



Medicare Premium Payment Program of the California State Teachers' Retirement System

June 30, 2018 Actuarial Valuation

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April 23, 2019

Teachers' Retirement Board
California State Teachers' Retirement System

Re: Medicare Premium Payment Program Actuarial Valuation as of June 30, 2018

Dear Members of the Board:

At your request, we have performed an actuarial valuation of the Medicare Premium Payment (MPP) Program of the California State Teachers' Retirement System as of June 30, 2018. Details about the actuarial valuation are contained in the following report. This report reflects the benefit provisions as of the valuation date and Medicare premium amounts effective for the 2019 calendar year. Note that prior to June 30, 2018, the MPP Program funding valuation was performed every two years. We are now performing the valuation annually in order to meet the timing requirements of GASB 74/75, as the funding valuation is used as the basis for the GASB 74/75 valuation.

Actuarial Certification

To the best of our knowledge and belief, this report is complete and accurate and contains sufficient information to fully and fairly disclose the funded condition of the Medicare Premium Payment Program as of June 30, 2018.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by CalSTRS staff. This information includes, but is not limited to, statutory provisions, employee data, and financial information. In our examination of these data, we have found them to be reasonably consistent and comparable with data used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for CalSTRS have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of CalSTRS and reasonable expectations) and which, in combination, offer a reasonable estimate of anticipated experience affecting the CalSTRS MPP Program. Further, in our opinion, each actuarial assumption used is reasonably related to the experience of CalSTRS and to reasonable expectations which, in combination, represent a reasonable estimate of anticipated experience.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the Plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an

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analysis of the potential range of future measurements. The Teachers' Retirement Board has sole authority to determine the actuarial assumptions and methods used for the valuation of the MPP Program. The board adopted the actuarial methods and assumptions used in the 2018 valuation.

Actuarial computations presented in this report are for purposes of assessing the funding of the CalSTRS Medicare Premium Payment Program. The calculations in the enclosed report have been made on a basis consistent with our understanding of CalSTRS' funding. Determinations for other purposes, such as financial reporting in accordance with GASB standards, may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

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The consultants who worked on this assignment are public plan actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices, including the relevant Actuarial Standards of Practice. We are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

We would like to express our appreciation to the CalSTRS staff who gave substantial assistance in supplying the data on which this report is based. We respectfully submit the following report and we look forward to discussing it with you.

Sincerely,

A handwritten signature in black ink that reads 'Nick J. Collier'.

Nick J. Collier, ASA, EA, MAAA
Consulting Actuary

A handwritten signature in black ink that reads 'Mark C. Olleman'.

Mark C. Olleman, FSA, EA, MAAA
Consulting Actuary

A handwritten signature in black ink that reads 'Daniel R. Wade'.

Daniel R. Wade, FSA, EA, MAAA
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Julie D. Smith, FSA, EA, MAAA
Consulting Actuary

April 23, 2019

Date

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1. Summary of the Findings

The primary purpose of the actuarial valuation is to analyze the sufficiency of the current assets and allocated contributions to meet the current and future obligations of the Medicare Premium Payment (MPP) Program. By using the actuarial methods and assumptions adopted by the Teachers' Retirement Board, this actuarial valuation provides the best estimate of the long-term financing of the MPP Program.

The key findings of this actuarial valuation are:

Funding Sufficiency

We find that as of June 30, 2018 the current MPP Program assets, along with MPP-allocated funding from future employer contributions that would otherwise have been credited to the Defined Benefit (DB) Program, are sufficient to finance the future MPP Program obligations of \$285.8 million for both Part A premiums and Part B penalties. The Teachers' Health Benefit Fund (THBF) does not have sufficient assets to fund this obligation; however, additional employer contributions have been allocated to fully fund the MPP Program obligations for total resources of \$285.8 million. Our valuation assumes that the value of these contributions is available to fund the MPP Program benefits.

If these allocated contributions were not included in this valuation, the THBF by itself would not be sufficient to fund the expected MPP Program obligation. These results are consistent with our prior valuation of the MPP Program.

Under current board policy, the obligation for funding the MPP Program, which is included as a liability for the DB Program, is equal to the MPP Program actuarial obligation less the value of any assets already in the THBF. Prior to the June 30, 2008 actuarial valuation, a fixed asset amount, with year-to-year adjustments, was used.

The Funded Status of a benefit plan is equal to the difference between its Actuarial Value of Assets and its Actuarial Obligation. Since the Actuarial Value of Assets is being set to match the Actuarial Obligation, the Funded Status of the MPP Program is 100.0%. Note that the THBF value is presented as a negative value due to the application of the CalSTRS GASB 68 and 75 obligations.

(\$ Millions)	2018 Valuation	2017 Valuation
Actuarial Obligation		
Part A Premiums	\$ 283.8	\$ 299.8
Part B Penalties	2.0	2.4
Actuarial Obligation	\$ 285.8	\$ 302.2
THBF Assets	(1.5)	0.0
Existing Unfunded Actuarial Obligation / (Surplus Funding)	\$ 287.3	\$ 302.2
Guaranteed Funding from future Employer Contributions	287.3	302.2
Effective Unfunded Actuarial Obligation / (Surplus Funding)	\$ 0.0	\$ 0.0

Assumptions

The board adopted the assumptions discussed in Section 5 and specified in Appendix B as part of this valuation at its February 2017 meeting. These assumptions are unchanged from the assumptions that were used in the June 30, 2017 MPP Program valuation. See Section 5 of this report for details and analysis. All assumptions not specifically listed in Section 5 or Appendix B of this report are the same as those used in the DB Program.

Changes Since the 2017 Valuation

Changes since the 2017 valuation of the MPP Program are as follows:

- The actual 2019 Medicare Part A monthly premium amount is \$437, which is greater than the projected 2019 amount of \$436 based on the prior valuation. This resulted in an increase in the actuarial obligation of approximately \$0.5 million.

Impact of Alternative Assumptions

The ultimate cost of the MPP Program is highly dependent on actual experience in the future. To provide information regarding the sensitivity of the results to the assumptions, we have varied the interest rate assumption and the assumed participation levels in the MPP Program. The valuation results are based on the "Best Estimate" set of assumptions. The following results show a comparison with a more conservative (i.e., higher cost) set of assumptions (investment return assumption reduced by 1.0% and higher member participation).

(\$ Millions)	2018 Valuation	2017 Valuation
Actuarial Obligation		
Best Estimate	\$ 285.8	\$ 302.2
Higher Cost Assumptions	317.9	337.7

Further Information

Details of our findings are included in later sections of this report. The Appendices include supporting documentation on the benefit and eligibility provisions used to project future benefits, the actuarial methods and assumptions used to value the projected benefits, and the underlying census data provided by CalSTRS for this valuation.

A summary of the key results of this actuarial valuation is shown on the next page.

Summary of Key Valuation Results

	2018 Valuation	2017 Valuation	Relative Change
1. Current MPP Program Membership			
A. Retirees with Part A Premium	5,907	6,163	(4.2)%
B. Retirees with Part B Penalty	549	617	(11.0)%
2. Monthly Medicare Premium Amount (for following calendar year)			
A. Part A	\$ 437.00	\$ 422.00	3.6%
B. Part B	135.50	134.00	1.1%
3. Average CalSTRS Payment for Participating Members (for following calendar year)			
A. Retirees with Part A Premium	\$ 399.30	\$ 387.91	2.9%
B. Retirees with Part B Penalty	65.53	66.35	(1.2)%
4. Actuarial Accrued Liability (\$ millions)			
A. Retirees with Part A Premium	\$ 283.8	\$ 299.8	(5.3)%
B. Retirees with Part B Penalty	2.0	2.4	(16.7)%
C. Total	\$ 285.8	\$ 302.2	(5.4)%
5. Actuarial Accrued Liability (\$ millions) - Alternate Measurement			
Total under Higher Cost Assumptions	\$ 317.9	\$ 337.7	(5.9)%
6. MPP Program Assets			
A. Market Value of THBF (\$millions)	\$ (1.54)	\$ 0.04	(3,861.0)%
B. Total Allocated MPPP Assets (\$ millions)	\$ 285.8	\$ 302.2	(5.4)%
7. Unfunded Actuarial Accrued Liability (4C - 6B) or (Surplus Funding) - \$ millions	\$ -	\$ -	-
8. Funding Sufficiency			
Are current allocated assets greater than or equal to the value of all expected payments?	Yes	Yes	

2. Actuarial Obligation

In this section, the discussion will focus on the commitments of CalSTRS for MPP Program benefits, which are referred to as its Actuarial Obligation.

Unlike the DB Program where new members join the plan, members eligible for the MPP Program are a closed group. Only those hired prior to April 1, 1986 who retired on or before June 30, 2012 are eligible. Another difference is that in the DB Program active members earn additional benefits based on service, whereas members who may join the MPP Program have a fixed benefit equal to the Part A premium that is not based on service.

Accordingly, the actuarial obligation for the MPP Program is equal to the value of all benefits expected to be paid in the future. This differs from the DB Program where a certain portion of the obligation is allocated to past service and the remainder is allocated to future service in the form of Normal Cost. Since there are no active members potentially eligible for this benefit, there is consequently no Normal Cost.

We first project all future MPP Program benefit payments for current retirees, including those who are not currently enrolled in the MPP Program but may join later. The level of premiums currently being paid is known, but assumptions are needed to estimate how long they will be paid and the probability that current retired members who are not currently receiving payments, will enroll in the MPP Program in the future. The summation of the discounted values of all of the projected benefit payments for all current members at the assumed rate of return is called the **Actuarial Present Value of Projected Benefits**. As discussed above, for the MPP Program the actuarial obligation is equal to this value.

Note that beginning with the June 30, 2012 valuation, active and deferred members were no longer eligible to enroll in the MPP Program in the future. Only members who were retired as of that date may be eligible to enroll if they have not done so already.

Details are shown below.

(\$ Millions)	2018 Valuation	2017 Valuation
Current Retirees	\$ 283.8	\$ 299.8
Inactive Deferred	N/A	N/A
Active Members	N/A	N/A
Present Value of Part A Premiums	\$ 283.8	\$ 299.8
Present Value of Part B Penalties	2.0	2.4
Total Present Value of MPP Program Benefits	\$ 285.8	\$ 302.2

Actuarial Gains and Losses

Comparing the Actuarial Obligation as of two valuation dates does not provide enough information to determine whether there were actuarial gains or losses. The correct comparison is between the Actuarial Obligation on the valuation date and the Expected Actuarial Obligation projected from the prior valuation date using the actuarial assumptions in effect since the previous study.

The actuarial gains and losses since the last report are summarized in the following table:

(\$ Millions)	Actuarial (Gains) or Losses
Expected Actuarial Obligation	
Actuarial Obligation as of June 30, 2017	\$ 302.2
Expected Increase due to Interest	22.1
Expected Decrease due to Payments	<u>(28.0)</u>
Expected Actuarial Obligation	\$ 296.3
Actuarial (Gains) or Losses by Source	
Change in Investment Return and Demographic Assumptions	\$ 0.0
Change in Premium/Penalty More than Expected	0.5
Part A Enrollment Less than Expected	(7.7)
All other sources	<u>(3.3)</u>
(Gain) or Loss on the Actuarial Obligation	\$ (10.5)
Actual Actuarial Obligation	
Actuarial Obligation as of June 30, 2018	\$ 285.8

Based on the 2017 valuation, the Actuarial Obligation was expected to decrease to \$296.3 million. The actual Actuarial Obligation of \$285.8 million represents a net actuarial gain of \$10.5 million. This gain was mostly caused by lower-than-assumed enrollment in the program.

3. Funding

The **Unfunded Actuarial Obligation (UAO)** is the excess of the Actuarial Obligation over the Actuarial Value of Assets, which represents a liability that must be funded over time. The MPP Program has been essentially funded on a pay-as-you-go basis with a portion of contributions that would have otherwise been credited to the DB Program being diverted to the THBF to make MPP Program payments. Beginning in 2008, DB Program assets in the amount of the MPP Program Actuarial Obligation (less any assets already in the THBF) are allocated for the purposes of paying the MPP Program benefits. The result is that the MPP Program does not have a UAO. Note that the THBF value is presented as a negative value due to the application of the CalSTRS GASB 68 and 75 obligations. This is consistent with how CalSTRS reports the THBF value for accounting purposes.

The Funded Status is shown below.

(\$ Millions)	2018 Valuation	2017 Valuation
Actuarial Obligation		
Part A Premiums	\$ 283.8	\$ 299.8
Part B Penalties	2.0	2.4
Actuarial Obligation	\$ 285.8	\$ 302.2
THBF Assets	(1.5)	0.0
Existing Unfunded Actuarial Obligation / (Surplus Funding)	\$ 287.3	\$ 302.2
Guaranteed Funding from future Employer Contributions	287.3	302.2
Effective Unfunded Actuarial Obligation / (Surplus Funding)	\$ 0.0	\$ 0.0

Annual Cost

As noted above, the MPP Program has essentially been funded on a pay-as-you-go basis. Therefore, the annual cost from a funding perspective is equal to the MPP Program payments. For the 2017-2018 fiscal year, the actual cost was \$28.0 million. For the 2018-2019 fiscal year, the expected cost is \$27.8 million.

A 40-year projection of the MPP Program costs is shown in **Table 1**. Note that the projection is shown under two scenarios. The first is the "Best Estimate" scenario, which is based on the valuation assumption for participation in the MPP Program. The second is the "Higher Cost Assumptions" scenario, which reflects higher MPP Program participation rates and lower discount rates. Details of these participation assumptions can be found in Appendix B.

The graph below represents the Best Estimate payouts shown in Table 1.

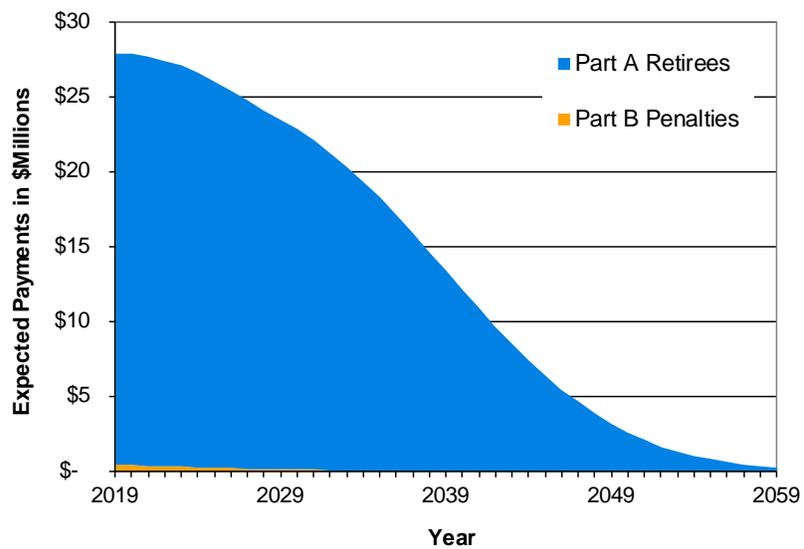


Table 1
Projected MPP Program Costs

Plan Year Ending June 30	Payouts (in \$Thousands)					
	Best Estimate Assumptions			Higher Cost Assumptions		
	Part A	Part B	Total	Part A	Part B	Total
2019	\$ 27,441	\$ 400	\$ 27,841	\$ 27,543	\$ 555	\$ 28,098
2020	27,451	361	27,812	27,665	361	28,026
2021	27,335	322	27,657	27,644	322	27,966
2022	27,114	284	27,398	27,508	284	27,792
2023	26,774	247	27,021	27,240	247	27,487
2024	26,339	212	26,551	26,872	212	27,084
2025	25,829	180	26,009	26,426	180	26,606
2026	25,238	150	25,388	25,894	150	26,044
2027	24,567	124	24,691	25,278	124	25,402
2028	23,960	101	24,061	24,724	101	24,825
2029	23,397	81	23,478	24,212	81	24,293
2030	22,744	65	22,809	23,603	65	23,668
2031	22,002	50	22,052	22,898	50	22,948
2032	21,170	38	21,208	22,095	38	22,133
2033	20,252	29	20,281	21,194	29	21,223
2034	19,254	21	19,275	20,205	21	20,226
2035	18,187	15	18,202	19,136	15	19,151
2036	17,060	11	17,071	17,998	11	18,009
2037	15,886	7	15,893	16,803	7	16,810
2038	14,643	5	14,648	15,530	5	15,535
2039	13,358	3	13,361	14,206	3	14,209
2040	12,084	2	12,086	12,889	2	12,891
2041	10,836	1	10,837	11,594	1	11,595
2042	9,628	1	9,629	10,334	1	10,335
2043	8,472	-	8,472	9,125	-	9,125
2044	7,381	-	7,381	7,979	-	7,979
2045	6,361	-	6,361	6,903	-	6,903
2046	5,423	-	5,423	5,908	-	5,908
2047	4,571	-	4,571	5,001	-	5,001
2048	3,805	-	3,805	4,180	-	4,180
2049	3,126	-	3,126	3,450	-	3,450
2050	2,536	-	2,536	2,813	-	2,813
2051	2,033	-	2,033	2,265	-	2,265
2052	1,609	-	1,609	1,802	-	1,802
2053	1,257	-	1,257	1,416	-	1,416
2054	970	-	970	1,099	-	1,099
2055	740	-	740	842	-	842
2056	558	-	558	639	-	639
2057	417	-	417	480	-	480
2058	309	-	309	357	-	357
2059	227	-	227	265	-	265
2060	167	-	167	196	-	196
2061	123	-	123	145	-	145
2062	92	-	92	109	-	109
2063	69	-	69	82	-	82
2064	53	-	53	64	-	64
2065	42	-	42	50	-	50
2066	34	-	34	41	-	41
2067	28	-	28	34	-	34
2068	24	-	24	29	-	29
2069	21	-	21	25	-	25

4. Accounting Information

GASB 74 applies to financial reporting for public OPEB plans, GASB 75 governs the specifics of accounting for public OPEB plan obligations for participating employers. These statements apply to the MPP Program. A separate report is prepared showing these results under these two statements. Therefore, no financial disclosure information is shown in this report.

5. Assumptions Used in MPP Program Valuation

The calculations presented in this report are based on the assumptions shown in Appendix B. The board adopted the assumptions as shown in Appendix B of this report for this (June 30, 2018) MPP Program valuation at its February 2017 meeting.

Economic

Table 2 contains a summary of economic and demographic assumptions for the June 30, 2018 MPP Program valuation and a comparison against the June 30, 2017 MPP Program valuation assumptions.

Note that the current valuation uses the 2019 Medicare Part A and Part B premiums as the basis for future premium calculations. Future premiums are assumed to increase with a medical trend that varies by year, as shown in the table below.

Years ⁽¹⁾	Trend Assumption	
	Assumed Annual Increase	
	Part A	Part B
2017 - 2026	3.4%	4.0%
2027 - 2036	4.6%	5.2%
2037 - 2046	4.1%	4.7%
2047 & Later	3.9%	4.5%

1. Trend rates indicate medical inflation in the specific year and therefore affect the premiums for the following year. For example, the projected 2019 premium is the 2018 premium increased by the assumed 2018 trend rate.

The Part A trend is approximately equivalent to assuming a fixed 3.7% increase each year. The Part B trend is approximately equivalent to assuming a fixed 4.1% increase each year.

Enrollment

Table B.3 in Appendix B presents the participation (enrollment) assumptions for the best estimate scenario and the conservative (high cost) estimate scenario included in this valuation. The enrollment rates are based on actual enrollments divided by all pre-April 1, 1986 hires. For valuation purposes, it is assumed that all pre-April 1, 1986 hires are potentially eligible for the MPP Program.

Other Assumptions

We have applied the mortality assumptions from the CalSTRS June 30, 2018 DB Program valuation. We have estimated the present value of the actuarial obligation for the MPP Program as of June 30, 2018, assuming an interest rate of 7.00%. This 7.00% rate is the same rate that was used to discount the pension liabilities for the June 30, 2018 DB Program valuation.

For financial reporting for the year ended June 30, 2019, GASB 74 and 75 apply to the MPP Program. Separate calculations will be done in the second half of 2019. It is our understanding that CalSTRS will use a discount rate based on the Bond Buyer 20-Bond GO Index.

Table 2
June 30, 2018 Economic Assumptions

	June 30, 2018 Valuation	June 30, 2017 Valuation
Retirement/Termination/Disability/Mortality	Same as pension valuation	Same as pension valuation
Enrollment Rates	No change recommended (See Tables 8 & 9)	See Tables 8 & 9
Interest Rate		
- For Funding	7.00%	7.00%
Part A Premiums		
- Initial Premium	\$437 (CY 2019)	\$422 (CY 2018)
- Inflation (Trend)	Varies by Year Equivalent to fixed 3.7%	Varies by Year Equivalent to fixed 3.7%
Part B Premiums		
- Initial Premium ⁽¹⁾	\$135.50 (CY 2019)	\$134.00 (CY 2018)
- Inflation (Trend)	Varies by Year Equivalent to fixed 4.1%	Varies by Year Equivalent to fixed 4.1%

1. CalSTRS pays the Part B penalty, which is a percentage of the Part B premium amount. Part B penalties used in the valuation are those supplied by CalSTRS after adjusting for the applicable trend rate.

Appendix A Provisions of Governing Law

All of the actuarial calculations contained in this report are based upon our understanding of the CalSTRS MPP Program as contained in Part 13.5 of the California Education Code. The provisions used in this valuation are summarized below for reference purposes.

Eligibility (Part A)

Member Eligibility Requirement: Satisfies either:

- 1) Retired or disabled prior to January 1, 2001;
Hired prior to April 1, 1986;
Age 65 or above;
Enrolled in Medicare Part A and Part B; and,
Not eligible for Part A without premium payment.

– OR –

- 2) Meet all of the above requirements, except retired or disabled before July 1, 2012;
District completed a Medicare Division election prior to retirement; and,
Active member less than 58 years of age at the time of the election.

Spouse Eligibility: Spouses of members are not eligible to participate in the program.

Eligibility (Part B)

Member Eligibility Requirement: Only those currently enrolled are eligible.

Benefits Paid

- Part A: Part A premium (\$437 per month in 2019). Reduced amount unless the member has covered employment, but less than 40 quarters.
- Part B: Part B premium (\$135.50 per month in 2019). Only the penalty is paid by CalSTRS.

Appendix B Actuarial Methods and Assumptions

This section of the report discloses the actuarial methods and assumptions used in this Actuarial Valuation. These methods and assumptions have been chosen based on recent experience of the MPP Program and on current expectations as to future economic conditions.

The assumptions are intended to estimate the future experience of the members of the MPP Program and of the MPP Program itself in areas that affect the projected benefit flow and anticipated investment earnings. Any variations in future experience from that expected from these assumptions will result in corresponding changes in estimated costs of the MPP Program's benefits.

Please refer to the 2016 Actuarial Experience Analysis for further information on the DB Program assumptions.

Actuarial Cost Method

The MPP Program obligations are funded on a pay-as-you-go basis.

Asset Valuation Method

For funding purposes, the assets are valued as the allocated value of DB Program Assets. This figure is equal to the actuarial obligation of the MPP Program benefits.

Actuarial Assumptions

The Actuarial Standards Board has adopted Actuarial Standard of Practice No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*. This Standard provides guidance on selecting economic assumptions under defined benefit retirement programs such as the System. In our opinion, the economic assumptions have been developed in accordance with the Standard.

The Actuarial Standards Board has adopted Actuarial Standard of Practice No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*. This Standard provides guidance on selecting demographic assumptions under defined benefit retirement programs such as the System. In our opinion, the demographic assumptions have been developed in accordance with the Standard.

The demographic assumptions are listed in **Table B.1** and illustrated at selected ages and duration combinations in **Tables B.2-B.7**.

Table B.1
List of Major Valuation Assumptions

Economic Assumptions

- A. Investment Return Best Estimate = 7.00%
 (net of investment and administrative expenses) Higher Cost = 6.00%

- B. Medical Inflation

Years ⁽¹⁾	Trend Assumption	
	Assumed Annual Increase	
	Part A	Part B
2017 - 2026	3.4%	4.0%
2027 - 2036	4.6%	5.2%
2037 - 2046	4.1%	4.7%
2047 & Later	3.9%	4.5%

1. Trend rates indicate medical inflation in the specific year and therefore affect the premiums for the following year. For example, the projected 2019 premium is the 2018 premium increased by the assumed 2019 trend rate.

- C. Price Inflation 2.75%

Demographic Assumptions

- A. Mortality⁽¹⁾

Active	- Male	N/A	
	- Female	N/A	
Retired & Beneficiary	- Male	2016 CalSTRS Retired Male	Table B.2
	- Female	2016 CalSTRS Retired Female	Table B.2
Disabled	- Male	RP-2014 Disabled Retiree Male set back 2 years	Table B.2
	- Female	RP-2014 Disabled Retiree Female set back 2 years (select rates in first 3 years for both Males and Females)	Table B.2

1. The mortality assumption uses a generational mortality approach with a base year of 2016. Projected improvement is based on 110% of the MP-2016 Ultimate Projection Scale. The combined base tables and projection scale specified contain a margin for expected future mortality improvement.

- B. Service Retirement N/A
 C. Disability Retirement N/A
 D. Withdrawal N/A
 E. Probability of Refund N/A
 F. MPP Program Enrollment Rates Experience Tables Table B.3

Table B.2
Mortality as of June 30, 2018

Age	Retired Members and Beneficiaries ⁽¹⁾		Disabled Members (After Year 3) ⁽¹⁾	
	Male	Female	Male	Female
50	0.238%	0.132%	1.827%	1.032%
55	0.350	0.208	2.125	1.291
60	0.469	0.277	2.410	1.524
65	0.667	0.418	2.805	1.820
70	1.068	0.689	3.478	2.363
75	1.915	1.266	4.586	3.363
80	3.514	2.428	6.349	4.981
85	6.756	4.842	9.223	7.401
90	13.026	9.847	13.983	10.932
95	22.246	18.442	20.892	16.170
Select rates for disability:				
	First year of disability		4.0%	3.0%
	Second year of disability		3.5	2.5
	Third year of disability		3.0	2.0

1. The mortality assumption uses a generational mortality approach with a base year of 2016. Projected improvement is based on 110% of the MP-2016 Ultimate Projection Scale. The rates shown reflect mortality improvement through June 30, 2018. The projection scale does not apply to the select minimum rates

Table B.3
Part A⁽¹⁾ Enrollment Rates

Assumption	Best Estimate	Higher Cost
% of Under 65 Retirees Enrolling (Retired on or After 2001) ⁽²⁾	2.50%	3.00%
% of Under 65 Retirees Enrolling (Retired Before 2001)	3.50%	4.25%
% of Over 65 Retirees Enrolling (for those not Currently Enrolled) at Age: ⁽³⁾		
65	0.60%	0.80%
66	0.06	0.10
67	0.04	0.08
68	0.03	0.06
69	0.03	0.04
70-84	0.02	0.03
85 & Above	0.00	0.00
 % of Over 65 Retirees Enrolling (for those Already Enrolled)	 100.0%	 100.0%

1. Only current enrollees are assumed to receive Part B payments.
2. For under age 65 retirees, the enrollment percent applies upon reaching age 65. No enrollment is assumed after age 65 for retirees currently under age 65.
3. For over 65 retirees, the enrollment percent applies in each future year.

Appendix C Valuation Data

The participant data for this actuarial valuation was supplied by CalSTRS and accepted without audit. We have examined the data for reasonableness and consistency with prior valuations and periodic reports from the CalSTRS staff to the Teachers' Retirement Board.

In preparing this report, we relied upon the participant data furnished by CalSTRS. Although we did not audit this data, we compared the data for this and the prior valuation and tested for reasonableness. Based on these tests, we believe the data to be sufficiently accurate for the purposes of this valuation. Since the valuation results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised.

Tables C.1 through **C.2** summarize the census data used in this valuation.

Table C.1
Summary of Statistical Information

	June 30, 2018	June 30, 2017
Number of Enrolled Members		
Retirees with Part A Premium	5,907	6,163
Retirees with Part B Penalty	549	617
Average CalSTRS Payment for Enrolled Members (for current calendar year)		
Retirees with Part A Premium	\$ 399.30	\$ 387.91
Retirees with Part B Penalty	65.53	66.35

Table C.2
Projected MPP Program Membership

Plan Yr Ending 6/30	Projected Participants					
	Part A			Part B		
	Current Status			Current Status		
	Active	Retired	Total	Active	Retired	Total
2019	-	5,708	5,708	-	495	495
2020	-	5,503	5,503	-	442	442
2021	-	5,257	5,257	-	391	391
2022	-	5,007	5,007	-	342	342
2023	-	4,755	4,755	-	295	295
2024	-	4,500	4,500	-	252	252
2025	-	4,245	4,245	-	213	213
2026	-	3,989	3,989	-	177	177
2027	-	3,735	3,735	-	144	144
2028	-	3,482	3,482	-	116	116
2029	-	3,232	3,232	-	92	92
2030	-	2,987	2,987	-	72	72
2031	-	2,746	2,746	-	55	55
2032	-	2,512	2,512	-	41	41
2033	-	2,284	2,284	-	30	30
2034	-	2,064	2,064	-	22	22
2035	-	1,854	1,854	-	15	15
2036	-	1,653	1,653	-	10	10
2037	-	1,463	1,463	-	7	7
2038	-	1,285	1,285	-	5	5
2039	-	1,119	1,119	-	3	3
2040	-	966	966	-	2	2
2041	-	826	826	-	1	1
2042	-	699	699	-	1	1
2043	-	586	586	-	-	-
2044	-	486	486	-	-	-
2045	-	398	398	-	-	-
2046	-	323	323	-	-	-
2047	-	259	259	-	-	-
2048	-	205	205	-	-	-
2049	-	160	160	-	-	-
2050	-	123	123	-	-	-
2051	-	94	94	-	-	-
2052	-	71	71	-	-	-
2053	-	53	53	-	-	-
2054	-	39	39	-	-	-
2055	-	28	28	-	-	-
2056	-	20	20	-	-	-
2057	-	14	14	-	-	-
2058	-	10	10	-	-	-
2059	-	7	7	-	-	-

Appendix D Glossary

The following definitions are largely excerpts from a list adopted by the major actuarial organizations in the United States. In some cases, the definitions have been modified for specific applicability to the CalSTRS MPP Program. Defined terms are capitalized throughout this Appendix.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension and medical costs, such as mortality, withdrawal, disablement, and retirement, changes in compensation, rates of investment earnings and asset appreciation or depreciation, and procedures used to determine other relevant items.

Actuarial Cost Method

A procedure for determining the Actuarial Present Value of pension and medical plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Obligation.

Actuarial Equivalent

Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.

Actuarial Gain or Loss

A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions during the period between two actuarial valuation dates, as determined in accordance with a particular Actuarial Cost Method.

Actuarial Obligation

That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of medical plan benefits and expenses which is not provided for by future Normal Costs. Note that for purposes of the MPP Program valuation, the value of future Normal Cost is \$0.

Actuarial Present Value

The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions.

Actuarial Surplus

The excess, if any, of the Actuarial Value of Assets over the Actuarial Obligation.

Actuarial Valuation

The determination, as of a Valuation Date, of the Normal Cost, Actuarial Obligation, Actuarial Value of Assets and related Actuarial Present Values for a pension or medical plan.

Actuarial Value of Assets

The value of cash, investments and other property belonging to a pension or medical plan, as used by the actuary for the purpose of an actuarial valuation. For the MPP Program valuation, the Actuarial Value of Assets is equal to the future MPP Program payments.

Normal Cost

The portion of the Actuarial Present Value of Projected Benefits which is allocated to a valuation year by the Actuarial Cost Method. Note that for purposes of the MPP Program valuation, the value of future Normal Cost is \$0.

Unfunded Actuarial Obligation

The excess, if any, of the Actuarial Obligation over the Actuarial Value of Assets.

Valuation Date

June 30, 2018.