

Public Employees' Retirement System of the State of Nevada

Actuarial Valuation and Review as of
June 30, 2018



This report has been prepared at the request of the Retirement Board to assist in administering the Fund. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Retirement Board and may only be provided to other parties in its entirety, unless expressly authorized by Segal. The measurements shown in this actuarial valuation may not be applicable for other purposes.

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November 15, 2018

*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, 2018 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 2018-2019 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,

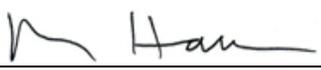
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SECTION 1: Valuation Summary for the Public Employees' Retirement System of Nevada

Purpose

This report has been prepared by Segal Consulting to present a valuation of the Public Employees' Retirement System of the State of Nevada as of June 30, 2018. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. 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, 2018,
- The assets of the Plan as of June 30, 2018, provided by the Retirement Office,
- Economic assumptions regarding future salary increases and investment earnings, and
- Other actuarial assumptions, regarding member terminations, retirement, death, etc.

Significant Issues in Valuation Year

The following key findings were the result of this actuarial valuation:

Reference: Pg. vi

- The ratios of the actuarial value of assets to actuarial accrued liabilities have increased from 73.9% to 74.7% for Regular members and increased from 76.4% to 76.5% for Police/Fire members.

Reference: Pg. 14

- There were actuarial experience losses due to a higher than expected change in the Consumer Price Index (2.87% vs 2.75% expected), which resulted in higher than expected post-retirement benefit increases (PRBIs) for continuing retirees, beneficiaries and survivors over the next several years. These losses amounted to \$38 million for Regular members and \$13 million for Police/Fire members, as shown in Chart 18.

There were also actuarial experience gains and losses due to individual salary increases less than expected for continuing active Regular members and greater than expected for continuing active Police/Fire members; this amounted to a \$96 million gain for Regular members and a \$52 million loss for Police/Fire members, as shown in Chart 18. The average actual increase for continuing active members during 2017-2018 was 4.7% for Regular members and 6.8% for Police/Fire members.

Reference: Pg. 16

- 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 2018 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; however, this increase was partially offset by the actuarial investment gains during the year.

Reference: Pg. 15

- 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

SECTION 1: Valuation Summary for the Public Employees’ Retirement System of Nevada

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 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 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 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, 2019 through June 30, 2021 as a result of this valuation.

Summary of Contribution Rates

	Regular	Police/Fire
Employer-Pay*:		
Statutory Rate for Fiscal Years July 1, 2017 through June 30, 2019 (as determined from the June 30, 2016 valuation)	28.00%	40.50%
Actuarially Determined Contribution Rate per June 30, 2018 Actuarial Valuation	29.34%	42.57%
Statutory Rate for Fiscal Years July 1, 2019 through June 30, 2021 (as determined from the June 30, 2018 valuation)	29.25%	42.50%
Employee/Employer**:		
Statutory Rate for Fiscal Years July 1, 2017 through June 30, 2019 (as determined from the June 30, 2016 valuation)	29.00%	41.50%
Actuarially Determined Contribution Rate per June 30, 2018 Actuarial Valuation	30.59%	43.93%
Statutory Rate for Fiscal Years July 1, 2019 through June 30, 2021 (as determined from the June 30, 2018 valuation)	30.50%	44.00%

* See cost-sharing mechanism in NRS 286.421

** See cost-sharing mechanism in NRS 286.410

Reference: Pg. 12

- The rate of investment return on the market value of assets for 2017-2018 for the PERS Fund was 8.5%, and was 11.8% for the preceding year.

Reference: Pg. 11

- The returns on the actuarial value of assets for 2017-2018 for the PERS Fund were 8.21% for Regular and 8.18% 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 \$211 million for Regular and \$59 million for Police/Fire.

Reference: Pg. 8

- As indicated in Section 2, Subsection B (see Chart 12) of this report, the total unrecognized investment gains as of June 30, 2018 were approximately \$58 million for Regular and \$20 million for Police/Fire, compared to losses of \$26

SECTION 1: Valuation Summary for the Public Employees’ Retirement System of Nevada

million and \$7 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, 2018. 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 Chart 12.

- The June 30, 2018 unrecognized investment gains of \$78 million represent about 0.2% of the PERS Fund market value of assets. Unless offset by future investment losses or other unfavorable experience, the recognition of the \$78 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:
 - If the deferred gains were recognized immediately in the actuarial value of assets, the funded ratio would increase from 74.7% to 74.8% for Regular members and increase from 76.5% to 76.7% for Police/Fire members.
 - If the deferred gains were recognized immediately in the actuarial value of assets, the actuarially determined contribution rates would decrease as follows:

	2018/2019 Actuarially Determined Contribution Rate	2018/2019 Rate Reflecting Deferred Gains
Regular:		
Employer-Pay	29.34%	29.27%
Employee/Employer Pay	30.59%	30.52%
Police/Fire:		
Employer-Pay	42.57%	42.47%
Employee/Employer Pay	43.93%	43.83%

- 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.
- The actuarial valuation report as of June 30, 2018 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.

SECTION 1: Valuation Summary for the Public Employees' Retirement System of Nevada

- 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 219 retired PERS members currently active and reenrolled in PERS under this provision. This program has a minimal effect on System costs.

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Summary of Key Valuation Results

	Total (Regular and Police/Fire Combined)	
	2018	2017
Actuarially determined contribution rates for plan year beginning July 1⁽¹⁾	31.73%	31.47%
Funding elements for plan year beginning July 1:		
Normal cost, including administrative expenses	18.11%	18.33%
Total rate payroll ⁽²⁾	\$6,508,871,854	\$6,237,158,079
Market value of assets	\$41,420,028,577	\$38,686,253,408
Actuarial value of assets	\$41,342,368,039	\$38,719,300,694
Actuarial accrued liability	\$55,069,428,741	\$51,986,097,492
Unfunded actuarial accrued liability	\$13,727,060,702	\$13,266,796,798
Funded ratio on actuarial value basis (AVA / AAL)	75.1%	74.5%
Funded ratio on market value basis (MVA / AAL)	75.2%	74.4%
Demographic data for plan year beginning July 1:		
Number of retired members and beneficiaries	67,108	64,130
Number of vested former members	16,607	16,668
Number of active members	107,506	105,801
Total salary ⁽³⁾	\$5,830,402,607	\$5,542,246,654
Average salary	\$54,233	\$52,384

⁽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.

SECTION 1: Valuation Summary for the Public Employees' Retirement System of Nevada

Summary of Key Valuation Results (continued)

	Regular		Police/Fire	
	2018	2017	2018	2017
Actuarially determined contribution rates for plan year beginning July 1:				
Employer-Pay ⁽¹⁾	29.34%	29.19%	42.57%	41.97%
Employee/Employer Pay ⁽²⁾	30.59%	30.42%	43.93%	43.33%
Funding elements for plan year beginning July 1:				
Normal cost, including administrative expenses				
Employer-Pay ⁽¹⁾	16.28%	16.54%	26.14%	26.32%
Employee/Employer Pay ⁽²⁾	17.53%	17.77%	27.50%	27.68%
Total rate payroll ⁽³⁾	\$5,431,074,656	\$5,222,055,031	\$1,077,797,198	\$1,015,103,048
Market value of assets	\$32,094,731,596	\$30,034,610,674	\$9,325,296,981	\$8,651,642,734
Actuarial value of assets	\$32,036,808,722	\$30,060,747,596	\$9,305,559,317	\$8,658,553,098
Actuarial accrued liability	\$42,912,826,980	\$40,651,650,857	\$12,156,601,761	\$11,334,446,635
Unfunded actuarial accrued liability	\$10,876,018,258	\$10,590,903,261	\$2,851,042,444	\$2,675,893,537
Funded ratio on actuarial value basis (AVA / AAL)	74.7%	73.9%	76.5%	76.4%
Funded ratio on market value basis (MVA / AAL)	74.8%	73.9%	76.7%	76.3%
Demographic data for plan year beginning July 1:				
Number of retired members and beneficiaries	58,561	55,975	8,547	8,155
Number of vested former members	15,714	15,763	893	905
Number of active members	94,615	93,276	12,891	12,525
Total salary ⁽⁴⁾	\$4,843,611,122	\$4,617,385,202	\$986,791,485	\$924,861,452
Average salary	\$51,193	\$49,502	\$76,549	\$73,841

⁽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.

SECTION 1: Valuation Summary for the Public Employees' Retirement System of Nevada

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 Consulting (“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 Plan 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.

SECTION 1: Valuation Summary for the Public Employees' Retirement System of Nevada

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.
- 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 Consulting 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: Valuation Results for the Public Employees' Retirement System of Nevada

A. MEMBER DATA

i. 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.

A historical perspective of how the member population has changed over the past ten valuations can be seen in this chart.

**CHART 1
Regular Member Population: 2009 – 2018**

Year Ended June 30	Active Members	Vested Terminated Members	Retired Members and Beneficiaries	Ratio of Non-Actives to Actives
2009	92,784	10,954	36,705	0.51
2010	90,219	11,167	38,400	0.55
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

SECTION 2: Valuation Results for the Public Employees' Retirement System of Nevada

i. 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 94,615 active members with an average age of 45.8, average years of service of 9.9 years and average salary of \$51,193. The 93,276 active members in the prior valuation had an average age of 45.9, average service of 9.8 years and average salary of \$49,502.

Inactive Members

In this year's valuation, there were 15,714 members with a vested right to a deferred or immediate vested benefit versus 15,763 members in the prior valuation.

The average age and service of these members is 49.5 and 8.9 years, as compared to 49.6 and 9.0 as of last year's valuation date.

These graphs show a distribution of active and inactive members by age and by years of service.

CHART 2
Distribution of Active & Inactive Regular Members by Age as of June 30, 2018

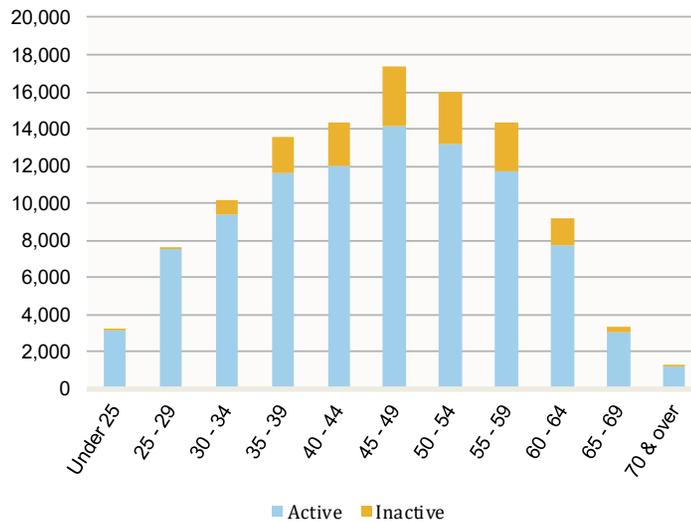
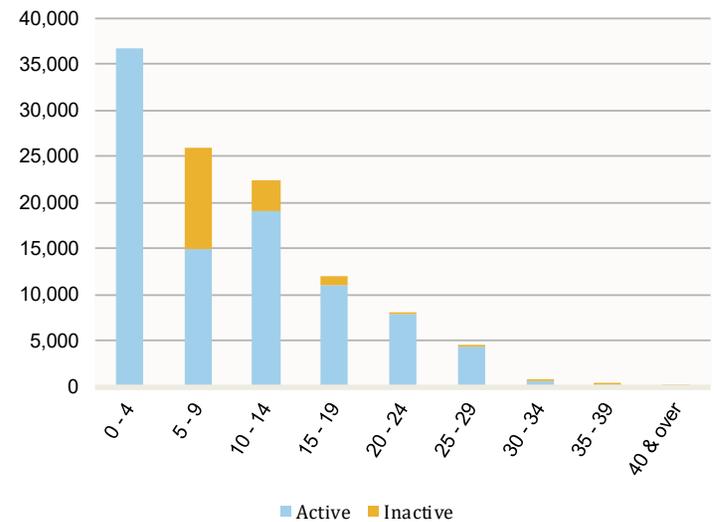


CHART 3
Distribution of Active & Inactive Regular Members by Years of Service as of June 30, 2018



SECTION 2: Valuation Results for the Public Employees' Retirement System of Nevada

i. Regular Members (continued)

Retired Members and Beneficiaries

As of June 30, 2018, 52,377 retired members and 6,184 beneficiaries and survivors were receiving total monthly benefits of \$164,419,260. Of these, 949 retired members and 20 beneficiaries and survivors were receiving annual benefits of at least \$100,000, which represents 1.7% of all retirees, beneficiaries and survivors. For comparison, in the previous valuation there were 50,091 retired members and 5,884 beneficiaries and survivors receiving monthly benefits of \$153,763,984, with 1.5% of those receiving annual benefits of at least \$100,000.

These graphs show a distribution of the current retired members and beneficiaries based on their monthly amount and age, by type of pension.

CHART 4
Distribution of Retired Regular Members and Beneficiaries by Type and by Monthly Amount as of June 30, 2018

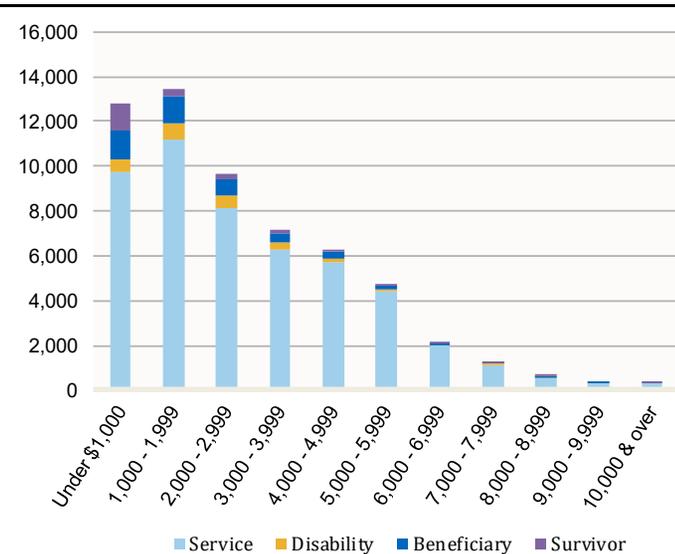
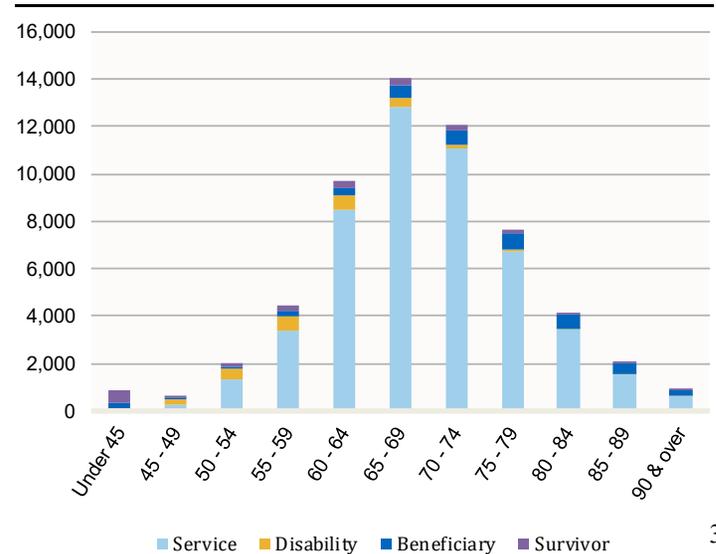


CHART 5
Distribution of Retired Regular Members and Beneficiaries by Type and by Age as of June 30, 2018



SECTION 2: Valuation Results for the Public Employees' Retirement System of Nevada

ii. 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.

A historical perspective of how the member population has changed over the past ten valuations can be seen in this chart.

CHART 6
Police/Fire Member Population: 2009 – 2018

Year Ended June 30	Active Members	Vested Terminated Members	Retired Members and Beneficiaries	Ratio of Non-Actives to Actives
2009	12,633	620	5,200	0.46
2010	12,375	640	5,519	0.50
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

SECTION 2: Valuation Results for the Public Employees' Retirement System of Nevada

ii. 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 12,891 active members with an average age of 39.9, average years of service of 11.1 years and average salary of \$76,549. The 12,525 active members in the prior valuation had an average age of 40.2, average service of 11.2 years and average salary of \$73,841.

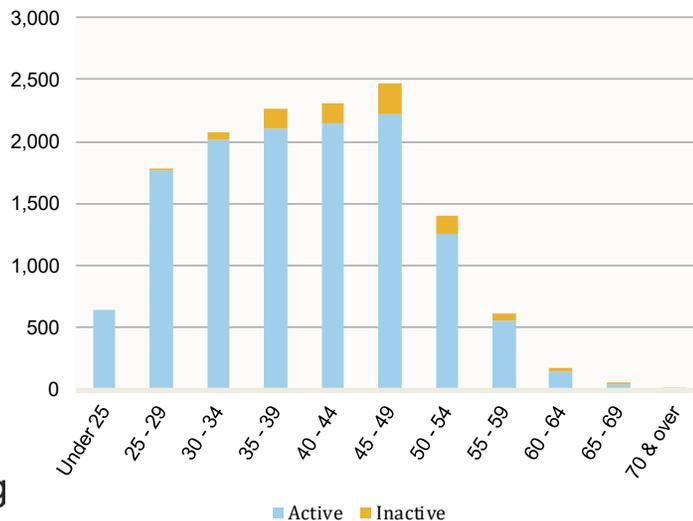
Inactive Members

In this year's valuation, there were 893 members with a vested right to a deferred or immediate vested benefit versus 905 members in the prior valuation.

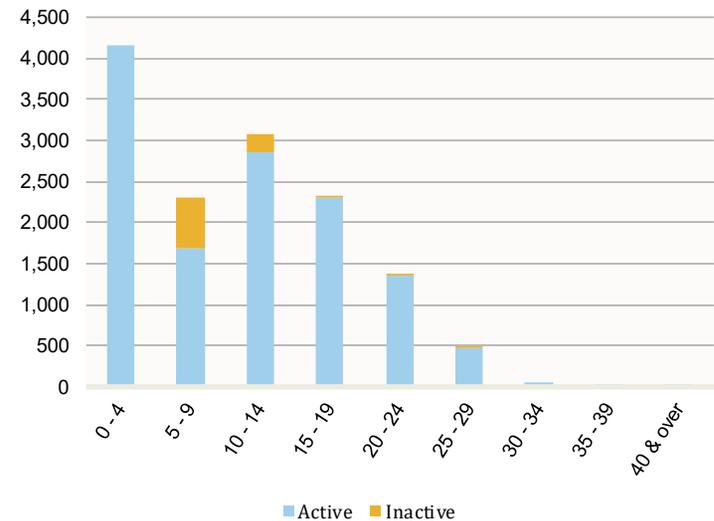
The average age and service of these members is 45.4 and 8.6 years, as compared to 45.6 and 8.5 as of last year's valuation date.

These graphs show a distribution of active and inactive members by age and by years of service.

**CHART 7
Distribution of Active & Inactive Police/Fire Members by Age as of June 30, 2018**



**CHART 8
Distribution of Active & Inactive Police/Fire Members by Years of Service as of June 30, 2018**



SECTION 2: Valuation Results for the Public Employees' Retirement System of Nevada

ii. Police/Fire Members (continued)

Retired Members and Beneficiaries

As of June 30, 2018, 7,442 retired members and 1,105 beneficiaries and survivors were receiving total monthly benefits of \$42,589,346. Of these, 1,158 retired members and 8 beneficiaries and survivors were receiving annual benefits of at least \$100,000, which represents 13.6% of all retirees, beneficiaries and survivors. For comparison, in the previous valuation there were 7,108 retired members and 1,047 beneficiaries and survivors receiving monthly benefits of \$39,589,227, with 12.5% of those receiving annual benefits of at least \$100,000.

These graphs show a distribution of the current retired members and beneficiaries based on their monthly amount and age, by type of pension.

CHART 9
Distribution of Retired Police/Fire Members and Beneficiaries by Type and by Monthly Amount as of June 30, 2018

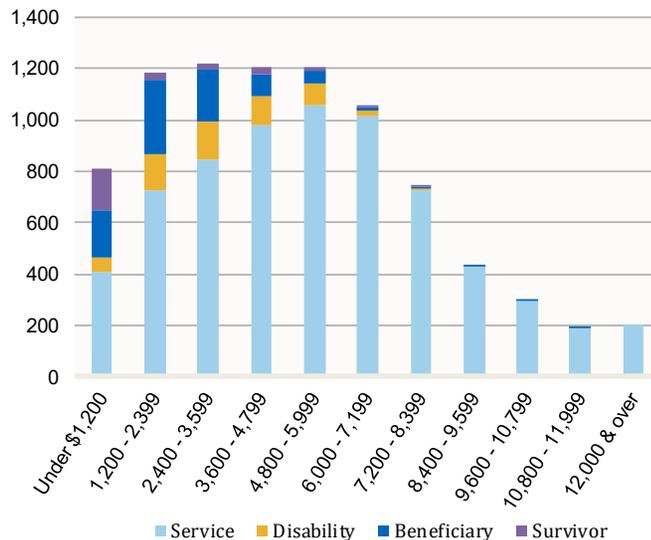
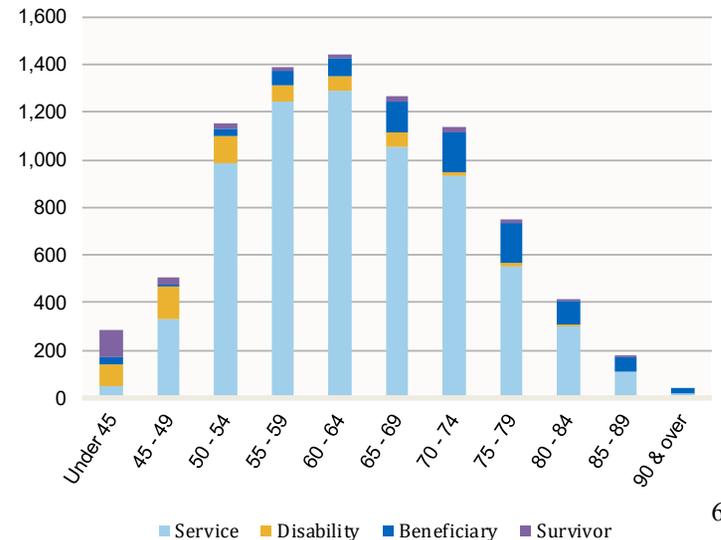


CHART 10
Distribution of Retired Police/Fire Members and Beneficiaries by Type and by Age as of June 30, 2018



SECTION 2: Valuation Results for the Public Employees' Retirement System of Nevada

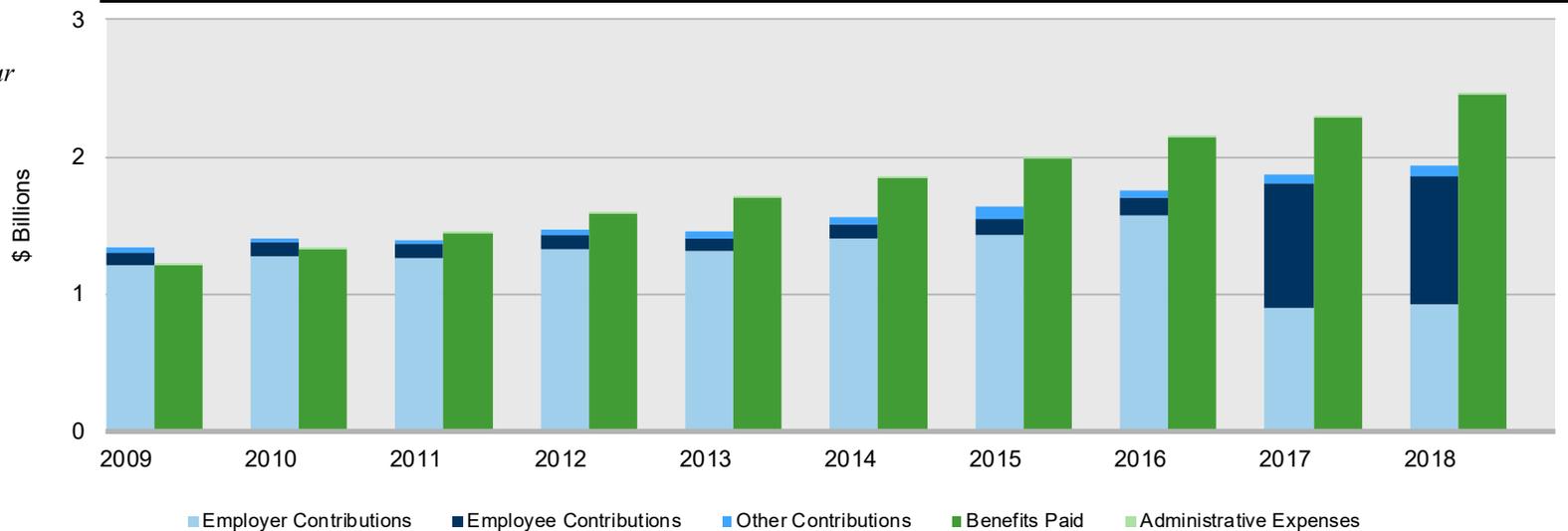
B. FINANCIAL INFORMATION

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.

The chart depicts the comparison of contributions with benefits and expenses over the last ten years. Note: The first bar represents increases in assets during each year while the second bar details the decreases.

CHART 11
Comparison of Contributions with Benefits and Expenses for Years Ended June 30, 2009 – 2018



* 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.

SECTION 2: Valuation Results for the Public Employees' Retirement System of Nevada

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.

The chart shows the determination of the actuarial value of assets as of the valuation date.

CHART 12
Determination of Actuarial Value of Assets for Year Ended June 30, 2018

	Regular		Police/Fire	
1. Market value of assets		\$32,094,731,596		\$9,325,296,981
		Unrecognized		Unrecognized
2. Calculation of unrecognized return	<u>Original Amount⁽¹⁾</u>	<u>Return</u>	<u>Original Amount⁽¹⁾</u>	<u>Return</u>
(a) Year ended June 30, 2018 ⁽²⁾	\$295,081,911	\$236,065,530	\$85,392,866	\$68,314,292
(b) Year ended June 30, 2017 ⁽²⁾	977,327,110	586,396,266	280,510,254	168,306,152
(c) Year ended June 30, 2016 ⁽²⁾	-1,479,964,178	-591,985,671	-421,255,666	-168,502,266
(d) Year ended June 30, 2015 ⁽²⁾	-862,766,254	-172,553,251	-241,902,572	-48,380,514
(e) Year ended June 30, 2014 ⁽²⁾	<u>2,125,431,988</u>	<u>0</u>	<u>590,979,307</u>	<u>0</u>
(f) Total unrecognized return ⁽³⁾	\$1,055,110,577	\$57,922,874	\$293,724,189	\$19,737,664
3. Preliminary actuarial value of assets: (1) - (2f)		\$32,036,808,722		\$9,305,559,317
4. Additional write up/(down) due to 70%/130% corridor:		\$0		\$0
5. Actuarial value of assets: (3) + (4)		<u>\$32,036,808,722</u>		<u>\$9,305,559,317</u>
6. Actuarial value as a percentage of market value: (5) ÷ (1) ⁽⁴⁾		99.82%		99.79%

⁽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, 2018 recognized in each of the next four years:	Regular	Police/Fire	Total
(a) Amount recognized during 2018/2019	-\$214,064,282	-\$59,451,024	-\$273,515,306
(b) Amount recognized during 2019/2020	-41,511,031	-11,070,509	-52,581,540
(c) Amount recognized during 2020/2021	254,481,804	73,180,624	327,662,428
(d) Amount recognized during 2021/2022	<u>59,016,383</u>	<u>17,078,573</u>	<u>76,094,956</u>
	\$57,922,874	\$19,737,664	\$77,660,538

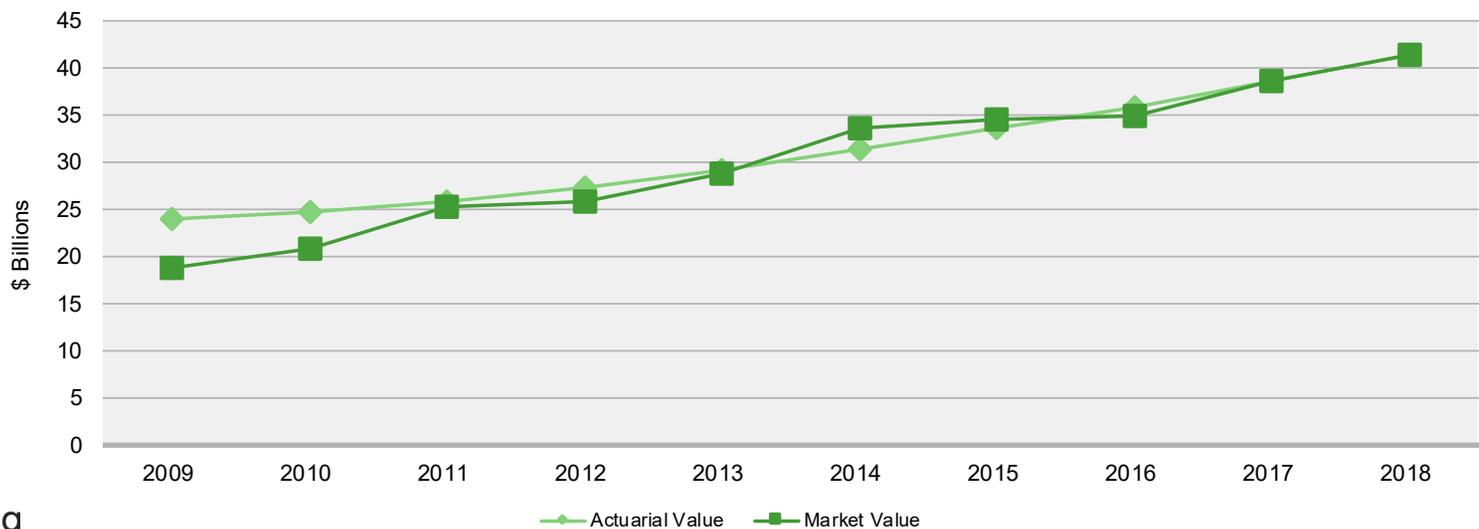
⁽⁴⁾ Total actuarial value as a percentage of total market value is 99.81% for Regular and Police/Fire.

SECTION 2: Valuation Results for the Public Employees' Retirement System of Nevada

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.

This chart shows the change in the actuarial value of assets versus the market value over the past ten years.

CHART 13
Actuarial Value of Assets vs. Market Value of Assets as of June 30, 2009 – 2018



SECTION 2: Valuation Results for the Public Employees' Retirement System of Nevada

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 \$163.0 million are shown below. The net experience loss from sources other than investments was 0.79% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

This chart provides a summary of the actuarial experience during the past year.

CHART 14
Actuarial Experience for Year Ended June 30, 2018

	Regular	Police/Fire	Total
1. Net gain/(loss) from investments ⁽¹⁾	\$211,022,115	\$58,744,838	\$269,766,953
2. Net gain/(loss) from post-retirement benefit increases other than expected ⁽²⁾	-37,683,740	-13,057,765	-50,741,505
3. Net gain/(loss) from individual salary increases other than expected ⁽²⁾	96,237,530	-52,132,635	44,104,895
4. Net gain/(loss) from other experience ⁽²⁾	<u>-314,214,124</u>	<u>-111,910,604</u>	<u>-426,124,728</u>
5. Net experience gain/(loss): (1) + (2) + (3) + (4)	-44,638,219	-118,356,166	-162,994,385

⁽¹⁾ Details in Chart 15.

⁽²⁾ Details in Chart 18. Does not include the effects of Plan or assumption changes, if any.

SECTION 2: Valuation Results for the Public Employees' Retirement System of Nevada

Investment Rate of Return

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 2017-2018 plan year is 7.50%. The actual rates of return on an actuarial basis for the 2017-2018 plan year were 8.21% for Regular and 8.18% 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, 2018 with regard to its investments.

This chart shows the gain/(loss) due to investment experience.

CHART 15
Actuarial Value Investment Experience for Year Ended June 30, 2018

	Regular	Police/Fire	Total
1. Actual return	\$2,447,884,797	\$705,926,799	\$3,153,811,596
2. Average value of assets	29,824,835,761	8,629,092,808	38,453,928,569
3. Actual rate of return: (1) ÷ (2)	8.21%	8.18%	8.20%
4. Assumed rate of return	7.50%	7.50%	7.50%
5. Expected return: (2) x (4)	<u>2,236,862,682</u>	<u>647,181,961</u>	<u>2,884,044,643</u>
6. Actuarial gain/(loss): (1) – (5)	<u>\$211,022,115</u>	<u>\$58,744,838</u>	<u>\$269,766,953</u>

SECTION 2: Valuation Results for the Public Employees' Retirement System of Nevada

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.

CHART 16
Investment Return – Actuarial Value vs. Market Value: 2009 – 2018

Year Ended	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	
June 30	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
2009	\$(2,834,457,823)	(15.98%)	\$497,747,740	2.68%	\$(706,537,749)	(16.00%)	\$123,352,371	2.67%	\$(3,540,995,572)	(15.99%)	\$621,100,111	2.68%
2010	1,641,734,286	11.03%	537,022,624	2.82%	419,574,635	11.03%	141,729,146	2.93%	2,061,308,921	11.03%	678,751,770	2.84%
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	<u>2,531,944,593</u>	8.50%	<u>2,447,884,797</u>	8.21%	<u>732,574,827</u>	8.50%	<u>705,926,799</u>	8.18%	<u>3,264,519,420</u>	8.50%	<u>3,153,811,596</u>	8.20%
Total	16,781,433,168		15,890,009,300		4,697,110,578		4,471,230,836		21,478,543,746		20,361,240,136	
Five-year average return		8.61%		8.47%		8.58%		8.52%		8.60%		8.48%
Ten-year average return		7.58%		6.91%		7.71%		7.11%		7.61%		6.95%

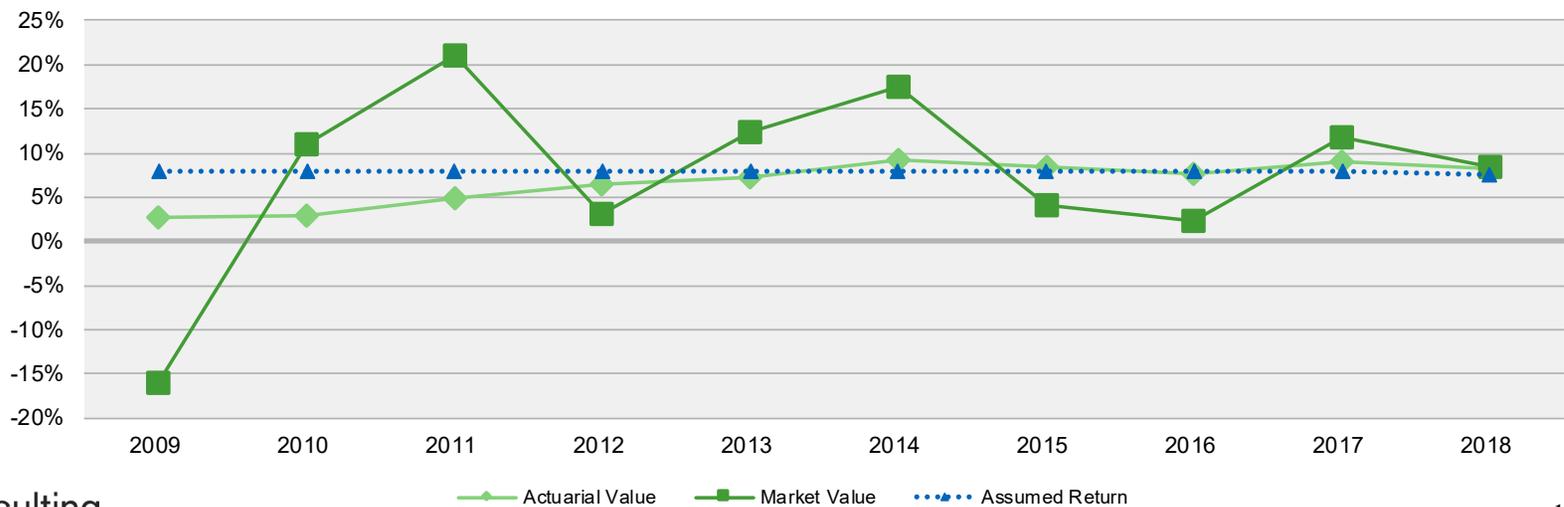
Note: Each year's yield is weighted by the average asset value in that year.

SECTION 2: Valuation Results for the Public Employees' Retirement System of Nevada

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.

This chart illustrates how this leveling effect has actually worked over the past ten years.

CHART 17
Market and Actuarial Rates of Return for Years Ended June 30, 2009 - 2018



SECTION 2: Valuation Results for the Public Employees' Retirement System of Nevada

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 expected),
- mortality (more or fewer deaths than expected),
- the number of disability retirements, and
- salary increases different than assumed.

The net gain/loss from this other experience for the year ended June 30, 2018 amounted to a loss of \$255.7 million for Regular and a loss of \$177.1 million for Police/Fire, which are 0.60% and 1.46% of the actuarial accrued liability, respectively.

A brief summary of the demographic gain/(loss) experience of the PERS for the year ended June 30, 2018 is shown in the chart below.

CHART 18
Experience Due to Sources Other Than Investment Return for Year Ended June 30, 2018

	Regular	% of AAL	Police/Fire	% of AAL	Total	% of AAL
Age and Service Retirements	-\$217,862,569	-0.51%	-\$57,209,716	-0.47%	-\$275,072,285	-0.50%
Disability Retirements	-9,893,562	-0.02%	-4,907,017	-0.04%	-14,800,579	-0.03%
Pre and Post-Retirement Mortality	11,582,182	0.02%	-26,608,176*	-0.22%	-15,025,994	-0.03%
Post-Retirement Benefit Increases (PRBIs)	-37,683,740	-0.09%	-13,057,765	-0.11%	-50,741,505	-0.09%
Withdrawal From Employment	11,062,227	0.03%	-7,751,074	-0.06%	3,311,153	0.01%
Individual Pay Increases	96,237,530	0.22%	-52,132,635	-0.43%	44,104,895	0.08%
Active New Entrants	-59,481,176	-0.14%	-8,999,313	-0.07%	-68,480,489	-0.12%
Active Rehires	-26,545,797	-0.06%	-3,957,745	-0.03%	-30,503,542	-0.06%
Retiree Return to Active	24,985,495	0.06%	1,700,567	0.01%	26,686,062	0.05%
Inactive and Retiree Showups	-69,922,319	-0.16%	-7,645,886	-0.06%	-77,568,205	-0.14%
Data Adjustments	26,140,625	0.06%	11,052,191	0.09%	37,192,816	0.07%
Other**	<u>-4,279,230</u>	<u>-0.01%</u>	<u>-7,584,435</u>	<u>-0.07%</u>	<u>-11,863,665</u>	<u>-0.03%</u>
Total Liability Experience Gain/(Loss) During Year	-\$255,660,334	-0.60%	-\$177,101,004	-1.46%	-\$432,761,338	-0.79%

* 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 have been valued assuming no surviving spouse.

** Other gain/(loss) includes actual purchase of service contributions of \$49.6 million for Regular and \$23.9 million for Police/Fire, offset by the corresponding increase in liability.

The chart shows elements of the experience gain/(loss) for the most recent year.

SECTION 2: Valuation Results for the Public Employees' Retirement System of Nevada

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 Exhibit III in Section 4 for details about this adjustment.

The chart compares this valuation's calculated contribution rates with the prior valuation.

CHART 19
Calculated Contribution Rates

	Year Beginning July 1			
	2018		2017	
	Regular	Police/Fire	Regular	Police/Fire
Employer-Pay, current statutory rate⁽¹⁾	28.00%	40.50%	28.00%	40.50%
Normal cost	16.13%	25.99%	16.39%	26.17%
Amortization percentage	13.06%	16.43%	12.65%	15.65%
Administrative expenses	<u>0.15%</u>	<u>0.15%</u>	<u>0.15%</u>	<u>0.15%</u>
Employer-Pay, total rate⁽¹⁾	29.34%	42.57%	29.19%	41.97%
New statutory rounded rate	<u>29.25%</u>	<u>42.50%</u>	<u>N/A</u>	<u>N/A</u>
Employee/Employer Pay, current statutory rate⁽²⁾	29.00%	41.50%	29.00%	41.50%
Normal cost	17.38%	27.35%	17.62%	27.53%
Amortization percentage	13.06%	16.43%	12.65%	15.65%
Administrative expenses	<u>0.15%</u>	<u>0.15%</u>	<u>0.15%</u>	<u>0.15%</u>
Employee/Employer Pay, total rate⁽²⁾	30.59%	43.93%	30.42%	43.33%
New statutory rounded rate	<u>30.50%</u>	<u>44.00%</u>	<u>N/A</u>	<u>N/A</u>

⁽¹⁾ See cost-sharing mechanism in NRS 286.421

⁽²⁾ See cost-sharing mechanism in NRS 286.410

SECTION 2: Valuation Results for the Public Employees' Retirement System of Nevada

The actuarially determined contribution rates as of June 30, 2018 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.

Reconciliation of Actuarially Determined Contribution Rate

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

The chart reconciles the actuarially determined contribution rates from the prior rate-setting year to the amount determined in this valuation.

CHART 20

Reconciliation of Actuarially Determined Contribution Rate⁽¹⁾ from June 30, 2016 to June 30, 2018

	Regular	Estimated Annual Dollar Cost ⁽²⁾	Police/Fire	Estimated Annual Dollar Cost ⁽²⁾
Actuarially Determined Contribution Rate as of June 30, 2016	28.21%	\$1,440,354,006	39.99%	\$390,000,183
Effect of investment (gain)/loss	-0.57%	-30,245,136	-0.74%	-7,675,602
Effect of (gains)/losses on individual salary experience	-0.31%	-16,114,284	0.21%	2,324,897
Effect on existing amortization of payroll growth less than expected	0.61%	74,347,048 ⁽³⁾	0.40%	20,024,913 ⁽³⁾
Effect of changes in normal cost	-0.52%	29,327,928 ⁽⁴⁾	-0.47%	23,806,213 ⁽⁴⁾
Effect of contributions (more)/less than expected	0.27%	14,405,181	0.18%	1,895,657
Effect of (gain)/loss on post-retirement benefit increases	-0.22%	-11,555,323	-0.25%	-2,595,360
Effect of other (gains)/losses ⁽⁵⁾	0.49%	27,063,918	1.04%	11,145,812
Effect of assumption changes	<u>1.60%</u>	<u>77,842,330</u>	<u>2.33%</u>	<u>21,184,911</u>
Total change	<u>1.35%</u>	<u>\$165,071,662</u>	<u>2.70%</u>	<u>\$70,111,441</u>
Actuarially Determined Contribution Rate as of June 30, 2018	29.56%	\$1,605,425,668	42.69%	\$460,111,624

⁽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, 2016 valuation.

SECTION 2: Valuation Results for the Public Employees' Retirement System of Nevada

E. FUNDED RATIO

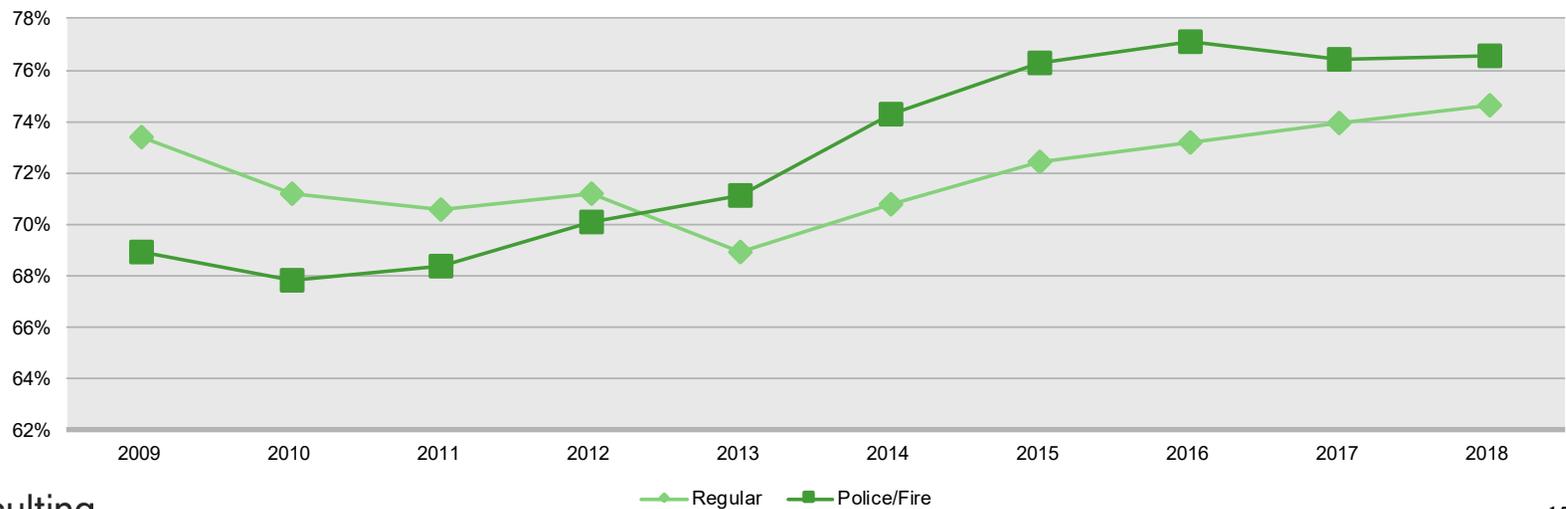
One critical piece of information regarding the Plan's financial status is the funded ratio. This ratio compares the actuarial value of assets to the actuarial accrued liabilities of the plan.

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 funding of the plan below actuarial requirements, poor asset performance, or a variety of other factors.

This graph shows the funded ratios on an AVA basis for Regular and Police/Fire.

CHART 21
Funded Ratios



SECTION 3: Supplemental Information for the Public Employees' Retirement System of Nevada

EXHIBIT A

Table of Plan Coverage

i. Regular

Category	Year Ended June 30		Change From Prior Year
	2018	2017	
Active members in valuation:			
Number	94,615	93,276	1.44%
Employer-Pay	75,107	74,165	1.27%
Employee/Employer	19,508	19,111	2.08%
Average age	45.8	45.9	-0.1
Average service	9.9	9.8	0.1
Total annual salary	\$4,843,611,122	\$4,617,385,202	4.90%
Average annual salary	\$51,193	\$49,502	3.42%
Account balances	\$853,942,350	\$789,547,374	8.16%
Total active vested members	61,689	62,007	-0.51%
Vested terminated members	15,714	15,763	-0.31%
Retired members:			
Number in pay status	49,851	47,571	4.79%
Average age	69.9	69.7	0.2
Average monthly benefit	\$2,961	\$2,899	2.14%
Disabled members:			
Number in pay status	2,526	2,520	0.24%
Average age	59.7	59.3	0.4
Average monthly benefit	\$2,173	\$2,119	2.55%
Beneficiaries:			
Number in pay status	4,138	3,914	5.72%
Average age	71.4	71.3	0.1
Average monthly benefit	\$2,027	\$1,985	2.12%
Survivors:			
Number in pay status	2,046	1,970	3.86%
Average age	55.5	56.0	-0.5
Average monthly benefit	\$1,426	\$1,395	2.22%
Total pay status:			
Number in pay status	58,561	55,975	4.62%
Average age	69.1	68.9	0.2
Average monthly benefit	\$2,807	\$2,747	2.20%

SECTION 3: Supplemental Information for the Public Employees' Retirement System of Nevada

EXHIBIT A

Table of Plan Coverage

ii. Police/Fire

Category	Year Ended June 30		Change From Prior Year
	2018	2017	
Active members in valuation:			
Number	12,891	12,525	2.92%
Employer-Pay	11,204	10,732	4.40%
Employee/Employer	1,687	1,793	-5.91%
Average age	39.9	40.2	-0.3
Average service	11.1	11.2	-0.1
Total annual salary	\$986,791,485	\$924,861,452	6.70%
Average annual salary	\$76,549	\$73,841	3.67%
Account balances	\$142,530,623	\$131,260,183	8.59%
Total active vested members	9,059	9,120	-0.67%
Vested terminated members	893	905	-1.33%
Retired members:			
Number in pay status	6,869	6,558	4.74%
Average age	64.0	63.9	0.1
Average monthly benefit	\$5,548	\$5,407	2.61%
Disabled members:			
Number in pay status	573	550	4.18%
Average age	54.3	54.2	0.1
Average monthly benefit	\$3,278	\$3,195	2.60%
Beneficiaries:			
Number in pay status	840	785	7.01%
Average age	71.1	70.6	0.5
Average monthly benefit	\$2,507	\$2,424	3.42%
Survivors:			
Number in pay status	265	262	1.15%
Average age	45.0	45.8	-0.8
Average monthly benefit	\$1,860	\$1,783	4.32%
Total pay status:			
Number in pay status	8,547	8,155	4.81%
Average age	63.5	63.3	0.2
Average monthly benefit	\$4,983	\$4,854	2.64%

SECTION 3: Supplemental Information for the Public Employees' Retirement System of Nevada

EXHIBIT A

Table of Plan Coverage

iii. Total

Category	Year Ended June 30		Change From Prior Year
	2018	2017	
Active members in valuation:			
Number	107,506	105,801	1.61%
Employer-Pay	86,311	84,897	1.67%
Employee/Employer	21,195	20,904	1.39%
Average age	45.1	45.2	-0.1
Average service	10.0	10.0	0.0
Total annual salary	\$5,830,402,607	\$5,542,246,654	5.20%
Average annual salary	\$54,233	\$52,384	3.53%
Account balances	\$996,472,973	\$920,807,557	8.22%
Total active vested members	70,748	71,127	-0.53%
Vested terminated members	16,607	16,668	-0.37%
Retired members:			
Number in pay status	56,720	54,129	4.79%
Average age	69.2	69.0	0.2
Average monthly benefit	\$3,275	\$3,203	2.25%
Disabled members:			
Number in pay status	3,099	3,070	0.94%
Average age	58.7	58.4	0.3
Average monthly benefit	\$2,377	\$2,311	2.86%
Beneficiaries:			
Number in pay status	4,978	4,699	5.94%
Average age	71.4	71.2	0.2
Average monthly benefit	\$2,108	\$2,059	2.38%
Survivors:			
Number in pay status	2,311	2,232	3.54%
Average age	54.3	54.8	-0.5
Average monthly benefit	\$1,476	\$1,441	2.43%
Total pay status:			
Number in pay status	67,108	64,130	4.64%
Average age	68.4	68.2	0.2
Average monthly benefit	\$3,085	\$3,015	2.32%

SECTION 3: Supplemental Information for the Public Employees' Retirement System of Nevada

EXHIBIT B

Members in Active Service as of June 30, 2018 By Age, Years of Service, and Average Annual Salary

i. Regular

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	3,162	3,153	9	--	--	--	--	--	--	--
	\$22,484	\$22,431	\$40,933	--	--	--	--	--	--	--
25 - 29	7,531	6,734	761	36	--	--	--	--	--	--
	34,437	33,453	42,679	\$43,441	--	--	--	--	--	--
30 - 34	9,405	5,822	2,460	1,091	32	--	--	--	--	--
	42,074	36,856	49,541	52,601	\$59,080	--	--	--	--	--
35 - 39	11,627	5,128	2,375	3,435	648	41	--	--	--	--
	48,847	38,155	53,074	58,655	64,413	\$73,397	--	--	--	--
40 - 44	12,003	4,131	1,968	3,053	2,063	731	57	--	--	--
	53,603	37,969	50,947	61,068	68,764	73,169	\$79,239	--	--	--
45 - 49	14,183	3,867	2,076	3,124	2,292	2,123	691	10	--	--
	57,620	39,096	50,343	59,894	68,624	76,284	78,691	\$80,346	--	--
50 - 54	13,148	2,995	1,882	2,845	2,055	1,792	1,443	135	1	--
	57,618	37,711	48,050	56,956	66,659	73,630	77,912	79,064	*	--
55 - 59	11,671	2,433	1,562	2,647	1,998	1,655	1,133	210	33	--
	57,269	38,818	47,647	55,592	63,797	71,364	77,137	80,274	\$76,830	--
60 - 64	7,713	1,591	1,090	1,821	1,326	1,051	627	154	43	10
	56,626	40,010	46,422	56,391	63,579	70,985	70,734	80,993	78,109	\$72,151
65 - 69	3,008	590	473	707	469	395	252	86	22	14
	56,286	41,499	48,381	55,220	61,446	65,836	73,768	74,492	81,924	91,214
70 & over	1,164	283	205	269	172	112	72	31	14	6
	48,894	32,778	38,998	50,599	56,845	67,554	65,609	72,808	72,785	114,509
Total	94,615	36,727	14,861	19,028	11,055	7,900	4,275	626	113	30
	\$51,193	\$35,915	\$49,248	\$57,731	\$66,046	\$72,997	\$76,341	\$79,027	\$78,142	\$89,519

* Not shown for groups with fewer than five members.

SECTION 3: Supplemental Information for the Public Employees' Retirement System of Nevada

EXHIBIT B

Members in Active Service as of June 30, 2018 By Age, Years of Service, and Average Annual Salary

ii. Police/Fire

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	642	639	3	--	--	--	--	--	--	--
	\$40,683	\$40,631	*	--	--	--	--	--	--	--
25 - 29	1,766	1,572	180	14	--	--	--	--	--	--
	52,088	50,382	\$64,916	\$76,383	--	--	--	--	--	--
30 - 34	2,014	994	570	428	22	--	--	--	--	--
	65,070	51,721	70,746	86,933	\$95,709	--	--	--	--	--
35 - 39	2,102	470	415	939	251	27	--	--	--	--
	77,604	51,903	71,442	87,382	96,945	\$100,708	--	--	--	--
40 - 44	2,143	237	232	665	714	281	14	--	--	--
	87,012	49,145	70,255	85,951	97,411	107,071	\$123,200	--	--	--
45 - 49	2,224	141	145	450	780	593	115	--	--	--
	92,278	43,638	63,107	83,530	95,813	108,397	115,844	--	--	--
50 - 54	1,252	68	79	224	338	309	218	16	--	--
	93,465	45,485	66,220	77,819	91,953	105,992	117,440	\$114,271	--	--
55 - 59	557	28	37	103	153	103	103	26	4	--
	91,267	56,989	65,538	73,811	87,833	102,879	113,221	116,626	*	--
60 - 64	147	13	15	21	38	36	14	9	1	--
	80,420	42,710	62,726	74,383	86,147	87,899	97,051	93,542	*	--
65 - 69	40	4	5	10	9	4	4	2	--	2
	71,582	*	54,080	67,372	69,779	*	*	*	--	*
70 & over	4	1	--	2	--	1	--	--	--	--
	*	*	--	*	--	*	--	--	--	--
Total	12,891	4,167	1,681	2,856	2,305	1,354	468	53	5	2
	\$76,549	\$48,980	\$69,085	\$84,921	\$95,069	\$106,381	\$115,570	\$111,155	\$121,762	*

* Not shown for groups with fewer than five members.

SECTION 3: Supplemental Information for the Public Employees' Retirement System of Nevada

EXHIBIT B

Members in Active Service as of June 30, 2018 By Age, Years of Service, and Average Annual Salary

iii. Total

Age	Years of Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	3,804	3,792	12	--	--	--	--	--	--	--
	\$25,555	\$25,498	\$43,624	--	--	--	--	--	--	--
25 - 29	9,297	8,306	941	50	--	--	--	--	--	--
	37,791	36,657	46,932	\$52,665	--	--	--	--	--	--
30 - 34	11,419	6,816	3,030	1,519	54	--	--	--	--	--
	46,130	39,024	53,530	62,275	\$73,872	--	--	--	--	--
35 - 39	13,729	5,598	2,790	4,374	899	68	--	--	--	--
	53,248	39,309	55,807	64,822	73,496	\$83,995	--	--	--	--
40 - 44	14,146	4,368	2,200	3,718	2,777	1,012	71	--	--	--
	58,664	38,575	52,983	65,519	76,129	82,583	\$88,031	--	--	--
45 - 49	16,407	4,008	2,221	3,574	3,072	2,716	806	10	--	--
	62,318	39,256	51,176	62,870	75,527	83,295	83,992	\$80,346	--	--
50 - 54	14,400	3,063	1,961	3,069	2,393	2,101	1,661	151	1	--
	60,735	37,883	48,782	58,479	70,232	78,390	83,100	82,795	*	--
55 - 59	12,228	2,461	1,599	2,750	2,151	1,758	1,236	236	37	--
	58,817	39,025	48,061	56,274	65,507	73,210	80,144	84,279	\$81,598	--
60 - 64	7,860	1,604	1,105	1,842	1,364	1,087	641	163	44	10
	57,071	40,032	46,643	56,596	64,208	71,545	71,309	81,686	79,177	\$72,151
65 - 69	3,048	594	478	717	478	399	256	88	22	16
	56,487	41,325	48,441	55,390	61,603	66,070	74,247	74,944	81,924	96,394
70 & over	1,168	284	205	271	172	113	72	31	14	6
	48,985	32,741	38,998	50,934	56,845	67,732	65,609	72,808	72,785	114,509
Total	107,506	40,894	16,542	21,884	13,360	9,254	4,743	679	118	32
	\$54,233	\$37,247	\$51,264	\$61,280	\$71,053	\$77,881	\$80,212	\$81,535	\$79,990	\$92,215

* Not shown for groups with fewer than five members.

SECTION 3: Supplemental Information for the Public Employees' Retirement System of Nevada

EXHIBIT C

Reconciliation of Member Data

	Active Members	Inactive Members	Retired Members	Disabled Members	Beneficiaries and Survivors	Total
Number as of June 30, 2017	105,801	16,668	54,129	3,070	6,931	186,599
New members	11,212	31	129	0	654	12,026
Terminations – with vested rights	-1,897	1,897	0	0	0	0
Terminations – without vested rights	-5,112	-412	N/A	N/A	N/A	-5,524
Retirements	-2,770	-980	3,821	-71	N/A	0
New disabilities	-169	-27	0	196	N/A	0
Return to work	559	-522	-36	-1	N/A	0
Died with or without beneficiary	-77	-47	-1,268	-90	-232	-1,714
Certain period expired	N/A	N/A	0	0	-64	-64
Data adjustments	<u>-41</u>	<u>-1</u>	<u>-55</u>	<u>-5</u>	<u>0</u>	<u>-102</u>
Number as of June 30, 2018	107,506	16,607	56,720	3,099	7,289	191,221

SECTION 3: Supplemental Information for the Public Employees' Retirement System of Nevada

EXHIBIT D

Summary Statement of Income and Expenses on an Actuarial Value Basis (based on unaudited financial statements)

	Year Ended June 30, 2018			Year Ended June 30, 2017
	Regular	Police/Fire	Total	Total
Net assets at actuarial value at the beginning of the year	\$30,060,747,596	\$8,658,553,098	\$38,719,300,694	\$35,896,247,280
Contribution income:⁽¹⁾				
Employer contributions ⁽²⁾	\$721,895,324	\$208,374,104	\$930,269,428	\$901,744,209
Member contributions	721,988,687	208,280,740	930,269,427	901,744,209
Repayment and purchase of service	<u>49,636,294</u>	<u>23,921,509</u>	<u>73,557,803</u>	<u>67,230,428</u>
Contribution income	\$1,493,520,305	\$440,576,353	\$1,934,096,658	\$1,870,718,846
Investment income:				
Interest	\$246,346,877	\$0	\$246,346,877	\$210,880,421
Dividends	595,172,224	-	595,172,224	571,620,668
Net appreciation	2,326,413,569	-	2,326,413,569	3,218,838,653
Other	117,458,561	-	117,458,561	120,178,514
Transfer of annual investment income	-732,040,189	732,040,189	-	-
Securities lending income	6,232,609	-	6,232,609	5,206,183
Change in fair value of securities lending	-11,658,275	-	-11,658,275	-
Other income	1,773,603	534,638	2,308,241	2,143,678
Change in unrecognized return	-84,059,796	-26,648,028	-110,707,824	-861,171,088
Less investment fees	<u>-17,754,386</u>	<u>-</u>	<u>-17,754,386</u>	<u>-16,458,380</u>
Net investment income	<u>\$2,447,884,797</u>	<u>\$705,926,799</u>	<u>\$3,153,811,596</u>	<u>\$3,251,238,649</u>
Total income available for benefits	\$3,941,405,102	\$1,146,503,152	\$5,087,908,254	\$5,121,957,495
Less operating expenses:				
Retirement and survivor benefits	-\$1,843,320,836	-\$469,020,380	-\$2,312,341,216	-\$2,152,856,819
Disability benefits	-82,849,426	-24,822,976	-107,672,402	-105,357,374
Post-retirement increases	-	-	-	-11,022
Refunds to members	-24,404,165	-6,962,064	-31,366,229	-30,388,174
Administrative expenses	-11,523,514	-1,343,933	-12,867,447	-9,870,284
Transfer to JRS	-515,342	-	-515,342	-418,673
Other Expenses	<u>-72,900</u>	<u>-5,373</u>	<u>-78,273</u>	<u>-1,735</u>
Net operating expenses	<u>-\$1,962,686,183</u>	<u>-\$502,154,726</u>	<u>-\$2,464,840,909</u>	<u>-\$2,298,904,081</u>
Interfund transfer	-\$2,657,793	\$2,657,793	\$0	\$0
Change in reserve for future benefits	\$1,976,061,126	\$647,006,219	\$2,623,067,345	\$2,823,053,414
Net assets at actuarial value at the end of the year	\$32,036,808,722	\$9,305,559,317	\$41,342,368,039	\$38,719,300,694

⁽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

SECTION 3: Supplemental Information for the Public Employees' Retirement System of Nevada

EXHIBIT E

Summary Statements of Assets (based on unaudited financial statements)

	Year Ended June 30, 2018	Year Ended June 30, 2017
Cash equivalents	\$211,016,287	\$155,681,189
Accounts receivable:		
Contributions receivable	\$166,424,654	\$163,139,100
Pending trades receivable	263,654,290	198,725,111
Accrued investment income	<u>143,335,793</u>	<u>109,058,611</u>
Total accounts receivable	573,414,737	470,922,822
Investments:		
Fixed income securities	\$11,916,868,196	\$10,504,305,561
Marketable equity securities	17,292,074,389	16,031,517,896
International securities	7,927,633,948	8,259,056,692
Real estate	1,808,733,104	1,789,219,998
Private equity	<u>1,963,430,139</u>	<u>1,677,291,420</u>
Total investments at market value	40,908,739,776	38,261,391,567
Collateral on loaned securities	282,149,258	377,917,975
Property and equipment	4,522,492	4,614,071
Other assets	<u>3,396,862</u>	<u>3,352,174</u>
Total assets	\$41,983,239,412	\$39,273,879,798
Liabilities:		
Accounts payable	-\$16,228,413	-\$12,909,341
Pending trades payable	-253,174,889	-196,799,074
Obligations under securities lending activities	<u>-293,807,533</u>	<u>-377,917,975</u>
Total liabilities	-\$563,210,835	-\$587,626,390
Net assets at market value	<u>\$41,420,028,577</u>	<u>\$38,686,253,408</u>
Net assets at actuarial value	<u>\$41,342,368,039</u>	<u>\$38,719,300,694</u>

SECTION 3: Supplemental Information for the Public Employees' Retirement System of Nevada

EXHIBIT F

Development of the Fund Through June 30, 2018

Year Ended June 30	Employer Contributions*	Member Contributions*	Other Contributions	Net Investment Return**	Administrative Expenses	Benefit Payments***	Actuarial Value of Assets at End of Year
2008							\$23,237,651,604
2009	\$1,213,067,534	\$93,648,004	\$28,116,522	\$621,100,111	\$9,714,463	\$1,211,993,461	23,971,875,851
2010	1,281,714,847	99,683,851	26,890,242	678,751,770	11,118,633	1,322,333,219	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

* 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.

** Net of investment fees.

*** Includes transfers in/out of the System (e.g. to the Judicial Retirement System) that correspond to transfers of liability.

SECTION 3: Supplemental Information for the Public Employees' Retirement System of Nevada

EXHIBIT G

Development of Unfunded Actuarial Accrued Liability for Year Ended June 30, 2018

	Regular	Police/Fire	Total
1. Unfunded actuarial accrued liability at beginning of year	\$10,590,903,261	\$2,675,893,537	\$13,266,796,798
2. Normal cost at beginning of year	867,123,177	266,958,346	1,134,081,523
3. Actual total contributions, excluding purchase of service	-1,443,884,011	-416,654,844	-1,860,538,855
4. Actual administrative expenses	11,596,414	1,349,306	12,945,720
5. Interest			
(a) For whole year on (1) + (2)	\$859,351,983	\$220,713,891	\$1,080,065,874
(b) For a half year on (3) + (4)	<u>-53,710,785</u>	<u>-15,573,958</u>	<u>-69,284,743</u>
(c) Total interest	<u>805,641,198</u>	<u>205,139,933</u>	<u>1,010,781,131</u>
6. Expected unfunded actuarial accrued liability	\$10,831,380,039	\$2,732,686,278	\$13,564,066,317
7. Changes due to ⁽¹⁾			
(a) Investment gain	-\$211,022,115	-\$58,744,838	-\$269,766,953
(b) Post-retirement benefit increases higher than expected	37,683,740	13,057,765	50,741,505
(c) Individual salary increases higher/(lower) than expected	-96,237,530	52,132,635	-44,104,895
(d) Other experience	<u>314,214,124</u>	<u>111,910,604</u>	<u>426,124,728</u>
(e) Total changes	<u>\$44,638,219</u>	<u>\$118,356,166</u>	<u>\$162,994,385</u>
8. Unfunded actuarial accrued liability at end of year	<u>\$10,876,018,258</u>	<u>\$2,851,042,444</u>	<u>\$13,727,060,702</u>

⁽¹⁾ For Regular, does not include separate item showing effect of contribution loss of \$152,903,604, which resulted from actual contributions for the year falling short of those expected. This in turn was 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.

For Police/Fire, does not include separate item showing effect of contribution loss of \$27,106,663, which resulted from actual contributions for the year falling short of those expected. This in turn was 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.

SECTION 3: Supplemental Information for the Public Employees' Retirement System of Nevada

EXHIBIT H

Table of Amortization Bases

Date Established	Initial Years	Initial Amount	Current Annual Payment⁽¹⁾	Years Remaining	Outstanding Balance
Regular					
06/30/2004	30	\$3,306,492,730	\$332,490,003	16	\$4,638,256,181
06/30/2005	30	825,676,847	78,129,176	17	1,147,758,699
06/30/2006	30	376,199,046	33,497,108	18	516,432,080
06/30/2007	30	-325,346,914	-27,259,455	19	-439,705,425
06/30/2008	30	597,061,087	47,072,198	20	792,238,367
06/30/2009	30	1,396,781,607	103,620,060	21	1,815,129,205
06/30/2010	30	804,325,423	56,145,006	22	1,021,348,392
06/30/2011	30	322,201,646	21,162,428	23	398,971,400
06/30/2012	23	-31,427,931	-2,384,052	17	-35,022,985
06/30/2013	22	1,365,091,459	100,980,902	17	1,483,462,561
06/30/2014	21	-430,228,451	-31,098,920	17	-456,859,493
06/30/2015	20	-351,958,978	-24,916,427	17	-366,035,426
06/30/2016	20	-50,637,913	-3,373,308	18	-52,007,013
06/30/2017	20	208,578,319	13,074,655	19	210,899,177
06/30/2018	20	201,152,538	<u>11,951,822</u>	<u>20</u>	<u>201,152,538</u>
Subtotal			\$709,091,196	17.9 ⁽²⁾	\$10,876,018,258

⁽¹⁾ Level percentage of payroll with payroll expected to increase 5.5% per year for Regular and 6.5% 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 17.8.

SECTION 3: Supplemental Information for the Public Employees' Retirement System of Nevada

EXHIBIT H

Table of Amortization Bases (continued)

Date Established	Initial Years	Initial Amount	Current Annual Payment⁽¹⁾	Years Remaining	Outstanding Balance
Police/Fire					
06/30/2004	30	\$1,248,577,900	\$128,551,977	16	\$1,919,377,009
06/30/2005	30	166,690,723	15,963,268	17	252,089,633
06/30/2006	30	145,811,902	12,988,155	18	216,187,254
06/30/2007	30	-52,497,545	-4,349,451	19	-76,072,410
06/30/2008	30	130,126,655	10,027,658	20	183,781,086
06/30/2009	30	204,577,462	14,663,095	21	280,899,914
06/30/2010	30	144,950,584	9,663,163	22	193,057,711
06/30/2011	30	585,886	36,328	23	755,362
06/30/2012	23	-101,888,427	-7,426,127	17	-117,272,327
06/30/2013	22	-14,571,831	-1,028,095	17	-16,235,521
06/30/2014	21	-245,329,185	-16,829,537	17	-265,769,618
06/30/2015	20	-122,710,590	-8,203,405	17	-129,546,989
06/30/2016	20	-1,048,428	-65,346	18	-1,087,684
06/30/2017	20	261,380,946	15,188,756	19	265,653,144
06/30/2018	20	145,225,880	<u>7,923,968</u>	<u>20</u>	<u>145,225,880</u>
Subtotal			\$177,104,407	17.4 ⁽²⁾	<u>\$2,851,042,444</u>
Grand Total					\$13,727,060,702

⁽¹⁾ Level percentage of payroll with payroll expected to increase 5.5% per year for Regular and 6.5% 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 17.8.

SECTION 3: Supplemental Information for the Public Employees' Retirement System of Nevada

EXHIBIT I

Definitions of Pension Terms

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

Assumptions or Actuarial

Assumptions:

The estimates on which the cost of the Plan is calculated including:

- (a) Investment return — the rate of investment yield that the Plan will earn over the long-term future;
- (b) Mortality rates — the death rates of employees and pensioners; life expectancy is based on these rates;
- (c) Retirement rates — the rate or probability of retirement at a given age;
- (d) Turnover rates — the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement.

Normal Cost:

The amount of contributions required to fund the level cost allocated to the current year of service.

Actuarial Accrued Liability

For Actives:

The value of all projected benefit payments for current members less the portion that will be paid by future normal costs.

Actuarial Accrued Liability

For Pensioners:

The single sum value of lifetime benefits to existing pensioners. This sum takes account of life expectancies appropriate to the ages of the pensioners and the interest that the sum is expected to earn before it is entirely paid out in benefits.

Unfunded Actuarial Accrued Liability:

The extent to which the actuarial accrued liability of the Plan exceeds the assets of the Plan.

SECTION 3: Supplemental Information for the Public Employees' Retirement System of Nevada

Amortization of the Unfunded Actuarial Accrued Liability:

Payments made over a period of years equal in value to the Plan's unfunded actuarial accrued liability.

Investment Return:

The rate of earnings of the Plan 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 4: Reporting Information for the Public Employees' Retirement System of Nevada

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 7,289 beneficiaries and survivors in pay status)	67,108
2. Members inactive during year ended June 30, 2018 with vested rights	16,607
3. Members active during the year ended June 30, 2018	<u>107,506</u>
4. Total members	191,221

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

1. Normal cost ⁽¹⁾		
Regular members	\$888,319,668	
Police/Fire members	<u>281,377,993</u>	
Total normal cost		\$1,169,697,661
2. Actuarial accrued liability		
Retired members and beneficiaries	\$31,385,766,715	
Inactive members with vested rights	1,351,048,976	
Active members	<u>22,332,613,050</u>	
Total actuarial accrued liability		\$55,069,428,741
3. Actuarial value of assets (\$41,420,028,577 at market value as reported by Retirement Office)		<u>41,342,368,039</u>
4. Unfunded actuarial accrued liability (2. – 3.)		\$13,727,060,702
5. Total rate payroll		6,508,871,854

⁽¹⁾ Does not include administrative expenses

SECTION 4: Reporting Information for the Public Employees' Retirement System of Nevada

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.

Economic Assumptions

Net Investment Return:	7.50% (including 2.75% for inflation).
Consumer Price Index:	Increase of 2.75% per year.
Administrative Expenses:	0.15% of payroll added to Normal Cost.

SECTION 4: Reporting Information for the Public Employees' Retirement System of Nevada

Salary Increases:

Inflation: 2.75% Plus

Productivity pay increases: 0.50% Plus

Promotional and merit salary increases:

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 or More	1.00	1.30

SECTION 4: Reporting Information for the Public Employees' Retirement System of Nevada

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.

SECTION 4: Reporting Information for the Public Employees' Retirement System of Nevada

Demographic Assumptions

Mortality Rates (Regular and Police/Fire):

<i>Pre-Retirement:</i>	Headcount-Weighted RP-2014 Employee Table, projected to 2020 with Scale MP-2016.
<i>Healthy:</i>	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.
<i>Disabled:</i>	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.

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Termination Rates before Retirement:

Mortality		
Regular and Police/Fire		
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.

SECTION 4: Reporting Information for the Public Employees' Retirement System of Nevada

Termination Rates before Retirement (continued):

Years of Service	Withdrawal Rates	
	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 withdrawal is assumed after a member reaches earliest unreduced retirement age.

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Termination Rates before Retirement (continued):

Age	Disability Rates	
	Regular	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.

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Retirement Rates:

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

Age	Years of Service (%)					
	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:

Age	Years of Service (%)					
	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

SECTION 4: Reporting Information for the Public Employees' Retirement System of Nevada

Retirement rates (continued):

Police/Fire:

Age	Years of Service (%)				
	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

SECTION 4: Reporting Information for the Public Employees' Retirement System of Nevada

Retirement Age for Inactive Vested Participants:	Earliest unreduced retirement age.
Unknown Data for Participants:	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.
Percent Married:	<p>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.</p> <p>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.</p> <p>70% of “employer-pay” Police/Fire male members and 55% of “employer-pay” Police/Fire female members are assumed to be married at retirement.</p>
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: Reporting Information for the Public Employees' Retirement System of Nevada

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;

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- 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.

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.

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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.

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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.

For members with an effective date of membership before January 1, 2010:

Benefit 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:

Benefit Accrued retirement benefit reduced 6% per year for each year that the member is under the age required for service retirement.

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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.

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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.

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- 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.

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.

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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:

For members with an effective date of membership before January 1, 2010:

Benefit

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 prior to July 1, 2015:

Benefit

Same as above, except the increases do not exceed 4% per year.

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

Benefit

2.0% per year following the third through fifth anniversaries of the commencement of benefits;

2.5% per year following the sixth through eighth anniversaries.

On succeeding anniversaries the annual increase shall be the lesser of 3.0% or the CPI for the preceding calendar year.

Optional Benefit Forms

Regular and disability retirees may elect one of the optional benefit plans:

Option 1 - 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.

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Contribution Rates

For the fiscal years July 1, 2017 through June 30, 2019, statutory contribution rates as a percentage of compensation are as follows:

	Regular	Police/Fire
Employer-Pay	28.00%	40.50%
Employee/Employer	14.50%/14.50%	20.75%/20.75%

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 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 more than 1.00% lower than the existing rate for Employee/Employer (and adjusted only by the amount in excess of 1.00%). Rates 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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