Tyler Firefighters' Relief and Retirement Fund

Actuarial Valuation as of December 31, 2015

August 23, 2016

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, A.S.A.
Christopher S. Johnson, F.S.A.
Oliver B. Kiel, F.S.A.
Robert M. May, F.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, A.S.A.
Raymond W. Tilotta
Ronald W. Tobleman, F.S.A.
David G. Wilkes, F.S.A.

August 23, 2016

Board of Trustees
Tyler Firefighters' Relief
and Retirement Fund
1718 West Houston
Tyler, Texas 75702

Members of the Board of Trustees:

At the request of the Board of Trustees of the Tyler Firefighters' Relief and Retirement Fund, we have prepared this report of the results of the actuarial valuation of the fund as of December 31, 2015. This valuation was prepared to determine whether the fund has an adequate contribution arrangement.

In a separate report dated June 20, 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, 2015. Similarly, we will provide a separate report later in the fall of 2016 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, 2016. GASB 68 prescribes the city's accounting for your 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

Mark R. Fenlaw, F.S.A.

Rebecca B. Morris

Rebecca B. Morris, A.S.A.

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9500 Arboretum Blvd., Suite 200
Austin, Texas 78759
Phone: (512) 346-1590
Fax: (512) 345-7437
www.ruddwisdom.com
Post Office Box 204209
Austin, Texas 78720-4209

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Section I

Valuation Summary

An actuarial valuation of the assets and liabilities of the Tyler Firefighters' Relief and Retirement Fund as of December 31, 2015 has been completed. The valuation was based on the Present Plan (plan effective July 1, 2011) and the provisions of the Texas Local Fire Fighters' Retirement Act (TLFFRA) which were in effect on December 31, 2015. Section II shows the key results of the actuarial valuation as of December 31, 2015 and discusses the significant changes since the prior valuation that we prepared as of December 31, 2013.

This valuation reflects an actuarially assumed total contribution rate of 33.0%, comprised of 13.5% by the firefighters and 19.5% by the city. The total contribution rate of 33.0% exceeds the normal cost rate of 20.53%, leaving 12.47% available to amortize the unfunded actuarial accrued liability (UAAL) of $20,639,623. Assuming that the total payroll increases at the rate of 3.5% per year in the future, the contributions in excess of the normal cost **will amortize the UAAL in 21.6 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 Pension Review Board guidelines for an actuarially adequate contribution arrangement, our professional judgment, and the actuarial assumptions and methods used in making this valuation, we consider periods of 15 years to 25 years to be preferable and 40 years to be the maximum acceptable period. 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. Section III presents considerations for future benefit improvements.**

Projected Actuarial Valuation Results

In addition to completing this actuarial valuation, we estimated the amortization periods as of December 31, 2017 and as of December 31, 2019 by making projections from the December 31, 2015 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 and 2015 and gains in 2012 and 2013) that have been only partially recognized as of December 31, 2015. As shown in Exhibit 6, 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

2012-2015 that the fund experienced. The AVA used in this valuation is $64,892,871. The market value of assets (MVA) is $59,949,406. The $4,943,465 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 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 market value of assets, as seen in Exhibit 7.

For the purpose of projecting the amortization period through 2019 we used six scenarios of various assumed annual rates of investment return, net of investment-related expenses, over the 2016-2019 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 December 31, 2015 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 December 31, 2015, and (2) of investment returns over the next four years different from the 7.65% assumption used in this valuation.

	Scenario					
	1	2	3	4	5	6
Assumed Investment Return for Calendar Year						
2016	7.65%	12.00%	12.00%	0.00%	0.00%	4.00%
2017	7.65	7.65	12.00	7.65	12.00	12.00
2018	7.65	7.65	7.65	7.65	12.00	12.00
2019	7.65	7.65	7.65	7.65	12.00	12.00
2020 and later	7.65	7.65	7.65	7.65	7.65	7.65
Amortization Period in Years as of December 31:						
2015 (actual)	21.6	21.6	21.6	21.6	21.6	21.6
2017 (projected)	22.9	21.0	20.1	27.2	25.7	23.7
2019 (projected)	27.5	23.0	20.0	37.8	29.3	24.7

The projected future December 31, 2017 valuation in Scenario 1 reveals that instead of decreasing by the expected two years from 21.6 years to 19.6 years, the amortization period is projected to increase to 22.9 years. The increase two years after that is even more dramatic to 27.5 years. These increases are due primarily to the significant deferred losses from 2014 and 2015 that will be recognized as of December 31, 2017 and 2019. The primary conclusion from Scenario 1, along with Scenarios 2 and 3, is that unless

there are some investment gains in 2016 and 2017 from returns greater than 7.65%, the deferred net loss as of December 31, 2015 will significantly increase the amortization period in the next two valuations. This conclusion is not surprising when you consider that if we had fully recognized the $5 million deferred net loss in this actuarial valuation by using the MVA instead of the AVA, the amortization period would have been 31.5 years.

One of the characteristics of a well-funded plan like yours is that the amortization period is very sensitive to investment gains and losses. For example, Scenario 4 is the same as Scenario 1 except for a projected rate of return of 0% for calendar year 2016. The one adverse year, without any investment gains or losses in the next three years, would result in a projected amortization period of 37.8 years as of December 31, 2019, which is 10.3 years greater than the projected amortization period of 27.5 years in Scenario 1.

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 the current deferred net loss, requiring solid gains with a 12% rate of return in 2016 and 2017 to offset the effect of the deferred losses (Scenario 3). 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 plausible scenarios for the next two valuations assuming no changes in benefits.

The primary conclusion from the scenarios is that since the fund has a deferred net loss in the AVA that will hinder the amortization of the UAAL, the board and the actuary should be cautious in considering benefit improvements in the future due to the sensitivity of the amortization period to investment losses similar to the ones the fund experienced in 2014 and 2015. We address this subject in more detail in Section III.

Participant and Asset Data

We have relied on and based our valuation on the active firefighter data, pensioner data, and asset data provided on behalf of the board of trustees by Paula Henderson, who provides administrative services for the board of trustees. We have not audited the data provided but have reviewed it for reasonableness and consistency relative to the data provided for the December 31, 2013 actuarial valuation. Exhibit 1 is a distribution of the active firefighters by age and service. The salaries used for projecting future contributions and benefits in the valuation were based on the actual pay for the 2015 calendar year, adjusted to fully reflect the 2% pay increase effective in October 2015. The total of these salaries is our assumed annualized covered payroll for the plan year beginning January 1, 2016 and is used in the valuation to determine the UAAL

amortization period. The averages of the assumed salaries for the 2016 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 December 31, 2015. Exhibit 2A is a reconciliation of firefighters and pensioners from December 31, 2013 to December 31, 2015. Exhibit 3 shows a breakdown of the dollar amount of the monthly benefits for retirees and surviving spouses. Exhibit 4 shows a historical comparison of the actuarial accrued liability and the actuarial value of assets.

The summary of assets contained in Exhibit 5 is based on the December 31, 2015 market value of assets contained in the information received from the board. This exhibit also shows a comparison with the market values and actuarial values of assets as of December 31, 2013 and December 31, 2015. Exhibit 5A contains the statement of changes in assets for 2014 and 2015. Exhibit 6 shows the development of the actuarial value of assets. Exhibit 7 shows a historical comparison between the market value and actuarial value of assets. A comparison of the market value asset allocation by asset class as of December 31, 2013 and December 31, 2015 is shown in Exhibit 8.

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. 7.65% annual investment return (interest rate) net of investment-related expenses;

2. 3.5% annual general compensation increase plus an average of 1.81% per year for promotion, step, and longevity increases over a 30-year career;

3. Retirement rates which result in an average expected age at retirement of 57.1;

4. RP-2000 Combined Healthy Mortality Tables projected to 2024; and

5. City contribution rate averaging 19.50% over the UAAL amortization period.

The following actuarial assumption changes have been made, and the new assumptions are compared to those used in the December 31, 2013 valuation:

1. The investment return assumption was changed from 7.75% net of investment-related expenses to 7.65% net of investment-related expenses. This change

reflects a decrease in the underlying price inflation assumption from 3.75% to 3.5% and an increase in the assumed net real rate of return from 4% to 4.15%.

2. We changed the general compensation increase from 3.75% per year to 3.5%, making it the same as the underlying price inflation assumption. As a result, we also changed the aggregate payroll increase assumption from 3.75% per year to 3.5%. Because of the somewhat slower growth anticipated in our economy for the long-term future, we think it is appropriate to reduce the price inflation assumption.

The effects of these changes in assumptions on the UAAL amortization period are identified in Section II. A summary of all the assumptions and methods used in the valuation is shown in Exhibits 9 and 10. 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 11 contains definitions of terms used in this actuarial valuation report. Exhibit 12 summarizes the plan provisions of the Present Plan.

Actuarially Determined Contributions by the City

GASB 68 is all about accounting for pensions and does away with the concept of annually required contributions, previously 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. In other words, the city's GASB 68 pension expense will usually be very different from its actual contributions. That is why separate reports have been needed each year since 2015 to provide the required GASB 68 actuarial information.

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 15 to 25 years in the PRB's guidelines for an actuarially adequate contribution arrangement, and since the UAAL amortization period is 21.6 years with the current 19.5% assumed average city contribution rate, we have shown the city contribution rate that would have been required beginning January 1, 2016 for amortization periods of 15, 18, and 20 years based on this December 31, 2015 actuarial valuation. Because of the significant effect of fully recognizing the net deferred loss of $5 million by using the MVA instead of the

AVA results in an amortization period of 31.5 years with the current 19.5% assumed average city contribution rate, we have added the last column for comparison.

UAAL Amortization Period With AVA	Actuarially Determined Contribution Rate by the City	Firefighter Contribution Rate	Total Contribution Rate	UAAL Amortization Period With MVA
15 years	23.06%	13.5%	36.56%	20.4 years
18 years	21.11%	13.5%	34.61%	25.2 years
20 years	20.14%	13.5%	33.64%	28.6 years

In 2015, the Legislature passed HB 3310 which became effective in June of 2015. It includes a new sentence which requires an actuarial valuation to include a recommended rate needed to have an amortization period for the UAAL that does not exceed 30 years. The city currently contributes at a rate that has been somewhat higher than our assumed average rate of 19.5% of payroll and has since 2012. Since our assumed continuation of this rate results in an actuarially determined amortization period of less than 30 years, we recommend the continuation of the current city's funding policy for the next few years.

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 for funding purposes. 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

	December 31, 2013[1]	December 31, 2015
1. Actuarial present value of future benefits		
a. Those now receiving benefits or former firefighters entitled to receive benefits	$ 31,747,272	$ 36,454,011
b. Firefighters	69,050,373	73,540,711
c. Total	$ 100,797,645	$ 109,994,722
2. Actuarial present value of future normal cost contributions	$ 23,974,326	$ 24,462,228
3. Actuarial accrued liability (Item 1c – Item 2)	$ 76,823,319	$ 85,532,494
4. Actuarial value of assets	$ 56,547,675	$ 64,892,871
5. Unfunded actuarial accrued liability (UAAL) (Item 3 - Item 4)	$ 20,275,644	$ 20,639,623
6. Contributions (percent of pay)		
a. Firefighters	13.50%	13.50%
b. City of Tyler (assumed average)	19.50%	19.50%
c. Total	33.00%	33.00%
7. Normal cost (percent of payroll)	20.64%	20.53%
8. Percent of payroll available to amortize the UAAL (Item 6c - Item 7)	12.36%	12.47%
9. Annualized covered payroll	$ 10,937,907	$ 11,576,085
10. Present annual amount available to amortize the UAAL (Item 8 x Item 9)	$ 1,351,925	$ 1,443,538
11. Years to amortize the UAAL	22.9 years	21.6 years
12. Funded ratio (Item 4 ÷ Item 3)[2]	73.6%	75.9%

[1] All items are from the December 31, 2013 actuarial valuation and reflect the Present Plan.

[2] 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 12 would have resulted in funded ratios of 70.1% as of December 31, 2015 and 80.0% as of December 31, 2013. **The best indicator of the fund's health is item 11.**

Change in Amortization Period

The amortization period, based on the Present Plan provisions, was determined in the actuarial valuation as of December 31, 2013 to be 22.9 years. Since two years have passed since that valuation date, a 20.9-year amortization period would be expected if all actuarial assumptions had been exactly met, no changes had occurred (other than those expected) in the firefighter and pensioner data, and no changes in assumptions or methods had been made. The amortization period is now 21.6 years based on the same plan provisions. The actual experience occurring between December 31, 2013 and December 31, 2015 differed from the expected experience, and in combination with the changes in assumptions, the resulting amortization period was 21.6 years, which is 0.7 of a year more than the expected 20.9-year period for the following reasons:

1. The average annual rate of investment return, net of investment-related expenses, on the market value of assets during the two plan years 2014 and 2015 was -0.4%. However, the actuarial value of assets (AVA) used in the valuation and the determination of the amortization period is based on an adjusted market value. The average annual rate of return on the AVA, net of investment-related expenses, for plan years 2014 and 2015 was 8.1%, almost the same as the assumed rate of return for those years of 7.75%. This resulted in a slight **decrease** in the amortization period of 0.5 of a year.

2. The aggregate payroll increased at an average rate of 2.9% per year instead of the assumed 3.75% per year rate, which caused the amortization period to **increase** by 0.5 of a year.

3. The gain from city contributions above the assumed long-term average of 19.5% in 2014 (21.31%) and 2015 (21.30%) **decreased** the amortization period by 0.7 of a year.

4. The net result of all experience other than the investment experience, the aggregate payroll experience, and the city contribution rate experience had the combined effect of **no net change** in the amortization period. This was the net result of slightly favorable experience such as lower-than-expected pay increases and slightly adverse experience such as no refunds and the death of an active in the last two years.

5. The change in the general compensation increase and aggregate payroll increase assumptions from 3.75% to 3.5% and the change in the investment return assumption from 7.75% to 7.65% had the net effect of **increasing** the amortization period by 1.4 years.

Section III

Benefit Improvements

The results of this actuarial valuation as of December 31, 2015 reveal that the fund, based on the Present Plan of benefits, has an adequate contribution arrangement. As disclosed in both Sections I and II, the amortization period of the UAAL is 21.6 years. With an amortization period of 21.6 years, we are not willing to give the actuarial approval required by the provisions of Section 7 of the Texas Local Fire Fighters' Retirement Act (TLFFRA) to increase benefits because of the deferred net investment loss of $5 million as of December 31, 2015 and the anticipated potential effects it will have over the next two biennial actuarial valuations shown in the six scenarios on page 2.

At the board's August 20, 2014 meeting, we presented some considerations for benefit improvements over the long-term future. The idea was to coordinate periodic benefit improvements with a gradual lowering of the benefit improvement cap on the UAAL amortization period to a long-term goal such as 15 years, even though we had been using 25 years as the cap for the previous 10 years. We recommended this approach primarily for the following reasons:

1. The expected significant decrease in the city's contribution rate to its TMRS plan beginning in 2036,
2. The Texas Pension Review Board (PRB) guidelines for an actuarially adequate contribution arrangement, and
3. The increasing scrutiny of public employee pension plans.

The approach for implementing this strategy for injecting caution in future benefit improvements we recommended in 2014 was to wait until the amortization period is below 22 years and then to approve benefit improvements that would increase the amortization period up to as much as 22 years. After that first step, then we would progressively lower the benefit improvement cap to 20 years, then 18 years, etc., coordinating periodic benefit improvements with the gradual lowering, until getting to a long-term goal such as 15 years. With this approach we did not approve any benefit improvements two years ago based on the December 31, 2013 actuarial valuation since the amortization period was above 22 years.

As we said then, this approach will both strengthen the actuarial condition of the fund and better prepare for the possibility of adverse experience to the fund in the future. The stronger actuarial condition of the fund will be demonstrated by the progressively lower UAAL amortization period until getting to the lower end of the preferred range in the PRB guidelines (15 to 25 years). The kinds of future adverse experience that the fund will be better prepared to withstand will be primarily adverse investment experience but also an eventual lowering of the city's contribution rate.

Reviewing the history of the city's contribution rate to the fund for the last 22 years, it was set at 11.5% year after year before October 1, 2004 as a part of the annual budget process. In contrast, the city's actuarially determined TMRS contribution rate was significantly less than the 11.5% being contributed to the fund for many years. Then the present TMRS plan was adopted in 1999, significantly increasing both benefits and the city's TMRS contribution rate, which increased to just under 11.5% for two years. Then the city's TMRS rate began increasing some each year, surpassing 11.5% in 2002. The city agreed beginning October 1, 2004 to contribute the same rate to your fund as to TMRS.

The rate was 15.12% in 2008, when TMRS offered an eight-year phase-in that began in 2009 to avoid a significant increase all at once. The phase-in is now completed, and the rate in 2016 is 20.85%. So it has been very beneficial for the fund since 2004 for the city's contribution rate to the fund to be the same as for the city's TMRS plan. The significant increases in the city's contribution rate to the fund have largely offset the significant investment losses from the 2000-2002 bear market and the even worse 2008 great recession.

In spite of this beneficial increase in the city's contribution rate to your fund, we do not believe that the city's linking of their contribution rate to your fund to their rate to their TMRS plan makes good sense for the long-term future for three reasons. First, the firefighters do not participate in Social Security for their employment with the city while all the other city employees do participate in Social Security. That difference alone would suggest that the city's contribution to your fund should exceed their contribution to the TMRS plan by 6.2%, the current employer contribution for the OASDI part of Social Security. The second reason for a higher city contribution is that firefighters have much lower turnover than other city employees. So a higher percent of newly hired firefighters will ultimately qualify for a retirement benefit than will newly hired other city employees. As a result, the cost of firefighter retirement benefits is higher than the cost of comparable retirement benefits for other city employees. The third reason is that because of the physical demands of the job, firefighters tend to retire at earlier ages than many of the other city employees. This also increases the cost of firefighter retirement benefits compared to the cost for other city employees because of a longer period for benefits to be paid.

At some point in the future, it would be appropriate for the city and the board to discuss a distinct funding policy for your fund different from their policy for their TMRS plan. In fact, the number one recommendation in the December 2014 report from the PRB to the Legislature was "the PRB recommends that the retirement system sponsor and the system should establish an adequate funding policy." Ideally there should be a formal written policy such as a city council resolution. Based on the current TMRS funding policy and on its December 31, 2015 actuarial valuation for the city's TMRS plan, it is expected that the TMRS rate will drop dramatically from over 20% to under

10% beginning in 2036. As it gets closer to that time, if the contribution rate to your fund is still tied to the TMRS rate, then this would probably result in an inadequate contribution arrangement for your fund.

Exhibit 1

Distribution of Firefighters by Age and Service on December 31, 2015 with Average Annual Compensation

Years of Service	Age									Total	Average Salary
	Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60 or Over		
0	0	0	1	0	0	0	0	0	0	1	$48,000
1	0	3	3	1	0	0	0	0	0	7	50,000
2	0	1	0	1	0	0	0	0	0	2	61,716
3	0	3	5	0	0	0	0	0	0	8	60,909
4	0	0	1	2	0	0	0	0	0	3	61,218
5	0	0	0	3	0	0	0	0	0	3	60,734
6	0	2	8	4	1	0	0	0	0	15	62,243
7	0	2	2	1	1	0	0	0	0	6	66,146
8	0	0	6	4	0	0	0	0	0	10	68,020
9	0	0	1	3	1	0	0	0	0	5	66,578
10	0	0	1	0	1	0	0	0	0	2	77,999
11	0	0	1	1	0	0	0	0	0	2	72,425
12	0	0	0	3	4	1	0	0	0	8	73,759
13	0	0	0	1	1	1	0	0	0	3	74,792
14	0	0	0	3	0	2	0	0	0	5	75,391
15	0	0	0	2	5	3	0	0	0	10	77,200
16	0	0	0	1	3	3	0	0	0	7	76,949
17	0	0	0	0	2	1	0	0	0	3	78,997
18	0	0	0	1	5	2	6	0	0	14	83,019
19	0	0	0	0	0	1	0	0	0	1	86,552
20-24	0	0	0	0	2	1	7	2	1	13	86,161
25-29	0	0	0	0	0	2	4	6	1	13	89,180
30-34	0	0	0	0	0	0	2	3	1	6	93,578
35+	0	0	0	0	0	0	0	4	3	7	104,043
Totals	0	11	29	31	26	17	19	15	6	154	$75,169

Average Compensation	$58,380	$61,684 $68,446	$79,435 $79,586	$85,444 $94,830	$93,179

Average age	42.0
Average years of service	14.5
Average age at hire	27.5

Exhibit 2

Summary of Pensioner Data

Type of Benefit	Pensioner Data Used in December 31, 2015 Valuation	
	Number of Recipients	Total Monthly Benefit Payments
Service Retirement[1]	77	$264,912
Disability Retirement	3	3,288
Vested Terminated (Deferred)[2]	1	4,970
Surviving Spouse	18	34,155
Surviving Child	1	468
Total	100	$307,793

Type of Benefit	Comparison of Pensioner Count by Type as of The Prior and Current Actuarial Valuations			
	December 31, 2013	New	Ceased	December 31, 2015
Service Retirement[1]	70	+8	-1	77
Disability Retirement	3	0	0	3
Vested Terminated (Deferred)[2]	1	0	0	1
Surviving Spouse	18	+2	-2	18
Surviving Child	0	+1	0	1
Total	92	+11	-3	100

[1] Includes two alternate payees entitled to receive benefits according to the terms of a Qualified Domestic Relations Order as of both December 31, 2013 and December 31, 2015.
[2] Monthly benefit payments are deferred to begin at terminated firefighter's future retirement date.

Exhibit 2A

Firefighter and Pensioner Reconciliation

	Firefighters	Current Payment Status	Vested Terminated Firefighters	Total
1. As of December 31, 2013	155	91	1	247
2. Change of status				
a. retirement	(8)	8	0	0
b. disability	0	0	0	0
c. death	(1)	(3)	0	(4)
d. survivor payment begins	0	3	0	3
e. withdrawal	0	0	0	0
f. vested termination	0	0	0	0
g. completion of payment	0	0	0	0
h. QDRO alternate payee	0	0	0	0
i. net changes	(9)	8	0	(1)
3. New firefighters	8	0	0	8
4. As of December 31, 2015	154	99 [1]	1	254

[1] Includes two alternate payees entitled to receive benefits according to the terms of a Qualified Domestic Relations Order.

Exhibit 3

Breakdown of Monthly Benefit Payment Amounts as of December 31, 2015

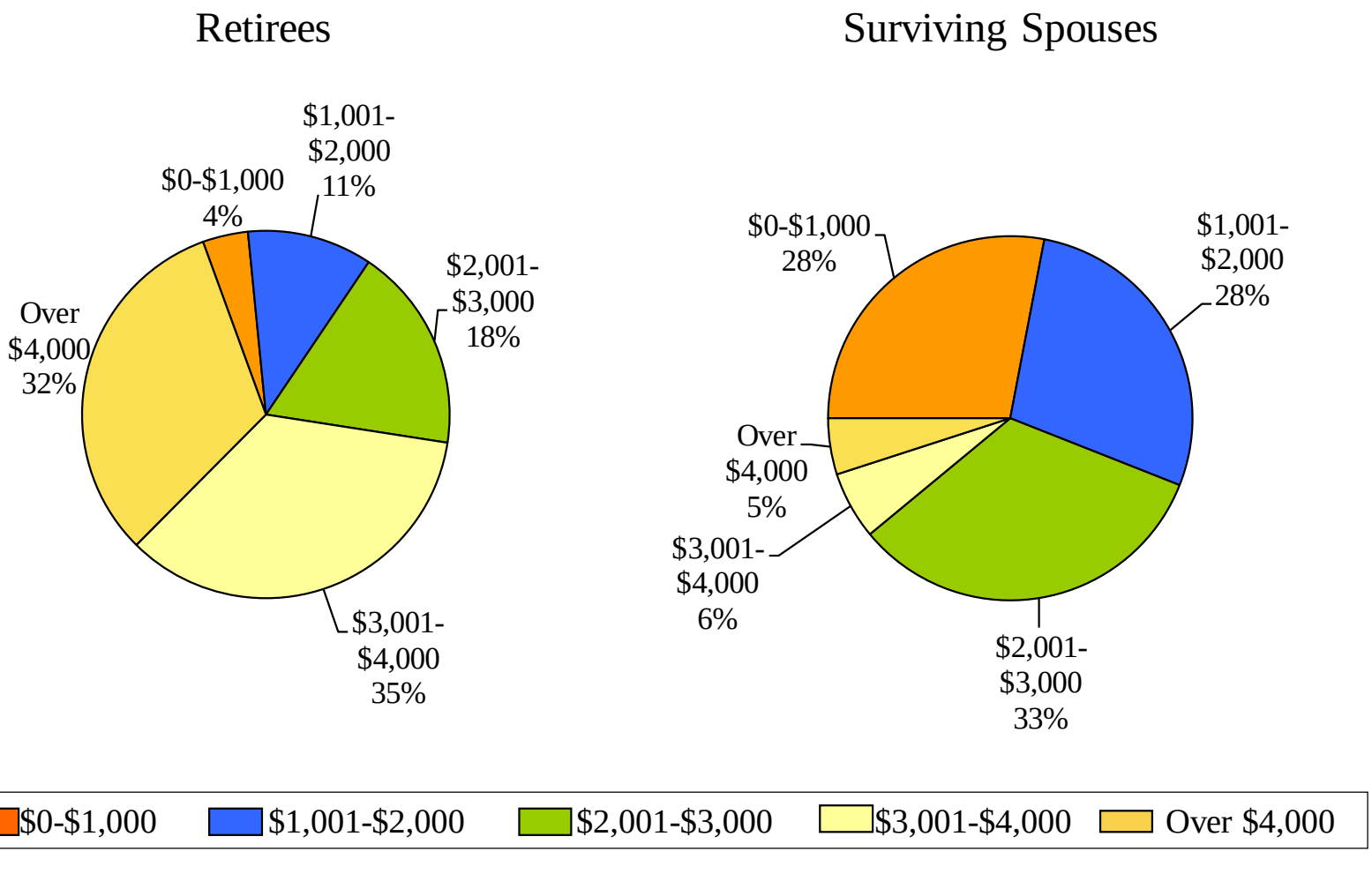


Exhibit 4

Historical Comparison of Actuarial Accrued Liability and Actuarial Value of Assets
(Present Plan Valuations as of December 31)

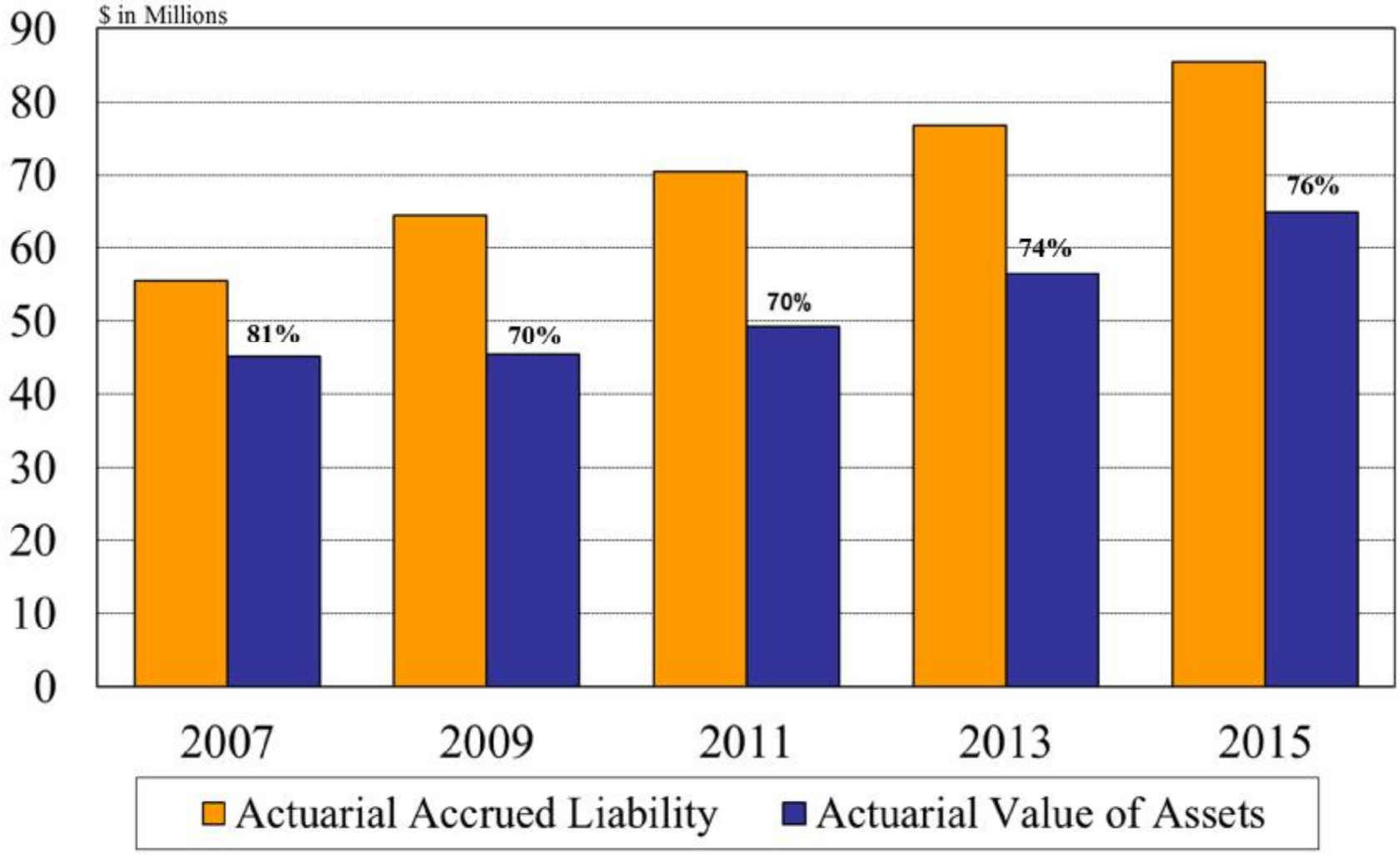


Exhibit 5

Summary of Asset Data

Asset Type	Market Value as of December 31, 2015	Allocation As a Percent of Grand Total
Equities		
Domestic Large Cap	$17,424,141	29.06%
Domestic Mid Cap	5,542,213	9.25
Domestic Small Cap	3,581,273	5.97
International Developed	4,153,111	6.93
International Developing	2,965,239	4.95
Total	33,665,977	56.16
Alternatives		
Real Estate	2,993,410	4.99
Commodities	3,238,395	5.40
Total	6,231,805	10.39
Fixed Income		
Domestic Core	13,527,278	22.56
Domestic High Yield	2,371,024	3.96
Global	2,929,518	4.89
Total	18,827,820	31.41
Cash Equivalents	1,223,804	2.04
Grand Total	$59,949,406	100.00%

Comparison of Asset Values as of the Prior and Current Actuarial Valuation Dates		
	December 31, 2013	December 31, 2015
Market Value	$ 61,495,625	$ 59,949,406
Actuarial Value	$ 56,547,675	$ 64,892,871
Actuarial Value as a Percent of Market Value	92.0%	108.2%

Exhibit 5A

Statement of Changes in Audited Assets for the Years Ended December 31, 2015 and 2014

	12/31/2015	12/31/2014
Additions		
1. Contributions		
a. Employer	$ 2,452,070	$ 2,407,993
b. Employees	1,555,182	1,522,493
c. Total	$ 4,007,252	$ 3,930,486
2. Investment Income		
a. Interest and dividends	$ 1,172,576	$ 1,142,808
b. Net appreciation in fair value	(3,936,444)	1,394,001
c. Total	$ (2,763,868)	$ 2,536,809
3. Other Additions	36,473	22,752
Total Additions	**$ 1,279,857**	**$ 6,490,047**
Deductions		
4. Benefit Payments	$ 5,498,546	$ 3,413,612
5. Expenses		
a. Investment-related	$ 164,419	$ 155,771
b. General administrative	30,035	53,740
c. Total	$ 194,454	$ 209,511
Total Deductions	**$ 5,693,000**	**$ 3,623,123**
Net Increase in Assets	**$ (4,413,143)**	**$ 2,866,924**
Market Value of Assets (Plan Net Position)		
Beginning of Year	$ 64,362,549	$ 61,495,625
End of Year	$ 59,949,406	$ 64,362,549
Rate of Return		
Net of All Expenses	-4.59%	3.81%
Net of Investment-Related Expenses	-4.55%	3.89%
Gross	-4.29%	4.15%
Investment-Related Expenses (Direct Only)	0.26%	0.26%

Exhibit 6

Development of Actuarial Value of Assets

Calculation of Actuarial Investment Gain/(Loss) Based on Market Value for Plan Years Ending December 31				
	2015	2014	2013	2012
1. Market Value of Assets as of beginning of year	$64,362,549	$61,495,625	$52,546,889	$45,892,932
2. Firefighter Contributions	1,555,182	1,522,493	1,442,898	1,397,206
3. City Contributions	2,452,070	2,407,993	2,218,688	2,056,837
4. Benefit Payments and Administrative Expenses[1]	(5,528,581)	(3,467,352)	(3,951,160)	(3,700,263)
5. Expected Investment Return[2]	4,929,146	4,783,857	4,061,372	3,547,339
6. Expected Market Value of Assets as of end of year	67,770,366	66,742,616	56,318,687	49,194,051
7. Actual Market Value of Assets as of end of year	59,949,406	64,362,549	61,495,625	52,546,889
8. Actuarial Investment Gain/(Loss)	(7,820,960)	(2,380,067)	5,176,938	3,352,838
9. Market Value Rate of Return Net of Expenses	(4.55)%	3.89%	17.63%	15.08%
10. Rate of Actuarial Investment Gain/(Loss)	(12.30)%	(3.86)%	9.88%	7.33%

[1] Administrative expenses are included for 2014 and 2015 because the investment return assumption was net of investment-related expenses for those years. In 2012 and 2013, the investment return assumption was net of all expenses.

[2] Assuming uniform distribution of contributions and payments during the plan year; actuarially assumed investment return is 7.75% per year.

Plan Year	Investment Gain/(Loss)	Deferral Percentage	Deferred Gain/(Loss) as of 12/31/2015
2015	$(7,820,960)	80%	$ (6,256,768)
2014	(2,380,067)	60%	(1,428,040)
2013	5,176,938	40%	2,070,775
2012	3,352,838	20%	670,568
Total			$ (4,943,465)

Actuarial Value of Assets as of December 31, 2015	
11. Market Value of Assets as of December 31, 2015	$ 59,949,406
12. Deferred Gain/(Loss) to be Recognized in Future	(4,943,465)
13. Preliminary Value (Item 12 – Item 13)	$ 64,892,871
14. Corridor for Actuarial Value of Assets	
a. 90% of Market Value as of December 31, 2015 (minimum)	$ 53,954,465
b. 110% of Market Value as of December 31, 2015 (maximum)	$ 65,944,347
15. Actuarial Value as of December 31, 2015	$ 64,892,871
16. Write Up/(Down) of Assets (Item 15 – Item 11)	$ 4,943,465

Exhibit 7

Historical Comparison of Market and Actuarial Value of Assets
(Valuation as of December 31)

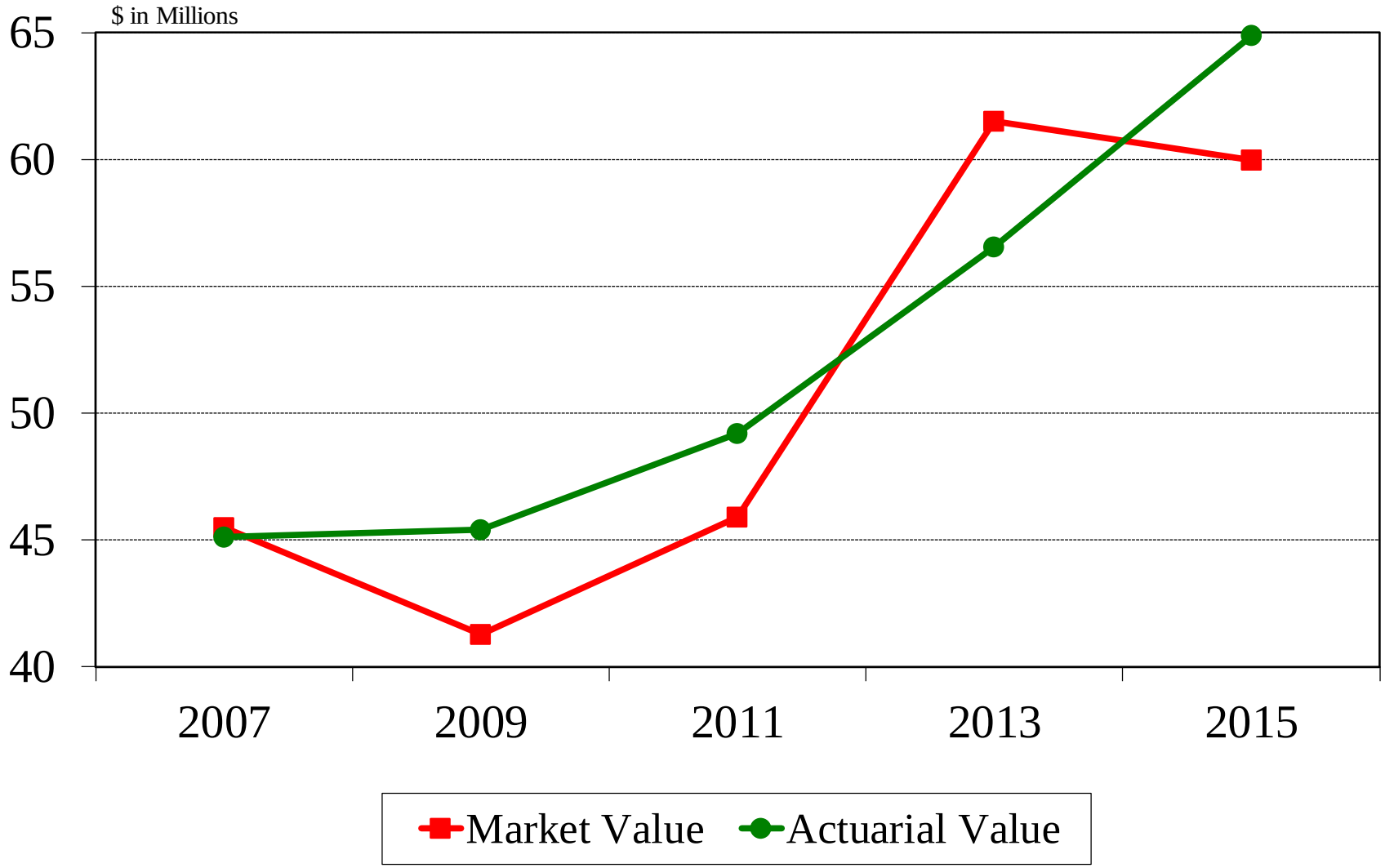
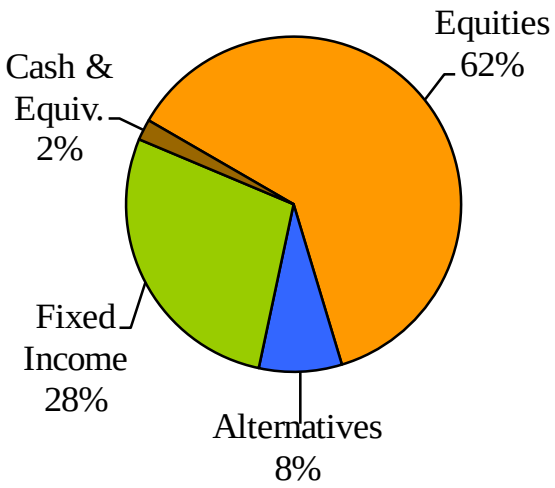


Exhibit 8

Comparison of Market Value Asset Allocation as of the Prior and Current Actuarial Valuation Dates

December 31, 2013



December 31, 2015

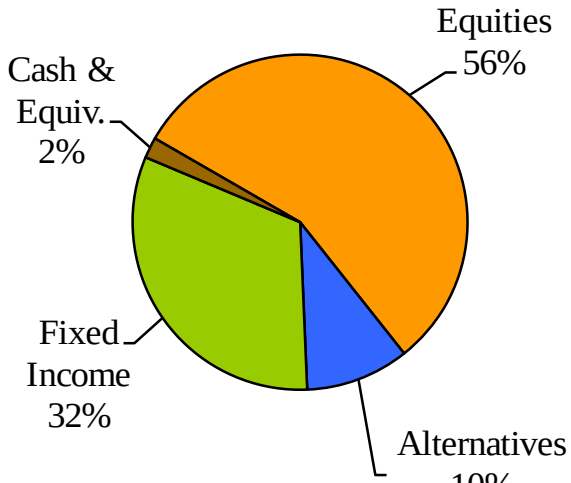


Exhibit 9

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 firefighter included in the valuation is allocated as a level percentage of compensation between age at hire and assumed termination. Each active firefighter's normal cost is the current annual contribution in a series of annual contributions which, if made throughout the firefighter's total period of employment, would fund his expected benefits. Each firefighter'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 firefighter for the year following the valuation date. 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 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 3.5% per year. The actuarial determination of the amortization period reflects that contributions are made biweekly.

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 total adjustment amount shall be limited as necessary such that the actuarial value of assets shall not be less than 90% of market value nor greater than 110% of market value. See Exhibit 6.

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 the economic assumptions and discuss them with the board before completing the actuarial valuation.

We review the termination and retirement experience since the prior valuation and periodically look back more than two years. We also periodically review the average salaries by years of service to get insights into the promotion, step, and longevity compensation patterns for the purpose of reviewing our compensation increase assumption. For the mortality assumptions, we use an appropriate published mortality table with projections for improvement beyond the valuation date. 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 for the fund for the long-term future.

1. Investment Return

   7.65% per year net of investment-related expenses.

2. Inflation

   3.5% per year included in compensation increases and investment return assumptions.

3. Mortality Rates

   RP-2000 Combined Healthy Mortality Table projected to 2024 for males and for females (sex distinct) for all three types of mortality: pre-retirement, post-retirement, and post-disability. See Exhibit 10 for the split between on-duty and off-duty mortality for active firefighters.

4. Compensation Increases

   General increases of 3.5% per year in addition promotion, step, and longevity increases that average 1.81% per year over a 30-year career. See Exhibit 10.

5. Retirement Rates

Age	Rate per Year for Firefighters Eligible to Retire
50	15%
51-53	5
54-55	10
56-59	25
60-64	50
65	100

The average expected retirement age for firefighters under age 50 based on these rates is 57.1.

6. RETRO DROP Election

   a. Percent of firefighters eligible electing RETRO DROP: 100% of service retirements eligible to elect at least a 12-month lump sum.

   b. Months assumed for lump sum: Maximum they are eligible for, up to 60 months.

7. Withdrawal Rates

   See Exhibit 10.

8. Disability Rates

   See Exhibit 10.

9. Reduction in Benefit after 2½ Years of Disability Retirement

   45% weighted average reduction in benefit.

10. Percent Married

    90% of the firefighters are assumed to be married at retirement, disability, or death while employed and have a spouse three years younger. The 10% assumed to be single at retirement are assumed to elect the life only option.

11. Payment Form for Retirement Benefits Due to Service Retirement, Disability Retirement, or Vested Termination

    - Joint and 100% to surviving spouse for the 90% assumed to be married of those with 20 or more years of service as of January 1, 2005
    - Joint and 2/3 to surviving spouse for the rest of the 90% assumed to be married
    - Life annuity for the 10% assumed to be single

    To the extent optional forms of payment are elected and the amounts are determined under an actuarial basis which differs from the basis used in the valuation, actuarial gains or losses will occur. These gains or losses are expected to be very small and will be recognized through the valuation process for those retiring since the prior valuation who made an optional election.

12. Surviving Child's Death Benefit

    None are assumed as a result of future deaths.

13. Firefighters' Contribution Rate

    13.50% of covered pay.

14. City's Assumed Contribution Rate

    19.50% of covered payroll.

15. Covered Payroll for First Year Following Valuation Date

    Actual (or annualized) pay for 2015 with adjustment of 1.5% for each firefighter to fully reflect the 2% pay increase effective in October 2015.

16. General Administrative Expenses

    The expenses paid by fund assets for other than investment-related expenses are assumed to be 0.35% of payroll. The normal cost rate as a percent of payroll is assumed to be 0.35% of payroll higher to reflect these expenses.

Exhibit 10
Disability, Mortality, and Withdrawal Rates per 1,000 Active Members
Compensation Increases by Years of Service

Attained Age	Disability and Mortality Rates			Withdrawal Rates		Compensation Increases	
		Mortality[2]		Years of		Years of	Increase
	Disability[1]	On-Duty	Off-Duty	Service	Rate	Service	Percent
20	0.14	0.104	0.114	0	30	1	9.71%
21	0.15	0.109	0.122	1	27	2	9.71
22	0.16	0.113	0.130	2	24	3	9.71
23	0.17	0.120	0.140	3	21	4	9.71
24	0.18	0.125	0.150	4	18	5	9.71
25	0.19	0.133	0.162	5	16	6	6.09
26	0.21	0.144	0.183	6	14	7	6.09
27	0.23	0.146	0.193	7	12	8	6.09
28	0.25	0.146	0.202	8	11	9	6.09
29	0.28	0.145	0.220	9	10	10	6.09
30	0.31	0.151	0.243	10	8	11	6.09
31	0.35	0.164	0.278	11	7	12	6.09
32	0.40	0.177	0.321	12	6	13	6.09
33	0.45	0.190	0.369	13	5	14	6.09
34	0.49	0.205	0.417	14	5	15	6.09
35	0.52	0.216	0.469	15	5	16	3.50
36	0.54	0.225	0.521	16	5	17	3.50
37	0.57	0.226	0.576	17	4	18	3.50
38	0.62	0.223	0.611	18	4	19	3.50
39	0.73	0.216	0.647	19	4	20	3.50
40	0.92	0.201	0.689	20 & Over	0	21	3.50
41	1.14	0.193	0.726			22	3.50
42	1.32	0.184	0.771			23	3.50
43	1.48	0.179	0.817			24	3.50
44	1.73	0.173	0.873			25	3.50
45	2.09	0.163	0.939			26	3.50
46	2.55	0.161	0.991			27	3.50
47	2.98	0.154	1.052			28	3.50
48	3.34	0.145	1.118			29	3.50
49	3.62	0.142	1.180			30	3.50
50	3.79	0.135	1.248			31	3.50
51	3.92	0.140	1.405			32	3.50
52	4.04	0.138	1.504			33	3.50
53	4.24	0.140	1.656			34	3.50
54	4.56	0.143	1.825			35	3.50
55	0.00	0.154	2.133			36	3.50
56	0.00	0.174	2.542			37	3.50
57	0.00	0.191	2.919			38	3.50
58	0.00	0.211	3.369			39	3.50
59	0.00	0.223	3.814			40	3.50
60		0.240	4.341				
61		0.265	5.076				
62		0.285	5.808				
63		0.313	6.825				
64		0.330	7.712				

[1] The on-duty rates and the off-duty rates are half of the rates shown.
[2] Illustrated for males. The relative splits between on-duty and off-duty rates for female mortality rates are the same as for male mortality rates.

Exhibit 11

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 12

Summary of Present Plan

1. Normal Service Retirement Monthly Benefit	
(a) Percent of highest 60-Month average salary	71.50%
(b) Additional service benefit for each year of service in excess of 20 years	$113.00
2. Normal Service Retirement Eligibility (Minimum)	Age 50 and 25 Years or Age 55 and 20 Years
3. 3-Year RETRO DROP	
(a) Earliest RETRO DROP benefit calculation date	Age 52.5 and 25 Years or Age 55 and 20 Years
(b) Maximum RETRO DROP benefit accumulation period	36 Months
(c) Earliest employment termination date with maximum RETRO DROP accumulation period	Age 55.5 and 28 Years or Age 58 and 23 Years
4. 5-Year RETRO DROP	
(a) Earliest RETRO DROP benefit calculation date	Age 54 and 26 Years or Age 57 and 22 Years
(b) Maximum RETRO DROP benefit accumulation period	60 Months
(c) Earliest employment termination date with maximum RETRO DROP accumulation period	Age 59 and 31 Years or Age 62 and 27 Years
5. RETRO DROP lump sum includes	
(a) Monthly benefits that would have been received between RETRO DROP benefit calculation date and termination of employment,	
(b) accumulated contributions made by the firefighter after the RETRO DROP benefit calculation date, and	
(c) no interest	
6. Actuarially Equivalent Early Retirement Eligibility	20 Years
7. Vested Terminated Benefit Eligibility (Benefit Deferred to Normal Retirement Age)	20 Years

8. Disability Retirement Monthly Benefit for a Firefighter Who Becomes Disabled as a Result of His Duties
   (a) For initial 30-month period, is (i) plus (ii) if not able to perform job in fire department
      (i) Minimum monthly amount based on 20 years
      (ii) Additional monthly amount per year of service in excess of 20 years
   (b) Following initial 30-month period, is the greater of (i) and (ii)
      (i) Initial benefit reduced by the portion of the initial benefit equal to estimated annual residual earning capacity divided by annual base earnings
      (ii) Initial benefit multiplied by percentage of disability
   (c) Upon attaining eligibility for normal retirement, the member's vested retirement benefit becomes payable if the disability benefit has been reduced

9. Off-Duty Disability Benefit as a Percentage of Duty-Related Disability Benefit — 10%/Year of Service (10% Min., 100% Max.)

10. Surviving Spouse Benefit on Behalf of Firefighter Who Dies Prior to Becoming Eligible for a Normal Service Retirement Benefit
   (a) If duty-related death, then two-thirds of the benefit Described in Item 1
   (b) If not duty-related, then 10%/year of service (10% min., 100% max.) of benefit described in Item 10(a)

11. Surviving Spouse Benefit on Behalf of Firefighter Who Dies While Eligible for a Normal Service Retirement Benefit — 96% of Item 1

12. Surviving Children's Monthly Benefit as a Percent of Highest 60-Month Average Salary
   (a) When the spouse is receiving a benefit, for each child — 9.53%
   (b) When the spouse is not receiving a benefit or there is no spouse — 47.67%

13. Contributions as a Percent of Payroll by:
   (a) Firefighters — 13.50%
   (b) Assumed average for City of Tyler — 19.50%

14. The normal form of annuity payment at service retirement is a Joint and 100% Spouse Annuity for those firefighters with 20 or more years of service as of January 1, 2005. For all others, the normal form is a Joint and $66^{2}/_{3}$% Spouse Annuity. The benefit is payable to the surviving spouse as long as the spouse is alive, except that for those

normal or early retirements or vested terminations (entitled to a deferred benefit) occurring before November 1, 1995, the spouse's benefit will cease upon remarriage.

15. In lieu of the normal Joint and 100% Spouse Annuity for those firefighters with 20 or more years of service as of January 1, 2005, optional forms of a Joint and $66^{2}/_{3}$% Spouse Annuity for a 4% benefit increase or a Straight Life Annuity for a 13% benefit increase are also available. In lieu of the normal Joint and $66^{2}/_{3}$% to Surviving Spouse for those firefighters with less than 20 years of service as of January 1, 2005, optional forms of a Joint and 100% Spouse Annuity for a 4% benefit reduction or a Straight Life Annuity for a 9% benefit increase are also available.

16. A member eligible for normal service retirement can elect at retirement the Partial Lump Sum Option (PLSO) which will provide a PLSO lump sum amount and a PLSO monthly benefit. The PLSO lump sum amount is either 12, 24, 36, or 48 months of the normal service retirement benefit, with the number of months elected by the member.

17. Salary used to determine the Highest 60-Month Average Salary includes all elements of pay except for lump sum distributions for unused sick leave or vacation. The average is based on the highest five years out of the last eight years.

18. Refund of firefighters' accumulated contributions without interest will be made to firefighters who terminate employment and either are not eligible for any other benefit from the fund or request a refund from the fund.