divergence may have a significant impact on the future financial condition of the plan. We have not been engaged to perform a detailed analysis of the potential range of the impact of risk relative to the System's future financial condition, but have included a brief discussion of key risks that may affect the System in *Section 2, Subsection F*. A more detailed assessment of the risks tailored to specific interests or concerns of the Board would provide the Board with a better understanding of the inherent risks and is recommended. This assessment would further discuss and highlight information and risks particular to PERS such as detailed historical experience and key events, growing plan maturity, heightened contribution sensitivity to asset and liability changes, and projected sensitivity to potential future investment returns through selected scenario or stress test projections.

14. Segal strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the unfunded actuarial accrued liability and the principal balance. The funding policy adopted by the Board meets this standard.

15. The actuarial assumptions used in this valuation were based on the results of an experience study dated October 16, 2017, which covered plan experience from the period July 1, 2012 to June 30, 2016. These assumptions were adopted by the Board. We have been directed to perform another such study covering the period July 1, 2016 to June 30, 2020. The recommendations of this study, once approved, will be implemented in the valuation as of June 30, 2021.

16. It is important to note that this actuarial valuation is based on plan assets as of June 30, 2020. Due to the COVID-19 pandemic, market conditions have changed significantly during 2020. The Plan's funded status does not reflect short-term fluctuations of the market, but rather is based on the market values on the last day of the Plan Year. Moreover, this actuarial valuation is based on System data as of June 30, 2020 and it does not include any short-term or long-term impacts on mortality of the covered population

since June 30, 2020. While it is impossible to determine how the pandemic will continue to affect market conditions and other demographic experience of the Plan prior to next year's valuation, Segal is available to prepare projections of potential outcomes upon request.

Summary of Key Valuation Results

	Total (Regular and Police/Fire Combined)	
	2020	**2019**
Actuarially determined contribution rates for plan year beginning July 1:[1]	32.43%	32.17%
Funding elements for plan year beginning July 1:		
Normal cost, including administrative expenses	17.84%	17.94%
Total rate payroll[2]	$7,059,506,770	$6,786,900,381
Market value of assets	$46,735,117,356	$44,284,252,583
Actuarial value of assets	$46,171,692,203	$43,608,971,844
Actuarial accrued liability	$60,663,454,082	$57,920,215,973
Unfunded actuarial accrued liability	$14,491,761,879	$14,311,244,129
Funded ratio on actuarial value basis (AVA / AAL)	76.1%	75.3%
Funded ratio on market value basis (MVA / AAL)	77.0%	76.5%
Demographic data for plan year beginning July 1:		
Number of retired members and beneficiaries	72,741	70,056
Number of vested former members	17,398	17,341
Number of active members	111,815	109,167
Total salary[3]	$6,276,771,765	$6,038,622,015
Average salary	$56,135	$55,315

[1] Average rate for the combined Regular and Police/Fire Employer-pay and Employee/Employer-pay plans.
[2] Based on actual pay for prior year, annualized for new hires and part-time employees, and projected one year using individual salary increase assumption.
[3] Based on actual pay for prior year, without adjustment.

Summary of Key Valuation Results (continued)

	Regular		Police/Fire	
	2020	2019	2020	2019
Actuarially determined contribution rates for plan year beginning July 1:				
Employer-Pay[1]	29.84%	29.65%	43.93%	43.33%
Employee/Employer-Pay[2]	31.21%	31.01%	45.42%	44.82%
Funding elements for plan year beginning July 1:				
Normal cost, including administrative expenses				
Employer-Pay[1]	15.92%	16.05%	26.01%	25.94%
Employee/Employer-Pay[2]	17.29%	17.41%	27.50%	27.43%
Total rate payroll[3]	$5,882,784,503	$5,651,370,939	$1,176,722,267	$1,135,529,442
Market value of assets	$36,064,850,675	$34,242,125,697	$10,670,266,681	$10,042,126,886
Actuarial value of assets	$35,627,887,300	$33,719,407,942	$10,543,804,903	$9,889,563,902
Actuarial accrued liability	$47,057,708,741	$44,994,435,660	$13,605,745,341	$12,925,780,313
Unfunded actuarial accrued liability	$11,429,821,441	$11,275,027,718	$3,061,940,438	$3,036,216,411
Funded ratio on actuarial value basis (AVA / AAL)	75.7%	74.9%	77.5%	76.5%
Funded ratio on market value basis (MVA / AAL)	76.6%	76.1%	78.4%	77.7%
Demographic data for plan year beginning July 1:				
Number of retired members and beneficiaries	63,376	61,104	9,365	8,952
Number of vested former members	16,475	16,409	923	932
Number of active members	98,228	96,072	13,587	13,095
Total salary[4]	$5,207,314,750	$4,996,442,557	$1,069,457,015	$1,042,179,458
Average salary	$53,013	$52,007	$78,712	$79,586

1 See cost-sharing mechanism in NRS 286.421.
2 See cost-sharing mechanism in NRS 286.410.
3 Based on actual pay for prior year, annualized for new hires and part-time employees, and projected one year using individual salary increase assumption.
4 Based on actual pay for prior year, without adjustment.

Important Information About Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal relies on a number of input items. These include:

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant data	An actuarial valuation for a plan is based on data provided to the actuary by the System. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the market value of assets as of the valuation date, as provided by the System. The System uses an “actuarial value of assets” that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.
Actuarial assumptions	In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan’s assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results that does not mean that the previous assumptions were unreasonable.
Models	Segal valuation results are based on proprietary actuarial modeling software. The actuarial valuation models generate a comprehensive set of liability and cost calculations that are presented to meet regulatory, legislative and client requirements. Our Actuarial Technology and Systems unit, comprised of both actuaries and programmers, is responsible for the initial development and maintenance of these models. The models have a modular structure that allows for a high degree of accuracy, flexibility and user control. The client team programs the assumptions and the plan provisions, validates the models, and reviews test lives and results, under the supervision of the responsible actuary.

Section 1: Actuarial Valuation Summary

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

The actuarial valuation is prepared at the request of the System. Segal is not responsible for the use or misuse of its report, particularly by any other party.

An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan. Future contribution requirements may differ from those determined in the valuation because of:

- Differences between actual experience and anticipated experience;
- Changes in actuarial assumptions or methods;
- Changes in statutory provisions; and
- Differences between the contribution rates determined by the valuation and those adopted by the Board.

Some actuarial results in this report are not rounded, but that does not imply precision.

If the System is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.

Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The System should look to their other advisors for expertise in these areas.

As Segal has no discretionary authority with respect to the management or assets of the Plan, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Plan.

Section 2: Actuarial Valuation Results

A. Member Data

Regular Members

The Actuarial Valuation and Review considers the number and demographic characteristics of covered members, including active members, vested terminated members, retired members and beneficiaries.

This section presents a summary of significant statistical data on the Regular member group.

More detailed information for this valuation year and the preceding valuation can be found in *Section 3, Exhibits A, B, and C*.

Regular Member Population: 2011 – 2020

Year Ended June 30	Active Members	Vested Terminated Members	Retired Members and Beneficiaries	Ratio of Non-Actives to Actives
2011	87,975	11,931	40,675	0.60
2012	86,719	12,253	43,258	0.64
2013	87,193	13,009	45,796	0.67
2014	88,709	13,851	48,283	0.70
2015	91,124	14,206	50,877	0.71
2016	93,030	14,795	53,484	0.73
2017	93,276	15,763	55,975	0.77
2018	94,615	15,714	58,561	0.79
2019	96,072	16,409	61,104	0.81
2020	98,228	16,475	63,376	0.81

Regular Members (continued)

Active Members

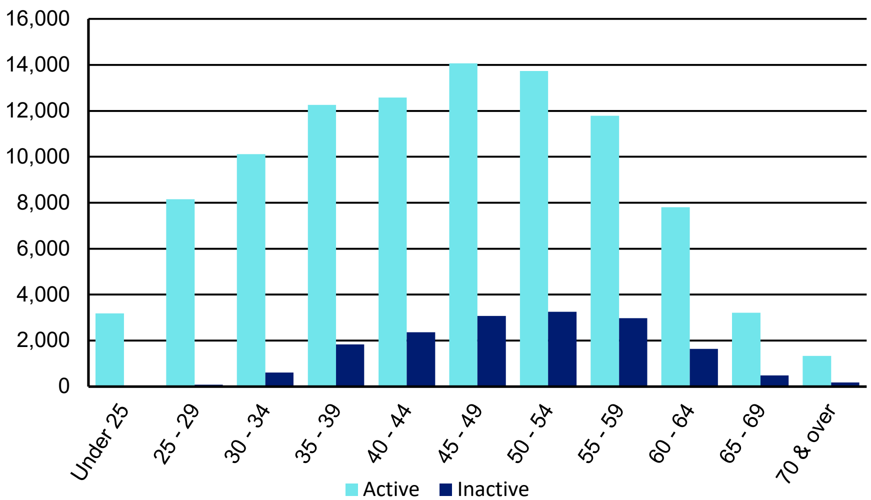
Plan costs are affected by the age, years of service and salaries of active members. In this year's valuation, there were 98,228 active members with an average age of 45.7, average years of service of 9.7 years and average salary of $53,013. The 96,072 active members in the prior valuation had an average age of 45.7, average service of 9.7 years and average salary of $52,007.

Inactive Members

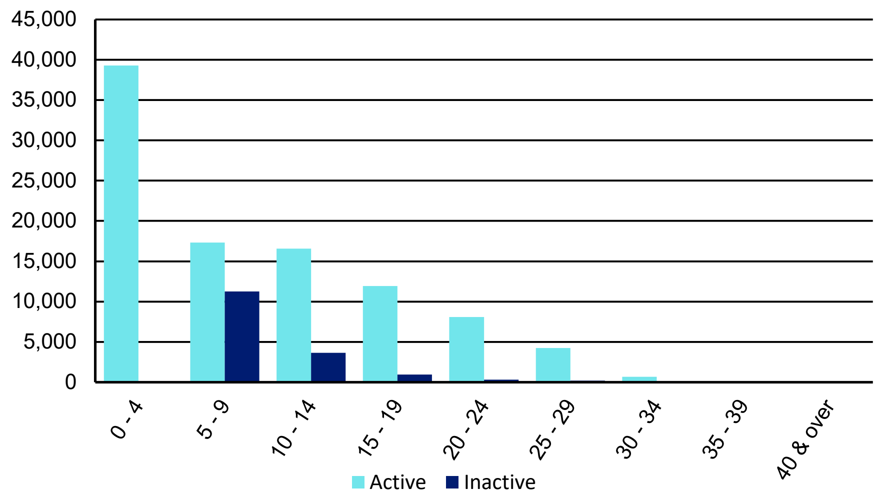
In this year’s valuation, there were 16,475 members with a vested right to a deferred or immediate vested benefit versus 16,409 members in the prior valuation. The average age and service of these members is 50.2 and 9.2 years, as compared to 49.9 and 9.2 as of last year’s valuation date.

Distribution of Active and Inactive Regular Members as of June 30, 2020

Active and Inactive Members by Age



Active and Inactive Members by Service



Regular Members (continued)

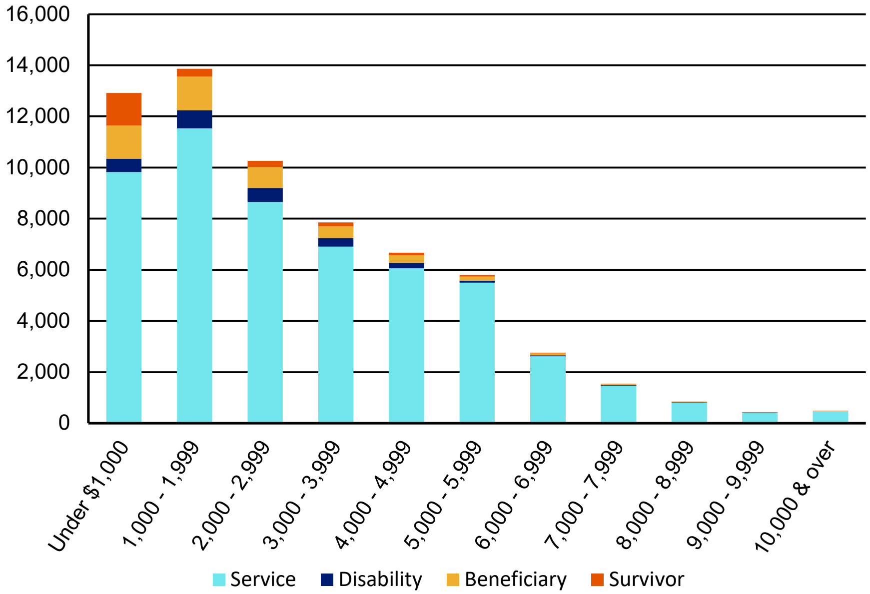
Retired Members and Beneficiaries

As of June 30, 2020, 56,733 retired members and 6,643 beneficiaries and survivors were receiving total monthly benefits of $188,785,793. Of these, 1,376 retired members and 30 beneficiaries and survivors were receiving annual benefits of at least $100,000, which represents 2.2% of all retirees, beneficiaries and survivors.

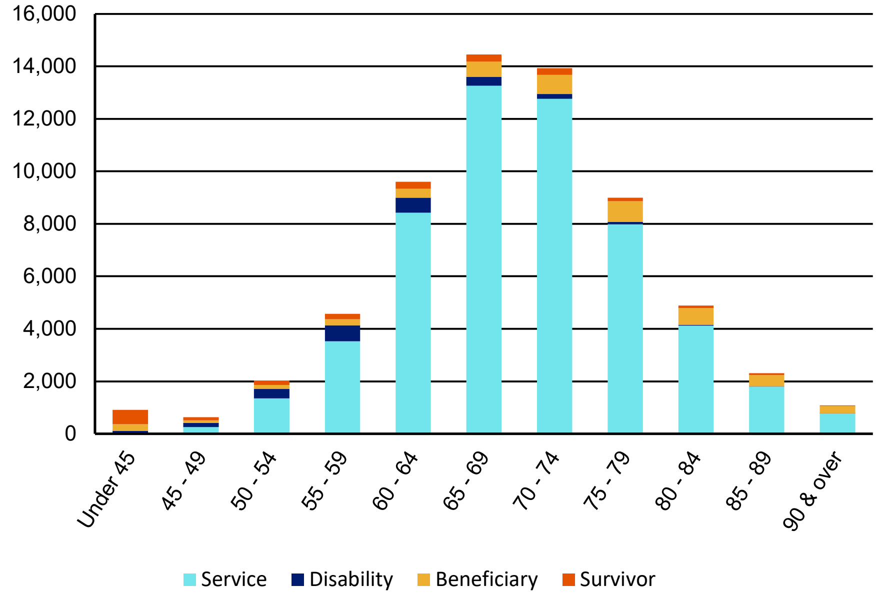
For comparison, in the previous valuation there were 54,678 retired members and 6,426 beneficiaries and survivors receiving monthly benefits of $176,415,869, with 1.9% of those receiving annual benefits of at least $100,000.

Distribution of Regular Retired Members and Beneficiaries as of June 30, 2020

Retired Members and Beneficiaries by Type and Monthly Amount



Retired Members and Beneficiaries by Type and Age



A. Member Data (continued)

Police/Fire Members

The Actuarial Valuation and Review considers the number and demographic characteristics of covered members, including active members, vested terminated members, retired members and beneficiaries.

This section presents a summary of significant statistical data on the Police/Fire member group.

More detailed information for this valuation year and the preceding valuation can be found in *Section 3, Exhibits A, B, and C*.

Police/Fire Member Population: 2011 – 2020

Year Ended June 30	Active Members	Vested Terminated Members	Retired Members and Beneficiaries	Ratio of Non-Actives to Actives
2011	11,936	701	5,903	0.55
2012	11,793	709	6,288	0.59
2013	11,845	730	6,634	0.62
2014	11,813	782	6,925	0.65
2015	11,984	826	7,282	0.68
2016	12,137	844	7,696	0.70
2017	12,525	905	8,155	0.72
2018	12,891	893	8,547	0.73
2019	13,095	932	8,952	0.75
2020	13,587	923	9,365	0.76

Police/Fire Members (continued)

Active Members

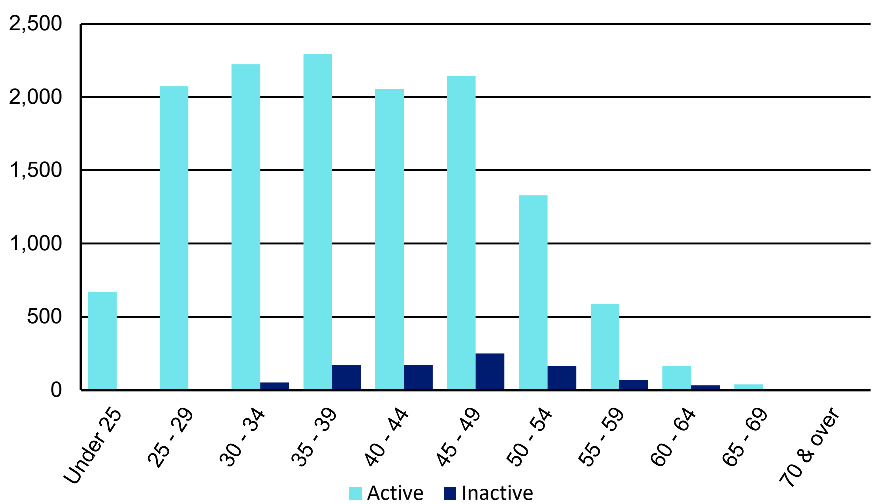
Plan costs are affected by the age, years of service and salaries of active members. In this year's valuation, there were 13,587 active members with an average age of 39.5, average years of service of 10.8 years and average salary of $78,712. The 13,095 active members in the prior valuation had an average age of 39.8, average years of service of 11.0 years and average salary of $79,586.

Inactive Members

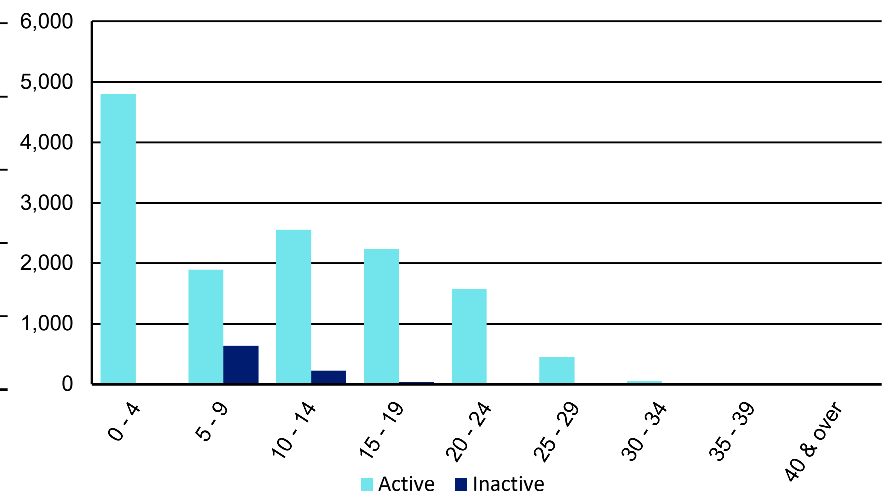
In this year's valuation, there were 923 members with a vested right to a deferred or immediate vested benefit versus 932 members in the prior valuation. The average age and service of these members is 46.2 and 8.7 years, as compared to 45.7 and 8.7 as of last year's valuation date.

Distribution of Active and Inactive Police/Fire Members as of June 30, 2020

Active and Inactive Members By Age



Active and Inactive Members By Service



Police/Fire Members (continued)

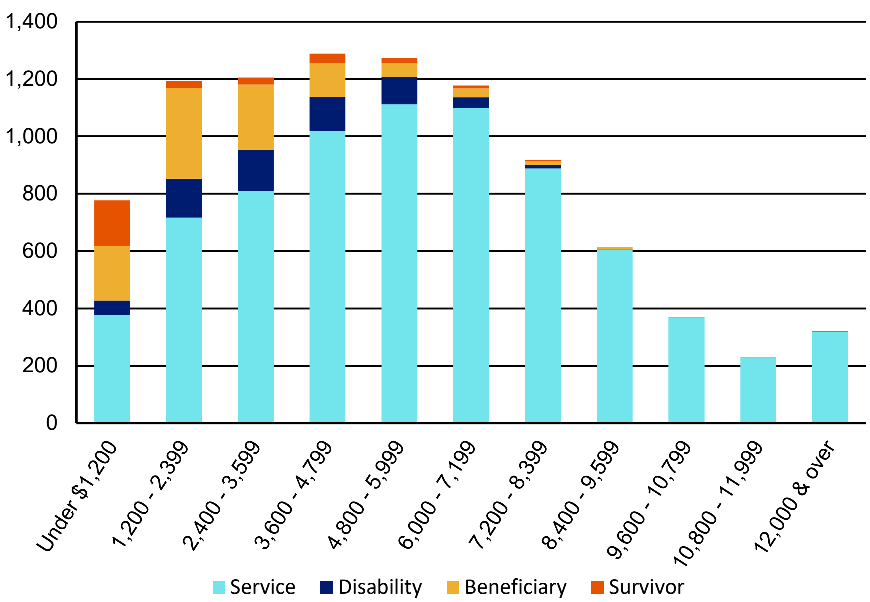
Retired Members and Beneficiaries

As of June 30, 2020, 8,134 retired members and 1,231 beneficiaries and survivors were receiving total monthly benefits of $49,768,787. Of these, 1,563 retired members and 14 beneficiaries and survivors were receiving annual benefits of at least $100,000, which represents 16.8% of all retirees, beneficiaries and survivors.

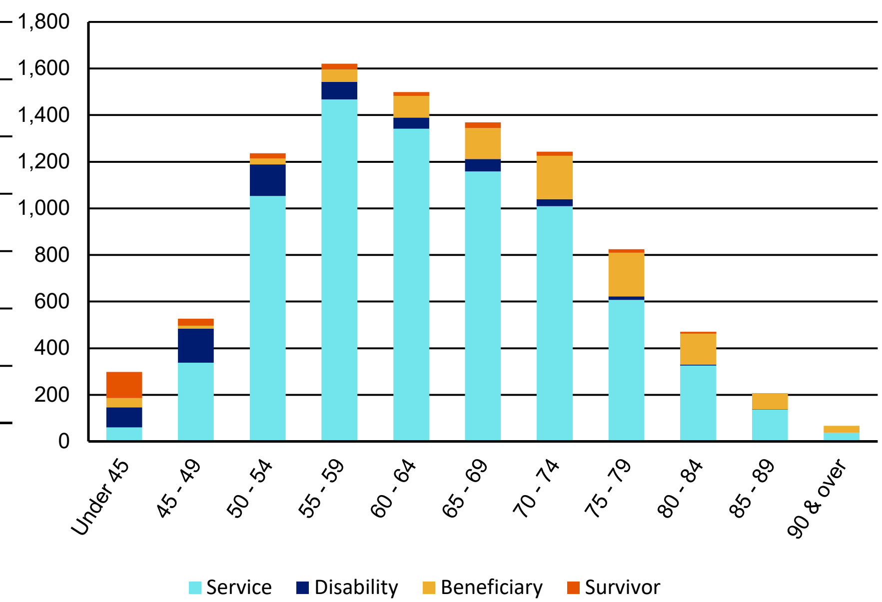
For comparison, in the previous valuation there were 7,788 retired members and 1,164 beneficiaries and survivors receiving monthly benefits of $46,128,240, with 15.3% of those receiving annual benefits of at least $100,000.

Distribution of Police/Fire Retired Members and Beneficiaries as of June 30, 2020

Retired Members and Beneficiaries by Type and Monthly Amount



Retired Members and Beneficiaries by Type and Age

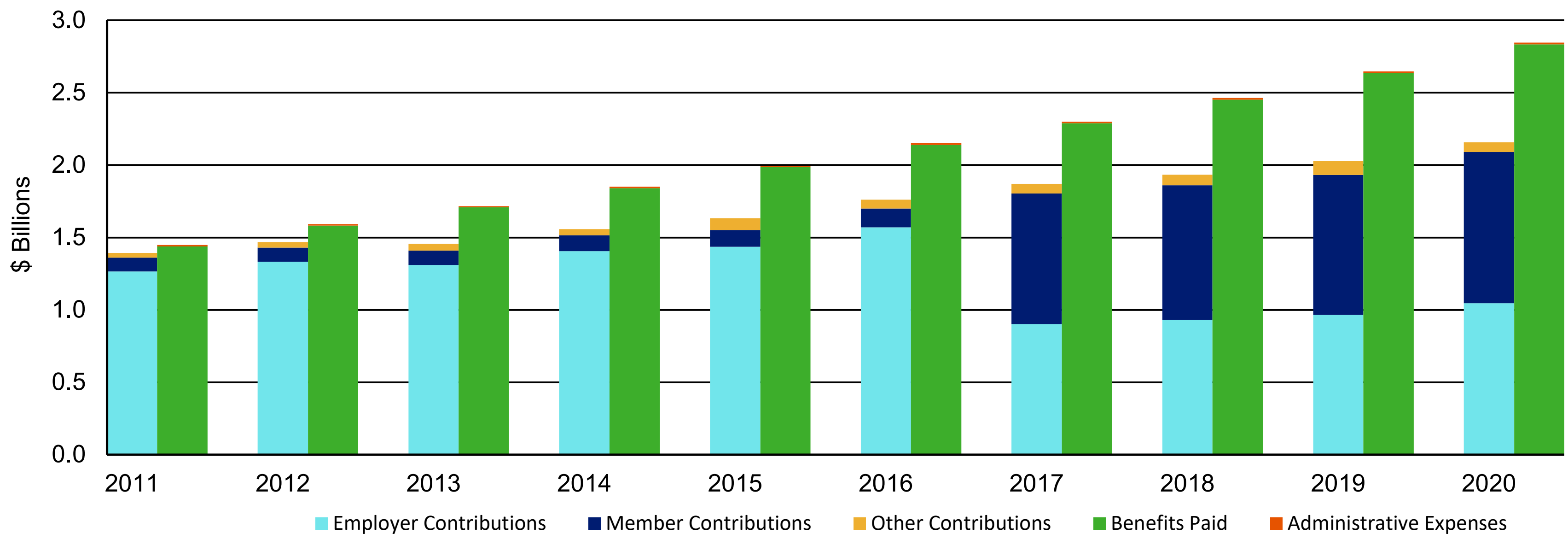


B. Financial Information

Retirement plan funding anticipates that, over the long term, both net contributions (less administrative expenses) and net investment earnings (less investment fees) will be needed to cover benefit payments.

Retirement plan assets change as a result of the net impact of these income and expense components. Additional financial information, including a summary of these transactions for the valuation year, is presented in *Section 3, Exhibits D, E, and F*.

Comparison of Contributions with Benefits and Expenses For Years Ended June 30, 2011 – 2020[1]



[1] Starting in the year ended June 30, 2017, pursuant to GASB Statement No. 82, the financial statements recognize half of the employer contributions made on behalf of Employer-Pay members as member contributions.

Determination of Actuarial Value of Assets for Year Ended June 30, 2020

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable.

The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

		Regular		Police/Fire	
1	**Market Value of Assets**		**$36,064,850,675**		**$10,670,266,681**
2	Calculation of unrecognized return	**Original Amount[1]**	**Unrecognized Return**	**Original Amount[1]**	**Unrecognized Return**
a)	Year ended June 30, 2020[2]	$(80,728,453)	$(64,582,762)	$(23,535,176)	$(18,828,142)
b)	Year ended June 30, 2019[2]	313,413,248	188,047,951	91,717,871	55,030,723
c)	Year ended June 30, 2018[2]	295,081,911	118,032,764	85,392,866	34,157,146
d)	Year ended June 30, 2017[2]	977,327,110	195,465,422	280,510,254	56,102,051
e)	Year ended June 30, 2016[2]	(1,479,964,178)	0	(421,255,666)	0
f)	Total unrecognized return[3]	$25,129,638	$436,963,375	$12,830,149	$126,461,778
3	Preliminary Actuarial Value of Assets 1 – 2f		$35,627,887,300		$10,543,804,903
4	Additional write up/(down) due to 70%/130% corridor		$0		$0
5	**Actuarial Value of Assets 3 + 4**		**$35,627,887,300**		**$10,543,804,903**
6	Actuarial Value of Assets as a percentage of Market Value of Assets[4]		98.79%		98.81%

[1] Market value minus prior year's actuarial value, adjusted for cash flows and expected return, minus prior year's unrecognized return.
[2] Recognition at 20% per year over 5 years.
[3] Deferred return as of June 30, 2020 recognized in each of the next four years:

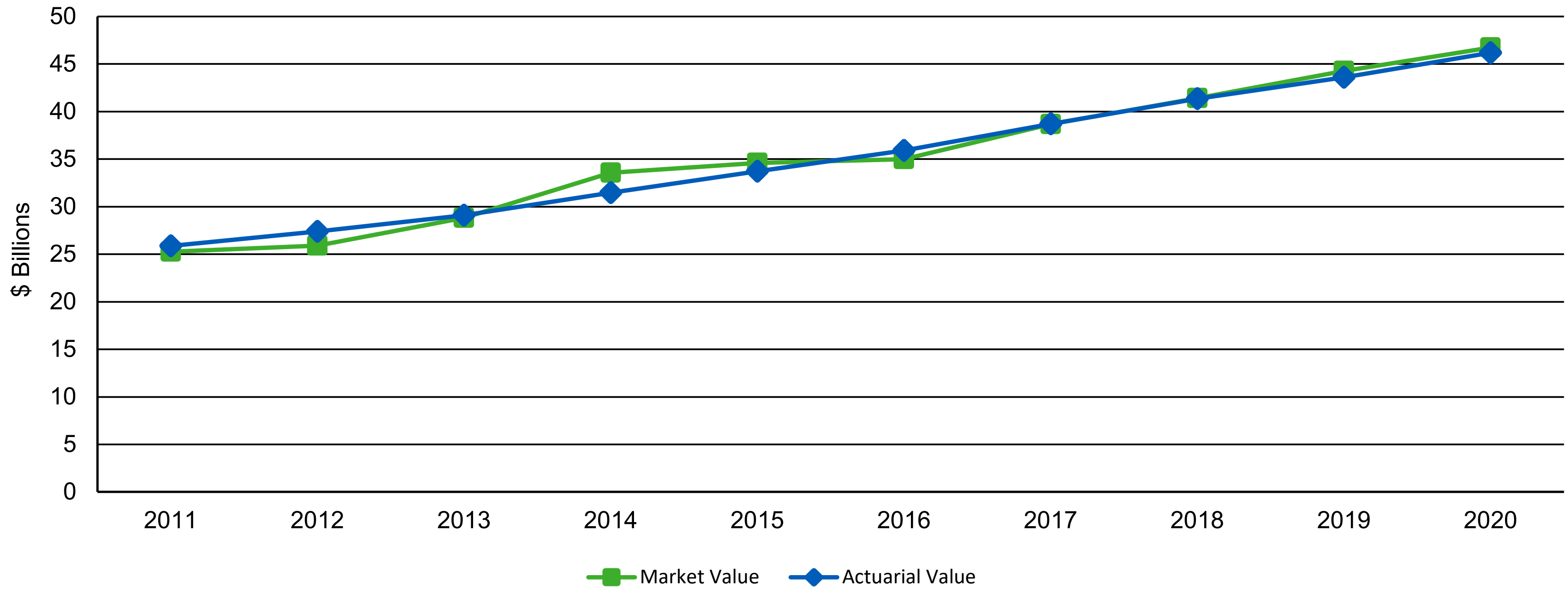
	Regular	Police/Fire	Total
(a) Amount recognized during 2020/2021	$301,018,763	$86,817,163	$387,835,926
(b) Amount recognized during 2021/2022	105,553,341	30,715,112	136,268,453
(c) Amount recognized during 2022/2023	46,536,959	13,636,539	60,173,498
(d) Amount recognized during 2023/2024	(16,145,688)	(4,707,036)	(20,852,724)
	$436,963,375	$126,461,778	$563,425,153

[4] Total actuarial value as a percentage of total market value is 98.79% for Regular and Police/Fire.

Section 2: Actuarial Valuation Results

Both the actuarial value and market value of assets are representations of PERS's financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because PERS's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

Market Value and Actuarial Value of Assets as of June 30, 2011 – 2020



C. Actuarial Experience

To calculate the required contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the contribution requirement will decrease from the previous year. On the other hand, the contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The components of the total loss of $146 million are shown below. The net experience loss from sources other than investments was 0.25% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

Actuarial Experience for Year Ended June 30, 2020

		Regular	Police/Fire	Total
1	Net gain/(loss) from investments[1]	$5,025,927	$2,566,030	$7,591,957
2	Net gain/(loss) from post-retirement benefit increases other than expected[2]	372,790,325	112,683,778	485,474,103
3	Net gain/(loss) from individual salary and service increases other than expected[2]	24,620,421	7,505,383	32,125,804
4	Net gain/(loss) from contributions other than expected	(137,132,632)	(41,615,957)	(178,748,589)
5	Net gain/(loss) from administrative expenses other than expected	(1,681,266)	(238,252)	(1,919,518)
6	Net gain/(loss) from other experience[2]	(399,060,764)	(91,157,684)	(490,218,448)
7	**Net experience gain/(loss): 1 + 2 + 3 + 4 + 5 + 6**	**$(135,437,989)**	**$(10,256,702)**	**$(145,694,691)**

[1] Details on page 25.
[2] Details on page 28. Does not include the effect of plan or assumption changes, if any.

Investment Experience

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the PERS investment policy. For valuation purposes, the assumed rate of return on the actuarial value of assets for the 2019-2020 plan year is 7.50%. The actual rates of return on an actuarial basis for the 2019-2020 plan year were 7.52% for Regular and 7.53% for Police/Fire.

Since the actual return for the year was greater than the assumed return, PERS experienced an actuarial gain during the year ended June 30, 2020 with regard to its investments.

Investment Experience for Year Ended June 30, 2020

		Regular	Police/Fire	Total
1	Actual return	$2,511,373,011	$741,028,781	$3,252,401,792
2	Average value of assets	33,417,961,116	9,846,170,012	43,264,131,128
3	Actual rate of return: **1 ÷ 2**	7.52%	7.53%	7.52%
4	Assumed rate of return	7.50%	7.50%	7.50%
5	Expected return: **2 × 4**	2,506,347,084	738,462,751	3,244,809,835
6	**Actuarial gain/(loss): 1 – 5**	**$5,025,927**	**$2,566,030**	**$7,591,957**

Section 2: Actuarial Valuation Results

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the market value investment return for the last ten years, including five-year and ten-year averages.

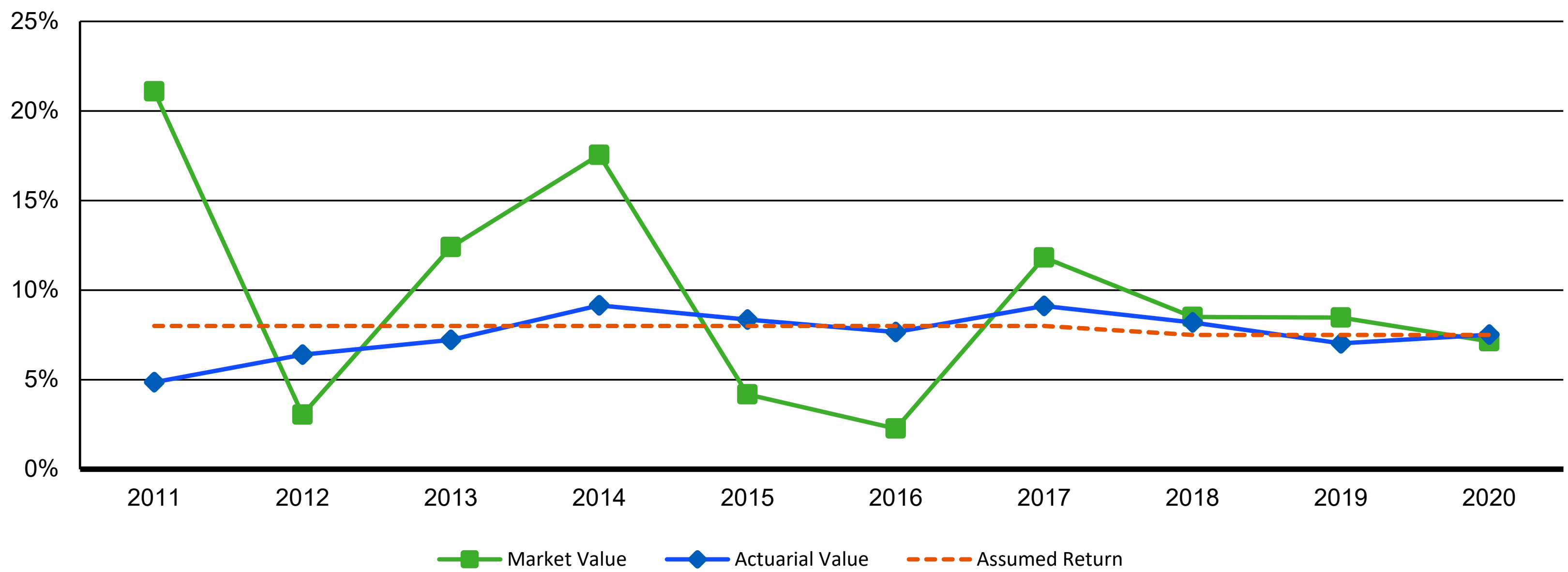
Investment Return – Actuarial Value vs. Market Value: 2011 – 2020

Year Ended June 30	Regular				Police/Fire				Total			
	Market Value Investment Return		Actuarial Value Investment Return		Market Value Investment Return		Actuarial Value Investment Return		Market Value Investment Return		Actuarial Value Investment Return	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
2011	$3,489,069,530	21.10%	$942,690,794	4.81%	$915,513,116	21.09%	$258,581,939	5.07%	$4,404,582,646	21.10%	$1,201,272,733	4.86%
2012	605,897,096	3.05%	1,297,183,274	6.36%	162,299,827	3.05%	354,285,182	6.53%	768,196,923	3.05%	1,651,468,456	6.40%
2013	2,511,331,333	12.41%	1,541,374,010	7.19%	685,094,279	12.40%	429,796,701	7.39%	3,196,425,612	12.40%	1,971,170,711	7.23%
2014	3,941,218,147	17.55%	2,066,313,021	9.10%	1,092,158,512	17.54%	583,651,095	9.32%	5,033,376,659	17.55%	2,649,964,116	9.15%
2015	1,091,598,827	4.19%	2,032,338,690	8.32%	306,479,335	4.18%	582,473,284	8.50%	1,398,078,162	4.19%	2,614,811,974	8.36%
2016	607,842,576	2.27%	1,998,441,567	7.66%	172,798,662	2.27%	569,208,453	7.67%	780,641,238	2.27%	2,567,650,020	7.66%
2017	3,195,254,603	11.82%	2,529,012,783	9.12%	917,155,134	11.82%	722,225,866	9.08%	4,112,409,737	11.82%	3,251,238,649	9.11%
2018	2,531,944,593	8.50%	2,447,884,797	8.21%	732,574,827	8.50%	705,926,799	8.18%	3,264,519,420	8.50%	3,153,811,596	8.20%
2019	2,695,615,596	8.47%	2,230,820,715	7.02%	787,003,317	8.47%	654,177,997	7.06%	3,482,618,913	8.47%	2,884,998,712	7.03%
2020	2,425,618,631	7.15%	2,511,373,011	7.52%	714,927,575	7.15%	741,028,781	7.53%	3,140,546,206	7.15%	3,252,401,792	7.52%
Total	$23,095,390,932		$19,597,432,662		$6,486,004,584		$5,601,356,097		$29,581,395,516		$25,198,788,759	
Five-year average return		**7.67%**		**7.87%**		**7.68%**		**7.87%**		**7.67%**		**7.87%**
Ten-year average return		**9.07%**		**7.61%**		**9.00%**		**7.72%**		**9.06%**		**7.64%**

Note: Each year's yield is weighted by the average asset value in that year.

In the preceding *Subsection B* we described the actuarial asset valuation method that gradually takes into account fluctuations in the market value rate of return. The effect of this method is to stabilize the actuarial rate of return, which contributes to leveling pension plan costs. This effect is clear in the chart below, where the year-to-year returns on actuarial value are less volatile than the returns on market value.

Market and Actuarial Rates of Return for Years Ended June 30, 2011 – 2020



Other Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include the extent of turnover among the participants, retirement experience (earlier or later than projected), mortality (more or fewer deaths than projected), the number of disability retirements, and salary increases different than assumed, and post-retirement benefit increases (PRBIs) different than expected.

The net gain/(loss) from this other experience for the year ended June 30, 2020 amounted to a loss of $1.7 million for Regular and a gain of $29.0 million for Police/Fire, which are 0.00% and 0.21% of the actuarial accrued liability, respectively. A brief summary of the demographic gain/(loss) experience (excluding contribution and administrative expense experience) of the PERS for the year ended June 30, 2020 is shown in the chart below.

Experience Due To Sources Other Than Investment Return For Year Ended June 30, 2020

	Regular	% of AAL	Police/Fire	% of AAL	Total	% of AAL
Age and Service Retirements	$(222,311,560)	(0.45%)	$(47,914,181)	(0.35%)	$(270,225,741)	(0.44%)
Disability Retirements	(4,323,725)	(0.01%)	(3,051,500)	(0.02%)	(7,375,225)	(0.01%)
Pre and Post-Retirement Mortality	20,922,773	0.04%	(17,307,144) [1]	(0.13%)	3,615,629	0.01%
Post-Retirement Benefit Increases (PRBIs)[2]	372,790,325	0.79%	112,683,778	0.83%	485,474,103	0.80%
Withdrawal From Employment	(76,001,228)	(0.16%)	(17,031,978)	(0.13%)	(93,033,206)	(0.15%)
Individual Pay and Service Increases	24,620,421	0.05%	7,505,383	0.06%	32,125,804	0.05%
Active New Entrants	(63,650,714)	(0.14%)	(9,735,317)	(0.07%)	(73,386,031)	(0.12%)
Active Rehires	(40,774,608)	(0.09%)	(5,153,543)	(0.04%)	(45,928,151)	(0.08%)
Inactive and Retiree Showups	(14,363,694)	(0.03%)	(2,056,104)	(0.02%)	(16,419,798)	(0.03%)
Other[3]	1,441,992	0.00%	11,092,083	0.08%	12,534,075	0.02%
Total Liability Experience Gain/(Loss) During Year	**$(1,650,018)**	**0.00%**	**$29,031,477**	**0.21%**	**$27,381,459**	**0.05%**

[1] Reflects Police/Fire mortality experience and also the assumption that existing “employer-pay” Police/Fire retirees with an unmodified option who retired after June 30, 1981 and before July 1, 2011 will have no surviving spouse.
[2] Includes the effect of benefit adjustments due to the PRBI audit for some members. We understand that the System is continuing to make benefit adjustments to some retirees and beneficiaries, and any remaining adjustments will be reflected in future actuarial valuations once their amounts are known and reported to us.
[3] Other gain/(loss) includes actual purchase of service contributions of $43.9 million for Regular and $23.1 million for Police/Fire.

D. Calculated Contribution Rates

The amount of annual contribution required to fund the Plan is comprised of a normal cost payment and a payment on the unfunded actuarial accrued liability. This total amount is then divided by the projected payroll for active members to determine the actuarially determined contribution rate.

The statutory contribution rates are adjusted at the beginning of each odd-numbered fiscal year, based on the actuarially determined rates indicated in the actuarial valuation report for the immediately preceding year. See *Section 4, Exhibit III* for details about this adjustment.

Calculated Contribution Rates for Year Beginning July 1

	2020		2019	
	Regular	Police/Fire	Regular	Police/Fire
Employer-Pay, Current Statutory Rate[1]	**29.25%**	**42.50%**	**29.25%**	**42.50%**
Normal cost	15.77%	25.86%	15.90%	25.79%
Amortization percentage	13.92%	17.92%	13.60%	17.39%
Administrative expenses	0.15%	0.15%	0.15%	0.15%
Employer-Pay, Total Rate[1]	**29.84%**	**43.93%**	**29.65%**	**43.33%**
New Statutory Rounded Rate	**29.75%**	**44.00%**	**N/A**	**N/A**
Employee/Employer-Pay, Current Statutory Rate[2]	**30.50%**	**44.00%**	**30.50%**	**44.00%**
Normal cost	17.14%	27.35%	17.26%	27.28%
Amortization percentage	13.92%	17.92%	13.60%	17.39%
Administrative expenses	0.15%	0.15%	0.15%	0.15%
Employee/Employer-Pay, Total Rate[2]	**31.21%**	**45.42%**	**31.01%**	**44.82%**
New Statutory Rounded Rate	**31.00%**	**45.50%**	**N/A**	**N/A**

[1] See cost-sharing mechanism in NRS 286.421.
[2] See cost-sharing mechanism in NRS 286.410.

Reconciliation of Actuarially Determined Contribution Rate

The actuarially determined contribution rates as of June 30, 2020 are based on all of the data described in the previous sections, the actuarial assumptions described in *Section 4*, and the Plan provisions adopted at the time of preparation of the Actuarial Valuation. They include all changes affecting future costs, adopted benefit changes, actuarial gains and losses and changes in the actuarial assumptions.

The chart below details the changes in the actuarially determined contribution rate from the prior rate-setting year to the current year's valuation.

Reconciliation of Actuarially Determined Contribution Rate from June 30, 2018 to June 30, 2020[1]

	Regular	Estimated Annual Dollar Cost[2]	Police/Fire	Estimated Annual Dollar Cost[2]
Actuarially Determined Contribution Rate as of June 30, 2018	**29.56%**	**$1,605,425,668**	**42.69%**	**$460,111,624**
• Effect of investment (gain)/loss	0.15%	8,695,975	0.19%	2,102,938
• Effect of (gains)/losses on individual salary and service experience	(0.13%)	(7,763,520)	0.26%	2,895,589
• Effect on existing amortization of payroll growth less than expected	0.36%	81,274,362[3]	0.66%	24,345,442[3]
• Effect of changes in normal cost	(0.32%)	54,976,414[4]	(0.11%)	24,581,748[4]
• Effect of contributions (more)/less than expected	0.32%	18,501,687	0.40%	4,609,975
• Effect of (gain)/loss on post-retirement benefit increases	(0.57%)	(32,883,734)	(0.78%)	(9,094,964)
• Effect of other (gains)/losses[5]	0.73%	42,491,283	0.76%	9,029,151
Total change	**0.54%**	**$165,292,467**	**1.38%**	**$58,469,879**
Actuarially Determined Contribution Rate as of June 30, 2020	**30.10%**	**$1,770,718,135**	**44.07%**	**$518,581,503**

1 Average rate for the Employer-pay and Employee/Employer pay plans.
2 Based on rate payroll for each valuation date shown.
3 Actual dollar increase in existing amortization bases.
4 Actual dollar increase/(decrease) in normal cost.
5 Estimated annual dollar cost also reflects change in payroll from the June 30, 2018 valuation.

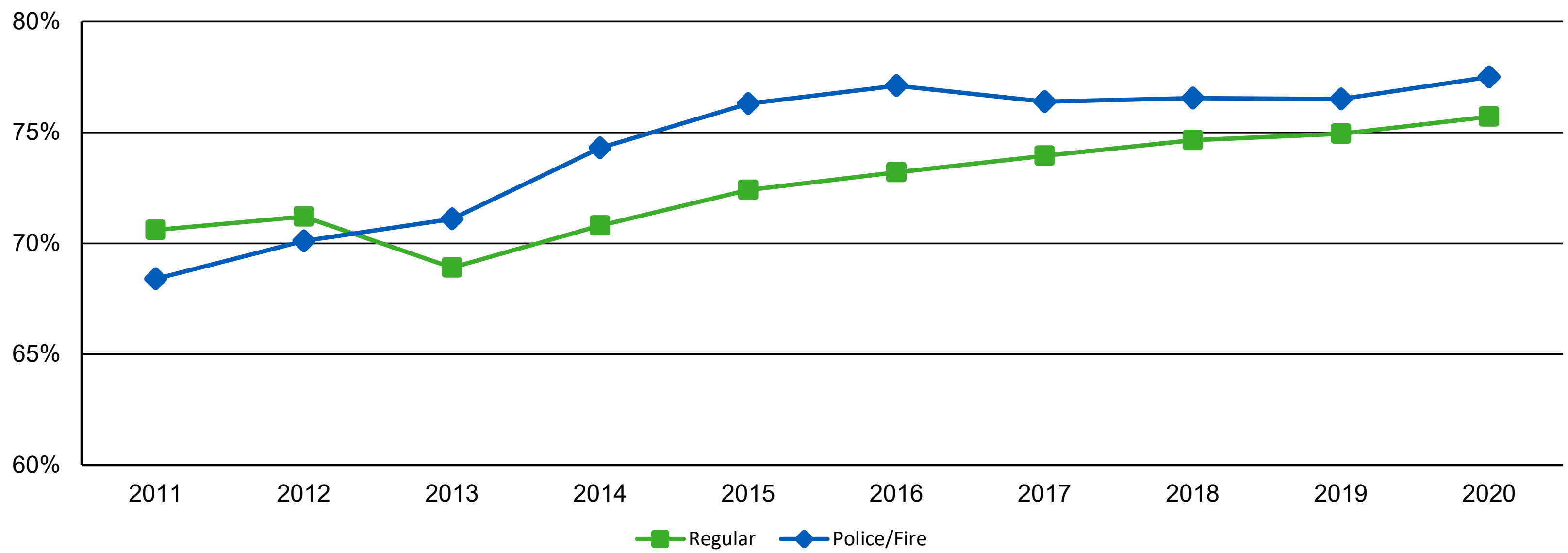
E. Funded Ratio

One critical piece of information regarding the Plan's financial status is the funded ratio. This ratio compares the actuarial value of assets to the actuarial accrued liabilities of the plan.

The funded status measures shown in this valuation are appropriate for assessing the need for or amount of future contributions. However, they are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations.

High ratios indicate a well-funded plan with assets sufficient to cover the plan's liabilities. Lower ratios may indicate recent changes to actuarial assumptions, benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other factors.

Funded Ratio for Years Ending June 30, 2011 – 2020



F. Risk Assessment

Since the actuarial valuation results are dependent on a fixed set of assumptions and data as of a specific date, there is risk that emerging results may differ, perhaps significantly, as actual experience is fluid and will not exactly track current assumptions. This potential divergence may have a significant impact on the future financial condition of the plan.

This section does not contain a detailed analysis of the potential range of future measurements, but does include a concise discussion of some of the primary risks that may affect the Plan's future financial condition. We recommend a more detailed assessment of the risks to provide the Board with a better understanding of the risks inherent in the Plan that can inform both financial preparation and future decision making. This assessment would enable us to work with the Board to highlight and illustrate particular risks or potential future outcomes that the Board may be interested in discussing and could include tailored scenario testing, sensitivity testing, stress testing and stochastic modeling.

This section provides descriptions and basic assessments of the primary risks that are likely to have an ongoing influence on the Plan's financial health, as well as a discussion of historical trends and maturity measures:

Risk Assessments

- Asset/Liability Mismatch Risk (the potential that future plan experience does not affect asset and liability values in the same way, causing them to diverge)

  The most significant asset/liability mismatch risk to the Plan is investment risk, as discussed below. In fact, investment risk has the potential to impact asset/liability mismatch in two ways. The first mismatch is evident in annual valuations: when asset values deviate from assumptions they are typically independent from liability changes. The second mismatch can be caused when systemic asset deviations from assumptions may signal the need for an assumption change, which causes liability values and contribution rates to move in the opposite direction from any change in the expected experience of asset growth rates.

  Asset/liability mismatch can also be caused by demographic assumption risks such as longevity, which affect liabilities but have no impact on asset levels. This risk is also discussed below.

- Investment Risk (the risk that investment returns will be different than expected)

  The investment return assumption is a long-term, static assumption for valuation purposes even though in reality market experience can be quite volatile in any given year. That volatility can cause significant changes in the financial condition of the plan, affecting both funded status and contribution rates. The inherent year-to-year volatility is reduced by smoothing through the Actuarial Value of Assets; however, investment experience can still have a sizable impact.

The market value rate of return over the last 10 years has ranged from a low of 2.27% to a high of 21.10%.

- Longevity Risk (the risk that mortality experience will be different than expected)

  The actuarial valuation includes current life expectancy assumptions and an expectation of future improvement in life expectancy, which are significant assumptions given the relatively long duration of liabilities for pension plans. Emerging plan experience that does not match these expectations will result in increases or decreases in the actuarially determined contribution over time. This risk can be reduced by using tables appropriate for the Plan (public experience tables) that are weighted by benefit levels, and by using generational mortality projections. The current mortality assumption of the Plan is based on a headcount-weighted table with a static projection.

- Other Risks

  In addition to longevity, the valuation includes a variety of other assumptions that are unlikely to match future experience exactly. One example is projected salary scales over time. As salary is central to the determination of benefits paid in retirement, deviations from the projected salary scales could have a material impact on the benefits anticipated for each member. Examples of demographic assumptions include retirement, termination and disability assumptions, and will likely vary in significance for different cost groups.

Some plans also carry significant contribution risk, defined as the potential for actual future contributions deviating from expected future contributions. However, the employers have a proven track record of contributing at the statutory contributions that are closely related to the Actuarially Determined Contributions based on the Board's Actuarial Funding Policy, so contribution risk is minimal.

Based on the Plan's amortization policy, any new UAAL from actuarial gains, losses or assumption changes is amortized over a "closed" amortization period of 20 years as a level percentage of payroll. The assumed total payroll growth rates used to compute the UAAL amortization payment are set by the Board and are currently 5.50% per year for Regular and 6.50% for Police/Fire. Prior to 2009, total payroll growth had historically met or exceeded the assumptions, however actual experience in recent years has been less than assumed. This relatively high total payroll growth assumption has the following impact on the funding of the UAAL and contribution rates:

- The relatively high total payroll growth assumption results in a UAAL contribution progression that starts low and increases materially over time. This causes a significant amount of negative amortization, where even with full expected payments the outstanding balance of a new UAAL layer will be larger than the original balance for the first 8 years for Regular and 10 years for Police/Fire before falling below the original level. This planned expansion of UAAL in the near future further exposes the System to the other risks detailed in this section.
- In years when the actual total payroll growth is less than the assumption, the System will receive less UAAL contributions than expected. This "contribution loss" could lead to future contribution rate increases.

Evaluation of Historical Trends

Past experience can help demonstrate the sensitivity of key results to the Plan's actual experience. Over the past ten years:

- The funded percentage on the actuarial value of assets basis has increased from 70.6% to 75.7% for Regular and 68.4% to 77.5% for Police/Fire. This is primarily due to contributions made to amortize the UAAL using a 20-year amortization period (as compared to a 30-year amortization period used before 2012) and average investment return over recent years higher than the assumption on a smoothed basis, and other experience. For a more detailed history see *Section 2, Subsection E, Funded Ratio* on page 31.
- The average investment return weighted by the actuarial value of assets over the last 10 years was 7.64%. This includes a high of a 9.15% return and a low of 4.86%. The average over the last 5 years was 7.87%. For more details see the Investment Return table in *Section 2, Subsection C* on page 26.
- A major source of new UAAL was the strengthening of assumptions through multiple assumption changes. For example, the assumption changes in 2013 updated mortality tables and other assumptions, adding $1,460 million in unfunded liability. The assumption changes in 2017 changed the discount rate from 8.00% to 7.50% and updated mortality tables and other assumptions, adding $1,046 million in unfunded liability. For more details on the unfunded liability changes see *Section 3, Exhibit H, Table of Amortization Bases* starting on page 46.

Maturity Measures

In the last 10 years the ratio of non-active members to active members has increased from 0.60 to 0.81 for Regular and 0.55 to 0.76 for Police/Fire. An increased ratio indicates that the plan has grown in maturity over time. This is to be expected, but is also informative for understanding plan sensitivity to particular risks. For more details see *Section 2, Subsection A, Member Data* on pages 15 and 18.

As pension plans mature, the cash needed to fulfill benefit obligations will increase over time. Therefore, cash flow projections and analysis should be performed to assure that the Plan's asset allocation is aligned to meet emerging pension liabilities. For the prior year, benefits and expenses paid were $690 million more than contributions received. This outflow is 1.5% of the market value of assets. Plans with higher levels of negative cash flows have a need for a larger allocation to income generating assets, which can create a drag on investment return. For more details on historical cash flows see the Comparison of Contributions with Benefits and Expenses in *Section 2, Subsection B, Financial Information* on page 21.

Section 3: Supplemental Information

Exhibit A: Table of Plan Coverage

Regular

	Year Ended June 30		Change From Prior Year
	2020	2019	
Active members in valuation:			
• Number	98,228	96,072	2.24%
Employer-Pay	77,215	75,772	1.90%
Employee/Employer-Pay	21,013	20,300	3.51%
• Average age	45.7	45.7	0.0
• Average service	9.7	9.7	0.0
• Total annual salary	$5,207,314,749	$4,996,442,557	4.22%
• Average annual salary	$53,013	$52,007	1.93%
• Account balances	$990,589,231	$912,740,918	8.53%
• Total active vested members	63,326	61,958	2.21%
Vested terminated members	16,475	16,409	0.40%
Retired members:			
• Number in pay status	54,266	52,202	3.95%
• Average age	70.4	70.2	0.2
• Average monthly benefit	$3,136	$3,040	3.16%
Disabled members:			
• Number in pay status	2,467	2,476	(0.36%)
• Average age	60.2	59.7	0.5
• Average monthly benefit	$2,320	$2,254	2.93%
Beneficiaries:			
• Number in pay status	4,510	4,327	4.23%
• Average age	71.9	71.7	0.2
• Average monthly benefit[1]	$2,145	$2,095	2.39%
Survivors:			
• Number in pay status	2,133	2,099	1.62%
• Average age	55.9	55.4	0.5
• Average monthly benefit[1]	$1,505	$1,456	3.37%
Total pay status:			
• Number in pay status	63,376	61,104	3.72%
• Average age	69.6	69.4	0.2
• Average monthly benefit	$2,979	$2,887	3.19%

[1] The 2019 benefit amounts provided for some continuing beneficiaries and survivors included the retroactive payments due to the PRBI audit benefit adjustment. For those affected beneficiaries, we estimated the 2019 benefit amounts based on the benefit amounts reported for 2018.

Exhibit A: Table of Plan Coverage (continued)

Police/Fire	Year Ended June 30 2020	Year Ended June 30 2019	Change From Prior Year
Active members in valuation:			
• Number	13,587	13,095	3.76%
Employer-Pay	11,857	11,439	3.65%
Employee/Employer-Pay	1,730	1,656	4.47%
• Average age	39.5	39.8	(0.3)
• Average service	10.8	11.0	(0.2)
• Total annual salary	$1,069,457,015	$1,042,179,458	2.62%
• Average annual salary	$78,712	$79,586	(1.10%)
• Account balances	$162,236,373	$152,232,169	6.57%
• Total active vested members	9,168	9,036	1.46%
Vested terminated members	923	932	(0.97%)
Retired members:			
• Number in pay status	7,536	7,214	4.46%
• Average age	64.1	64.0	0.1
• Average monthly benefit	$5,911	$5,727	3.21%
Disabled members:			
• Number in pay status	598	574	4.18%
• Average age	54.4	54.1	0.3
• Average monthly benefit	$3,524	$3,375	4.41%
Beneficiaries:			
• Number in pay status	958	900	6.44%
• Average age	71.2	71.4	(0.2)
• Average monthly benefit[1]	$2,691	$2,632	2.24%
Survivors:			
• Number in pay status	273	264	3.41%
• Average age	45.7	45.3	0.4
• Average monthly benefit[1]	$1,978	$1,916	3.24%
Total pay status:			
• Number in pay status	9,365	8,952	4.61%
• Average age	63.7	63.6	0.1
• Average monthly benefit	$5,315	$5,153	3.14%

[1] The 2019 benefit amounts provided for some continuing beneficiaries and survivors included the retroactive payments due to the PRBI audit benefit adjustment. For those affected beneficiaries, we estimated the 2019 benefit amounts based on the benefit amounts reported for 2018.

Exhibit A: Table of Plan Coverage (continued)

Total	Year Ended June 30 2020	Year Ended June 30 2019	Change From Prior Year
Active members in valuation:			
• Number	111,815	109,167	2.43%
Employer-Pay	89,072	87,211	2.13%
Employee/Employer-Pay	22,743	21,956	3.58%
• Average age	44.9	45.0	(0.1)
• Average service	9.8	9.9	(0.1)
• Total annual salary	$6,276,771,764	$6,038,622,015	3.94%
• Average annual salary	$56,135	$55,315	1.48%
• Account balances	$1,152,825,604	$1,064,973,087	8.25%
• Total active vested members	72,494	70,994	2.11%
Vested terminated members	17,398	17,341	0.33%
Retired members:			
• Number in pay status	61,802	59,416	4.02%
• Average age	69.6	69.4	0.2
• Average monthly benefit	$3,474	$3,367	3.18%
Disabled members:			
• Number in pay status	3,065	3,050	0.49%
• Average age	59.1	58.7	0.4
• Average monthly benefit	$2,555	$2,465	3.65%
Beneficiaries:			
• Number in pay status	5,468	5,227	4.61%
• Average age	71.8	71.7	0.1
• Average monthly benefit[1]	$2,241	$2,187	2.47%
Survivors:			
• Number in pay status	2,406	2,363	1.82%
• Average age	54.8	54.3	0.5
• Average monthly benefit[1]	$1,559	$1,508	3.38%
Total pay status:			
• Number in pay status	72,741	70,056	3.83%
• Average age	68.8	68.6	0.2
• Average monthly benefit	$3,279	$3,177	3.21%

[1] The 2019 benefit amounts provided for some continuing beneficiaries and survivors included the retroactive payments due to the PRBI audit benefit adjustment. For those affected beneficiaries, we estimated the 2019 benefit amounts based on the benefit amounts reported for 2018.

Exhibit B: Members in Active Service as of June 30, 2020 by Age, Years of Service, and Average Projected Compensation

Regular

Age	Total	Years of Service 0 – 4	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34	35 – 39	40 & over
Under 25	3,183	3,167	16	- -	- -	- -	- -	- -	- -	- -
	$23,344	$23,246	$42,870	- -	- -	- -	- -	- -	- -	- -
25 – 29	8,160	7,190	951	19	- -	- -	- -	- -	- -	- -
	36,246	34,909	46,109	$48,616	- -	- -	- -	- -	- -	- -
30 – 34	10,122	6,249	3,040	789	44	- -	- -	- -	- -	- -
	43,788	38,661	51,626	53,006	$65,081	- -	- -	- -	- -	- -
35 – 39	12,257	5,442	2,971	2,975	811	58	- -	- -	- -	- -
	50,870	39,776	55,608	61,696	66,330	$77,478	- -	- -	- -	- -
40 – 44	12,589	4,478	2,346	2,728	2,255	714	68	- -	- -	- -
	55,749	39,805	55,755	63,212	70,796	77,158	$83,568	- -	- -	- -
45 – 49	14,066	4,030	2,278	2,689	2,289	2,107	657	16	- -	- -
	59,429	40,656	53,756	62,059	70,609	78,895	81,362	$90,075	- -	- -
50 – 54	13,730	3,322	2,051	2,480	2,264	1,953	1,523	136	1	- -
	60,686	40,211	52,334	59,305	68,163	78,439	83,007	82,234	*	- -
55 – 59	11,784	2,590	1,689	2,314	2,126	1,723	1,086	231	24	1
	59,541	41,314	50,830	56,398	66,343	74,910	80,403	81,743	$78,063	*
60 – 64	7,800	1,745	1,226	1,653	1,385	996	584	163	41	7
	57,717	40,206	52,750	56,709	63,715	71,398	76,612	80,778	92,755	$79,038
65 – 69	3,206	697	516	663	554	396	249	91	28	12
	56,890	39,631	52,097	56,104	63,006	67,471	73,782	78,035	90,176	88,918
70 & over	1,331	374	224	240	207	150	85	32	13	6
	49,099	32,604	42,517	52,014	56,383	63,431	75,217	69,948	67,880	74,865
Total	**98,228**	**39,284**	**17,308**	**16,550**	**11,935**	**8,097**	**4,252**	**669**	**107**	**26**
	$53,013	**$37,555**	**$52,820**	**$59,614**	**$67,710**	**$76,006**	**$80,501**	**$80,738**	**$85,878**	**$82,583**

* Not shown for groups with fewer than five members.

Exhibit B: Members in Active Service as of June 30, 2020 by Age, Years of Service, and Average Projected Compensation (continued)

Police/Fire

		Years of Service								
Age	Total	0 – 4	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34	35 – 39	40 & over
Under 25	670	668	2	- -	- -	- -	- -	- -	- -	- -
	$42,607	$42,573	*	- -	- -	- -	- -	- -	- -	- -
25 – 29	2,073	1,794	267	12	- -	- -	- -	- -	- -	- -
	55,572	53,415	$68,810	$83,529	- -	- -	- -	- -	- -	- -
30 – 34	2,224	1,183	744	269	28	- -	- -	- -	- -	- -
	65,075	54,438	71,966	89,383	$97,841	- -	- -	- -	- -	- -
35 – 39	2,293	598	432	901	329	33	- -	- -	- -	- -
	80,330	54,043	72,174	93,650	99,715	$106,478	- -	- -	- -	- -
40 – 44	2,055	256	216	628	657	279	19	- -	- -	- -
	90,566	53,039	70,113	93,310	100,834	109,982	$97,830	- -	- -	- -
45 – 49	2,145	153	121	395	670	679	126	1	- -	- -
	96,896	48,609	64,891	87,856	99,190	111,229	124,981	*	- -	- -
50 – 54	1,328	91	61	223	359	391	180	23	- -	- -
	96,961	48,662	66,942	84,003	94,544	109,521	121,620	$124,542	- -	- -
55 – 59	589	37	34	92	144	151	102	22	7	- -
	95,488	53,593	67,449	82,251	87,195	105,863	121,109	120,023	$123,453	- -
60 – 64	163	11	13	29	35	39	26	7	3	- -
	87,217	38,308	68,992	74,137	84,342	97,189	108,923	108,989	*	- -
65 – 69	38	5	5	5	16	5	- -	2	- -	- -
	74,004	46,623	55,250	68,975	83,095	90,159	- -	*	- -	- -
70 & over	9	- -	2	1	3	- -	1	1	- -	1
	88,528	- -	*	*	*	- -	*	*	- -	*
Total	**13,587**	**4,796**	**1,897**	**2,555**	**2,241**	**1,577**	**454**	**56**	**10**	**1**
	$78,712	**$51,931**	**$70,556**	**$90,651**	**$97,849**	**$109,558**	**$120,739**	**$118,731**	**$127,509**	*

* Not shown for groups with fewer than five members.

Exhibit B: Members in Active Service as of June 30, 2020 by Age, Years of Service, and Average Projected Compensation (continued)

Total

		Years of Service								
Age	**Total**	**0 – 4**	**5 – 9**	**10 – 14**	**15 – 19**	**20 – 24**	**25 – 29**	**30 – 34**	**35 – 39**	**40 & over**
Under 25	3,853	3,835	18	- -	- -	- -	- -	- -	- -	- -
	$26,694	$26,612	$44,088	- -	- -	- -	- -	- -	- -	- -
25 – 29	10,233	8,984	1,218	31	- -	- -	- -	- -	- -	- -
	40,161	38,604	51,085	$62,131	- -	- -	- -	- -	- -	- -
30 – 34	12,346	7,432	3,784	1,058	72	- -	- -	- -	- -	- -
	47,622	41,172	55,625	62,255	$77,821	- -	- -	- -	- -	- -
35 – 39	14,550	6,040	3,403	3,876	1,140	91	- -	- -	- -	- -
	55,512	41,189	57,711	69,124	75,965	$87,995	- -	- -	- -	- -
40 – 44	14,644	4,734	2,562	3,356	2,912	993	87	- -	- -	- -
	60,636	40,521	56,965	68,844	77,573	86,381	$86,794	- -	- -	- -
45 – 49	16,211	4,183	2,399	3,084	2,959	2,786	783	17	- -	- -
	64,387	40,946	54,318	65,363	77,081	86,776	88,381	$91,823	- -	- -
50 – 54	15,058	3,413	2,112	2,703	2,623	2,344	1,703	159	1	- -
	63,885	40,436	52,756	61,343	71,774	83,623	87,089	88,354	*	- -
55 – 59	12,373	2,627	1,723	2,406	2,270	1,874	1,188	253	31	1
	61,252	41,487	51,158	57,387	67,666	77,404	83,898	85,072	$88,313	*
60 – 64	7,963	1,756	1,239	1,682	1,420	1,035	610	170	44	7
	58,321	40,194	52,920	57,010	64,223	72,370	77,989	81,940	95,769	$79,038
65 – 69	3,244	702	521	668	570	401	249	93	28	12
	57,091	39,681	52,127	56,200	63,569	67,754	73,782	78,267	90,176	88,918
70 & over	1,340	374	226	241	210	150	86	33	13	7
	49,363	32,604	42,568	52,178	56,767	63,431	75,881	70,363	67,880	84,513
Total	**111,815**	**44,080**	**19,205**	**19,105**	**14,176**	**9,674**	**4,706**	**725**	**117**	**27**
	$56,135	**$39,119**	**$54,572**	**$63,765**	**$72,474**	**$81,476**	**$84,383**	**$83,673**	**$89,437**	**$84,798**

* Not shown for groups with fewer than five members.

Exhibit C: Reconciliation of Member Data

	Active Members	Inactive Vested Members	Retired Members	Disabled Members	Beneficiaries and Survivors	Total
Number as of June 30, 2019	**109,167**	**17,341**	**59,416**	**3,050**	**7,590**	**196,564**
• New members	10,464	33	171	3	644	11,315
• Terminations – with vested rights	(1,651)	1,651	0	0	0	0
• Terminations – without vested rights	(3,663)	(104)	N/A	N/A	N/A	(3,767)
• Retirements	(2,802)	(961)	3,798	(35)	N/A	0
• New disabilities	(135)	(14)	0	149	N/A	0
• Return to work	576	(521)	(55)	0	N/A	0
• Died with or without beneficiary	(77)	(23)	(1,438)	(100)	(309)	(1,947)
• Certain period expired	N/A	N/A	0	0	(51)	(51)
• Data adjustments	(64)	(4)	(90)	(2)	0	(160)
Number as of June 30, 2020	**111,815**	**17,398**	**61,802**	**3,065**	**7,874**	**201,954**

Exhibit D: Summary Statement of Income and Expenses on An Actuarial Value Basis (Based On Unaudited Financial Statements)

	Year Ended June 30, 2020			Year Ended June 30, 2019
	Regular	Police/Fire	Total	Total
Net assets at actuarial value at the beginning of the year	$33,719,407,942	$9,889,563,902	$43,608,971,844	$41,342,368,039
Contribution income:[1]				
• Employer contributions[2]	$809,453,974	$235,654,830	$1,045,108,804	$965,518,968
• Member contributions	809,453,974	235,654,830	1,045,108,804	965,518,968
Repayment and purchase of service	43,925,820	23,113,089	67,038,909	98,357,134
Contribution income	$1,662,833,768	$494,422,749	$2,157,256,517	$2,029,395,070
Investment income:				
• Interest	$268,591,378	$0	$268,591,378	$278,467,354
• Dividends	640,135,686	0	640,135,686	657,360,468
• Net appreciation	2,124,519,458	0	2,124,519,458	2,420,987,272
• Other	119,982,070	0	119,982,070	124,740,975
• Transfer of annual investment income	(714,089,578)	714,089,578	0	0
• Securities lending income	4,086,256	0	4,086,256	4,980,937
• Change in fair value of securities lending	0	0	0	11,658,275
• Other income	2,232,032	837,997	3,070,029	2,812,185
• Change in unrecognized return	85,754,380	26,101,206	111,855,586	(597,620,201)
• Less investment fees	(19,838,671)	0	(19,838,671)	(18,388,553)
Net investment income	$2,511,373,011	$741,028,781	$3,252,401,792	$2,884,998,712
Total income available for benefits	**$4,174,206,779**	**$1,235,451,530**	**$5,409,658,309**	**$4,914,393,782**
Less operating expenses:				
• Retirement and survivor benefits	$(2,137,168,542)	$(551,945,232)	$(2,689,113,774)	$(2,489,516,564)
• Disability benefits	(88,212,611)	(27,708,116)	(115,920,727)	(112,253,708)
• Refunds to members	(23,536,231)	(5,968,766)	(29,504,997)	(33,987,510)
• Administrative expenses	(10,403,658)	(1,994,499)	(12,398,157)	(11,812,306)
• Transfer to JRS	0	0	0	(219,889)
• Other expenses	(295)	0	(295)	0
Net operating expenses	$(2,259,321,337)	$(587,616,613)	$(2,846,937,950)	$(2,647,789,977)
Interfund transfer	$(6,406,084)	$6,406,084	$0	$0
Change in reserve for future benefits	**$1,908,479,358**	**$654,241,001**	**$2,562,720,359**	**$2,266,603,805**
Net assets at actuarial value at the end of the year	**$35,627,887,300**	**$10,543,804,903**	**$46,171,692,203**	**$43,608,971,844**

1 Pursuant to GASB Statement No. 82, the financial statements recognize half of the employer contributions made on behalf of Employer-Pay members as member contributions.

2 See cost-sharing mechanisms in NRS 286.410 and NRS 286.421.

Exhibit E: Summary Statement of Plan Assets (Based on Unaudited Financial Statements)

	Year Ended June 30, 2020		Year Ended June 30, 2019	
Cash equivalents		$773,941,346		$164,703,626
Accounts receivable:				
• Contributions receivable	$170,348,048		$157,566,599	
• Pending trades receivable	599,026,854		309,517,700	
• Accrued investment income	143,688,471		166,986,553	
Total accounts receivable		913,063,373		634,070,852
Investments:				
• Fixed income securities	$12,694,853,860		$11,086,165,411	
• Marketable equity securities	18,879,521,208		19,486,990,092	
• International securities	9,342,475,742		8,847,721,742	
• Real estate	2,115,552,553		2,018,660,096	
• Private equity	2,635,864,456		2,376,261,251	
Total investments at market value		45,668,267,819		43,815,798,592
Collateral on loaned securities		205,982,715		253,210,571
Property and equipment		3,873,113		3,902,671
Other assets		4,131,236		3,532,311
Total assets		$47,569,259,602		$44,875,218,623
Liabilities:				
• Accounts payable	$(21,062,690)		$(16,989,448)	
• Pending trades payable	(607,096,841)		(320,766,021)	
• Obligations under securities lending activities	(205,982,715)		(253,210,571)	
Total liabilities		$(834,142,246)		$(590,966,040)
Net assets at market value		**$46,735,117,356**		**$44,284,252,583**
Net assets at actuarial value		**$46,171,692,203**		**$43,608,971,844**

Exhibit F: Development of the Fund Through June 30, 2020

Year Ended June 30	Employer Contributions[1]	Member Contributions[1]	Other Contributions	Net Investment Return[2]	Administrative Expenses	Benefit Payments[3]	Actuarial Value of Assets at End of Year
2010							$24,725,464,709
2011	$1,264,759,603	$97,033,823	$31,547,354	$1,201,272,733	$10,579,998	$1,438,358,514	25,871,139,710
2012	1,332,320,660	98,183,663	37,993,705	1,651,468,456	10,002,855	1,582,118,483	27,398,984,856
2013	1,310,082,859	99,230,935	46,467,628	1,971,170,711	9,560,240	1,707,835,385	29,108,541,364
2014	1,405,006,553	109,656,492	42,752,491	2,649,964,116	9,592,570	1,840,771,509	31,465,556,937
2015	1,436,652,815	114,302,545	82,485,688	2,614,811,974	9,648,626	1,986,231,557	33,717,929,776
2016	1,569,709,596	129,788,195	61,736,428	2,567,650,020	11,950,720	2,138,616,015	35,896,247,280
2017	901,744,209	901,744,209	67,230,428	3,251,238,649	9,872,019	2,289,032,062	38,719,300,694
2018	930,269,428	930,269,427	73,557,803	3,153,811,596	12,945,720	2,451,895,189	41,342,368,039
2019	965,518,968	965,518,968	98,357,134	2,884,998,712	11,812,306	2,635,977,671	43,608,971,844
2020	1,045,108,804	1,045,108,804	67,038,909	3,252,401,792	12,398,452	2,834,539,498	46,171,692,203

1 Starting in the year ended June 30, 2017, pursuant to GASB Statement No. 82, the financial statements recognize half of the employer contributions made on behalf of Employer-Pay members as member contributions.
2 Net of investment fees.
3 Includes transfers in/out of the System (e.g. to the Judicial Retirement System) that correspond to transfers of liability.

Exhibit G: Development of Unfunded Actuarial Accrued Liability For Year Ended June 30, 2020

		Regular	Police/Fire	Total
1	**Unfunded actuarial accrued liability at beginning of year**	**$11,275,027,718**	**$3,036,216,411**	**$14,311,244,129**
2	Normal cost at beginning of year	912,898,091	294,437,007	1,207,335,098
3	Expected total contributions at beginning of year	(1,689,999,654)	(493,581,143)	(2,183,580,797)
4	Expected administrative expenses at beginning of year	8,477,057	1,703,294	10,180,351
5	Interest for whole year on **1 + 2 + 3 + 4**	787,980,240	212,908,167	1,000,888,407
6	Expected unfunded actuarial accrued liability at end of year	$11,294,383,452	$3,051,683,736	$14,346,067,188
7	Changes due to			
	a) Investment gain	$(5,025,927)	$(2,566,030)	$(7,591,957)
	b) Post-retirement benefit increases lower than expected	(372,790,325)	(112,683,778)	(485,474,103)
	c) Individual salary and service increases lower than expected	(24,620,421)	(7,505,383)	(32,125,804)
	d) Contributions less than expected[1]	137,132,632	41,615,957	178,748,589
	e) Administrative expenses greater than expected	1,681,266	238,252	1,919,518
	f) Other experience	399,060,764	91,157,684	490,218,447
	Total changes	$135,437,989	$10,256,702	$145,694,691
8	**Unfunded actuarial accrued liability at end of year**	**$11,429,821,441**	**$3,061,940,438**	**$14,491,761,879**

[1] The contribution loss is due to the net effect of a) lower than expected payroll growth, b) statutory contribution rates lower than the actuarially determined contribution rates, and c) timing effect of actuarially determined contributions payable at the beginning of the year vs. actual contributions payable throughout the year.

Exhibit H: Table of Amortization Bases

Regular

Date Established	Initial Years	Initial Amount	Current Annual Payment[1]	Years Remaining	Outstanding Balance
June 30, 2004	30	$3,306,492,730	$370,069,686	14	$4,598,765,815
June 30, 2005	30	825,676,847	86,959,726	15	1,147,482,365
June 30, 2006	30	376,199,046	37,283,119	16	520,101,819
June 30, 2007	30	(325,346,914)	(30,340,455)	17	(445,717,245)
June 30, 2008	30	597,061,087	52,392,534	18	807,746,898
June 30, 2009	30	1,396,781,607	115,331,717	19	1,860,344,656
June 30, 2010	30	804,325,423	62,490,796	20	1,051,737,707
June 30, 2011	30	322,201,646	23,554,312	21	412,604,654
June 30, 2012	23	(31,427,931)	(2,653,510)	15	(35,014,554)
June 30, 2013	22	1,365,091,459	112,394,268	15	1,483,105,403
June 30, 2014	21	(430,228,451)	(34,613,876)	15	(456,749,500)
June 30, 2015	20	(351,958,976)	(27,732,607)	15	(365,947,300)
June 30, 2016	20	(50,637,913)	(3,754,576)	16	(52,376,572)
June 30, 2017	20	208,578,319	14,552,417	17	213,782,670
June 30, 2018	20	201,152,538	13,302,677	18	205,090,217
June 30, 2019	20	345,581,126	21,662,625	19	349,426,419
June 30, 2020	20	135,437,989	8,047,280	20	135,437,989
Subtotal			**$818,946,133**	**16.0**[2]	**$11,429,821,441**

1 Level percentage of payroll with payroll expected to increase 5.50% per year for Regular and 6.50% per year for Police/Fire. Payments shown as of beginning of year.
2 Effective average amortization period. Combined Regular and Police/Fire average amortization period is 15.9.

Exhibit H: Table of Amortization Bases (continued)

Police/Fire

Date Established	Initial Years	Initial Amount	Current Annual Payment[1]	Years Remaining	Outstanding Balance
June 30, 2004	30	$1,248,577,900	$145,806,866	14	$1,922,346,232
June 30, 2005	30	166,690,723	18,105,938	15	254,597,583
June 30, 2006	30	145,811,902	14,731,490	16	219,952,144
June 30, 2007	30	(52,497,545)	(4,933,256)	17	(77,905,267)
June 30, 2008	30	130,126,655	11,373,620	18	189,313,391
June 30, 2009	30	204,577,462	16,631,249	19	290,882,513
June 30, 2010	30	144,950,584	10,960,201	20	200,872,210
June 30, 2011	30	585,886	41,204	21	789,343
June 30, 2012	23	(101,888,427)	(8,422,899)	15	(118,439,028)
June 30, 2013	22	(14,571,831)	(1,166,091)	15	(16,397,041)
June 30, 2014	21	(245,329,185)	(19,088,481)	15	(268,413,666)
June 30, 2015	20	(122,710,590)	(9,304,507)	15	(130,835,807)
June 30, 2016	20	(1,048,428)	(74,117)	16	(1,106,625)
June 30, 2017	20	261,380,946	17,227,468	17	272,053,681
June 30, 2018	20	145,225,880	8,987,562	18	149,597,569
June 30, 2019	20	161,733,024	9,398,250	19	164,376,504
June 30, 2020	20	10,256,702	559,637	20	10,256,702
Subtotal			**$210,834,134**	**15.5**[2]	**$3,061,940,438**
Total					**$14,491,761,879**

[1] Level percentage of payroll with payroll expected to increase 5.50% per year for Regular and 6.50% per year for Police/Fire. Payments shown as of beginning of year.
[2] Effective average amortization period. Combined Regular and Police/Fire average amortization period is 15.9.

Exhibit I: Definition of Pension Terms

The following list defines certain technical terms for the convenience of the reader:

Actuarial Accrued Liability for Actives:	The equivalent of the accumulated normal costs allocated to the years before the valuation date.
Actuarial Accrued Liability for Pensioners and Beneficiaries:	The single-sum value of lifetime benefits to existing pensioners and beneficiaries. This sum takes account of life expectancies appropriate to the ages of the annuitants and the interest that the sum is expected to earn before it is entirely paid out in benefits.
Actuarial Cost Method:	A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the actuarially determined contribution.
Actuarial Gain or Loss:	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., assets earn more than projected, salary increases are less than assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield in actuarial liabilities that are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.
Actuarially Equivalent:	Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value (APV):	The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is: Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.) Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and Discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Plan Benefits:	The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits when due.
Actuarial Valuation:	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB, such as the Actuarially Determined Contribution (ADC) and the Net Pension Liability (NPL).
Actuarial Value of Assets (AVA):	The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ADC.
Actuarially Determined:	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.
Actuarially Determined Contribution (ADC):	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Plan's funding policy. The ADC consists of the Employer Normal Cost and the Amortization Payment.
Amortization Method:	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
Amortization Payment:	The portion of the pension plan contribution, or ADC, that is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Assumptions or Actuarial Assumptions:	The estimates upon which the cost of the Fund is calculated, including: Investment return - the rate of investment yield that the Fund will earn over the long-term future; Mortality rates - the death rates of employees and pensioners; life expectancy is based on these rates; Retirement rates - the rate or probability of retirement at a given age or service; Disability rates – the probability of disability retirement at a given age; Termination rates - the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement; Salary increase rates - the rates of salary increase due to inflation and productivity growth.
Closed Amortization Period:	A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Open Amortization Period.
Decrements:	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.
Defined Benefit Plan:	A retirement plan in which benefits are defined by a formula applied to the member's compensation and/or years of service.
Defined Contribution Plan:	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
Employer Normal Cost:	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
Experience Study:	A periodic review and analysis of the actual experience of the Fund that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.
Funded Ratio:	The ratio of the Actuarial Value of Assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the Market Value of Assets (MVA), rather than the AVA.
Investment Return:	The rate of earnings of the Fund from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.

Section 3: Supplemental Information

Normal Cost:	That portion of the Actuarial Present Value of pension plan benefits and expenses allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated.
Open Amortization Period:	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period with level percentage of payroll is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never decrease, but will become smaller each year, in relation to covered payroll, if the actuarial assumptions are realized.
Unfunded Actuarial Accrued Liability:	The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.
Valuation Date or Actuarial Valuation Date:	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.

Section 4: Actuarial Valuation Basis

Exhibit I: Summary of Actuarial Valuation Results

The valuation was made with respect to the following data supplied to us:

1	Retired members as of the valuation date (including 7,874 beneficiaries and survivors in pay status)	72,741
2	Members inactive during year ended June 30, 2020 with vested rights	17,398
3	Members active during the year ended June 30, 2020	111,815
4	Total members	201,954

The actuarial factors as of the valuation date are as follows:

1	Normal cost[1]		
	Regular members	$943,296,082	
	Police/Fire members	305,959,741	
	Total normal cost		$1,249,255,823
2	Actuarial accrued liability		
	Retired members and beneficiaries	$35,327,650,844	
	Inactive members with vested rights	1,677,045,414	
	Active members	23,658,757,824	
	Total actuarial accrued liability		$60,663,454,082
3	Actuarial value of assets ($46,735,117,356 at market value as reported by the Retirement Office)		46,171,692,203
4	Unfunded actuarial accrued liability: **2 - 3**		$14,491,761,879
5	Total rate payroll		$7,059,506,770

[1] Does not include administrative expenses.

Exhibit II: Actuarial Assumptions and Methods

Rationale for Assumptions:	The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the Actuarial Experience Study dated October 16, 2017. These assumptions were adopted by the Board.
Economic Assumptions	
Net Investment Return:	7.50% (including 2.75% for inflation) Based on the actuarial experience study referenced above, expected investment expenses represent about 0.10% of the actuarial value of assets.
Consumer Price Index:	Increase of 2.75% per year
Administrative Expenses:	0.15% of payroll added to normal cost
Salary Increases:	*Inflation:* 2.75% plus *Productivity pay increases:* 0.50% plus *Promotional and merit salary increases:*

	Rate (%)	
Years of Service	**Regular**	**Police/Fire**
Less than 1	5.90	10.65
1	4.80	7.15
2	4.00	5.20
3	3.60	4.60
4	3.30	4.30
5	3.00	4.15
6	2.80	3.90
7	2.70	3.50
8	2.50	3.15
9	2.35	2.90
10	2.15	2.50
11	1.75	1.90
12	1.50	1.50
13	1.25	1.30
14	1.10	1.30
15 & Over	1.00	1.30

Future salary increases are assumed to occur at the beginning of the year.

Section 4: Actuarial Valuation Basis

Total Payroll Growth:	Assumed payroll growth rates are used to compute the unfunded actuarial accrued liability amortization payments as a level percentage of projected payroll. For this valuation, the payroll for the coming year is based on actual annualized payroll for the actives as of the valuation date and projected by the salary scale. For the purpose of calculating the actuarially determined contribution rate, the total payroll growth assumption for future years is 5.50% per year for Regular and 6.50% for Police/Fire. The payroll growth assumptions are set by the Board and affect the timing of payments toward the unfunded liabilities. Considerations for setting these assumptions include future financial conditions that are difficult for Segal to evaluate. In recent years, payroll growth has been less than assumed. This has the effect of delaying contributions toward the unfunded liabilities and could result in increases to required contributions in future years. We recommend that the Board closely monitor actual payroll growth to verify that the assumptions remain valid.
Post-Retirement Benefit Increases:	For current retirees and beneficiaries, future Post-Retirement Benefit Increases reflect actual changes in historical CPI and are assumed to follow the formulas described in Exhibit III of this section. For future retirees, those hired prior to 2010 are assumed to reach the cap after 16 years of retirement. Those hired in between 2010 and 2015 are also assumed to reach the cap after 16 years of retirement. Those hired after 2015 will never receive an annual increase that exceeds 2.75%. Underlying all of these assumptions is that CPI will grow over time at a rate of 2.75% per year.
<u>Demographic Assumptions:</u>	
Mortality Rates:	*Pre-Retirement* • Regular and Police/Fire: Headcount-Weighted RP-2014 Employee Table, projected to 2020 with Scale MP-2016. *Healthy* • Regular and Police/Fire: Headcount-Weighted RP-2014 Healthy Annuitant Table projected to 2020 with Scale MP-2016, set forward one year for spouses and beneficiaries. For ages less than 50[1], mortality rates are based on the Headcount-Weighted RP-2014 Employee Mortality Tables. Those mortality rates are adjusted by the ratio of the mortality rate for members at age 50 to the mortality rate at age 50 from the Employee mortality tables listed above. The mortality rates are then projected to 2020 with Scale MP-2016. *Disabled* • Regular and Police/Fire: Headcount-Weighted RP-2014 Disabled Retiree Table, set forward four years. The RP-2014 Headcount-Weighted Mortality Tables, set forward one year for spouses and beneficiaries, reasonably reflect the projected mortality experience of the Plan as of the measurement date. The additional projection of 6 years is a provision made for future mortality improvement. [1] *The RP-2014 Healthy Annuitant Mortality Tables have rates only for ages 50 and later.*

Termination Rates Before Retirement:

Regular and Police/Fire Mortality Rates (%)		
Age	**Male**	**Female**
20	0.05	0.02
25	0.06	0.02
30	0.06	0.03
35	0.07	0.04
40	0.08	0.05
45	0.11	0.08
50	0.19	0.13
55	0.32	0.20
60	0.55	0.30

Any mortality that occurs during the first two years of employment is assumed to be non-duty related.

	Termination Rates (%)	
Years of Service	**Regular**	**Police/Fire**
0 – 1	16.00	15.00
1 – 2	12.50	8.00
2 – 3	10.25	7.50
3 – 4	8.00	6.00
4 – 5	7.50	5.00
5 – 6	6.00	3.75
6 – 7	5.25	3.50
7 – 8	4.25	2.50
8 – 9	4.00	2.25
9 – 10	3.75	1.90
10 – 11	3.25	1.50
11 – 12	3.00	1.30
12 – 13	2.75	1.00
13 – 14	2.50	0.90
14 – 15	2.25	0.80
15 – 16	2.00	0.70
16 – 17	2.00	0.60
17 – 18	1.75	0.50
18 – 19	1.75	0.50
19 – 20	1.75	0.50
20 & Over	1.75	0.45

No termination is assumed after a member reaches earliest unreduced retirement age.

Termination Rates Before Retirement (Continued):

Age	Disability Rates (%) Regular	Disability Rates (%) Police/Fire
20 – 24	0.01	0.00
25 – 29	0.03	0.06
30 – 34	0.06	0.12
35 – 39	0.10	0.30
40 – 44	0.21	0.45
45 – 49	0.35	0.65
50 – 54	0.60	0.80
55 – 59	0.75	0.65
60 – 64	0.35	0.50
65 & Over	0.00	0.00

Disability rates are applied only for members with more than 5 years of service and less than 30 years of service for Regular members with an effective date of membership before July 1, 2015, less than 33 1/3 years of service for Regular members with an effective date of membership on or after July 1, 2015, or 25 years for Police/Fire members.

Retirement Rates:

Regular members with an effective date of membership before July 1, 2015:

	Years of Service (%)					
Age	**5 – 9**	**10 – 19**	**20 – 24**	**25 – 29**	**30 – 32**	**33 or More**
45-49	0.00	0.00	0.75	6.50	16.00	16.00
50-54	0.50	1.50	1.50	8.50	18.00	18.00
55-59	1.50	3.50	5.00	12.00	20.00	20.00
60-61	6.50	11.00	17.00	22.00	22.00	22.00
62-64	9.00	13.00	17.00	22.00	22.00	22.00
65-69	20.00	20.00	22.00	25.00	25.00	25.00
70-74	30.00	30.00	40.00	40.00	40.00	40.00
75 & Over	100.00	100.00	100.00	100.00	100.00	100.00

Regular members with an effective date of membership on or after July 1, 2015:

	Years of Service (%)					
Age	**5 – 9**	**10 – 19**	**20 – 24**	**25 – 29**	**30 – 32**	**33 or More**
45-49	0.00	0.00	0.75	6.50	6.50	16.00
50-54	0.50	1.50	1.50	8.50	8.50	18.00
55-59	1.50	3.50	5.00	12.00	20.00	20.00
60-61	6.50	11.00	17.00	22.00	22.00	22.00
62-64	9.00	13.00	17.00	22.00	22.00	22.00
65-69	20.00	20.00	22.00	25.00	25.00	25.00
70-74	30.00	30.00	40.00	40.00	40.00	40.00
75 & Over	100.00	100.00	100.00	100.00	100.00	100.00

Retirement Rates (continued):	*Police/Fire members:*

	Years of Service (%)				
Age	**5 – 9**	**10 – 19**	**20 – 24**	**25 – 29**	**30 or More**
Less than 40	0.00	0.00	0.00	0.00	0.00
40-44	0.00	0.50	3.50	0.00	0.00
45-49	0.00	1.00	6.50	18.00	18.00
50-54	1.50	4.50	13.00	20.00	24.00
55-59	3.50	10.00	20.00	25.00	28.00
60-64	9.00	18.00	25.00	35.00	35.00
65-69	50.00	50.00	60.00	60.00	60.00
70 & Over	100.00	100.00	100.00	100.00	100.00

Retirement Age for Inactive Vested Members:	Earliest unreduced retirement age.
Unknown Data for Members:	Same as those exhibited by members with similar known characteristics. If not specified, Regular members are assumed to be female, and Police/Fire members are assumed to be male.
Form of Payment:	All active and inactive members are assumed to elect the unmodified option at retirement (Option 1).
Percent Married:	Since pre-retirement death benefits are payable to a surviving beneficiary of an unmarried member, all members are assumed to have a beneficiary upon pre-retirement death. The unmodified option is a straight life annuity except for “employer-pay” Police/Fire retirees, for whom it is a 50% joint and survivor annuity. Existing “employer-pay” Police/Fire retirees with an unmodified option who retired after June 30, 1981 and before July 1, 2011 have been valued assuming no surviving spouse, pending the results of an analysis and verification of spousal information. 70% of “employer-pay” Police/Fire male members and 55% of “employer-pay” Police/Fire female members are assumed to be married at retirement.
Age of Spouse:	Male members 3 years older than their spouses, female members 2 years younger than their spouses. Spouses are assumed to be of the opposite sex of the member.
Dependent Children:	The assumption for dependent children in the actuarial valuation is one dependent child who is 28 years younger than the member.

Section 4: Actuarial Valuation Basis

Actuarial Methods	
Actuarial Cost Method:	Entry Age Normal Actuarial Cost Method. Entry Age is the age at the time the participant commenced employment. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are based on costs allocated as a level percentage of salary, with Normal Cost determined based on the plan provisions and benefit accrual rate applicable to that individual.
Actuarial Value of Assets:	Market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual market return and the expected return on the actuarial value, and is recognized over a five-year period, further adjusted, if necessary, to be within 30% of the market value.
Amortization Policy:	The UAAL, (i.e., the difference between the Actuarial Accrued Liability and the Valuation Value of Assets), as of June 30, 2011 shall continue to be amortized over separate 30-year period amortization layers based on the valuations during which each separate layer was previously established. Any new UAAL as a result of actuarial gains or losses identified in the annual valuation as of June 30 will be amortized over a period equal to the truncated average remaining amortization period of all prior UAAL layers. This would occur until the average remaining amortization period is less than 20 years. At that point, amortization periods of 20 years would be used for actuarial gains and losses. Any new UAAL as a result of change in actuarial assumptions or methods will be amortized over a period equal to the truncated average remaining amortization period of all prior UAAL layers. This would occur until the average remaining amortization period is less than 20 years. At that point, amortization periods of 20 years would be used for assumption or method changes. Unless an alternative amortization period is recommended by the Actuary and accepted by the Board based on the results of an actuarial analysis: a) with the exception noted in b., below, the increase in UAAL as a result of any plan amendments will be amortized over a period of 15 years; b) the increase in UAAL that would result from a temporary retirement incentive will be pre-funded by the participating employer(s). UAAL layers shall be amortized over “closed” amortization periods so that the amortization period for each layer decreases by one year with each actuarial valuation. UAAL layers shall be amortized as a level percentage of payroll so that the amortization amount in each year during the amortization period shall be expected to be a level percentage of covered payroll, taking into consideration the current assumption for general payroll increase. If an overfunding exists (i.e., the total of all UAAL becomes negative so that there is a surplus), such surplus and any subsequent surpluses will be amortized over an “open” amortization period of 30 years. Any prior UAAL amortization layers will be considered fully amortized, and any subsequent UAAL will be amortized over 20 years as the first of a new series of amortization layers.

Amortization Policy (Continued):	These amortization policy components will apply separately to each of the Regular and Police/Fire UAAL cost groups.
Changes in Actuarial Assumptions and Methods:	There have been no changes in actuarial assumptions or methods since the last valuation.

Exhibit III: Summary of Plan Provisions

This exhibit summarizes the major provisions of the Nevada Public Employees' Retirement Act included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Plan Year:	July 1 through June 30
Service Retirement:	
	For members with an effective date of membership before January 1, 2010:
Requirement for Regular Members	Age 65 with five years of service, or age 60 with ten years of service, or at any age with 30 years of service.
Requirement for Police/Fire Members	Age 65 with five years of service, or age 55 with ten years of Police/Fire service, or age 50 with 20 years of Police/Fire service, or at any age with 25 years of Police/Fire service.
Benefit	2.67% of final average compensation (average of 36 highest consecutive months) per year of service earned on or after July 1, 2001 plus 2.50% of final average compensation per year of service before July 1, 2001. Maximum benefits are 90% of average compensation for individuals who became members before July 1, 1985 and 75% of average compensation for individuals who became members after June 30, 1985.
	For members with an effective date of membership on or after January 1, 2010:
Requirement for Regular Members	Age 65 with five years of service, or age 62 with ten years of service, or at any age with 30 years of service.
Requirement for Police/Fire Members	Age 65 with five years of service, or age 60 with ten years of Police/Fire service, or age 50 with 20 years of Police/Fire service, or at any age with 30 years of Police/Fire service.
Benefit	2.50% of final average compensation (average of 36 highest consecutive months) per year of service. Maximum benefits are 75% of average compensation.
	For Regular members with an effective date of membership on or after July 1, 2015:
Requirement	Age 65 with five years of service, or age 62 with ten years of service, or age 55 with 30 years of service, or any age with 33 1/3 years of service. Purchased service generally may not be counted toward years needed to attain eligibility.
Benefit	2.25% of final average compensation (average of 36 highest consecutive months) per year of service. Maximum benefits are 75% of average compensation.
Limitation on Compensation Used in Determining Retirement Benefits:	For any member with an effective date of membership on or after July 1, 2015, compensation used in determining retirement benefits is limited to $200,000. This limit shall be adjusted annually based on CPI.

Early Retirement:	
Requirement	Any age with five years of service.
Benefit	**For members with an effective date of membership before January 1, 2010:** Accrued retirement benefit reduced 4% per year for each year that the member is under the age required for service retirement. **For members with an effective date of membership on or after January 1, 2010:** Accrued retirement benefit reduced 6% per year for each year that the member is under the age required for service retirement.
Disability:	
Requirement	Five years of service and totally unable to perform current job or any comparable job for which the member is qualified by training and experience, because of injury or illness of a permanent nature, provided the member is in the employ of a participating employer at the time of application for disability retirement.
Benefit	Accrued service retirement benefit without reduction for age. (System disability benefit is reduced for other benefits received on account of same disability, if such other benefits are financed by a Nevada public employer, to the extent that total disability benefits would otherwise exceed 100% of final average compensation.)
Vesting:	
Requirement	Any age with five years of service, provided the member has not received a refund of member contributions.
Benefit	Accrued service retirement benefit payable upon attainment of age 65 if member has between five and ten years of service at termination, or upon attainment of the age required for service retirement if member has ten or more years of service at termination.

Spouse's Pre-Retirement Death Benefit:	
Requirement	Eligible survivors of an active member who dies receive survivor benefits if: (a) the deceased member had two years of service in the 2½ years immediately preceding death; or (b) the deceased member had ten years of service; or (c) death was caused by occupational disease or a service-connected accident regardless of the deceased member's length of service; or (d) death occurred within 18 months after termination of employment where mental or physical condition required the termination; or (e) death occurred while member was on leave of absence for training and member met requirements of (a) at time such leave began.
Benefit	a) Unmarried children under age 18, or age 18 to 23 and attending an accredited school on a full-time basis: $400 per month per child. Payments cease upon attaining age 18 or age 23 if full-time student, unless child is incapacitated; or upon marriage, adoption, or death. b) Spouse, or survivor beneficiary of an unmarried member, of deceased member with fewer than ten years of service (and at least two years of service in the last 2½ years): $450 per month. Payments cease upon death. c) Spouse, or survivor beneficiary of an unmarried member, of deceased member with ten but fewer than 15 years of service: greater of $450 per month or Option 3 benefit that would have been payable if deceased member had retired on date of death without reduction for early payment. Payments cease upon death. d) Spouse, or survivor beneficiary of an unmarried member, of deceased member with 15 or more years of service: greater of $450 per month or Option 2 benefit that would have been payable if deceased member had retired on date of death without reduction for early payment. Payments cease upon death. e) Spouse, or survivor beneficiary of an unmarried member, of deceased member eligible to retire with respect to both age and service: greater of $450 per month, Option 2 or Option 3 benefit that would have been payable if deceased member had retired on death, without reduction for early payment. Payments cease upon death. f) Dependent parents: $400 per month each, provided there are no other eligible survivors. Payments cease upon death. g) Lump sum payment option: a spouse, or survivor beneficiary of an unmarried member, may waive right to monthly survivor benefits and instead receive a lump sum refund of deceased member's contributions plus half the contributions made under the Employer-Pay provisions, provided no other person is eligible for survivor benefits.
Benefit Limitations	Total survivor benefits, including any other survivor benefit received from any other source, shall not exceed final average compensation (a) if the other benefit was provided or purchased by a public employer, except for lump sum payments under a group insurance program; and (b) to the extent that the total of the allowance and the other benefit would otherwise exceed the deceased member's final average compensation.

Spouse's Pre-Retirement Death Benefit (Continued):	
Benefit for Certain Spouses	A member who begins receiving service or disability retirement benefits from the Police/Fire members retirement fund after June 30, 1981, is eligible to receive an unreduced service retirement allowance. Upon the death of such a retired member, a spouse who was the retired member's spouse at the time of retirement is entitled to receive 50% of the unreduced allowance; this benefit is payable to the surviving spouse beginning at age 50. A surviving spouse is not eligible to receive this 50% spouse's benefit if the retired member elects an optional benefit form at the time of retirement. Service performed after July 1, 1981, in positions other than as a Police/Fire member, except military service, is not credited toward this 50% spouse's benefit. Existing "employer-pay" Police/Fire retirees who retired after June 30, 1981 and before July 1, 2011 have been valued assuming no surviving spouse, pending the results of an analysis and verification of spousal information.
Benefit for Spouses of Members Killed in the Line of Duty:	The spouse of a member who is a police officer or firefighter killed in the line of duty on or after July 1, 2013, or the spouse of any other member killed in the course of employment on or after July 1, 2013, is entitled to receive a monthly allowance equal to the greater of: a) 50% of the salary of the member on the date of the member's death; or b) 100% of the retirement allowance that the member was eligible to receive based on the member's years of service obtained before the member's death without any reduction for age for the deceased member. The spouse may elect to receive this benefit in lieu of any other available death benefit. This benefit is also available to a survivor beneficiary of an unmarried member.

Post-Retirement Benefit Increases:	
Benefit	**For members with an effective date of membership before January 1, 2010:** The lesser of a) 2% per year following the third anniversary of the commencement of benefits, 3% per year following the sixth anniversary, 3 ½% per year following the ninth anniversary, 4% per year following the twelfth anniversary and 5% per year following the fourteenth anniversary, or b) The annual benefit increase is equal to the average percentage increase in the Consumer Price Index (or other Board approved index) for the three preceding years. In any event, a member's benefit must be increased by the percentages in paragraph (a) if their benefit has not been increased at a rate greater than or equal to the average of the Consumer Price Index (All Items) (or other Board approved index) for the period between retirement and the date of increase. **For members with an effective date of membership on or after January 1, 2010 and before July 1, 2015:** Same as above, except the increases do not exceed 4% per year. **For members with an effective date of membership on or after July 1, 2015:** 2% per year following the third through fifth anniversaries of the commencement of benefits; 2 ½% per year following the sixth through eighth anniversaries. On succeeding anniversaries the annual increase shall be the lesser of 3% or the CPI for the preceding calendar year.
Optional Benefit Forms	Retirees may elect one of the following forms of payment: • Option 1 (unmodified) – Single life annuity except for: Police/Fire members who contribute under the "employer pay" contribution plan, Option 1 is a 50% joint and survivor annuity • Option 2 – 100% joint and survivor • Option 3 – 50% joint and survivor • Option 4 – 100% joint and survivor, with payments to beneficiary commencing at age 60 • Option 5 – 50% joint and survivor, with payments to beneficiary commencing at age 60 • Option 6 – Specific sum option up to 100% of allowance paid to retiree • Option 7 – Specific sum option up to 100% of allowance paid to retiree, with payments to beneficiary commencing at age 60 If the beneficiary predeceases the retired member, the optional allowance reverts to the unmodified allowance.

Contribution Rates:	For the fiscal years July 1, 2019 through June 30, 2021, statutory contribution rates as a percentage of compensation are as follows:

	Regular	Police/Fire
Employer-Pay	29.25%	42.50%
Employee/Employer-Pay	15.25% / 15.25%	22.00% / 22.00%

Total contribution rates are adjusted at the beginning of each odd-numbered fiscal year, based on the actuarially determined rates indicated in the actuarial valuation report for the immediately preceding year. Rates are only adjusted upward if the new rates are more than 0.50% higher than the existing rate for Employer-Pay and if the new rates (for each the employee and the employer) are more than 0.25% higher for Employee/Employer. Rates are only adjusted downward if the new rates are more than 2.00% lower than the existing rate for Employer-Pay (and adjusted only by the amount in excess of 2.00%) and if the new rates (for each the employee and the employer) are more than 1.00% lower than the existing rate for Employee/Employer (and adjusted only by the amount in excess of 1.00%). Rates for each the employee and the employer are rounded to the nearest 0.25% of payroll.

Under the Employer-Pay provisions, the contributions made by employers on behalf of members are not credited to member accounts and are not refunded upon termination. For members covered by the Employer-Pay provisions, final average compensation is increased by half the total contribution made by the public employer and may not be less than it would have been if contributions had been made by the member and the employer separately.

Changes in Plan Provisions:	There were no changes in plan provisions since the last actuarial valuation.

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