
El Paso Policemen's Pension Fund

Actuarial Valuation as of January 1, 2018

August 29, 2018



Rudd and Wisdom, Inc.
CONSULTING ACTUARIES

Rudd and Wisdom, Inc.

CONSULTING ACTUARIES

Mitchell L. Bilbe, F.S.A.
Evan L. Dial, F.S.A.
Philip S. Dial, F.S.A.
Philip J. Ellis, A.S.A.
Charles V. Faerber, F.S.A., A.C.A.S.
Mark R. Fenlaw, F.S.A.
Brandon L. Fuller, F.S.A.

Shannon R. Hatfield, A.S.A.
Christopher S. Johnson, F.S.A.
Oliver B. Kiel, F.S.A.
Dustin J. Kim, A.S.A.
Edward A. Mire, F.S.A.
Rebecca B. Morris, A.S.A.
Amanda L. Murphy, F.S.A.
Michael J. Muth, F.S.A.

Khiem Ngo, F.S.A., A.C.A.S.
Elizabeth A. O'Brien, F.S.A.
Timothy B. Seifert, A.S.A.
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David G. Wilkes, F.S.A.

August 29, 2018

Board of Trustees
El Paso Policemen's Pension Fund
c/o Mr. Tyler Grossman, Executive Director
909 E. San Antonio Avenue
El Paso, Texas 79901

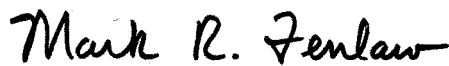
Members of the Board of Trustees:

At your request, we have prepared this report of the results of the actuarial valuation of the El Paso Policemen's Pension Fund (the Fund) as of January 1, 2018. This valuation was prepared to determine whether the Fund has an adequate contribution arrangement.

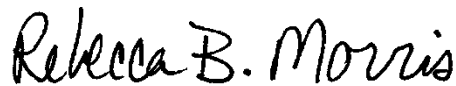
In a separate report dated April 30, we provided the necessary disclosures for the Fund's compliance with the Governmental Accounting Standards Board (GASB) Statement No. 67 for the plan year ending December 31, 2017. Similarly, we will provide a separate report later in the fall of 2018 containing the pension expense, net pension liability, and disclosure information for the city's compliance with GASB 68 for the fiscal year ending September 30, 2018. GASB 68 prescribes the city's accounting for the Fund, while this actuarial valuation report reflects the assumed continuation of the current funding policy.

We certify that we are members of the American Academy of Actuaries who meet Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report.

Sincerely,



Mark R. Fenlaw, F.S.A.



Rebecca B. Morris, A.S.A.

MRF/RBM:ph

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Section I

Valuation Summary

An actuarial valuation of the assets and liabilities of the El Paso Policemen's Pension Fund as of January 1, 2018 has been completed. The valuation was based on the Present Plan (plan effective December 31, 2017) and the provisions of Article 6243b, Vernon's Texas Civil Statutes. Section II shows the key results of the actuarial valuation as of January 1, 2018.

This valuation reflects an actuarially assumed total contribution rate of 36.25%, comprised of 18% by the members and 18.25% by the city. The total contribution rate of 36.25% exceeds the normal cost rate of 21.23%, leaving 15.02% available initially to amortize the unfunded actuarial accrued liability (UAAL) of \$233,937,349. The 21.23% normal cost rate is the weighted average as of the valuation date of the 23.72% normal cost rate of the base plan and the 17.31% normal cost rate of the second-tier plan. Over time the weighted average normal cost rate will gradually decline to that of the second-tier plan. Assuming that the total payroll increases at the rate of 3% per year in the future, the contributions in excess of the normal cost **will amortize the UAAL in 30.5 years.**

In order for a retirement plan to have an adequate contribution arrangement, contributions must be made that are sufficient to pay the plan's normal cost and to amortize the plan's UAAL over a reasonable period of time. Based on the Texas State Pension Review Board guidelines for pension funding, our professional judgment, and the actuarial assumptions and methods used in making this valuation, we consider periods of 10 years to 25 years to be preferable and 40 years to be the current maximum acceptable period. The PRB guidelines will be changing to a maximum of 30 years allowing for phase in through 2025. Since the total contributions are sufficient to pay the Fund's normal cost and to amortize the Fund's UAAL within the maximum acceptable period, we are of the opinion that the Fund, based on present levels of benefits and contributions, **has an adequate contribution arrangement.**

Changes in Plan Provisions

Since the January 1, 2016 actuarial valuation, there have been two sets of changes in the plan provisions governing the Fund. The first set was effective July 1, 2016, when the Back Deferred Retirement Option Program (Back DROP) was effectively replaced by a new Forward DROP program. A member eligible for any unreduced retirement benefit (age 45 with 20 years for the base plan) is now eligible to enter the Forward DROP by an irrevocable election, and there is no maximum length for the period between entering and retiring. The Back DROP has a maximum three-year period and a minimum age of 50, and it will be available until June 30, 2019.

Effective December 31, 2017, a package of changes was adopted: (1) the second-tier plan retirement eligibility provisions were changed to be the same as the base plan provisions, (2) the member contribution rate will increase in a uniform increment every September 1, beginning in 2018, for five years to an ultimate rate of 18%, and (3) the Forward DROP eligibility provisions for the second-tier plan were changed to be the same as the base plan provisions. These changes are all reflected in this January 1, 2018 actuarial valuation.

Projected Actuarial Valuation Results

In addition to completing this actuarial valuation, we estimated the amortization periods as of January 1, 2020 and as of January 1, 2022 by making projections from the January 1, 2018 actuarial valuation. These projections examine the effect on the amortization period in the next two actuarial valuations of the actuarial investment gains and losses that the Fund experienced in the four years prior to the valuation date (losses in 2014, 2015, and 2016, and a gain in 2017) that have been only partially recognized as of January 1, 2018. As shown in Exhibit 8, a smoothing method is used to determine the actuarial value of assets (AVA) for this valuation. This method phases in over a five-year period any investment gains or losses (net actual investment return greater or less than the actuarially assumed investment return) that the Fund has had. The AVA used in this current valuation is deferring recognition of various portions of the gains and losses in 2013-2016 that the Fund experienced. The AVA used in this valuation is \$844.0 million. The market value of assets (MVA) is \$870.7 million. The \$26.7 million difference between the MVA and the AVA is the net of the deferred gains and losses over the past four years that will be recognized in the next two biennial actuarial valuations.

The theory behind the AVA method is to allow time for investment gains and losses to partially offset each other and thereby dampen the volatility associated with the progression of the MVA over time. In practice, the timing and amounts of investment gains and losses can result in irregular effects on the AVA in a given year. However, as intended, the pattern of the AVA is smoother over time than the pattern of the MVA, as seen in Exhibit 9.

For the purpose of projecting the amortization period through 2021 we used six scenarios of various assumed annual rates of investment return, net of investment-related expenses, over the 2018-2021 projection period. The projected amortization periods will not be the same as the actual amortization periods from completed future actuarial valuations but are the result of projected future actuarial valuation results based on the completed January 1, 2018 actuarial valuation. These projections show the expected effects over the next four years after the valuation date (1) of the recognition of the portions of the investment gains and losses over the past four years that are deferred as of January 1, 2018 and (2) of investment returns over the next four years different from the 7.75% assumption used in this valuation.

	Scenario					
	1	2	3	4	5	6
Assumed Investment Return for Calendar Year						
2018	7.75%	10.00%	13.00%	9.00%	-5.00%	-5.00%
2019	7.75	10.00	13.00	0.00	10.00	13.00
2020	7.75	10.00	7.75	4.00	10.00	13.00
2021	7.75	10.00	7.75	4.00	10.00	13.00
2022 and later	7.75	7.75	7.75	7.75	7.75	7.75
Amortization Period in Years as of January 1:						
2018 (actual)	30.5	30.5	30.5	30.5	30.5	30.5
2020 (projected)	27.8	25.1	21.9	29.8	41.9	40.0
2022 (projected)	20.5	14.1	10.7	32.7	39.9	29.9

The projected January 1, 2022 valuation in Scenario 1 reveals that instead of decreasing by the expected four years, the amortization period is projected to decrease by ten years. This conclusion is not surprising when you consider that if we had fully recognized the \$26.7 million deferred net gain in this actuarial valuation by using the MVA instead of the AVA, the amortization period would have been 24.5 years (instead of 30.5 years).

We do not know what the investment experience will be for each of the next four calendar years. However, these scenarios show the sensitivity of the UAAL amortization period in the next two biennial actuarial valuations to various gains or losses combined with the current deferred net gain. Variations in experience from the underlying assumptions, other than investment return, will cause the actual amortization periods to be different from the periods shown above. In addition, the future investment experience in each of the next four years could be better or worse than the assumed rates shown. These scenarios present a range of both favorable and adverse scenarios for the next two valuations assuming no changes in benefits.

The primary conclusion from the scenarios is that the Fund's UAAL amortization period is sensitive to the investment experience, even with the AVA methodology that dampens market volatility. The board members should be cautious about their expectations and remember the long-term nature of the Fund.

Participant and Asset Data

We have relied on and based our valuation on the active member data, pensioner data, and asset data provided on behalf of the board of trustees by the Fund's staff. We have not audited the data provided but have reviewed it for reasonableness and consistency relative to the data provided for the January 1, 2016 actuarial valuation. Exhibit 1 is a distribution of the active members by age and service. The compensation used for projecting future benefits for each active member in the valuation was the annualized rate of pay in

December 2017. For projecting contributions, the compensation used for projecting benefits was increased by 10% to reflect the assumed overtime for the year. The total of these assumed compensation amounts for projecting contributions is our assumed covered payroll for the plan year beginning January 1, 2018 and is used in the valuation to determine the UAAL amortization period. The averages of the assumed compensation amounts for projecting contributions for the 2018 plan year are shown in Exhibit 1.

Exhibit 2 contains summary information on the pensioners. The monthly benefit payments are generally based on the amounts paid January 1, 2018. Exhibit 3 is a reconciliation of members and pensioners from January 1, 2016 to January 1, 2018. Exhibit 4 shows a breakdown of the dollar amount of the monthly benefits for retirees and surviving spouses. Exhibit 5 shows a historical comparison of the actuarial accrued liability and the actuarial value of assets.

The summary of assets contained in Exhibit 6 is based on the December 31, 2017 report from the Summit Strategies Group. This exhibit also shows a comparison with the market values and actuarial values of assets as of December 31, 2015 and December 31, 2017. Exhibit 7 contains the statement of changes in assets for 2017 and 2016. Exhibit 8 shows the development of the actuarial value of assets. Exhibit 9 shows a historical comparison between the market value and actuarial value of assets. The market value asset allocation by major asset class as of December 31, 2017 is in a pie chart shown in Exhibit 10.

Assumptions

As a part of each actuarial valuation, we review the actuarial assumptions used in the prior actuarial valuation. As a result of our review, we have selected actuarial assumptions we consider to be reasonable and appropriate estimates of future experience for the Fund for the long-term future. Their selection complies with the applicable actuarial standards of practice. Significant actuarial assumptions used in the valuation are:

1. 7.75% annual investment return net of investment-related expenses;
2. 4% general annual compensation increase plus promotion and longevity increases that vary by service and average 2.77% per year over a 25-year career; and
3. RP-2014 Blue Collar Mortality Tables projected by Scale BB to 2030.

The following actuarial assumption changes, recommended in a separate letter to the Board, have been made, and the new assumptions are compared to those used in the January 1, 2016 valuation by the prior actuary:

1. We changed the investment return assumption from 7.75% net of all expenses to 7.75% net of investment-related expenses. The recognition of administrative expenses is now an assumed percent of payroll (1.15%) based on the average historical relationship in the last three years. It is added to the normal cost. These assumptions are consistent with the requirements of GASB 67 and 68.

2. We developed and recommended new assumptions for the Forward DROP provisions which were added July 1, 2016 and not reflected in the January 1, 2016 actuarial valuation.
 - a. The assumed retirement rates used in the January 1, 2016 actuarial valuation were modified to be rates of entering the Forward DROP or of retiring without entering the Forward DROP. The modified rates reflect the requirements of GASB 67 and 68 for Forward DROP.
 - b. New Forward DROP election rates of those assumed to retire differentiate at a given age between those entering Forward DROP and those retiring without entering Forward DROP.
 - c. We assumed the length of the Forward DROP period will average four years.
3. The prior actuarial firm assumed that 100% of the retirees in pay status were married. Since the Fund obtains the spouse date of birth for those retirees who are married, we changed the assumption to use the marital status indicated by the presence or absence of the spouse date of birth to value the retirement benefit.
4. We changed the assumed city contribution rate from 18.5% to 18.25% based on recent experience.

A summary of all the assumptions and methods used in the valuation is shown in Exhibits 11 and 12. In our opinion, the assumptions used, both in the aggregate and individually, are reasonably related to the experience of the Fund and to reasonable expectations. The assumptions represent a reasonable estimate of anticipated experience of the Fund over the long-term future.

Supporting Exhibits

Exhibit 13 contains definitions of terms used in this actuarial valuation report. Exhibit 14 summarizes the plan provisions of the Present Plan.

Actuarially Determined Contributions by the City

GASB 68 is all about accounting for pensions and did away with the concept of annually required contributions, referred to as the ARC. The GASB made a point of separating their accounting standard for public employee defined benefit plans from the actual funding of those plans. As a result of GASB getting out of the business of providing a funding standard, the Texas Pension Review Board (PRB) recommended in their report to the Texas Legislature at the end of 2014 that actuarial valuation reports for fixed contribution rate plans should disclose contribution levels required for a variety of appropriate amortization periods. Since the preferred range for the UAAL amortization period is 10 to 25 years in the PRB's pension funding guidelines, and since the UAAL amortization period is slightly over the eventual maximum acceptable period of 30 years, we have shown the city

contribution rate that would have been required beginning January 1, 2018 for amortization periods of 26, 24 and 22 years based on this January 1, 2018 actuarial valuation.

UAAL Amortization Period	Actuarially Determined Contribution Rate by the City	Police Contribution Rate	Total Contribution Rate
26 Years	19.82%	18%	37.82%
24 Years	20.73%	18%	38.73%
22 Years	21.82%	18%	39.82%

In 2015, the Legislature passed HB 3310 which amended Sections 801 and 802 of the Government Code. It includes a new sentence in Section 802.101(a) which requires an actuarial valuation to include a recommended rate needed to have an amortization period that does not exceed 30 years. Since the current funding policy results in an amortization period that is only slightly over 30 years, we recommend the continuation of that funding policy.

Variability in Future Actuarial Measurement

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 current economic or demographic assumptions;
- Increases or decreases expected as part of the natural operation of the methodology used for these measurements;
- Changes in economic or demographic assumptions; and
- Changes in plan provisions.

Analysis of the potential range of such future measurements resulting from the possible sources of measurement variability is typically outside the scope of an actuarial valuation. However, we provided projected amortization periods for the next two biennial actuarial valuations under six scenarios. Additional or other sensitivity analysis could be performed in a subsequent report if desired by the board of trustees.

Respectfully submitted,
RUDD AND WISDOM, INC.

Mark R. Fenlaw

Mark R. Fenlaw
Fellow, Society of Actuaries
Member, American Academy of Actuaries

Rebecca B. Morris

Rebecca B. Morris
Associate, Society of Actuaries
Member, American Academy of Actuaries

Section II
Key Results of the Actuarial Valuation

	<u>January 1, 2016¹</u>	<u>January 1, 2018</u>
1. Actuarial present value of future benefits		
a. Those now receiving benefits or former members entitled to receive benefits	N/A	\$ 678,976,703
b. Police who have entered Forward DROP ²	N/A	160,993,369
c. Police not in Forward DROP	N/A	<u>386,248,291</u>
d. Total	\$ 1,112,978,503	\$1,226,218,363
2. Actuarial present value of future normal cost contributions	\$ 160,307,762	\$ 148,314,120
3. Actuarial accrued liability (Item 1d – Item 2)	\$ 952,670,741	\$1,077,904,243
4. Actuarial value of assets	\$ 772,732,458	\$ 843,966,894
5. Unfunded actuarial accrued liability (UAAL) (Item 3 - Item 4)	\$ 179,938,283	\$ 233,937,349
6. Contributions (percent of pay)		
a. Police	13.89%	18.00%
b. City of El Paso	<u>18.50%</u>	<u>18.25%</u>
c. Total	32.39%	36.25%
7. Normal cost (percent of payroll)	23.05%	21.23%
8. Percent of payroll available to amortize the UAAL (Item 6c - Item 7)	9.34%	15.02%
9. Annualized covered payroll	\$ 76,793,753	\$ 82,226,724
10. Years to amortize the UAAL ³	33 years	30.5 years
11. Funded ratio (Item 4 ÷ Item 3) ⁴	81.1%	78.3%

¹ All items are from the January 1, 2016 actuarial valuation by the prior actuary based on the plan provisions in effect at that time. The breakdown of Item 1d was not provided.

² The forward DROP account balances are excluded from the Fund's net assets in the audited financial report; so they are also excluded from the actuarial present value of future benefits.

³ The amortization period is actuarially determined using the normal cost of the Second-Tier Plan members for all members. For the January 1, 2018 actuarial valuation, the determination reflects the phasing into the ultimate member contribution rate of 18%.

⁴ The funded ratio is not appropriate for assessing either the need for or the amount of future contributions or the adequacy of the assumed contribution rates. Using the market value of assets instead of the actuarial value of assets for Item 11 would have resulted in funded ratios of 77.7% as of January 1, 2016 and 80.8% as of January 1, 2018. **The best indicator of the fund's health is Item 10.**

Exhibit 1
Distribution of Police¹ by Age and Service on January 1, 2018
with Average Annual Compensation

Years of Service	Age									Total	Average Compensation
	Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60 or Over		
0	14	29	11	5	2	1	0	0	0	62	\$47,177
1	14	34	16	8	4	1	0	0	0	77	49,679
2	7	12	13	5	2	1	0	0	0	40	51,311
3	0	18	11	4	1	0	0	1	0	35	54,218
4	0	24	17	6	3	2	0	0	0	52	57,413
5	0	3	21	4	1	0	0	0	0	29	62,511
6	0	4	13	4	3	0	1	0	0	25	63,072
7	0	3	9	3	3	2	0	0	0	20	67,541
8	0	0	0	0	2	1	0	0	0	3	81,742
9	0	0	23	20	10	6	4	1	0	64	73,789
10	0	0	2	12	9	7	0	1	0	31	76,628
11	0	0	10	28	17	4	3	3	0	65	78,189
12	0	0	3	14	7	8	3	2	0	37	82,685
13	0	0	0	19	21	6	2	1	0	49	82,572
14	0	0	0	8	6	4	1	1	0	20	82,479
15	0	0	0	9	14	9	2	4	1	39	83,587
16	0	0	0	4	13	6	6	6	0	35	83,838
17	0	0	0	6	34	21	8	4	0	73	84,938
18	0	0	0	0	13	10	5	2	0	30	84,513
19	0	0	0	0	25	23	8	8	1	65	86,940
20-24	0	0	0	0	12	33	8	2	3	58	90,828
25-29	0	0	0	0	0	3	5	1	0	9	102,929
30-34	0	0	0	0	0	0	0	0	0	0	0
35+	0	0	0	0	0	0	0	0	0	0	0
Totals	35	127	149	159	202	148	56	37	5	918	\$72,312

Average Compensation	\$48,229	\$61,112	\$80,591	\$86,958	\$85,750
	\$51,912	\$73,458	\$85,103	\$84,941	\$72,312

Average age 38.8
 Average years of service 10.4
 Average age at hire 28.4

¹ This distribution is of the members who have not entered the Forward DROP.

Exhibit 2
Summary of Pensioner Data

Type of Benefit	Pensioner Data Used in January 1, 2018 Valuation	
	Number of Recipients	Total Monthly Benefit Payments
Service Retirement	861 ¹	\$ 3,363,989
Disability Retirement	37	94,869
Vested Terminated (Deferred)	15	26,384
Surviving Spouse	136	371,534
Surviving Child	<u>14</u>	<u>13,446</u>
Total	1,063	\$ 3,870,222

Type of Benefit	Comparison of Pensioner Count by Type as of The Prior and Current Actuarial Valuations			
	January 1, 2016	New	Ceased	January 1, 2018
Service Retirement	829 ²	+57	-25	861 ¹
Disability Retirement	34	+3	-0	37
Vested Terminated (Deferred)	16	+4	-5	15
Surviving Spouse	130	+17	-11	136
Surviving Child	<u>14</u>	<u>+2</u>	<u>-2</u>	<u>14</u>
Total	1,023	+83	-43	1,063

¹ Includes 74 alternate payees receiving benefits according to the terms of a Qualified Domestic Relations Order (QDRO).

² Includes 75 alternate payees receiving benefits according to the terms of a QDRO.

Exhibit 3
Police and Pensioner Reconciliation

	Active Members	Current Payment Status	Vested Terminated Members	Total
1. As of January 1, 2016 ⁴	1,002	1,007 ¹	16	2,025
2. Change of status				
a. retirement	(51)	53	(2)	0
b. disability	(3)	3	0	0
c. death	(1)	(38)	0	(39)
d. survivor payment begins	0	19	0	19
e. withdrawal	(32)	0	(2)	(34)
f. vested termination	(4)	0	4	0
g. QDRO alternate payee	0	3	0	3
h. return to work	1	0	(1)	0
i. correction	<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>
j. net changes	(90)	41	(1)	(50)
3. New members	<u>179</u>	<u>0</u>	<u>0</u>	<u>179</u>
4. As of January 1, 2018	1,091 ^{3,5}	1,048 ²	15	2,154

¹ Includes 75 alternate payees receiving benefits according to the terms of a Qualified Domestic Relations Order (QDRO).

² Includes 74 alternate payees receiving benefits according to the terms of a QDRO.

³ Includes 173 who have entered the Forward DROP.

⁴ These counts are based on census data provided by the Fund's staff. They are somewhat different than the counts shown in the prior valuation report, primarily because we included the alternate payees in the count of those in current payment status. Adjusting for the alternate payees, the counts above have 11 more in payment status and three fewer active members.

⁵ Includes 653 Base Plan members and 438 Tier 2 Plan members.

Exhibit 4

Breakdown of Monthly Benefit Payment Amounts as of January 1, 2018

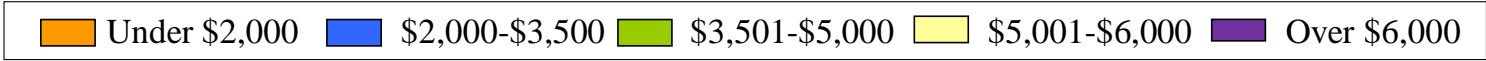
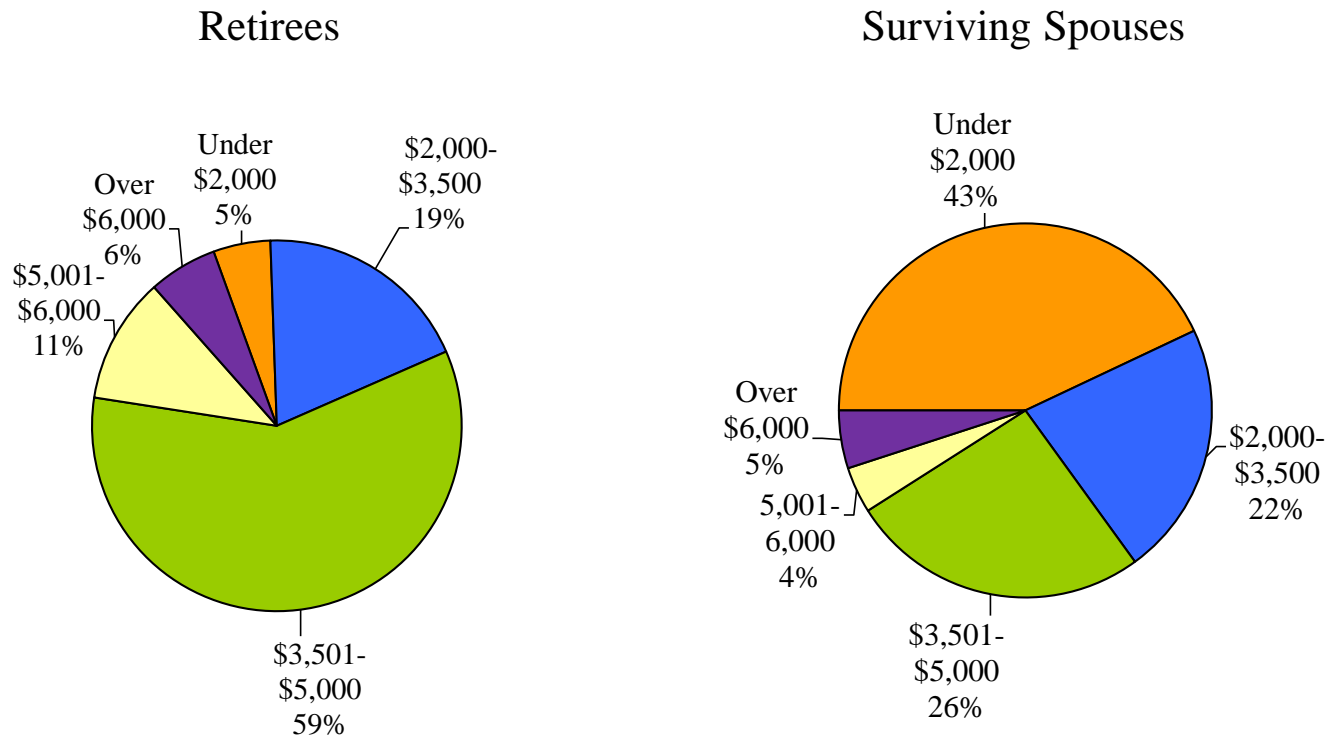


Exhibit 5

**Historical Comparison of Actuarial Accrued Liability and Actuarial Value of Assets
(Present Plan Valuations as of January 1)**

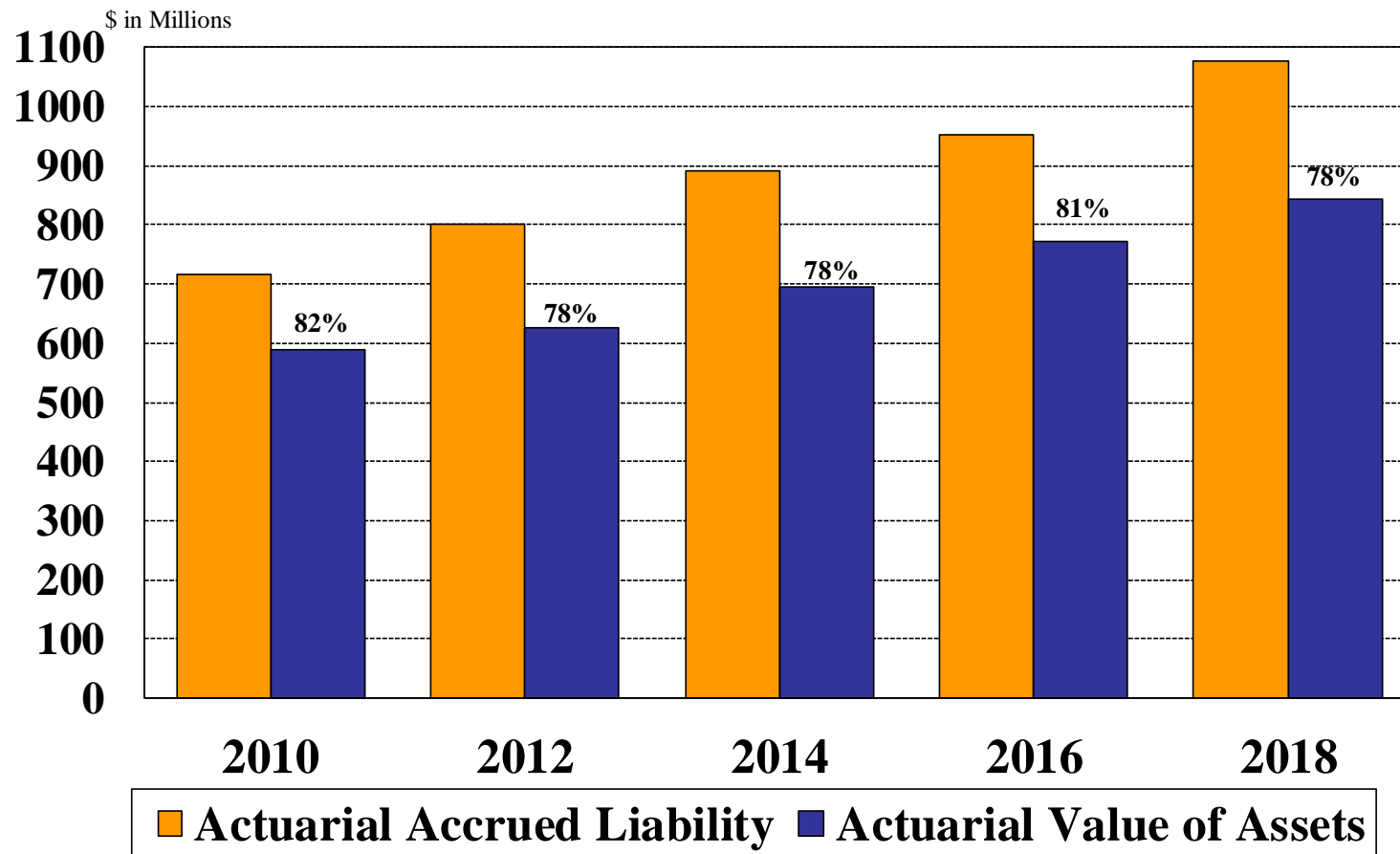


Exhibit 6
Summary of Asset Data

Asset Type	Market Value Allocation as a Percent of Total Assets as of December 31, 2017
Equities	
U.S. Large Cap	21.5%
U.S. Small Cap	8.4
International Developed	25.3
Emerging Markets	<u>5.6</u>
Total	60.8
Alternatives	
Real Estate	8.5
Private Equity	<u>6.4</u>
Total	14.9
Fixed Income	
U.S. Core - Active	11.7
U.S. Core - Passive	7.0
Bank Loans	<u>4.8</u>
Total	23.5
Cash Equivalents	<u>0.8</u>
Grand Total	100.0% ¹

¹ This allocation is from the December 31, 2017 performance review and report from the Summit Strategies Group.

Comparison of Asset Values as of the Prior and Current Actuarial Valuation Dates		
	<u>December 31, 2015</u>	<u>December 31, 2017</u>
Market Value	\$740,006,100	\$ 870,658,507
Actuarial Value	\$772,732,458	\$ 843,966,894 ²
Actuarial Value as a Percent of Market Value	104.4%	96.9%

² The average annual rate of return on the actuarial value of assets for the two years 2016 and 2017 was 7.82%.

Exhibit 7

**Statement of Changes in Audited Assets
for the Years Ended December 31, 2017 and 2016**

	<u>12/31/2017</u>	<u>12/31/2016</u>
Additions		
1. Contributions		
a. Employer	\$ 15,261,366	\$ 14,486,842
b. Employees	<u>11,703,802</u>	<u>11,081,648</u>
c. Total	\$ 26,965,168	\$ 25,568,490
2. Investment Income		
a. Interest, dividends, other	\$ 18,875,635	\$ 12,269,345
b. Net appreciation in fair value	<u>114,159,343</u>	<u>41,720,031</u>
c. Total	\$133,034,978	\$ 53,989,376
3. Other Additions	<u>0</u>	<u>0</u>
Total Additions	\$160,000,146	\$ 79,557,866
Deductions		
4. Benefit Payments	\$ 54,415,579	\$ 46,549,983
5. Expenses		
a. Investment-related	\$ 3,049,541	\$ 3,055,984
b. General administrative	<u>974,083</u>	<u>860,435</u>
c. Total	\$ 4,023,624	\$ 3,916,419
Total Deductions	\$ 58,439,203	\$ 50,466,402
Net Increase in Assets	\$101,560,943	\$ 29,091,464
Market Value of Assets (Plan Net Position) ¹		
Beginning of Year	\$769,097,564	\$740,006,100
End of Year	\$870,658,507	\$769,097,564
Rate of Return		
Net of Investment-Related Expenses	17.22%	6.99%

¹ The Forward DROP account balances are excluded from the Fund's net assets in the audited financial report.

Exhibit 8
Development of Actuarial Value of Assets

Calculation of Actuarial Investment Gain/(Loss) Based on Market Value for Plan Years Ending December 31				
	2017	2016	2015	2014
1. Market Value of Assets as of beginning of year	\$769,097,564	\$740,006,100	\$753,637,428	\$736,491,380
2. Police Contributions	11,703,802	11,081,648	11,347,467	10,898,003
3. City Contributions	15,261,366	14,486,842	14,754,441	14,776,141
4. Benefit Payments and Administrative Expenses ¹	(55,389,662)	(47,410,418)	(42,402,193)	(39,524,961)
5. Expected Investment Return ²	<u>58,503,612</u>	<u>56,504,098</u>	<u>57,775,265</u>	<u>56,541,363</u>
6. Expected Market Value of Assets as of end of year	799,176,682	774,668,270	795,112,408	779,181,926
7. Actual Market Value of Assets as of end of year	<u>870,658,507</u>	<u>769,097,564</u>	<u>740,006,100</u>	<u>753,637,428</u>
8. Actuarial Investment Gain/(Loss)	71,481,825	(5,570,706)	(55,106,308)	(25,544,498)
9. Market Value Rate of Return Net of Expenses	17.22%	6.99%	0.36%	4.25%
10. Rate of Actuarial Investment Gain/(Loss)	9.47%	(0.76)%	(7.39)%	(3.50)%

¹ Administrative expenses are included for all years to retroactively make the investment return assumption net of investment-related expenses.

² Assuming uniform distribution of contributions and payments during the plan year; investment return assumed to be 7.75% per year.

Plan Year	Investment Gain/(Loss)	Deferral Percentage	Deferred Gain/(Loss) as of 12/31/2017
2017	\$ 71,481,825	80%	\$ 57,185,460
2016	(5,570,706)	60%	(3,342,424)
2015	(55,106,308)	40%	(22,042,523)
2014	(25,544,498)	20%	<u>(5,108,900)</u>
Total			\$ 26,691,613

Actuarial Value of Assets as of December 31, 2017	
11. Market Value of Assets as of December 31, 2017	\$ 870,658,507
12. Deferred Gain/(Loss) to be Recognized in Future	<u>26,691,613</u>
13. Actuarial Value as of December 31, 2017 (Item 12 – Item 13)	\$ 843,966,894
14. Item 13 ÷ Item 11	96.9%

Exhibit 9

Historical Comparison of Market and Actuarial Value of Assets
(Valuation as of January 1)

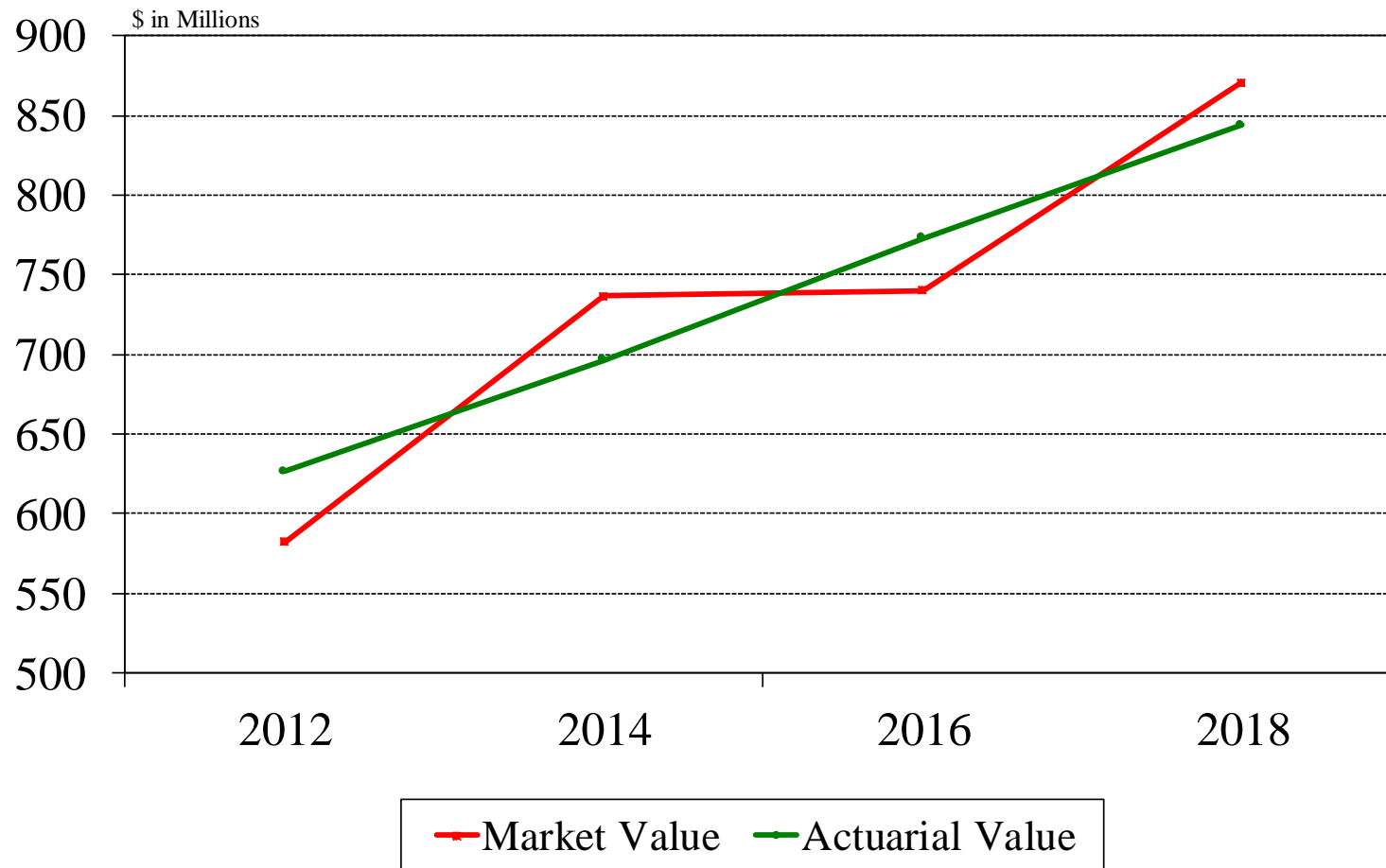


Exhibit 10

Market Value Asset Allocation as of the Current Actuarial Valuation Date

December 31, 2017

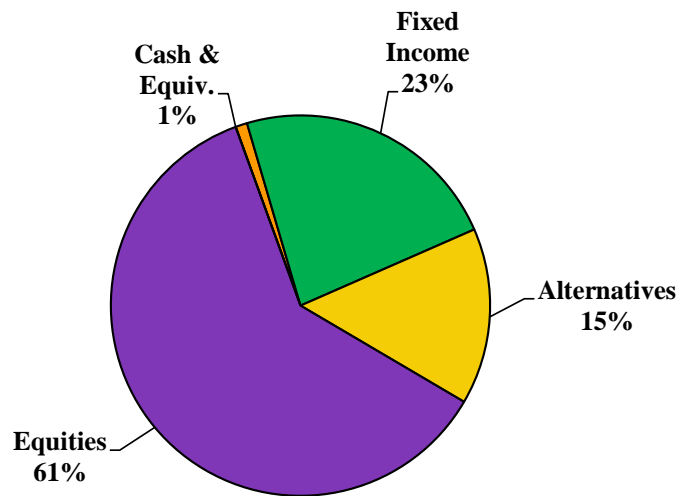


Exhibit 11

Actuarial Methods and Assumptions

A. Actuarial Methods

1. Actuarial Cost Method

The Entry Age Actuarial Cost Method is an actuarial cost method in which the actuarial present value of projected benefits of each active member included in the valuation is allocated as a level percentage of compensation between age at hire and assumed termination. Each active member's normal cost is the current annual contribution in a series of annual contributions which, if made throughout the member's total period of employment, would fund his expected benefits. Each member's normal cost is calculated to be a constant percentage of his expected compensation in each year of employment. The normal cost for the Fund is the sum of the normal costs for each active member for the year following the valuation date, recognizing whether a member is covered by the base plan or the second-tier plan. The normal cost as a percent of payroll reflects that contributions are made biweekly.

The Fund's actuarial accrued liability is the excess of the actuarial present value of projected benefits over the actuarial present value of all future remaining normal cost contributions. (The present value of projected benefits and of future normal cost contributions for each member reflect whether the member is covered by the base plan or the second-tier plan.) The unfunded actuarial accrued liability (UAAL) is the amount by which the actuarial accrued liability exceeds the actuarial value of assets. The UAAL is recalculated each time a valuation is performed. Experience gains and losses, which represent deviations of the UAAL from its expected value based on the prior valuation, are determined at each valuation and are amortized as part of the newly calculated UAAL.

2. Amortization Method

The UAAL is assumed to be amortized with level percentage of payroll contributions (total assumed contribution rate less normal cost contribution rate) based on assumed payroll growth of 3% per year. The actuarial determination of the amortization period reflects that contributions are made biweekly. In addition, the determination uses the normal cost contribution rate of the Second-Tier Plan members (those hired after June 30, 2007) for all members and the UAAL based on the present value of future normal costs with the same normal cost contribution rate.

3. Actuarial Value of Assets Method

All assets are valued at market value with an adjustment made to uniformly spread actuarial gains or losses (as measured by actual market value investment return vs. expected market value investment return) over a five-year period. The 7.75% investment return assumption net of investment-related expenses used in this actuarial valuation was made retroactive for determining the actuarial gains or losses.

B. Actuarial Assumptions

As a part of each actuarial valuation, we review the actuarial assumptions used in the prior actuarial valuation. The investment return assumption is reviewed using the building block approach that includes several asset allocations, assumed real rates of return for each asset class, an assumed rate of investment-related expenses, and an assumed rate of inflation, with all assumptions for the long-term future. Our economic assumptions are influenced both by long-term historical experience and by future expectations of investment consultants and economists, but we select and recommend the economic assumptions as a part of each actuarial valuation.

We relied on the demographic assumptions recommended by the prior actuarial firm as a result of an experience study completed in 2016, except for the retirement rates as explained in our letter to the board dated August 16, 2018. We are guided in our review and selection of assumptions by the relevant actuarial standards of practice. As a result of our review, we have selected actuarial assumptions we consider to be reasonable and appropriate estimates of future experience for the Fund for the long-term future.

1. Investment Return

7.75% per year net of investment-related expenses.

2. Inflation

3% per year included in compensation increases and investment return assumptions.

3. Mortality Rates

RP-2014 Mortality Tables projected to 2030 by Scale BB for males and for females (sex distinct) for both pre-retirement and post-retirement mortality, except for disabled pensioners for which we use the RP-2014 Tables for Disabled Lives.

4. Compensation Increases

General increases of 4% per year plus promotion and longevity increases that vary by service and average 2.77% per year over a 25-year career. See Exhibit 12B.

5. Retirement Rates

See Exhibit 12A for the percentage of members eligible to retire assumed either to retire without Forward DROP or to enter the Forward DROP.

6. Forward DROP Election

See Exhibit 12A for the percentage of members assumed to retire who elect to enter the Forward DROP. The DROP period is assumed to average four years.

7. Withdrawal Rates

See Exhibit 12B.

8. Disability Rates

See Exhibit 12B.

9. Percent Married

100% of the active members are assumed to be married at retirement, disability, or death while employed, with male members having a spouse three years younger and female members having a spouse three years older. Actual marital status and spouse date of birth are used for current retirees.

10. Surviving Child's Death Benefit

None are assumed as a result of future deaths.

11. Members' Contribution Rate

18% of covered pay.

12. City's Contribution Rate

18.25% of covered pay for at least as long as the period required to amortize the UAAL.

13. Covered Payroll for First Year Following Valuation Date

The annualized rate of pay in December 2017 used for projecting benefits is increased 10% to reflect the assumed overtime for the year.

14. Administrative Expenses

The expenses paid by Fund assets for other than investment-related expenses are assumed to be 1.15% of payroll. The normal cost rate as a percent of payroll is assumed to be 1.15% of payroll higher to reflect these expenses.

Exhibit 12A

**Rates of Retirement and Forward DROP Election
for Both the Base Plan and the Second-Tier Plan**

Age	Assumed Rate of Retirement ¹	Division of Those Assumed to Retire	
		Election to Enter Forward DROP	Retirement without Forward DROP
Under 42	0%	0%	100%
42	5	0	100
43	10	0	100
44	10	0	100
45	18	100	0
46	23	100	0
47	23	100	0
48	19	100	0
49	19	100	0
50	25	100	0
51	25	100	0
52	25	100	0
53	25	100	0
54	15	0	100
55	15	0	100
56	15	0	100
57	20	0	100
58	20	0	100
59	20	0	100
60	15	0	100
61	10	0	100
62	10	0	100
63	10	0	100
64	10	0	100
65	10	0	100
66	25	0	100
67	25	0	100
68	25	0	100
69	25	0	100
70	100	0	100

¹ Percentage of members eligible to retire assumed either to retire without Forward DROP or to enter the Forward DROP.

Exhibit 12B
Disability and Withdrawal Rates per 1,000 Active Members
Compensation Increases by Years of Service

Attained Age	Disability and Withdrawal Rates		Compensation Increases	
	Disability	Withdrawal	Years of Service	Increase Percent
20	1.0	50	1	12.0%
21	1.0	50	2	12.0
22	1.0	50	3	11.0
23	1.0	50	4	10.0
24	1.0	45	5	10.0
25	1.0	45	6	10.0
26	1.0	40	7	10.0
27	1.0	40	8	9.0
28	1.0	40	9	8.0
29	1.0	35	10	7.0
30	1.0	35	11	7.0
31	1.0	35	12	7.0
32	1.0	30	13	7.0
33	1.0	30	14	5.0
34	1.0	30	15	5.0
35	1.0	15	16	5.0
36	1.0	15	17	5.0
37	3.0	15	18	4.5
38	3.0	15	19	4.5
39	3.0	15	20	4.0
40	3.0	15	21	4.0
41	3.0	15	22	4.0
42	3.0	15	23	4.0
43	3.0	10	24	4.0
44	3.5	10	25	4.0
45	3.5	10	26	4.0
46	3.5	10	27	4.0
47	3.5	10	28	4.0
48	3.5	10	29	4.0
49	3.5	10	30	4.0
50	3.5	10	31	4.0
51	3.5	10	32	4.0
52	3.5	10	33	4.0
53	3.5	10	34	4.0
54	3.5	10	35	4.0
55	3.5	10	36	4.0
56	3.5	10	37	4.0
57	3.5	10	38	4.0
58	3.5	10	39	4.0
59	3.5	10	40+	4.0
60+	0.0	10		

Exhibit 13
Definitions

1. Actuarial Accrued Liability That portion, as determined by the particular actuarial cost method used, of the Actuarial Present Value of future pension plan benefits as of the Valuation Date that is not provided for by the Actuarial Present Value of future Normal Costs.
2. Actuarial Assumptions Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, termination, disablement and retirement; changes in compensation; rates of investment earnings and asset appreciation; and other relevant items.
3. Actuarially Equivalent Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.
4. Actuarial Gain (Loss) A measure of the difference between actual experience and that expected based on the Actuarial Assumptions during the period between two Actuarial Valuation dates, as determined in accordance with the particular actuarial cost method used.
5. Actuarial Present Value The value of an amount or series of amounts payable or receivable at various times, determined as of a given date (the Valuation Date) by the application of the Actuarial Assumptions.
6. Actuarial Valuation The determination, as of a Valuation Date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets and related Actuarial Present Values for a pension plan.
7. Actuarial Value of Assets The value of cash, investments and other property belonging to a pension plan, as determined by a method and used by the actuary for the purpose of an Actuarial Valuation.

8. Entry Age Actuarial Cost Method
An actuarial cost method under which the Actuarial Present Value of the Projected Benefits of each individual included in the Actuarial Valuation is allocated as a level percentage of earnings between entry age and assumed termination. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a Valuation Date by the Actuarial Present Value of future Normal Costs is called the Actuarial Accrued Liability. Under this method, Actuarial Gains (Losses), as they occur, reduce (increase) the Unfunded Actuarial Accrued Liability.
9. Plan Year
A 12-month period beginning January 1 and ending December 31.
10. Normal Cost
That portion of the Actuarial Present Value of pension plan benefits that is allocated to a valuation year by the actuarial cost method.
11. Projected Benefits
Those pension plan benefit amounts that are expected to be paid at various future times according to the Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future qualified service.
12. Overfunded Actuarial Accrued Liability
The excess, if any, of the Actuarial Value of Assets over the Actuarial Accrued Liability.
13. Unfunded Actuarial Accrued Liability
The excess, if any, of the Actuarial Accrued Liability over the Actuarial Value of Assets.
14. Valuation Date
The date upon which the Normal Cost, Actuarial Accrued Liability and Actuarial Value of Assets are determined. Generally, the Valuation Date will coincide with the end of a Plan Year.
15. Years to Amortize the Unfunded Actuarial Accrued Liability
The period is determined in each Actuarial Valuation as the number of years, beginning with the Valuation Date, to amortize the Unfunded Actuarial Accrued Liability with a level percent of payroll that is the difference between the expected total contribution rate and the Normal Cost contribution rate.

Exhibit 14

Summary of Present Plan

Police in the El Paso Police Department are covered by the Fund which provides service retirement, death and disability benefits. Those hired prior to July 1, 2007 are in the Base Plan, while those hired on or after July 1, 2007 are in the Second-Tier Plan.

Retirement

Base Plan – Police may retire with at least 20 years of service and the attainment of age 45 or more. The monthly benefit is equal to 2.75% of the final 36-month average wages, excluding overtime, for each year of service, not to exceed 28 years. If a member terminates with at least 20 years of service before age 45, the member may elect an early retirement benefit which is actuarially reduced based on the years and months below age 45. If a member terminates with at least 10 years of service but less than 20, the member is entitled to a retirement benefit commencing at age 50, or their age at termination if older. The normal form of the monthly benefit in all three of these types of retirement is joint and 100% to a surviving spouse. A 3% cost-of-living adjustment (COLA) is provided upon the earlier of the retiree having attained age 60 or the second anniversary of the pension commencement date and on each January 1st thereafter.

A retiring member who is age 50 or more with more than 20½ years of service may elect until June 30, 2019, the Back Deferred Retirement Option Program (Back DROP) in which he receives a monthly benefit and a lump sum benefit. He elects a benefit computation date a minimum of six months and a maximum of 36 months prior to his retirement date, as long as he has at least 20 years of service for his benefit computation. The Back DROP monthly benefit is based on the service, not to exceed 28 years minus the DROP period, and final 36-month average wages as of the benefit computation date. The lump sum is the monthly benefit multiplied by the number of months between the benefit computation date and the retirement date.

Effective July 1, 2016, a member who attains age 45 or more with at least 20 years of service is eligible to participate in the Forward DROP by an irrevocable written election. His benefit is calculated based on the service and final 36-month average wages as of the date participation in the Forward DROP begins. Upon retirement, he receives the lump sum of the total of the monthly retirement benefits between the benefit computation date and the retirement date as if they had commenced when the Forward DROP began, and he begins receiving the monthly benefit.

Second-Tier Plan – Police may retire with at least 20 years of service and the attainment of age 45. The monthly benefit is equal to 2.5% of the final 36-month average wages, excluding overtime, for each year of service. If a member terminates with at least 20 years of service before age 45, the member may elect an early retirement benefit which is actuarially reduced based on the years and months below age 45. If a member

terminates with at least 10 years of service but less than 20, the member is entitled to a retirement benefit commencing at age 50, or their age at termination if older. The normal form of the monthly benefit is joint and 75% to a surviving spouse. COLAs are not provided.

A member who attains age 45 or more with at least 20 years of service is eligible to participate in the Forward DROP by an irrevocable written election. His benefit is calculated based on the service and final 36-month average wages as of the date participation in the Forward DROP begins. Upon retirement, he receives the lump sum of the total of the monthly retirement benefits between the benefit computation date and the retirement date, and he begins receiving the monthly benefit.

Death

Base Plan – Upon the death of a retiree with 20 or more years of service, the death benefit for a qualified spouse is 100% of the pension. If the deceased retiree has less than 20 years of service, the death benefit for a qualified spouse is two-thirds of the pension but not to exceed one-third of the retiree's final average wages.

Upon the death of a member with 20 or more years of service, the death benefit for a qualified spouse is the greater of 50% of the member's final average wages and 100% of the benefit calculated as if the member had retired. If the deceased member has less than 20 years of service, the death benefit for a qualified spouse is the greater of 50% of the member's final average wages or the benefit calculated as if the member were eligible for early retirement based on actual service and reduced for age.

Upon the death of a former member with at least 10 but less than 20 years of service, the death benefit for a qualified spouse is two-thirds of the deferred pension benefit, payable when the former member would have attained age 50, but not to exceed one-third of the member's final average wages.

Second-Tier Plan – Upon the death of a retiree with 20 or more years of service, the death benefit for a qualified spouse is 75% of the pension. If the deceased retiree has less than 20 years of service, the death benefit for a qualified spouse is two-thirds of the pension, but not to exceed one-third of the retiree's final average wages.

Upon the death of a member with 20 or more years of service and age 45 or above, the death benefit for a qualified spouse is the greater of 50% of the member's final average wages and 75% of the amount calculated as if the member had retired. If the deceased member has less than 20 years of service, the death benefit for a qualified spouse is the greater of 50% of the member's final average wages on the benefit calculated as if the member were eligible for early retirement based on actual service and reduced for age.

Upon the death of a former member with at least 10 but less than 20 years of service, the death benefit for a qualified spouse is two-thirds of the deferred pension benefit, payable when the former member would have attained age 50, but not to exceed one-third of the member's final average wages.

Base Plan and Second-Tier Plan

Disability – If a member becomes permanently disabled, the benefit is the greater of 50% of the member's final average wages or the benefit calculated as if the member were eligible for an unreduced retirement benefit based on actual service.

Refund – A former member with less than five years of vesting service shall not be entitled to a pension or a refund of amounts contributed by the member or by the city. A former member with five or more years of vesting service may be refunded the amount contributed by the member, without interest, and shall forfeit all years of credited service.

Member Contributions – Each member of the police department shall contribute each pay period 13.89% of total wages through August 31, 2018; 14.712% of total wages from September 1, 2018 through August 31, 2019; 15.534% of total wages from September 1, 2019 through August 31, 2020; 16.356% of total wages from September 1, 2020 through August 31, 2021; 17.178% of total wages from September 1, 2021 through August 31, 2022; and 18% of total wages beginning September 1, 2022.

City Contributions – The city shall contribute 18% of total wages each pay period for all members according to a city ordinance and an additional amount as a percentage of total wages of members hired above age 29 according to another city ordinance.