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March 21, 2017

Teachers' Retirement Board
California State Teachers' Retirement System

Re: Medicare Premium Payment Program Actuarial Valuation as of June 30, 2016

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, 2016. 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 2017 calendar year.

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, 2016.

In preparing the valuation, we relied without audit upon the financial and membership 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 our calculations. 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.

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. 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 2016 valuation (shown in Appendix B). Note that the board adopted a 7.25% investment return assumption for the 2016 valuation, but a 7.00% assumption is scheduled to be used for the 2017 roll-forward and the 2018 and future funding valuations.

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

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changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements.

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 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 which are consistent with principles prescribed by the Actuarial Standards Board and the code of Professional conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries.



We would like express our appreciation to the CalSTRS staff who gave substantial assistance in supplying the data on which this report is based.

Respectfully submitted,

A handwritten signature in black ink that reads "Nick 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
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A handwritten signature in black ink that reads "Julie D. Smith".

Julie D. Smith, FSA, EA, MAAA
Actuary

A handwritten signature in black ink that reads "Daniel Wade".

Daniel R. Wade, FSA, EA, MAAA
Consulting Actuary

Enclosure

NJC/MCO/JDS/DRW/nlo

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Section 1 Summary of the Findings



The primary purpose of the actuarial valuation is to analyze the sufficiency of the current allocated assets 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, 2016 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 \$314.9 million for both Part A premiums and Part B penalties. Currently, the Teachers’ Health Benefit Fund (THBF) has approximately \$0.01 million in assets; however, additional employer contributions have been allocated to fully fund the MPP Program obligations for a total value of \$314.9 million. Our valuation assumes that the value of these contributions is available to fund the MPP Program benefits.

If these allocated assets 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%.

(\$ Millions)	2016 Valuation	2014 Valuation
Actuarial Obligation		
Part A Premiums	\$ 312.1	\$ 338.5
Part B Penalties	2.8	3.2
Actuarial Obligation	\$ 314.9	\$ 341.7
THBF Assets	0.0	0.9
Existing Unfunded Actuarial Obligation / (Surplus Funding)	\$ 314.9	\$ 340.8
Guaranteed Funding from future Employer Contributions	314.9	340.8
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 include longer life expectancies and slightly lower enrollment assumptions than were used in the June 30, 2014 MPP Program valuation. See our letter dated January 18, 2017 for details and analysis. All assumptions not specifically listed in Appendix B of this report are the same as those used in the DB Program. Note that the board adopted a 7.25% investment return assumption for the 2016 valuation, but a 7.00% assumption is scheduled to be used for the 2017 roll-forward and the 2018 and future valuations.

Changes Since the 2014 Valuation

Changes since the 2014 valuation of the MPP Program are as follows:

- As in the 2016 Defined Benefit Program actuarial valuation, the investment return assumption was lowered from 7.50% to 7.25%. Additionally, other demographic assumptions (such as improved mortality) were adopted. See the 2016 Experience Analysis report for details. The adoption of the new assumptions increased the actuarial obligation of the MPP Program by about \$24 million.
- The actual 2017 Medicare Part A monthly premium amount is \$413, which is less than the projected 2017 amount of \$438 based on the prior valuation. This resulted in a reduction in the actuarial obligation of approximately \$19 million.
- The medical trend assumption was revised for the current valuation, from a 3.7% assumption for Part A premiums and 5.7% assumption for Part B penalties in the last valuation, to trend assumptions that vary by year in the current valuation. The Part A premium trend is approximately equivalent to assuming a fixed 3.7% increase each year. For Part B premiums, the trend assumptions is 0.6% higher than Part A. The change in trend assumption decreased the actuarial obligation by approximately \$1 million.
- The Medicare Part A enrollment rates were revised for the 2016 valuation to reflect recent experience. The change in enrollment rates resulted in a reduction in the actuarial obligation of approximately \$3 million. See our letter date January 18, 2017 for details of the enrollment rate study.

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)	2016 Valuation	2014 Valuation
Actuarial Obligation		
Best Estimate	\$ 314.9	\$ 341.7
Higher Cost Assumptions	353.3	387.8

Further Information

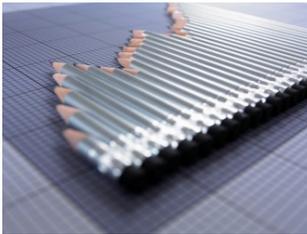
Details of our findings are included in later sections of this report. The Appendices include supporting documentation on the benefit and eligibility provisions used to project future benefits, the actuarial methods and assumptions used to value the projected benefits, and the underlying census data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

	2016 Valuation	2014 Valuation	Relative Change
1. Current MPP Program Membership			
A. Retirees with Part A Premium	6,387	6,676	(4.3)%
B. Retirees with Part B Penalty	684	827	(17.3)%
2. Monthly Medicare Premium Amount (for following calendar year)			
A. Part A	\$ 413.00	\$ 407.00	1.5%
B. Part B	134.00	104.90	27.7%
3. Average CalSTRS Payment for Participating Members (for following calendar year)			
A. Retirees with Part A Premium	\$ 381.01	\$ 380.33	0.2%
B. Retirees with Part B Penalty	66.28	56.12	18.1%
4. Actuarial Accrued Liability (\$ millions)			
A. Retirees with Part A Premium	\$ 312.1	\$ 338.5	(7.8)%
B. Retirees with Part B Penalty	2.8	3.2	(12.5)%
C. Total	\$ 314.9	\$ 341.7	(7.8)%
5. Actuarial Accrued Liability (\$ millions) - Alternate Measurement			
Total under Higher Cost Assumptions	\$ 353.3	\$ 387.8	(8.9)%
6. MPP Program Assets			
A. Market Value of THBF (\$millions)	\$ 0.01	\$ 0.9	(98.9)%
B. Total Allocated MPPP Assets (\$ millions)	\$ 314.9	\$ 341.7	(7.8)%
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	

Section 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)	2016 Valuation	2014 Valuation
Current Retirees	\$ 312.1	\$ 338.5
Inactive Deferred	N/A	N/A
Active Members	N/A	N/A
Present Value of Part A Premiums	\$ 312.1	\$ 338.5
Present Value of Part B Penalties	2.8	3.2
Total Present Value of MPP Program Benefits	\$ 314.9	\$ 341.7

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:

<i>(\$ Millions)</i>	Actuarial (Gains) or Losses
Expected Actuarial Obligation	
Actuarial Obligation as of June 30, 2014	\$ 341.7
Expected Increase due to Interest	48.7
Expected Decrease due to Payments	<u>(60.3)</u>
Expected Actuarial Obligation	\$ 330.1
Actuarial (Gains) or Losses by Source	
Change in Investment Return and Demographic Assumptions	\$ 24.0
Change in Premium/Penalty Different than Expected	(19.3)
Change in Medical Trend Assumption	(1.3)
Change in Part A Enrollment Assumptions	(3.2)
All other sources	<u>(15.4)</u>
(Gain) or Loss on the Actuarial Obligation	\$ (15.2)
Actual Actuarial Obligation	
Actuarial Obligation as of June 30, 2016	\$ 314.9

Based on the 2014 valuation, the Actuarial Obligation was expected to increase to \$330.1 million. The actual Actuarial Obligation of \$314.9 million represents a net actuarial gain of \$15.2 million. This gain was mostly caused by smaller than expected increases in Part A Premiums over the last two years.

Section 3 Funding



The **Unfunded Actuarial Obligation** 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 an Unfunded Actuarial Obligation (UAO).

The Funded Status is shown below.

(\$ Millions)	2016 Valuation	2014 Valuation
Actuarial Obligation		
Part A Premiums	\$ 312.1	\$ 338.5
Part B Penalties	2.8	3.2
Actuarial Obligation	\$ 314.9	\$ 341.7
THBF Assets	0.0	0.9
Existing Unfunded Actuarial Obligation / (Surplus Funding)	\$ 314.9	\$ 340.8
Guaranteed Funding from future Employer Contributions	314.9	340.8
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 2015-2016 fiscal year, the actual cost was \$29.7 million. For the 2016-2017 fiscal year, the expected cost is \$29.5 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.

Annual Cost
(continued)

This graph represents the Best Estimate payouts shown in Table 1.

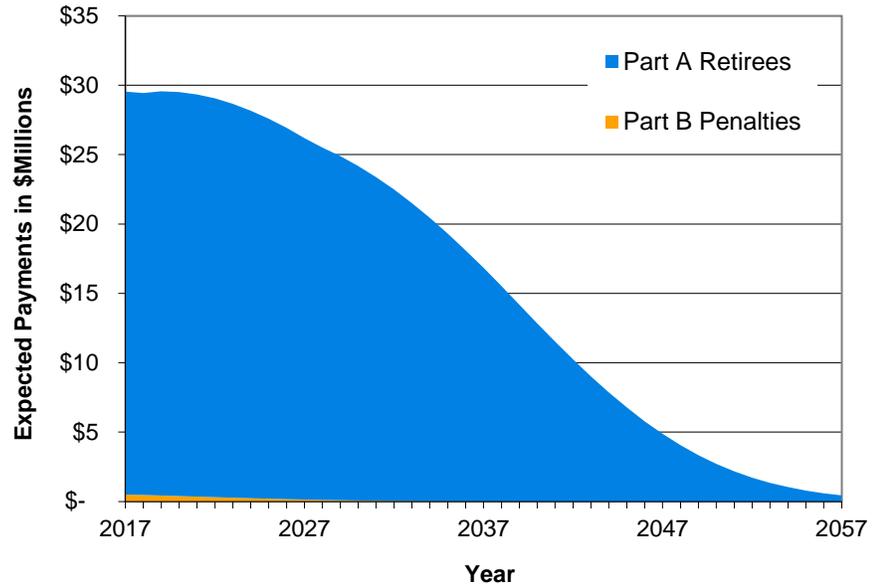


Table 1
Projected MPP Program Costs

Plan Year Ending June 30	Payouts (in \$Thousands)					
	Best Estimate Assumptions			Higher Cost Assumptions		
	Part A	Part B	Total	Part A	Part B	Total
2017	\$ 29,048	\$ 492	\$ 29,540	\$ 29,171	\$ 647	\$ 29,818
2018	28,971	469	29,440	29,296	469	29,765
2019	29,135	430	29,565	29,575	430	30,005
2020	29,121	390	29,511	29,672	390	30,062
2021	28,985	350	29,335	29,642	350	29,992
2022	28,749	310	29,059	29,484	310	29,794
2023	28,389	272	28,661	29,193	272	29,465
2024	27,931	234	28,165	28,807	234	29,041
2025	27,391	199	27,590	28,331	199	28,530
2026	26,767	167	26,934	27,763	167	27,930
2027	26,050	138	26,188	27,112	138	27,250
2028	25,396	113	25,509	26,510	113	26,623
2029	24,804	91	24,895	25,955	91	26,046
2030	24,105	73	24,178	25,299	73	25,372
2031	23,316	57	23,373	24,558	57	24,615
2032	22,448	43	22,491	23,698	43	23,741
2033	21,469	33	21,502	22,729	33	22,762
2034	20,422	24	20,446	21,685	24	21,709
2035	19,292	17	19,309	20,529	17	20,546
2036	18,082	12	18,094	19,320	12	19,332
2037	16,840	8	16,848	18,043	8	18,051
2038	15,525	6	15,531	16,694	6	16,700
2039	14,175	4	14,179	15,281	4	15,285
2040	12,827	2	12,829	13,896	2	13,898
2041	11,516	1	11,517	12,518	1	12,519
2042	10,239	1	10,240	11,173	1	11,174
2043	9,010	-	9,010	9,865	-	9,865
2044	7,856	-	7,856	8,651	-	8,651
2045	6,782	-	6,782	7,484	-	7,484
2046	5,771	-	5,771	6,414	-	6,414
2047	4,876	-	4,876	5,443	-	5,443
2048	4,060	-	4,060	4,551	-	4,551
2049	3,335	-	3,335	3,758	-	3,758
2050	2,707	-	2,707	3,058	-	3,058
2051	2,172	-	2,172	2,472	-	2,472
2052	1,714	-	1,714	1,962	-	1,962
2053	1,337	-	1,337	1,534	-	1,534
2054	1,040	-	1,040	1,182	-	1,182
2055	783	-	783	914	-	914
2056	587	-	587	689	-	689
2057	439	-	439	514	-	514

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Section 4 Accounting Information



In previous years, we have provided actuarial computations under Governmental Accounting Standards Board (GASB) Statements No. 43 and 45. The new GASB Statements No. 74 and 75 will be effective starting with the fiscal year ending June 30, 2017. A separate report will be prepared showing these results. Therefore, no financial disclosure information is shown in this section.

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Section 5 Assumptions Used in MPP Program Valuation



The calculations presented in this report are based on the assumptions shown in Appendix B. This valuation reflects higher future increases in expected Medicare premiums, in line with current expectations. Additionally, this valuation reflects slightly lower Medicare Part A enrollment assumptions, based on an experience study over the previous two years. The board adopted the assumptions as shown in Appendix B of this report for this (June 30, 2016) MPP Program valuation at its February 2017 meeting.

Economic

Table 7 contains a summary of economic and demographic assumptions for the June 30, 2016 MPP Program valuation and a comparison against the June 30, 2014 MPP Program valuation assumptions.

Note that the current valuation uses the 2017 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 2018 premium is the 2017 premium increased by the assumed 2017 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. Previously, the trend was 3.7% per year for Part A and 4.7% per year for Part B.

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.

Other Assumptions

We have applied the mortality assumptions from the CalSTRS June 30, 2016 DB Program valuation. We have estimated the present value of the actuarial obligation for the MPP Program as of June 30, 2016, assuming an interest rate of 7.25% (3.50% for GASB 43). This 7.25% rate is the same rate that was used to discount the pension liabilities for the June 30, 2016 DB Program valuation.

For financial reporting for the year ended June 30, 2017, GASB 74 and 75 will apply to the MPP Program. Separate calculations will be done at that time. It is our understanding that CalSTRS will use a discount rate based on the Bond Buyer 20-Bond GO Index. This rate is 3.95% as of March 2, 2017. A discount rate of around 4.00% will likely result in a Total OPEB Liability (where OPEB is Other Post-Employment Benefits) that is significantly greater than the \$315 million actuarial obligation reported for funding purposes and slightly less than the \$438 million reported in the Accounting Information section of this report.

Table 2
June 30, 2016 Economic Assumptions

	<u>June 30, 2016 Valuation</u>	<u>June 30, 2014 Valuation</u>
Retirement/Termination/Disability/Mortality	Same as pension valuation	Same as pension valuation
Enrollment Rates	Lower rates recommended (See Tables 8 & 9)	See Tables 8 & 9
Interest Rate - For Funding	7.25%	7.50%
Part A Premiums - Initial Premium - Inflation (Trend)	\$413 (CY 2017) Varies by Year Equivalent to fixed 3.7%	\$407 (CY 2015) 3.7%
Part B Premiums - Initial Premium ⁽¹⁾ - Inflation (Trend)	\$134.00 (CY 2017) Varies by Year Equivalent to fixed 4.1%	\$104.90 (CY 2015) 5.7%

1. CalSTRS pays the Part B penalty, which is a percentage of the Part B premium amount.

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 (\$413 per month in 2017). Reduced amount unless the member has covered employment, but less than 40 quarters.

Part B:

Part B premium (\$134.00 per month in 2017). Only the penalty is paid by CalSTRS.

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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 on the basis of 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.

For GASB reporting purposes, MPP Program obligations are shown under the entry age normal cost method (level dollar).

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.

For GASB purposes, the assets are equal to the fair value of THBF.

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

I. Economic Assumptions

- A. Investment Return Best Estimate = 7.25%
 (net of investment and administrative expenses) Higher Cost = 6.25%

- 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 2018 premium is the 2017 premium increased by the assumed 2017 trend rate.

- C. Price Inflation 2.75%

II. Demographic Assumptions

- A. Mortality⁽¹⁾

(1) Active	- Male	N/A	
	- Female	N/A	
(2) Retired & Beneficiary	- Male	2016 CalSTRS Retired Male	Table B.2
	- Female	2016 CalSTRS Retired Female	Table B.2
(3) 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. All proposed tables use 110% of the MP-2016 Ultimate Projection Scale. The combined base tables and projection scale specified contain a margin for expected future mortality improvement. See Table B.9 of this report for a key to the custom mortality tables used for CalSTRS.

- 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, 2016

Age	Retired Members and Beneficiaries ⁽¹⁾		Disabled Members (After Year 3) ⁽¹⁾	
	Male	Female	Male	Female
50	0.243%	0.124%	1.868%	1.055%
55	0.358	0.213	2.172	1.320
60	0.480	0.283	2.464	1.558
65	0.682	0.427	2.867	1.861
70	1.091	0.704	3.556	2.416
75	1.958	1.294	4.689	3.438
80	3.592	2.482	6.491	5.092
85	6.907	4.950	9.430	7.566
90	13.297	10.051	14.273	11.159
95	22.668	18.791	21.289	16.477
Select rates for disability:				
	First year of disablement		4.0%	3.0%
	Second year of disablement		3.5	2.5
	Third year of disablement		3.0	2.0

1. Projected improvement based on 110% of the MP-2016 Ultimate Projection Scale. Projection scale does not apply to select minimum rates.

Table B.3
Part A⁽¹⁾ Enrollment Rates

Assumption	Best Estimate	Higher Cost
% of Actives and 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

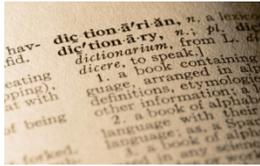
	June 30, 2016		June 30, 2014
Number of Enrolled Members			
Retirees with Part A Premium	6,387		6,676
Retirees with Part B Penalty	684		827
Average CalSTRS Payment for Enrolled Members (for current calendar year)			
Retirees with Part A Premium	\$ 381.01		\$ 380.33
Retirees with Part B Penalty	66.28		56.12

Table C.2
Projected MPP Program Membership

Plan Yr Ending 6/30	Projected Participants					
	Part A			Part B		
	Current Status		Total	Current Status		Total
	Active	Retired		Active	Retired	
2017	-	6,342	6,342	-	656	656
2018	-	6,197	6,197	-	601	601
2019	-	6,111	6,111	-	546	546
2020	-	5,897	5,897	-	491	491
2021	-	5,661	5,661	-	437	437
2022	-	5,426	5,426	-	385	385
2023	-	5,180	5,180	-	336	336
2024	-	4,932	4,932	-	289	289
2025	-	4,709	4,709	-	246	246
2026	-	4,463	4,463	-	206	206
2027	-	4,199	4,199	-	170	170
2028	-	3,936	3,936	-	138	138
2029	-	3,673	3,673	-	110	110
2030	-	3,422	3,422	-	87	87
2031	-	3,161	3,161	-	67	67
2032	-	2,920	2,920	-	51	51
2033	-	2,662	2,662	-	38	38
2034	-	2,428	2,428	-	27	27
2035	-	2,198	2,198	-	19	19
2036	-	1,970	1,970	-	14	14
2037	-	1,758	1,758	-	9	9
2038	-	1,555	1,555	-	6	6
2039	-	1,362	1,362	-	4	4
2040	-	1,182	1,182	-	2	2
2041	-	1,021	1,021	-	1	1
2042	-	868	868	-	1	1
2043	-	734	734	-	-	-
2044	-	610	610	-	-	-
2045	-	509	509	-	-	-
2046	-	410	410	-	-	-
2047	-	329	329	-	-	-
2048	-	265	265	-	-	-
2049	-	205	205	-	-	-
2050	-	158	158	-	-	-
2051	-	124	124	-	-	-
2052	-	91	91	-	-	-
2053	-	68	68	-	-	-
2054	-	51	51	-	-	-
2055	-	37	37	-	-	-
2056	-	26	26	-	-	-
2057	-	19	19	-	-	-

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Appendix D Glossary



The following definitions are largely excerpts from a list adopted in 1981 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 medical costs, participation in the MPP Program, 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 Costs 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 value of 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 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, 2016.