



The Water and Power Employees' Retirement, Disability and Death Benefit Insurance Plan

**Review of the Disability Fund as of
July 1, 2019**

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

Copyright © 2019 by The Segal Group, Inc. All rights reserved.



180 Howard Street Suite 1100 San Francisco, CA 94105-6147
T 415.263.8200 www.segalco.com

December 23, 2019

Board of Administration
The Water and Power Employees' Retirement Plan of the City of Los Angeles
111 North Hope street, Room 357
Los Angeles, California 90012

Dear Members of the Board:

We are pleased to submit this Actuarial Valuation and Review of the Disability Fund as of July 1, 2019. It establishes the funding requirements for fiscal year 2019-2020 and analyzes the preceding year's experience.

This review has been completed 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 prepared by the Retirement Office. That assistance is gratefully acknowledged.

The actuarial calculations were directed under the supervision of John Monroe, ASA, MAAA, and 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 this 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 Fund.

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

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By: 
Paul Angelo, FSA, MAAA, FCA, EA
Senior Vice President and Actuary



John Monroe, ASA, MAAA, EA
Vice President and Actuary

Table of Contents

The Water and Power Employees' Retirement, Disability and Death Benefit Insurance Plan Review of the Disability Fund as of July 1, 2019

Section 1: Actuarial Valuation Summary

Purpose and Basis	4
Significant Issues	5
Important Information about Actuarial Valuations	6

Section 2: Actuarial Valuation Results

A. Introduction and Consolidated Financial Information	8
B. Temporary and Extended Temporary Disability Benefits	11
C. Temporary Disability Experience Table	14
D. Permanent Total Disability Benefits	19
E. Permanent Total Disability Experience Table	21

Section 3: Actuarial Valuation Basis

Exhibit I – Actuarial Assumptions and Methods Used for Temporary and Extended Temporary Disability Benefit	26
Exhibit II – Summary of Temporary and Extended Temporary Disability Benefit	28
Exhibit III – Actuarial Assumptions and Methods Used for Permanent Total Disability Benefit	29
Exhibit IV – Summary of Permanent Total Disability Benefit	31
Exhibit V – Actuarial Assumptions and Methods Used for Supplemental Industrial Disability Benefit	32
Exhibit VI – Summary of Supplemental Industrial Disability Benefit	33

Section 1: Actuarial Valuation Summary

Purpose and Basis

This report was prepared by Segal Consulting (“Segal”) to present a valuation of the Disability Fund of The Water and Power Employees’ Retirement Disability and Death Benefit Insurance Plan of the City of Los Angeles (“the Fund”) as of July 1, 2019. The valuation was performed to determine whether the assets and contribution rates are sufficient to provide the prescribed benefits. The measurements shown in this actuarial valuation may not be applicable for other purposes. In particular, the measures herein are not necessarily appropriate for assessing the sufficiency of current plan assets to cover the estimated cost of settling the plan’s accrued benefit obligations.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

The contribution requirements presented in this report are based on:

- The benefit provisions of the Disability Fund, as administered by the Retirement Board;
- The characteristics of covered active members and disabled members as of March 31, 2019, provided by the Retirement Office;
- The assets of the Fund as of June 30, 2019, provided by the Retirement Office;
- Economic assumptions regarding future salary increases and investment earnings adopted by the Retirement Board for the July 1, 2019 valuation;
- The funding policy adopted by the Retirement Board.

Our calculations are based upon member data and financial information provided to us by the Retirement Office. This information has not been audited by us, but it has been reviewed and found to be consistent, both internally and with prior year’s information.

The rates calculated in this report may be adopted by the Board for the fiscal year that extends from July 1, 2019 through June 30, 2020.

Significant Issues

- Ref: Pg. 26*
1. The Temporary Disability benefits and Permanent Total Disability benefits are included in this review. The funding for the Temporary Disability Benefit includes both the Temporary Disability Benefit and the Extended Temporary Disability Benefit. Only the Supplemental Industrial Disability benefit is funded by the Department on a “pay-as-you-go” basis. All the disability benefits are summarized in Section 3 of this report.
- Ref: Pgs. 9, 10*
2. The total reserve for the disability benefits has increased from \$46.4 million on June 30, 2018 to \$48.3 million on June 30, 2019. Member contributions amounted to about \$493,000 for the 2017-2018 fiscal year and \$504,000 for the 2018-2019 fiscal year. Department contributions amounted to about \$16.5 million for both 2017-2018 and 2018-2019 fiscal year.
- Ref: Pgs. 17, 18*
3. The General Reserve for the Temporary Disability Benefit Fund increased from \$2.1 million as of June 30, 2018 to about \$2.9 million as of June 30, 2019. See Section 2.C for details.
- Ref: Pg. 13*
4. The recommended Department contribution rate for the Temporary Disability Benefit Fund has remained the same at \$1.31 per \$100 of compensation. See Section 2.B for details.
- Ref: Pg. 20*
5. The recommended Department contribution rate for the Permanent Total Disability Fund remains at \$0 per \$100 of compensation.
 6. For purposes of determining the contribution rate for both the Temporary Disability and Permanent Total Disability Funds, in 2019 the Board adopted a non-declining (“rolling”) five year period for the General Reserve to reach the target reserve level. In the prior valuation, there was one year (remaining) funding period for the Temporary Disability Benefits. For both funds, the General Reserve is greater than the target reserve level as of June 30, 2019.
 7. The 3.50% discount rate is based on the Disability Fund’s current target asset allocation that is virtually all fixed income investments. It reflects expected real returns for that asset class as well as the 2.75% inflation assumption for the July 1, 2019 valuation report.
 8. The results of this valuation reflect changes in the economic assumptions as recommended by Segal and adopted by the Board on June 26, 2019 for the July 1, 2019 pension valuation. These changes were documented in our *Analysis of Actuarial Experience During the Period July 1, 2015 through June 30, 2018* for The Water and Power Employees’ Retirement Plan of the City of Los Angeles dated June 12, 2019 and our supplemental letter dated June 12, 2019 entitled *Review of Investment Return Assumption for Death and Disability Funds*.

Important Information about Actuarial Valuations

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

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

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant data	An actuarial valuation for a plan is based on data provided to the actuary by the Retirement Office. 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 Retirement Office.
Actuarial assumptions	There is a reasonable range for each assumption used 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.

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 WPERP. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- Except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan. Future contribution requirements may differ from those determined in the valuation because of:
 - Differences between actual experience and anticipated experience;
 - Changes in actuarial assumptions or methods; and
 - Changes in plan provisions.
- If the WPERP 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 WPERP should look to their other advisors for expertise in these areas.

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

Section 2: Actuarial Valuation Results

A. Introduction and Consolidated Financial Information

In this section, we give a general description of the method used to fund the various disability benefits of the Department of Water and Power. Under the funding method used, the total annual contribution to the Disability Fund equals the present value of all future payments for those expected to become disabled during the year, with a further adjustment for any interest credited to the reserves. The present value referred to is for disabilities that “accrue” in a given year and is called the “incurred claims” for the year.

Under this funding method no reserves are expected to accumulate to help cover future claims beyond those incurred during the forthcoming year.

The incurred claims for a year are estimated as the paid claims for the year plus the increase in claim reserves from one fiscal year-end to another. The claim reserve as of any year-end is the present value of all future disability payments on all claims that remain “open” (i.e., still disabled).

Amounts of paid claims, open claims (number and amount), and the general reserves are provided by the Retirement Office, and accepted by Segal Consulting without audit.

The total annual contribution to the Disability Fund is levied as a dollar rate per \$100 of covered compensation. There are separate rates for Temporary Disability and Permanent Total Disability; these rates in turn are split between employees and the Department of Water and Power. Employees pay \$1.00 each biweekly payroll period for both Temporary and Permanent Disability benefits.

In subsequent pages we recommend contribution rates for the various benefits based on a review of the past experience of the funds. We present tables that show the actual annual rate per \$100 of covered payroll. However, there has been substantial fluctuation in these rates over the years. Accordingly, we recommend a rate that, in our judgment, reflects a reasonable balance of recent experience and probable future trends.

Our recommended contribution rates also are designed to maintain a general reserve for each fund. The general reserve is maintained primarily to provide funds in the event of adverse experience. In subsequent pages, we state a recommended level for each general reserve that is based on historical practices. However, in practice the general reserve is set equal to any balance of funds at book value available over claim reserves. Thus, it is unlikely that the general reserve will be exactly at recommended levels at any given time. Rather, the recommended level should be regarded as a long-term goal for the general reserve.

In 2019 the Board adopted a resolution to maintain the annual interest rate assumption at 3.50% effective with the July 1, 2019 valuation.

In the following sections, we present our detailed analysis of the Temporary Disability Benefits and the Permanent Total Disability Benefits.

CHART 1 – CONSOLIDATED SUMMARY STATEMENT OF INCOME AND EXPENSES

	Year Ended June 30, 2019	Year Ended June 30, 2018
Contribution income:		
• Employer contributions – temporary disability benefit	\$14,176,920	\$14,103,745
• Employer contributions – permanent total disability benefit	0	0
• Employer contributions – supplemental disability benefit	1,304,880	1,497,638
• Employer contributions – administrative expenses	<u>1,021,835</u>	<u>897,795</u>
Total employer contribution income	\$16,503,635	\$16,499,178
• Employee contributions – temporary disability benefit	\$251,825	\$249,642
• Employee contributions – permanent total disability benefit	<u>252,574</u>	<u>243,575</u>
Total employee contribution income	\$504,399	\$493,217
Investment income:		
• Interest income	\$1,190,476	\$1,001,807
• Net appreciation (depreciation) in market value	1,613,231	(1,117,049)
• Less investment fees	<u>(42,759)</u>	<u>(43,793)</u>
Net investment income	<u>\$2,760,948</u>	<u>(\$159,035)</u>
Total income available for benefits	\$19,768,982	\$16,833,360
Less benefit payments:		
• Distributions – temporary disability benefit	\$13,353,351	\$12,989,490
• Distributions – extended temporary disability benefit	320,631	379,185
• Distributions – permanent total disability benefit	1,901,678	1,853,258
• Distributions – supplemental disability benefit	<u>1,304,880</u>	<u>1,497,638</u>
Total distributions	\$16,880,540	\$16,719,571
Administrative expenses	<u>1,019,044</u>	<u>895,315</u>
Total deductions	\$17,899,584	\$17,614,886
Net increase (decrease) in reserve	\$1,869,398	(\$781,526)

CHART 2 – CONSOLIDATED SUMMARY STATEMENT OF PLAN ASSETS

	Year Ended June 30, 2019	Year Ended June 30, 2018
Cash equivalents	\$2,004,310	\$1,292,540
Accounts receivable:		
• Employer contributions	\$2,772,908	\$2,867,535
• Accrued investment income	107,617	92,379
• Other	1,828,443	1,751,910
• Contingent disability benefit advance	<u>3,310,339</u>	<u>3,310,339</u>
Total accounts receivable	\$8,019,307	\$8,022,163
Investments:		
• Fixed income	\$38,478,528	\$37,327,310
• Short-term investments	<u>251,500</u>	<u>245,110</u>
Total investments at market value	<u>\$38,730,028</u>	<u>\$37,572,420</u>
Total assets	\$48,753,645	\$46,887,123
Less accounts payable	(\$470,370)	(\$473,246)
Net assets at market value	\$48,283,275	\$46,413,877

B. Temporary and Extended Temporary Disability Benefits

The Temporary Disability Benefits referred to in this section normally commence on the fifteenth calendar day of disability and terminate at the end of the twelfth month of disability. The monthly benefit is 40% to 85% of compensation, depending on length of service and disability. The table below shows a history of the contribution rates for the Temporary Disability Benefits. The table shown in Section C (page 14) includes a summary of the cost of the Temporary Disability Benefits from inception of the Plan to June 30, 2019.

CHART 3 – RATES OF CONTRIBUTION PER \$100 OF COMPENSATION FOR TEMPORARY AND EXTENDED TEMPORARY DISABILITY BENEFITS

As of June 30	Rates Per \$100 of Compensation		
	By Member	By Department	Total
1939 - 1940	\$0.36	\$0.24	\$0.60
1941 – 1943	0.47	0.31	0.78
1943 – 1948	0.39	0.26	0.65
1948 – 1954	0.59	0.39	0.98
1954 – 1957	0.47	0.31	0.78
1958 - 1959	0.36	0.24	0.6
1960 – 1974	0.27	0.18	0.45
1975 – 1976	0.39	0.26	0.65
1976 – 1981	0.45	0.30	0.75
1981 - 1988	*	*	0.75
1988 – 1993	*	*	0.61
1994	*	*	0.45
1995 – 1996	*	*	0.35
1997	*	*	0.30
1998 – 1999	*	*	0.25

CHART 3 – RATES OF CONTRIBUTION PER \$100 OF COMPENSATION FOR TEMPORARY AND EXTENDED TEMPORARY DISABILITY BENEFITS (CONTINUED)

Rates Per \$100 of Compensation			
As of June 30	By Member	By Department	Total
2000 – 2001	*	*	\$0.35
2002 – 2004	*	*	0.68
2005 – 2006	*	*	0.74
2007	*	*	1.55
2008	*	*	2.18
2009	*	*	1.73
2010	*	*	1.37
2011	*	*	1.32
2012	*	*	1.46
2013	*	*	1.55
2014	*	*	1.54
2015	*	*	1.68
2016	*	*	1.74
2017	*	*	1.55
2018	*	*	1.47
2019	*	*	1.34

**From January 1980 to January 1984, employees paid \$1 per month and the Department paid the balance of the total rate. As of January 1984, the employee amount was increased to \$1 per biweekly payroll period.*

For Temporary and Extended Temporary Disability, the claim reserve is calculated as the sum of:

1. The open claim reserve, which is the number of open claims times the reserve factor specified in Section III D (2) of the Plan, and
2. The pending claim reserve, which is 1/26 of the benefits paid during the preceding fiscal year.

Incurred claims at an annual rate per \$100 of covered payroll are calculated as described in Section 2.A. and Section 3, Exhibit I. Since 1980, the goal for the general reserve has been to maintain it at approximately 20% of the claim reserve (\$5,172,322 as of June 30, 2019). Thus, the “target” is equal to \$1,034,464 (20% x \$5,172,322), as compared to the actual general reserve of \$2,883,277 as of June 30, 2019. Therefore, as of June 30, 2019, the current reserve surpasses the funding target by \$1,848,813. The Board adopted a change in the funding period for the general reserve to reach the target reserve level from only one year remaining as of July 1, 2018 to a five year rolling period effective with the July 1, 2019 valuation.

The Temporary Disability Experience Table indicates that the average cost for the last 20 years per \$100 of covered payroll is \$1.43 before taking into account interest on the general reserve. Based on reserves as of June 30, 2019, the expected interest credit for the next year is \$0.01 per \$100 of covered payroll (assuming a 3.50% investment return). Thus, the net average rate per \$100 of covered payroll is \$1.42. In 2000, \$11 million was transferred over from the Permanent Total Disability Fund and the entire Temporary and Extended Temporary Disability Benefit became payable from this Fund. Then, from 2000 through 2007, the general reserve followed a decreasing trend due to the contribution rates being lower than the increased claim rates. However, this trend reversed itself during 2008 through 2010 and then decreased during 2010 to 2012. During 2013, the General Reserve increased due to a decrease in the claim reserve and a decrease in benefit payments. During 2014, the General reserve decreased due to an increase in the claims reserve and the increase in benefit payments. During 2015 to 2019, the general reserve increased due to the contribution rates being higher than the claim rates. The claim reserve has increased slightly from the last year due to an increase in the reserve factor determined by the Retirement office as noted below.

As noted above, the total contribution rate needed to pay for expected claims is \$1.43 per \$100 of covered payroll. In order to reduce the general reserve to the target level over the current policy period of five years, we recommend a total contribution of \$1.33 per \$100 of covered payroll. After taking into account the employee contribution of \$1 per biweekly payroll period (which amounts to approximately \$0.02 per \$100 of covered payroll), the net recommended Department rate is \$1.31. The recommended contribution rate is unchanged from the prior valuation.

Pursuant to Section III D (2) of the Plan, the Temporary Disability claim reserve at the end of each year is determined by multiplying the number of open claims at the end of the year by a reserve factor of \$19,200 for 2019. This is an increase from \$18,400 for 2018. The current reserve factor of \$19,200 was provided by the Retirement Office, and accepted by Segal without audit.

C. Temporary Disability Experience Table

Year Ended June 30	Covered Payroll	Claims and Expenses Paid	Claims and Expenses Incurred	Annual Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	Cumulative Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	General Reserve
1939	\$9,705,000	\$33,138	\$44,138	\$0.45	\$0.45	\$14,090
1940	14,015,000	60,138	65,797	0.47	0.46	45,061
1941	13,350,000	73,867	78,867	0.59	0.51	70,323
1942	13,415,000	79,870	79,870	0.60	0.53	95,090
1943	12,645,000	87,933	87,933	0.70	0.56	89,351
1944	12,400,000	108,197	113,197	0.91	0.62	56,753
1945	12,396,000	98,138	104,138	0.84	0.65	33,189
1946	15,293,000	123,539	123,539	0.81	0.68	9,056
1947	20,027,000	156,483	165,483	0.83	0.70	(8,741)
1948	23,316,000	161,558	158,558	0.68	0.70	61,194
1949	27,386,000	157,975	155,975	0.57	0.68	173,506
1950	30,105,000	163,475	175,476	0.58	0.66	293,063
1951	30,130,000	180,286	177,286	0.59	0.65	411,057
1952	37,792,000	204,381	208,381	0.55	0.64	573,038
1953	40,678,000	228,354	262,354	0.64	0.64	757,895
1954	44,915,000	255,289	244,289	0.54	0.63	892,666
1955	50,632,000	241,898	215,898	0.43	0.60	1,102,717
1956	53,988,000	244,824	242,824	0.45	0.59	1,317,674
1957	56,225,000	268,883	280,883	0.50	0.58	1,419,437
1958	63,087,000	286,924	291,924	0.46	0.56	1,557,783

C. Temporary Disability Experience Table (Continued)

Year Ended June 30	Covered Payroll	Claims and Expenses Paid	Claims and Expenses Incurred	Annual Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	Cumulative Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	General Reserve
1959	\$65,930,000	\$368,644	\$414,644	\$0.63	\$0.57	\$1,578,671
1960	65,993,000	388,060	305,260	0.46	0.56	1,628,091
1961	68,055,000	381,033	380,833	0.56	0.56	1,611,264
1962	73,192,000	393,013	404,413	0.55	0.56	1,593,485
1963	78,546,000	500,671	512,371	0.65	0.57	1,491,219
1964	83,672,000	562,565	518,765	0.62	0.57	1,401,956
1965	87,976,000	536,280	543,480	0.62	0.58	1,304,304
1966	92,885,000	554,020	548,920	0.59	0.58	1,220,641
1967	98,253,000	566,985	580,185	0.59	0.58	1,127,344
1968	103,283,000	634,571	633,871	0.61	0.58	999,592
1969	111,396,000	704,242	703,542	0.63	0.58	833,701
1970	121,866,000	767,820	775,170	0.64	0.59	637,461
1971	131,730,000	889,228	897,478	0.68	0.59	354,292
1972	140,154,000	859,374	864,575	0.62	0.60	132,771
1973	143,834,000	1,011,796	1,034,196	0.72	0.61	(253,712)
1974	146,962,000	1,140,512	1,175,512	0.80	0.62	(483,644)
1975	156,628,000	1,190,786	1,206,236	0.77	0.63	(702,745)
1976	163,951,000	1,304,122	1,325,572	0.81	0.64	(852,027)
1977	165,258,000	1,300,411	1,312,161	0.79	0.65	(959,819)
1978	172,256,000	1,404,379	1,393,979	0.81	0.66	(1,103,713)

C. Temporary Disability Experience Table (Continued)

Year Ended June 30	Covered Payroll	Claims and Expenses Paid	Claims and Expenses Incurred	Annual Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	Cumulative Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	General Reserve
1979	\$177,648,000	\$1,378,601	\$1,410,042	\$0.79	\$0.67	(\$107,066)
1980	175,962,000	1,400,805	1,350,503	0.77	0.67	(132,312)
1981	202,902,000	1,496,480	1,514,388	0.75	0.68	64,895
1982	245,734,000	1,394,848	1,438,322	0.59	0.67	505,214
1983	274,644,000	1,687,704	1,678,899	0.61	0.67	957,656
1984	288,311,000	1,789,909	1,864,263	0.65	0.67	1,370,865
1985	310,359,000	1,975,135	1,977,432	0.64	0.66	1,875,475
1986	327,365,000	2,210,661	2,251,124	0.69	0.67	2,157,948
1987	360,065,000	1,969,935	2,005,236	0.56	0.66	2,728,701
1988	400,537,000	2,290,491	2,260,068	0.56	0.65	3,348,749
1989	394,086,000	2,261,337	2,248,205	0.57	0.64*	3,849,928
1990	411,248,000	2,171,299	2,160,636	0.53	0.62*	4,580,470
1991	402,648,000	2,233,586	2,194,051	0.54	0.59*	5,286,005
1992	475,252,000	2,354,177	2,375,545	0.50	0.59*	6,298,902
1993	464,000,000	2,348,727	2,373,719	0.51	0.58*	6,888,804
1994	470,000,000	2,516,640	2,567,498	0.55	0.57*	6,709,671
1995	450,713,000	2,964,258	2,933,789	0.65	0.57*	5,845,370
1996	441,956,000	2,225,030	2,076,306	0.47	0.54*	5,593,988
1997	472,678,000	2,019,565	2,016,440	0.43	0.53*	5,286,560
1998	417,262,000	2,416,341	2,473,601	0.59	0.53*	4,210,250

C. Temporary Disability Experience Table (Continued)

Year Ended June 30	Covered Payroll	Claims and Expenses Paid	Claims and Expenses Incurred	Annual Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	Cumulative Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	General Reserve
1999	\$355,148,948	\$1,858,677	\$2,016,329	\$0.57	\$0.53*	\$3,371,035
2000	369,509,233	4,682,621	4,809,494	1.30	1.30**	13,339,138***
2001	403,265,472	4,211,036	4,426,638	1.10	1.20**	11,141,509
2002	430,397,884	4,584,284	4,528,640	1.05	1.15**	9,999,795
2003	472,432,303	5,306,242	5,388,510	1.14	1.15**	8,353,541
2004	522,227,280	6,210,253	6,246,423	1.20	1.16**	5,966,023
2005	554,839,816	7,298,197	7,480,641	1.35	1.19**	2,715,895
2006	574,315,572	8,897,820	9,028,144	1.57	1.24**	(2,009,091)
2007	604,514,525	9,502,988	9,556,168	1.58	1.29**	(4,328,285)
2008	623,634,208	9,578,292	9,540,484	1.53	1.31**	(1,103,230)
2009	696,704,083	8,889,938	9,337,463	1.34	1.32**	2,719,985
2010	767,912,436	10,947,771	11,262,418	1.47	1.33**	3,006,739
2011	791,760,493	11,720,424	13,268,642	1.68	1.36**	421,664
2012	805,607,436	12,469,833	13,051,706	1.62	1.38**	(1,243,338)
2013	817,421,028	12,130,514	11,770,414	1.44	1.38**	(538,036)
2014	819,923,866	14,171,121	14,648,006	1.79	1.41**	(2,476,726)
2015	839,213,254	13,158,645	13,500,304	1.61	1.42**	(2,270,074)
2016	861,818,854	12,614,416	12,573,684	1.46	1.43**	19,712
2017	892,332,196	13,251,004	13,616,488	1.53	1.43**	1,003,421
2018	953,635,670	13,368,674	13,390,600	1.40	1.43**	2,118,648

C. Temporary Disability Experience Table (Continued)

Year Ended June 30	Covered Payroll	Claims and Expenses Paid	Claims and Expenses Incurred	Annual Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	Cumulative Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	General Reserve
2019	\$1,028,212,002	\$13,673,983	\$13,934,525	\$1.36	\$1.43**	\$2,883,277

* Average of ten most recent rates prior to the addition of the entire Temporary and Extended Temporary Disability Benefit.

** Average of rates after addition of the entire Temporary and Extended Temporary Disability Benefits.

*** In 2000, \$11 million was transferred from the Permanent Total Disability Fund. Starting in 2000, the entire Temporary and Extended Temporary Disability Benefit became payable from this Fund.

Note: Starting in 1987, expenses are not included.

D. Permanent Total Disability Benefits

Permanent Total Disability Benefits may commence as early as the thirteenth month of disability or as late as the twenty-fifth month, depending on the member's condition and Extended Temporary Disability Coverage. The monthly benefit is an amount equal to 40% of the member's compensation. Cost-of-living benefits, with a 3% maximum increase per year (similar to those provided to service retirees), were adopted as of April 1, 1970. The table below shows a history of the contribution rates for the Permanent Total Disability Benefits. The table on page 22 summarizes the cost of Permanent Total Disability Benefits from inception of the Plan to June 30, 2019.

CHART 4 – RATES OF CONTRIBUTION PER \$100 OF COMPENSATION FOR PERMANENT TOTAL DISABILITY BENEFITS

As of June 30	Rates Per \$100 of Compensation		
	By Member	By Department	Total
1938 – 1942	\$0.62	\$0.41	\$1.03
1942 – 1947	0.52	0.34	0.86
1947 – 1953	0.62	0.41	1.03
1953 – 1956	0.52	0.34	0.86
1956 – 1959	0.36	0.24	0.60
1959 – 1969	0.21	0.14	0.35
1969 – 1973	0.12	0.08	0.20
1973 – 1975	0.24	0.16	0.40
1975 – 1980	0.36	0.24	0.60
1980 – 1981	*	*	0.60
1981 – 1987	*	*	0.55
1987 – 1992	*	*	0.25
1992– 1998	*	*	0.05
1998– 2019	*	0.00	*

* From January 1980 to January 1984, employees paid \$1 per month and the Department paid the balance of the total rate. As of January 1984, the employee amount was increased to \$1 per biweekly payroll period.

For Permanent Total Disability Benefit, the claim reserve is calculated as the sum of:

1. The open (or reported) claim reserve, which is the present value of future disability benefits for open claims, and
2. The pending claim reserve, which is the contributions made during the fiscal year.

The rate of interest used by the Board in the present value calculation is 3.50%. Beginning in 1983, the present value calculation also reflects 3% cost-of-living increases. The incurred claims and the annual experience rate per \$100 of covered payroll were calculated as described in Section 2.A. and Section 3, Exhibit III. The current goal for the general reserve is that it be maintained at approximately 20% of the claim reserve (\$12,701,516 as of June 30, 2019).

For several years, the Permanent Total Disability Experience Table has shown a downward trend in the annual cost per \$100 of covered payroll. In 1983, the claim cost returned to earlier levels, but this was artificially high due to the change in reflecting cost-of-living increases. It appears that the Fund has reached a somewhat stable cumulative rate of claim costs, although year-by-year costs are still fluctuating.

As of June 30, 2019, the general reserve for Permanent Total Disability is \$20,707,032. This is much larger than the amount needed to meet the 2019 goal for the reserve, which is \$2,540,303 (20% x \$12,701,516). Also, it should be noted that expected interest on the general reserve (which amounts to \$724,746, or \$0.07 per \$100 of covered payroll, based on the reserve as of June 30, 2019 and 3.50% interest) is not reflected in the annual rate shown in the experience table.

If no expected interest on the general reserve had been taken into account, the average annual rate of contribution would have been \$0.27 per \$100 of covered payroll over the last 20 years, and the annual rate of contribution as of June 30, 2019 would have been \$0.20 per \$100 of covered payroll. The expected interest on the reserves (\$0.07 per \$100 of covered payroll) would reduce the \$0.27 per \$100 of payroll and \$0.20 per \$100 of payroll contribution rates to \$0.20 and \$0.13, respectively.

The general reserve is so large that interest alone is expected to be enough to pay a significant portion of the claims for many years to come. Thus, we recommend that the Board maintain the Department contribution of zero cents per \$100 of covered compensation so that the general reserve can be reduced closer to its target level over time.

E. Permanent Total Disability Experience Table

Year Ended June 30	Covered Payroll	Claims and Expenses Paid	Claims and Expenses Incurred*	Annual Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll*	Cumulative Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	General Reserve
1939	\$9,742,000	\$3,711	\$87,711	\$0.90	\$0.90	\$13,604
1940	13,989,000	21,342	103,588	0.74	0.81	56,344
1941	13,266,000	24,788	74,936	0.56	0.72	122,383
1942	13,306,000	32,566	91,896	0.69	0.71	175,539
1943	12,574,000	43,318	74,067	0.59	0.69	219,667
1944	12,319,000	58,699	83,340	0.68	0.69	252,063
1945	12,309,000	85,014	146,059	1.19	0.76	218,072
1946	15,152,000	89,721	241,219	1.59	0.88	111,847
1947	19,836,000	109,058	270,398	1.36	0.96	18,764
1948	23,235,000	120,837	175,320	0.75	0.93	80,980
1949	27,275,000	136,224	133,200	0.49	0.86	233,675
1950	29,974,000	138,210	96,082	0.32	0.78	458,989
1951	29,990,000	135,367	144,943	0.48	0.74	632,438
1952	37,565,000	134,551	11,043	0.03	0.64	1,044,175
1953	40,464,000	156,803	403,365	1.00	0.76	1,055,235
1954	44,971,000	184,131	166,033	0.37	0.64	1,316,150
1955	49,389,000	192,397	234,939	0.48	0.62	1,547,758
1956	50,836,000	179,587	14,956	0.03	0.56	2,021,772
1957	52,720,000	180,814	249,641	0.47	0.55	2,157,769
1958	58,829,000	152,089	33,695	0.06	0.50	2,560,220

E. Permanent Total Disability Experience Table (Continued)

Year Ended June 30	Covered Payroll	Claims and Expenses Paid	Claims and Expenses Incurred*	Annual Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll*	Cumulative Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	General Reserve
1959	\$61,495,000	\$146,785	\$381,672	\$0.62	\$0.51	\$2,615,720
1960	64,964,000	187,826	367,442	0.57	0.52	2,572,558
1961	67,012,000	216,655	509,906	0.76	0.54	2,394,036
1962	71,708,000	230,601	205,588	0.29	0.52	2,526,768
1963	77,236,000	227,517	327,404	0.42	0.51	2,560,680
1964	82,455,000	240,242	319,583	0.39	0.50	2,624,717
1965	86,833,000	248,687	291,596	0.34	0.48	2,736,710
1966	91,488,000	277,855	395,424	0.43	0.48	2,763,324
1967	96,225,000	286,761	202,661	0.21	0.46	3,009,729
1968	101,556,000	298,893	401,943	0.40	0.46	3,079,294
1969	109,554,000	334,656	731,158	0.67	0.47	2,840,069
1970	120,246,000	374,358	729,926	0.61	0.48	2,446,761
1971	130,096,000	376,744	245,854	0.19	0.46	2,561,379
1972	138,857,000	446,816	1,012,405	0.73	0.48	1,902,860
1973	143,308,000	502,274	930,350	0.65	0.49	1,283,193
1974	146,886,000	582,628	1,244,725	0.85	0.52	651,223
1975	156,760,000	682,830	1,483,906	0.95	0.54	(214,183)
1976	164,183,000	761,200	1,332,986	0.81	0.56	(644,432)
1977	165,224,000	867,586	1,629,326	0.99	0.59	(1,348,628)
1978	171,767,000	920,799	1,042,386	0.61	0.59	(1,432,449)

E. Permanent Total Disability Experience Table (Continued)

Year Ended June 30	Covered Payroll	Claims and Expenses Paid	Claims and Expenses Incurred*	Annual Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll*	Cumulative Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	General Reserve
1979	\$176,576,000	\$907,163	\$972,121	\$0.55	\$0.59	\$1,348,852
1980	177,340,000	912,703	837,008	0.47	0.58	1,887,689
1981	202,994,000	1,006,200	369,334	0.18	0.55	2,750,719
1982	245,580,000	946,778	29,798	0.01	0.51	4,404,597
1983	274,629,000	978,647	1,755,073	0.64**	0.52	4,534,031
1984	288,289,000	1,000,319	725,141	0.21	0.50	5,879,532
1985	310,360,000	1,006,631	591,410	0.19	0.48	7,623,235
1986	321,523,000	974,376	569,547	0.18	0.46	9,284,884
1987	360,072,000	901,033	121,268	0.03	0.45	11,090,748
1988	401,029,000	946,468	840,245	0.21	0.44	13,253,261
1989	394,084,000	1,024,870	1,563,694	0.40	0.47***	13,929,718
1990	411,248,000	1,038,907	594,815	0.14	0.45***	15,723,997
1991	405,132,000	1,046,404	739,845	0.18	0.45***	18,108,405
1992	472,984,000	1,054,203	989,998	0.21	0.42***	20,483,790
1993	464,000,000	1,102,722	1,652,617	0.36	0.41***	21,843,275
1994	470,000,000	1,058,778	320,344	0.07	0.37***	24,150,799
1995	515,122,000	1,059,537	1,506,726	0.29	0.34***	25,312,906
1996	456,604,000	1,027,066	1,230,694	0.27	0.27***	26,514,847
1997	460,540,000	930,321	1,166,197	0.25	0.27***	28,156,245
1998	432,750,000	1,022,029	839,204	0.19	0.25***	30,206,085

E. Permanent Total Disability Experience Table (Continued)

Year Ended June 30	Covered Payroll	Claims and Expenses Paid	Claims and Expenses Incurred*	Annual Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll*	Cumulative Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	General Reserve
1999	\$355,148,948	\$ 944,740	\$1,257,860	\$0.35	\$0.24***	\$32,320,298
2000	369,509,233	1,023,333	1,336,453	0.36	0.24***	22,231,871
2001	403,265,472	1,037,601	681,004	0.17	0.24***	24,428,829
2002	430,397,884	1,107,061	2,760,650	0.64	0.27***	23,552,296
2003	472,432,303	1,154,061	1,451,604	0.31	0.25***	24,159,068
2004	522,227,280	1,235,285	2,557,099	0.49	0.26***	23,211,839
2005	554,839,816	1,344,393	1,237,126	0.22	0.26***	25,396,120
2006	574,315,572	1,416,598	684,738	0.12	0.26***	26,438,032
2007	604,514,525	1,493,732	2,624,785	0.43	0.28***	25,697,531
2008	623,634,208	1,542,574	2,366,329	0.38	0.29***	25,256,078
2009	696,704,083	1,579,230	2,615,312	0.38	0.29***	24,645,343
2010	767,912,436	1,671,993	703,497	0.09	0.29***	25,810,871
2011	791,760,493	2,012,392	422,748	0.05	0.28***	27,094,608
2012	805,607,436	1,837,781	406,382	0.05	0.27***	28,145,999
2013	817,421,028	1,853,493	1,452,570	0.18	0.26***	27,886,706
2014	819,923,866	1,883,397	1,437,362	0.18	0.27***	27,842,135
2015	839,213,254	1,840,316	3,325,516	0.40	0.27***	25,466,109
2016	861,818,854	1,734,775	796,486	0.09	0.26***	25,643,332
2017	892,332,196	1,700,103	3,680,032	0.41	0.27***	22,846,141
2018	953,635,670	1,853,258	2,592,793	0.27	0.28***	21,304,975

E. Permanent Total Disability Experience Table (Continued)

Year Ended June 30	Covered Payroll	Claims and Expenses Paid	Claims and Expenses Incurred*	Annual Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll*	Cumulative Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	General Reserve
2019	\$1,028,212,002	\$1,901,678	\$2,056,125	\$0.20	\$0.27***	\$20,707,032

* Reflects credit of interest earnings on Claim Reserves but not on the General Reserve.

** This rate is artificially high due to the introduction of cost-of-living increases in the Claim Reserve Calculation.

*** Average of rates for last 20 years.

Note: Starting in 1987, expenses are not included.

Section 3: Actuarial Valuation Basis

EXHIBIT I – ACTUARIAL ASSUMPTIONS AND METHODS USED FOR TEMPORARY AND EXTENDED TEMPORARY DISABILITY BENEFIT

Plan Year:	July 1 through June 30
Definition of Active Member:	First day of biweekly payroll period following employment for new Department employees or immediately following transfer from other City departments.
Projected Covered Payroll:	\$1,141,875,615 for 2019-2020 plan year.
Projected Distributions:	\$15,581,092 for first year (Projected Covered Payroll times two-year average of actual distributions as a percent of actual payroll) increasing 3.25% per year thereafter.
Net Investment Return:	3.50%, net of investment expenses. The information and analysis used in selecting this assumption is shown in the Proposed Change in Investment Return Assumption for Death and Disability Funds letter dated June 12, 2019.
Consumer Price Index (CPI):	Increase of 2.75% per year.
Payroll Growth:	Increase of 3.25% per year.
Member Contribution Rate:	Employees start contributing on the first day of the payroll period following the completion of 26 continuous weeks of Department and/or City service at the rate of \$1.00 for each biweekly payroll period.
Department Contribution Rate:	Rate recommended by Board's Actuary multiplied by the total monthly equivalent of compensation.
Funding Method:	Annual contributions equal the present value of all future disability payments for those expected to become disabled during the year with an adjustment for interest credited to the reserves. Subject to modification by the Board's funding policy.
Funding Policy:	Recommend a contribution rate to reach a target general reserve equal to 20% of the claim reserve at the end of a fixed (rolling) five years period.
Claim Reserve:	The sum of the Open Claim Reserve and the Pending Claim Reserve.
Open Claim Reserve:	The number of open claims times the reserve factor specified in Section IIID(2) of the Plan. The reserve factor was increased to \$15,050 in 2012, \$16,000 in 2013, \$17,600 in 2014, \$18,450 in 2015, \$18,700 in 2016, decreased to \$18,100 in 2017, increased to \$18,400 in 2018 and \$19,200 in 2019. These reserve factors are provided by the Retirement Office and accepted by Segal Consulting without audit.
Pending Claim Reserve:	1/26 of the total benefits paid during the preceding fiscal year.

Incurred Claims:	Paid claims for the year plus the increase in claim reserves.
Changed Actuarial Assumptions and Methods:	The following actuarial assumptions and methods have been changed since the prior valuation.
<i>Consumer Price Index:</i>	Increase of 3.00% per year.
<i>Payroll Growth:</i>	Increase of 3.50% per year.
<i>Funding Policy:</i>	Recommend a contribution rate to reach a target general reserve equal to 20% of the claim reserve at the end of ten years from June 30, 2009.

EXHIBIT II – SUMMARY OF TEMPORARY AND EXTENDED TEMPORARY DISABILITY BENEFIT

Age Requirement:	Any age					
Service Requirement:	Six months of continuous service.					
Temporary Benefit:	The biweekly benefit is a percentage of the biweekly compensation payable from the fifteenth day of disability through the end of the twelfth month of disability. The percentage is based on the following table.					
	Period of Continuous Service		Maximum Period Payable at Percentage of Compensation			
	Not less than	Less than	85%	60%	50%	40%
	6 months	3 Years	2 Weeks	1 Week	26 Weeks	21 Weeks
	3 Years	5 Years	4 Weeks	2 Weeks	26 Weeks	18 Weeks
	5 Years	10 Years	6 Weeks	3 Weeks	26 Weeks	15 Weeks
	10 Years	15 Years	18 Weeks	10 Weeks	22 Weeks	--
	15 Years	20 Years	20 Weeks	12 Weeks	18 Weeks	--
	20 Years	25 Years	22 Weeks	14 Weeks	14 Weeks	--
	25 Years	30 Years	24 Weeks	16 Weeks	10 Weeks	--
	30 Years	35 Years	26 Weeks	18 Weeks	6 Weeks	--
	35 Years		28 Weeks	20 Weeks	2 Weeks	--
Extended Disability Requirements:	Received 50 weeks of Temporary Disability benefits and is not eligible for Permanent Total Disability.					
Extended Disability Benefit:	The biweekly benefit is 33 1/3 percent of their biweekly compensation payable from the end of the twelfth month of disability through the twenty-fourth month of disability. However, if a member qualifies for Permanent Total Disability while such member is receiving Extended Temporary Disability benefits, such benefits shall be terminated and the member shall receive the Permanent Total Disability benefits to which they are entitled.					

EXHIBIT III – ACTUARIAL ASSUMPTIONS AND METHODS USED FOR PERMANENT TOTAL DISABILITY BENEFIT

Plan Year:	July 1 through June 30
Definition of Active Member:	First day of biweekly payroll period following employment for new Department employees or immediately following transfer from other City departments.
Projected Covered Payroll:	\$1,141,875,615 for 2019-2020 plan year.
Net Investment Return:	3.50%, net of investment expenses. The information and analysis used in selecting this assumption is shown in the Proposed Change in Investment Return Assumption for Death and Disability Funds letter dated June 12, 2019.
Consumer Price Index (CPI):	Increase of 2.75% per year; benefit increases due to CPI subject to 3.00% maximum.
Payroll Growth:	Increase of 3.25% per year.
Member Contribution Rate:	Employees start contributing on the first day of the payroll period following the completion of 26 continuous weeks of Department and/or City service at the rate of \$1.00 for each biweekly payroll period.
Department Contribution Rate:	Rate recommended by Board's Actuary multiplied by the total monthly equivalent of compensation.
Funding Method:	Annual contributions equal the present value of all future disability payments for those expected to become disabled during the year with a further adjustment for interest credited to the reserves. Subject to modification by the Board's funding policy.
Funding Policy:	Recommend a contribution rate to maintain a target general reserve equal to 20% of the claim reserve at the end of a fixed (rolling) five years period.
Claim Reserve:	The sum of the Open Claim Reserve and the Pending Claim Reserve.
Open Claim Reserve:	The present value of future disability benefits for open claims.
Pending Claim Reserve:	Contributions made during the fiscal year.
Incurred Claims:	Paid claims for the year plus the increase in claim reserves.

Changed Actuarial Assumptions and Methods:	The following actuarial assumptions and methods have been changed since the prior valuation.
<i>Consumer Price Index:</i>	Increase of 3.00% per year.
<i>Payroll Growth:</i>	Increase of 3.50% per year.
<i>Funding Policy:</i>	Recommend a contribution rate to reach a target general reserve equal to 20% of the claim reserve.

EXHIBIT IV – SUMMARY OF PERMANENT TOTAL DISABILITY BENEFIT

Age Requirement:	Any age
Service Requirement:	Six months continuous service.
Other Requirements:	Received 50 weeks of Temporary Disability benefits and satisfies the rules for Permanent Total Disability.
Monthly Benefit:	The monthly benefit is 40 percent of the monthly compensation payable from the end of the twelfth month of disability (or later if benefits are payable under the extended temporary disability benefit) until the first day of the calendar month following the sixty-fifth birthday. If Permanent Total Disability benefits commence after the member's sixtieth birthday, the benefit is payable for 60 months. Permanent and Total Disability benefits are subject to annual cost-of-living adjustments, based on the CPI up to a maximum of 3% per year.

EXHIBIT V – ACTUARIAL ASSUMPTIONS AND METHODS USED FOR SUPPLEMENTAL INDUSTRIAL DISABILITY BENEFIT

Plan Year:	July 1 through June 30
Definition of Active Member:	First day of biweekly payroll period following employment for new Department employees or immediately following transfer from other City departments.
Projected Covered Payroll:	\$1,141,875,615 for 2019-2020 plan year.
Net Investment Return:	3.50%, net of investment expenses. The information and analysis used in selecting this assumption is shown in the Proposed Change in Investment Return Assumption for Death and Disability Funds letter dated June 12, 2019.
Member Contribution Rate:	None
Department Contribution Rate:	Funded on a cash basis
Funding Method:	Pay as you go
Funding Policy:	Funded on a cash basis
Claim Reserve:	None
Open Claim Reserve:	None
Pending Claim Reserve:	None
Incurred Claims:	Paid claims for the year
Changed Actuarial Assumptions and Methods:	There were no changes in actuarial assumptions and methods since the prior valuation.

EXHIBIT VI – SUMMARY OF SUPPLEMENTAL INDUSTRIAL DISABILITY BENEFIT

Age Requirement:	Any age
Service Requirement:	Six months of continuous service.
Additional Requirements:	Injury or disease which arises out of and in the course of employment in the Department. Receiving workers' compensation benefits.
Supplemental Benefit:	For the first ten days the biweekly benefit is their biweekly compensation offset by the amount received from workers' compensation. Afterwards, the biweekly benefit is the Temporary, Extended Temporary, or Permanent Total Disability benefits offset by the amount received from workers' compensation.