FIRE AND POLICE PENSION ASSOCIATION

STATEWIDE HYBRID PLAN – DEFINED BENEFIT COMPONENT
ACTUARIAL VALUATION REPORT

FOR THE YEAR BEGINNING JANUARY 1, 2016

GRS
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June 30, 2016

Board of Directors
Fire and Police Pension Association
5290 DTC Parkway, Suite 100
Greenwood Village, Colorado 80111

Re: Actuarial Valuation of the FPPA Statewide Hybrid Plan (Defined Benefit Component) as of January 1, 2016

Dear Members of the Board:

We are pleased to present our Report on the actuarial valuation of the Fire and Police Pension Association (FPPA) Statewide Hybrid Plan Defined Benefit Component as of January 1, 2016.

We certify that the information included herein and contained in the 2016 Actuarial Valuation Report is accurate and fairly presents the actuarial position of the Fire and Police Pension Association (FPPA) Statewide Hybrid Plan Defined Benefit Component as of January 1, 2016.

This report presents the results of the January 1, 2016 actuarial valuation of the FPPA Statewide Hybrid Plan (SWH). The Report describes the current actuarial condition of the Statewide Hybrid Plan Defined Benefit Component, determines actuarially appropriate contribution rates, and analyzes changes in these required rates. The results presented herein may not be applicable for other purposes. In addition, the Report provides various summaries of the data.

Valuations are prepared annually, as of January 1st, the first day of the FPPA plan year.

Financing Objectives

Contribution rates are established by the Board that, over time, are intended to remain level as a percent of payroll. The employer contributions, when combined with the contributions made by members, are intended to provide for the normal cost and to amortize the Unfunded Actuarial Accrued Liability (UAAL) over a period not to exceed 30 years.

Progress toward Realization of Financing Objectives

The UAAL/(surplus) and the funded ratio (ratio of the actuarial value of assets to the actuarial accrued liability) illustrate the progress toward the realization of certain financing objectives. Based on this actuarial valuation as of January 1, 2016, the Plan is over-funded and the surplus is now $11,582,314 assuming no future discretionary benefit adjustments.

As listed in the Executive Summary under Section I of our Report, the normal cost rate of the Plan is 9.52% of pay, plus 0.56% of pay to cover annual administrative expenses, is 10.08% of pay. Because the plan is currently over-funded, contributions above this 10.08% rate are available to fund future discretionary benefit adjustments.

The contribution rate required to fund the benefits (assuming no benefit adjustments) is 5.26%. This rate is the normal cost plus the amortization of the UAAL/(surplus) over 30 years. This amortization is a credit when the Plan is in a surplus position, and, therefore, because of the surplus, the annual required contribution is less than the normal cost. This also means that the ultimate cost of the Plan is the normal cost (e.g. when no surplus exists) plus administrative expenses, or 10.08% of pay.

For the valuation as of January 1, 2016, the cost of benefits assuming future discretionary benefit adjustments of 3% per year is 13.45%. This rate includes the normal cost rate of 13.38% for the current active members. The contribution rate allocated to the Defined Benefit portion of the Hybrid Plan is recommended to be the rounded value of the greater of these two rates (13.45%, 13.38%). This is more than the current combined employee/employer contribution Defined Benefit allocation of 12.50%. Based on a Board objective to provide 3% benefit adjustments, we recommend increasing the Defined Benefit allocation to 13.50%, effective July 1, 2016.

Benefit Provisions

The benefit provisions reflected in this valuation are those which were in effect on January 1, 2016. There were no changes to the benefit provisions since the prior valuation. The benefit provisions are summarized in Appendix B of our Report.

Assumptions and Methods

Since the prior valuation, new actuarial methods and assumptions have been selected by the Board of Directors of FPPA based upon the actuary's analysis and recommendations from the 2015 Experience Study.

The main actuarial factor changes effective January 1, 2016 were:

- Reduce the inflation assumption from 3.0% to 2.5%. It was determined that the current 3.0% assumption is higher than the long term historical average, the recent historical average, and most sources of future expectations. The decision to lower the assumption to 2.5% places the assumption closer to recent inflation levels and closer to the levels expected in the bond market.
- The real return on investments was increased to 5.0% for an overall nominal investment return of 7.50%. The productivity component of the salary increases was increased from 1.0% to 1.5%. The aggregate effect of these changes (inflation, real return, and the productivity component of the salary increase) on the actuarial results was minimal.

- Add an explicit charge for administrative expenses in the actuarial contribution calculation. Although the nominal investment return was not changed from 7.50%, adding an explicit administrative expense effectively reduces the return that must be earned by the plans in order to meet the actuarial assumption since the investment return is no longer net of administrative expenses. This does not alter the accrued liability, but it does increase the actuarially calculated contribution.
- Revise the base mortality tables and the explicit assumption for increasing longevity in the future to reflect current mortality studies. This had the effect of increasing longevity expectations, and in turn, increasing expected costs and liabilities.
- Increase the expected incidence of Total Disability for members of FPPA's defined benefit plans. Disability incidence is an important assumption for FPPA plans because a disability occurrence shifts all liability from the Defined Benefit System plans (Statewide Defined Benefit Plan, Statewide Hybrid – DB Component Plan, Colorado Springs New Hire Plan) to the Statewide Death & Disability Plan. Increasing the expected incidence of Total Disability creates a large increase in projected benefits from the Statewide Death & Disability Plan and reduces projected benefits from the Defined Benefit System retirement plans.

The actuarial assumptions implemented in January 1, 2016 are more reflective of future expectations as the Plan proceeds forward. As always, the assumptions will be reviewed against actual experience each year and gains or losses recognized in accordance with Governmental Accounting Standards Board standards and our actuarial methods and policies.

For a complete list of assumption changes as well as the detailed rationale for the changes, please see the experience study report dated June 1, 2015.

These assumptions and methods are detailed in Appendix A of our Report. The Board of Directors has sole authority to determine the actuarial assumptions used for the Plan. The assumptions that are based upon the actuary's recommendations are internally consistent and are reasonably based on the actual past experience of the Plan.

The actuarial assumptions represent estimates of future experience and are not market measures. The results of any actuarial valuation are dependent upon the actuarial assumptions used. Actual results (and future measures) can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rates and funding periods. The actuarial calculations presented in this Report are intended to provide information for rational decision making.

GASB Accounting

The Governmental Accounting Standards Board (GASB) Statement No. 67, Financial Reporting for Pension Plans (Issued 6/2012), has replaced the requirements under GASB Statement No. 25, Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined

Contribution Plans (Issued 11/1994), effective for financial statements for fiscal years beginning after June 15, 2013. GASB Statement No. 68, Accounting and Financial Reporting for Pensions (Issued 6/2012), has replaced GASB Statement No. 27, Accounting for Pensions by State and Local Governmental Employers (Issued 11/1994), effective for fiscal years beginning after June 15, 2014. Plan reporting information for GASB Statement No. 67 can be found in the FPPA Comprehensive Annual Financial Report at FPPA's website - FPPAco.org. Employer reporting information for GASB Statement No. 68 is provided in a separate report to the employer.

Projected Actuarial Results

The following table shows the Funded Ratio (FR) and Actuarially Determined Contribution (ADC) projected over the next five years given alternative investment returns on the market value of assets. With the exception of the market value investment returns, the projections beyond 2016 are based on the same assumptions, methods and provisions used for the January 1, 2016 valuation. Consistent with the funding recommendations of the Plan, the results shown assume a permanent benefit adjustment of 3.0% per year. The ADC is calculated as the higher of the Normal Cost or the Normal Cost plus 30-year Amortization of the Surplus or Unfunded Liability.

5-Year Deterministic Projection						
January 1,	Market Value Investment Return					
	3.50%		7.50%		11.50%	
	FR	ADC	FR	ADC	FR	ADC
2016	99.8%	13.50%	99.8%	13.50%	99.8%	13.50%
2017	98.7%	13.40%	99.5%	13.10%	100.3%	12.80%
2018	96.9%	14.50%	99.0%	13.40%	101.3%	12.80%
2019	94.8%	16.10%	98.6%	13.70%	103.1%	12.90%
2020	92.3%	18.30%	98.3%	14.00%	105.7%	12.90%
2021	90.0%	20.90%	98.5%	14.10%	109.2%	12.90%

Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future actuarial measurements other than that shown above.

Data

FPPA supplied data for retired, active and inactive members as of January 1, 2016. We did not audit this data, but we did apply a number of tests to the data, and we concluded that it was reasonable and consistent. FPPA also supplied asset data as of January 1, 2016.

Certification

All of our work conforms with generally accepted actuarial principles and practices, and to the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of Colorado state law and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards

Board. The undersigned are independent actuaries and consultants. Joseph Newton and Dana Woolfrey are Enrolled Actuaries and are Members of the American Academy of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries. Finally, all of the undersigned are experienced in performing valuations for large public retirement systems.

Respectfully submitted,
Gabriel, Roeder, Smith & Company

Joseph P. Newton, FSA, EA, MAAA
Senior Consultant

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Consultant

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SECTION I

EXECUTIVE SUMMARY

Executive Summary

Item	January 1, 2016	January 1, 2015
Membership		
• Number of:		
- Active members	160	156
- Retirees	29	19
- DROP Retirees	5	6
- Beneficiaries	0	0
- Inactive members	22	18
- Total	216	199
• Annualized payroll supplied by FPPA	$ 12,831	$ 12,140
Assets		
• Market value	$ 46,310	$ 41,037
• Actuarial value	47,345	39,773
• Return on market value	1.4%	6.7%
• Return on actuarial value	6.9%	8.7%
• Contribution for prior year	$ 5,644	$ 3,003
• Ratio of actuarial value to market value	102.2%	96.9%
Actuarial Information		
• Total normal cost %	10.08%	9.54%
• Unfunded actuarial accrued liability/(surplus)	$ (11,568)	$ (10,595)
• Amortization rate	(4.82%)	(4.66%)
• Total required contribution %	5.26%	4.88%
• Funded ratio	132.3%	136.3%

Note: Dollar amounts in $000

Executive Summary

1. The annual required contribution rate (with no future benefit adjustments) is 5.26%.

2. Assets earned 1.38% on a market basis and 6.89% on an actuarial, smoothed, basis in 2015, producing an actuarial loss.

3. The funded ratio decreased from 136.30% as of January 1, 2015, to 132.30% as of January 1, 2016. This was primarily due to assumption changes and investment losses.

4. The cost of benefits assuming future permanent benefit adjustments of 3% per year is 13.45% and the funded ratio based on permanent 3% annual benefit adjustments is 99.80%.

5. The contribution rate allocated to the Defined Benefit portion of the Hybrid plan is recommended to be the greater of the 13.38% normal cost associated with the permanent 3% annual benefit adjustments and the total cost of the plan with permanent 3% annual benefit adjustments which is 13.45%. Therefore, we recommend the Defined Benefit contribution be increased to 13.50% (based on a rounded value of the greater of the two calculated rates above) effective July 1, 2016.

6. The funded ratio of the plan, assuming 3% permanent benefit adjustments, is 99.8%. The cost of a one-year 3.00% benefit adjustment for current retirees is 0.26% of pay, or $360,000. The permanent benefit adjustment which would produce a 100% funded ratio is 2.98% per year.

7. Due to the small size of this group, a large influx of membership could and does quickly alter the actuarial measures of the plan. Thus, these measures should be viewed with the potential in volatility that could occur.

SECTION II

DISCUSSION

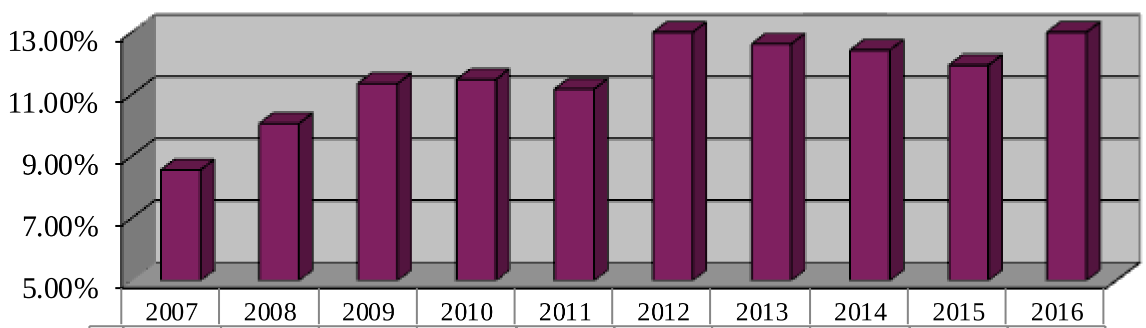
Actuarial Contribution Requirements and Contribution Allocation to the Defined Benefit Portion of the Hybrid Plan

Annually, at the discretion of the Board of Directors, the amount of the combined employee and employer contribution rate to be allocated to the Defined Benefit portion of the Hybrid plan is determined. This Actuarially Determined Contribution ("ADC") amount is recommended to be reflective of the current cost of the plan including permanent 3% annual benefit adjustments.

Currently, members of the Fire and Police Pension Association Statewide Hybrid Plan contribute 12.60% to the Defined Benefit portion of the Plan. For the valuation as of January 1, 2016, the cost of the plan including permanent 3% annual benefit adjustments is 13.45%. This includes the normal cost rate 13.38% of payroll plus 0.07% of payroll to amortize the surplus assets over the present value of future salary for the current active population. This methodology reflects the partially closed nature of the plan. Accordingly, we recommend increasing the Defined Benefit contribution rate from the current level of 12.60% of pay to 13.50% of pay as of July 1, 2016 (based on a rounded value of the greater of the normal cost and total actuarial rate).

The following graph shows the historical costs of the plan including permanent 3% annual benefit adjustments as a percentage of pay.

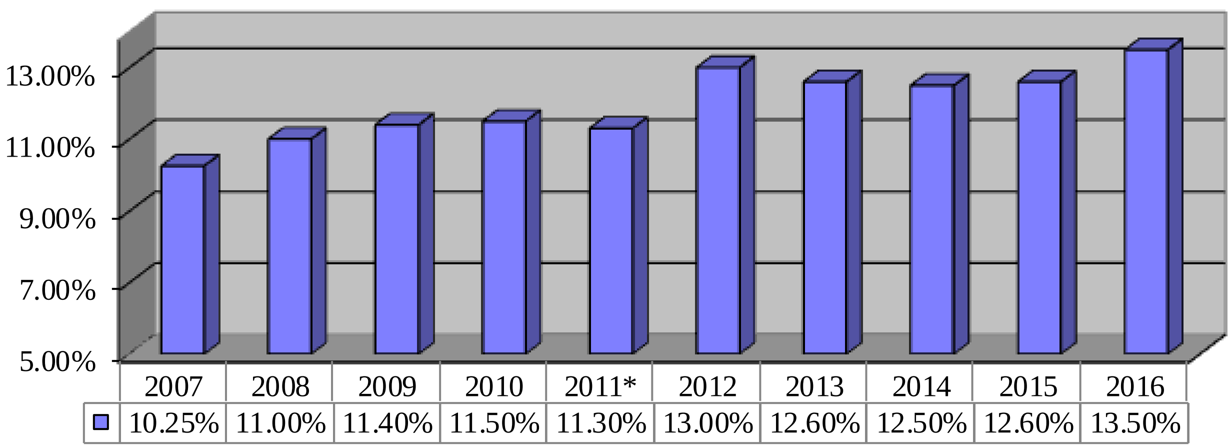
Cost of the Plan Including Permanent 3% Benefit Adjustments
As calculated in the valuation as of January 1,



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
■	8.56%	10.06%	11.36%	11.49%	11.17%	13.02%	12.62%	12.42%	11.95%	13.45%

The following graph illustrates the historical Defined Benefit allocation contribution percentages and the recommended percentage for 2016.

Recommended Defined Benefit Allocation
To be effective July 1,



**Rate effective July 1, 2011 through December 31, 2011 was 11.30%.*
Rate effective January 1, 2012 through June 30, 2012 was 12.90%.

Financial Data and Experience

This section provides an analysis of the change in Plan Net Assets during the year and an estimate of the yield on mean assets of the Hybrid Plan. FPPA provided GRS with a summary of plan assets as of January 1, 2016. The market value of assets reported was $46,309,805 as of January 1, 2016. Table 7 shows data from some of the tables included in the annual financial statements of the Plan. Table 9 shows the estimated yield on a market value basis and on the actuarial asset valuation method.

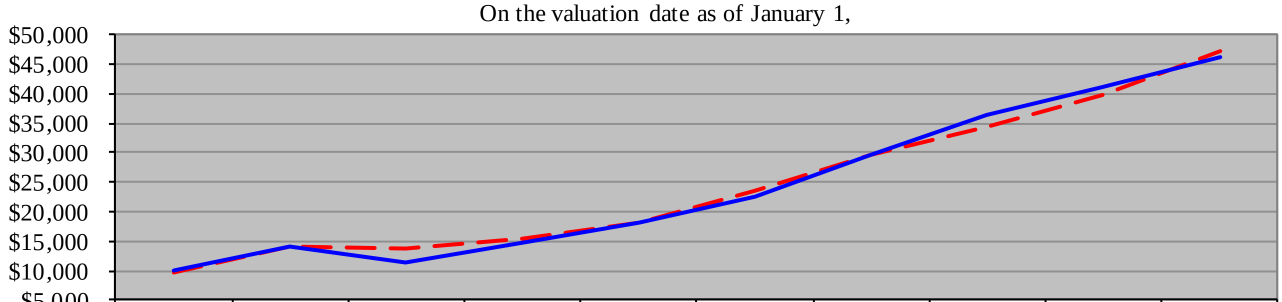
Effective January 1, 2013, the asset valuation method uses a five-year phase-in of the excess (shortfall) between expected investment return and actual income. Expected earnings used to project the actuarial value are determined using the assumed investment return rate and the beginning of year actuarial value of assets (adjusted for receipts and disbursements during the year). The returns are computed net of administrative and investment expenses.

Table 8 shows the development of the actuarial value of assets. The actuarial value of assets increased from $39,772,760 to $47,344,971 since the prior valuation. This increase was less than expected and produced a loss of approximately $0.29 million.

Effective January 1, 2012, the valuation assumed investment return was reduced from 8.0% to 7.5% per year. As indicated by item 8b of Table 9, the estimated return on mean market value is 1.38%. The actuarial asset value returned 6.89%. This difference in the estimated return on market value and actuarial value illustrates the smoothing effect of the asset valuation method.

History of AVA vs MVA

On the valuation date as of January 1,



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
AVA	$9,624	$14,076	$13,643	$15,374	$18,107	$23,667	$29,758	$34,476	$39,773	$47,345
MVA	$10,057	$14,242	$11,369	$14,651	$18,170	$22,688	$29,744	$36,324	$41,037	$46,310

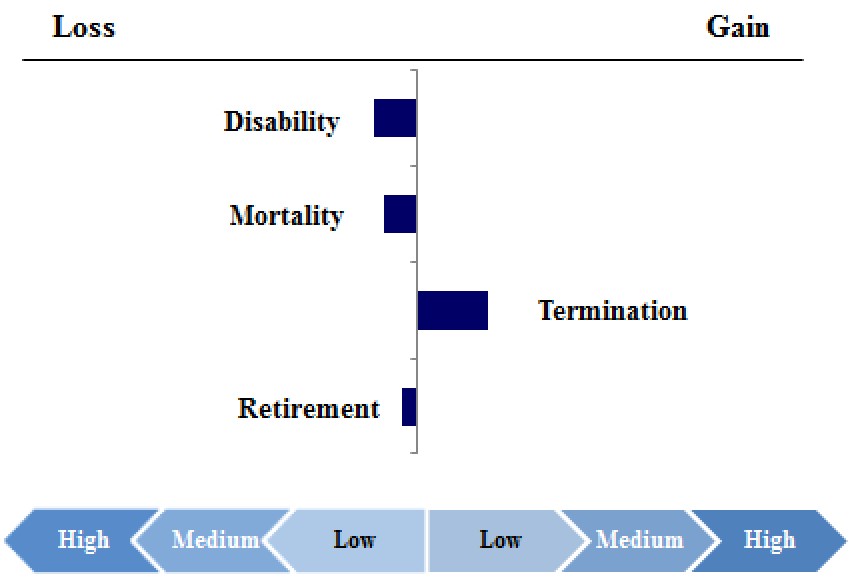
$ in thousands

AVA MVA

AVA: Actuarial (Smoothed) Value of Assets
MVA: Market Value of Assets

Demographic Experience

During the year, the plan had less disabilities than expected (loss), no retiree deaths (loss), more terminations than expected (gain). The number of actual retirements was very near the expected number.



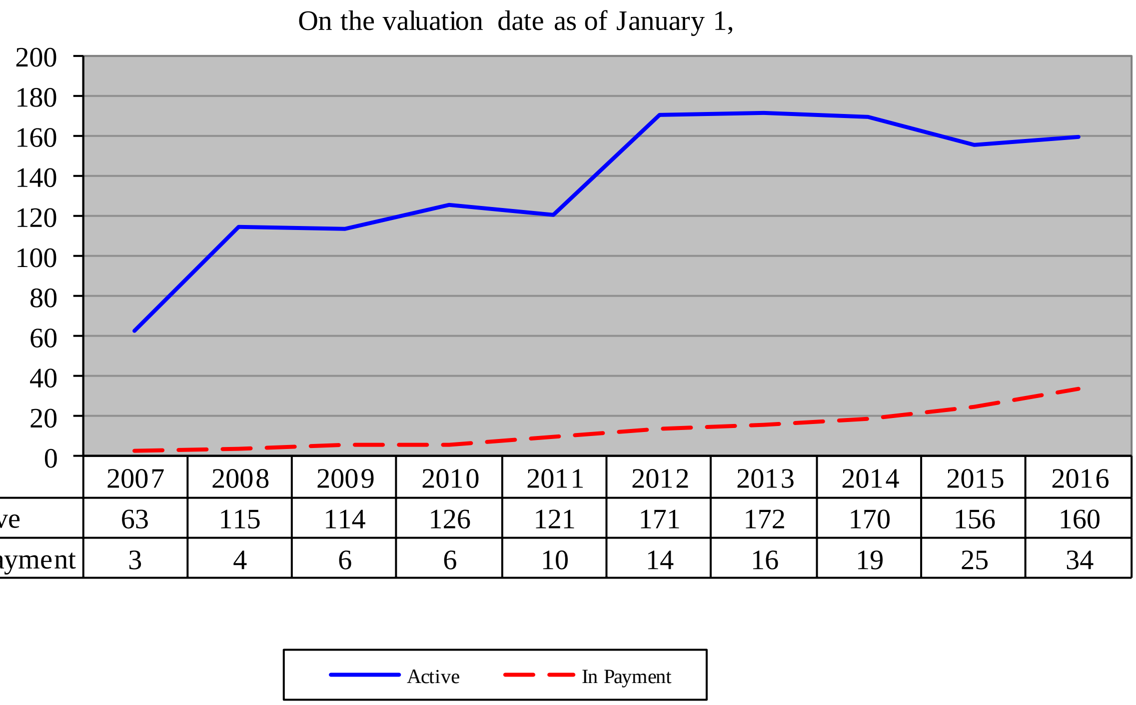
Member Data

FPPA supplied member data as of January 1, 2016. While we did not audit this data, we did perform various tests to ensure that it was internally consistent, consistent with the prior year's data, and was reasonable overall. Information provided for active members includes: name, member ID, sex, a code indicating whether the member was active or inactive, date of birth, service, salary, accumulated member contributions. For retired members, data includes: name, member ID, sex, date of birth, date of retirement, amount of benefit, a code indicating the option elected and the type of retiree (normal retiree, vested retiree, beneficiary), and if applicable, the joint pensioner's date of birth and sex.

Table 15 shows the number of members by category (active, inactive, retired, etc.). Table 16 shows a historical summary of active member statistics, and Table 17 shows the distribution of active members by age and service.

The total payroll shown on the statistical tables is the amount that was supplied by FPPA. For the cost calculations, the pays were adjusted in accordance with the actuarial assumptions to reflect one year's salary increase.

History of Counts: Active vs In Payment



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Active	63	115	114	126	121	171	172	170	156	160
In Payment	3	4	6	6	10	14	16	19	25	34

The Plan is partially closed in nature. For many of the groups that have re-entered, new entrants hired by those employers are covered under the FPPA Statewide Defined Benefit Plan. This will be a funding consideration as the Plan goes forward.

Benefit Provisions

Appendix B includes a summary of the benefit provisions for FPPA. Highlights include:

- Normal Retirement
  - Eligibility: Age 55 and 25 years of service
  - Annual Benefit: 1.5% of average of the member's highest three years base salary for each year of credit service.
  - Payment Form: Benefits are paid as a monthly life annuity. Optional forms of payment are available.
- Contributions: Members of this fund and their employers are currently each contributing at the rate determined by the individual employer. The amount allocated to the Defined Benefit portion of the Hybrid Plan is annually set by the Board of Directors. The current amount is 12.60%, effective July 1, 2015. The recommended amount is 13.50%, effective July 1, 2016.
- Benefit adjustments are granted periodically at the discretion of the FPPA Board.

Based on the results of this valuation, the plan can grant a permanent benefit adjustment of 3.00% and remain nearly fully funded (99.8%). The permanent benefit adjustment which would produce a 100% funded ratio is 2.98% per year.

Actuarial Methods and Assumptions

The valuation was prepared using the Entry Age Normal Method. This is the same funding method that has been used for the Statewide Defined Benefit Plan. Effective January 1, 2013, the asset valuation method is an actuarial value based on a five-year phase-in of excess investment gains and losses. See Appendix A for a complete description of this method.

The actuarial value of future benefits from the plan is based on several economic and non-economic assumptions. These are summarized in Appendix A. The economic assumptions include investment return and salary increases. Non-economic assumptions include rates of mortality, disability, and separation.

Since the prior valuation, the Board adopted new assumptions based on the 2015 Experience Study. The changes from the prior assumption set are summarized below:

Economic Assumptions

1. Reduce the inflation assumption from 3.00% to 2.50%.
2. Increase the real rate of return assumption from 4.50% to 5.00%, resulting in no overall change to the nominal return assumption of 7.50%.
3. Add an explicit assumption for administrative expenses in the contribution determination.
4. Increase the productivity component of the salary scale assumption from 1.00% to 1.50%. Combining with the inflation rate of 2.50% creates ultimate salary scale assumption of 4.00%, which is unchanged from the current assumption.
5. Slightly modify the service-based promotional/longevity component of the salary scale.

Mortality Assumptions

6. Update the post-retirement mortality tables for non-disabled retirees to a table based on the RP-2014 generational mortality tables with blue collar adjustment. In addition, update the projected rate of improvement in longevity from Scale AA to the more recently published Scale BB.
7. Update the occupationally disabled post-retirement mortality assumption to be the same table as used for the healthy annuitants, except with a three year set-forward.
8. Update the pre-retirement non-duty mortality tables to 55% of the RP-2014 mortality tables for active employees. Make no adjustment to the current duty mortality rate of 0.00020.

Other Demographic Assumptions

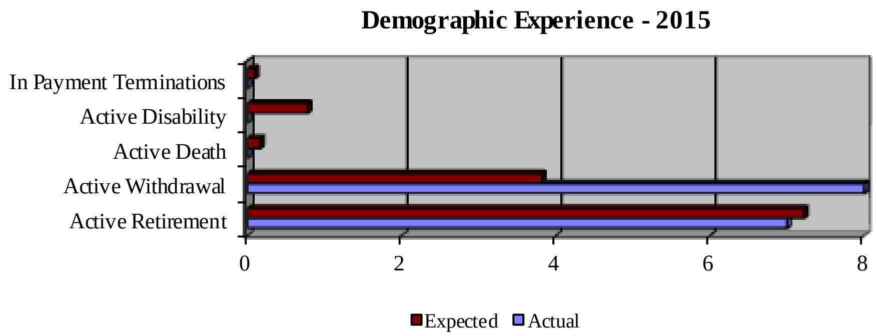
9. Slightly increase the pattern of retirement.
10. Combine the termination assumption for police and fire.
11. Increase the rates of both occupational and total disability to reflect higher incidence of disability observed during the study period than expected.

Actuarial Methods and Policies

12. Recommend no change to the use of the 5-year smoothing technique to determine the actuarial value of assets, used for determining the annual employer contribution rates.
13. Recommend continued use of the Entry Age Actuarial Cost Method.

The results of the actuarial valuation are dependent on the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions.

For FY2015, the actual salary increases were 99.2% of expected. The following charts provide a comparison of the actual experience versus the expected experience for selected demographic assumptions.



The In Payment Terminations above include deaths and benefits that were canceled for other reasons.

GASB and Funding Progress

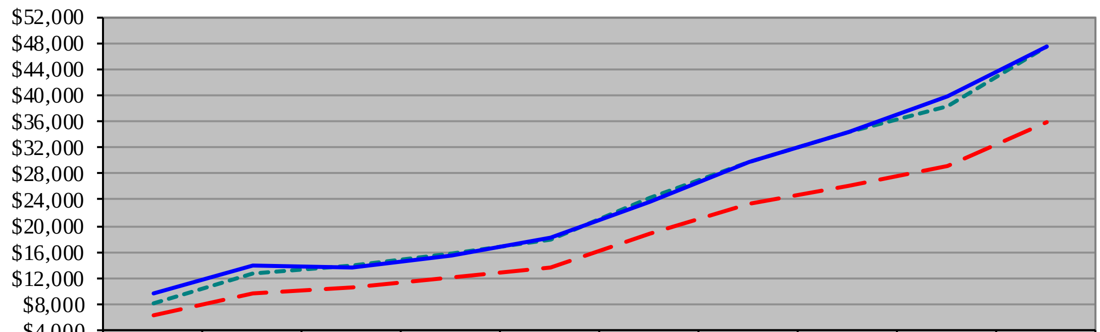
The Governmental Accounting Standards Board (GASB) Statement No. 67, Financial Reporting for Pension Plans (Issued 6/2012), has replaced the requirements under GASB Statement No. 25, Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans (Issued 11/1994), effective for financial statements for fiscal years beginning after June 15, 2013. GASB Statement No. 68, Accounting and Financial Reporting for Pensions (Issued 6/2012), has replaced GASB Statement No. 27, Accounting for Pensions by State and Local Governmental Employers (Issued 11/1994), effective for fiscal years beginning after June 15, 2014. GASB Statement No. 67 has been implemented in FPPA's Comprehensive Annual Financial Report for fiscal year 2014.

Plan reporting information for GASB Statement No. 67 can be found in the FPPA Comprehensive Annual Financial Report at FPPAco.org. Employer reporting information for GASB Statement No. 68 is provided in a separate report to the employer.

Although it will no longer be required for financial reporting purposes, we have continued to include Table 12 (Schedule of Funding Progress) which shows a historical summary of the funded ratios and other information for FPPA. While not required, it shows insight into funding trends over time. Similarly, the following graph shows the trend of assets and liabilities over the last decade.

History of AAL vs AVA

On the valuation date as of January 1,



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
AAL	$6,299	$9,775	$10,649	$12,107	$13,658	$18,833	$23,313	$26,124	$29,178	$35,777
3% Ben. Adj. AAL	$8,249	$12,657	$13,989	$15,800	$17,900	$24,319	$29,889	$34,254	$38,316	$47,425
AVA	$9,624	$14,076	$13,643	$15,374	$18,107	$23,667	$29,758	$34,476	$39,773	$47,345

$ in thousands

AAL 3% Ben. Adj. AAL AVA

Significant Factors Affecting Trends in Actuarial Information

Investment returns during 2015 and assumption changes following an experience study created actuarial losses for the Plan. Outstanding deferred investment gains will put upward pressure on the funded ratio in future valuations if not offset by future losses. The current recommended Defined Benefit contribution level is expected to be able to support a 3.0% permanent benefit adjustment, and is expected to continue to build a surplus when determining the actuarial results for base benefits alone. This surplus is important due to the closed nature of the plan. It can be used to fund future benefit adjustments and to protect against adverse deviation.

Risk Metrics

The Statewide Hybrid Plan covers firefighters and police officers from departments that elect coverage under the Plan after January 1, 2004. Most departments with members covered under the Plan do not cover newly hired members under the Plan, and so, going forward, the Plan will resemble a closed plan. Over time, active member payroll will diminish and liabilities will increase as a percentage of payroll. In recent years, this increase in leverage has not been observed because reentry groups have increased the active member payroll. This trend was not observed during 2014, but reappeared in 2015. This potential pool of reentry members is diminishing, and it is unlikely that this will continue at the historical rate. Because the Plan is largely closed and the payroll contributions for this plan have a finite horizon, the Board should give added consideration to the Plan's ability to sustain adverse experience.

Valuation Year	AVA as % of Covered Payroll	AAL as % of Covered Payroll	ARC % of Covered Payroll	Increase in ARC if Assets Decrease 10%	Funded Ratio	Change in Funded Ratio if Assets Decrease 10%
2007	219%	143%	3.55%	1.22%	152.8%	-15.3%
2008	192%	133%	5.35%	1.01%	144.0%	-14.4%
2009	177%	138%	6.42%	0.93%	128.1%	-12.8%
2010	170%	134%	6.69%	0.89%	127.0%	-12.7%
2011	206%	156%	5.99%	1.09%	132.6%	-13.3%
2012	194%	154%	7.38%	1.06%	125.7%	-12.6%
2013	222%	174%	6.90%	1.20%	127.6%	-12.8%
2014	260%	197%	6.07%	1.42%	132.0%	-13.2%
2015	319%	234%	4.88%	1.75%	136.3%	-13.6%
2016	361%	273%	5.26%	1.74%	132.3%	-13.2%

SECTION III

TABLES

Development of Contribution Rate

		January 1, 2016	January 1, 2015 Post-Experience Study	January 1, 2015 Pre-Experience Study
1.	Covered payroll for upcoming year	$ 13,622,258	$ 12,904,715	$ 12,904,715
2.	Present value of future pay	$ 112,229,339	$ 108,299,124	$ 111,674,974
3.	Total normal cost rate	9.52%	9.60%	9.54%
4.	Actuarial accrued liability for active members			
	a. Present value of future benefits for active members	$ 32,069,946	$ 29,002,292	$ 28,868,639
	b. Less: present value of future normal costs	(10,643,924)	(10,335,169)	(10,594,169)
	c. Actuarial accrued liability (a - b)	$ 21,426,022	$ 18,667,123	$ 18,274,470
5.	Total actuarial accrued liability for:			
	a. Retirees and beneficiaries	$ 12,016,162	$ 9,538,494	$ 9,318,306
	b. Inactive members (terminated vested and nonvested)	2,334,738	1601070.82	1,584,754
	c. Active members (Item 5c)	21,426,022	18,667,123	18,274,470
	d. Total	$ 35,776,922	$ 29,806,688	$ 29,177,530
6.	Actuarial value of assets	$ 47,344,971	$ 39,772,760	$ 39,772,760
7.	Unfunded actuarial accrued liability UAAL/(surplus) (Item 6d - Item 7)	$ (11,568,049)	$ (9,966,072)	$ (10,595,230)
8.	Contribution requirement			
	a. UAAL amortization payment as % of pay	(4.82%)	(4.38%)	(4.66%)
	b. Normal cost	9.52%	9.60%	9.54%
	c. Administrative Expense*	0.56%	0.55%	N/A
	d. Contribution requirement (a + b + c)	5.26%	5.77%	4.88%

**As of January 1, 2016, this is a method change to explicitly include administrative expenses in the contribution requirement.*

Actuarial Present Value of Future Benefits

			January 1, 2016	January 1, 2015
1.	Active members			
	a.	Retirement benefits	$ 30,887,680	$ 27,780,856
	b.	Deferred termination benefits	1,065,654	1,011,361
	c.	Refunds	59,181	37,673
	d.	Death benefits	57,431	38,749
	e.	Total	$ 32,069,946	$ 28,868,639
2.	Members in pay status			
	a.	Service retirements	$ 12,016,162	$ 9,318,306
	b.	Beneficiaries	0	0
	c.	Total	$ 12,016,162	$ 9,318,306
4.	Inactive members			
	a.	Vested terminations	$ 1,962,125	$ 777,681
	b.	Nonvested terminations	372,613	807,073
	c.	Total	$ 2,334,738	$ 1,584,754
5.	Total actuarial present value of future benefits		$ 46,420,846	$ 39,771,699

Analysis of Normal Cost by Component

		January 1, 2016	January 1, 2015
1.	Retirement benefits	8.65%	8.71%
2.	Deferred termination benefits	0.74%	0.71%
3.	Refunds	0.12%	0.11%
4.	Death benefits	0.01%	0.01%
5.	Total	9.52%	9.54%

Actuarial Gain/(Loss) on UAAL

		January 1, 2016	January 1, 2015
1.a.	Unfunded actuarial accrued liability (UAAL) as of January 1 of prior year	$ (10,595,230)	$ (8,352,346)
1.b.	Unfunded actuarial accrued liability (UAAL) as of January 1 of prior year after incorporation of the experience study recommendations	$ (9,966,072)	N/A
2.	Total normal cost for year (Normal cost % x actual payroll paid during year)	1,276,387	1,203,005
3.	Non service purchase contributions during year ending December 31	(1,689,225)	(1,593,310)
4.	Interest on UAAL for one year	(747,455)	(626,426)
5.	Interest on Item 2 and Item 3 for one-half year	(15,202)	(14,372)
6.	Expected UAAL as of January 1 (1 + 2 + 3 + 4 + 5)	$ (11,141,567)	$ (9,383,449)
7.	Actual UAAL at end of year	$ (11,568,049)	$ (10,595,230)
8.	Actuarial gain/(loss) for the period (6 - 7)	$ 426,482	$ 1,211,782
	<u>SOURCE OF GAINS/(LOSSES)</u>		
9.	Asset gain/(loss) (See Table 10)	$ (258,791)	$ 421,465
10.	Salary liability gain/(loss) for the period	$ (4,273)	$ 453,169
11.	Benefit adjustment granted as of October 1 (3.00% in 2015, 3.00% in 2014)	$ (279,549)	$ (195,705)
12.	Net liability gain/(loss) for the period (8 - 9 - 10 - 11)	$ 969,095	$ 532,853

Analysis of Change in Calculated Contribution Rate

		January 1, 2016	January 1, 2015
Results Assuming No Future Benefit Adjustments			
1.	Recommended contribution rate as of last valuation	4.88%	6.07%
2.	Change in Contribution Rate During Year		
a.	Change in normal cost	(0.07%)	0.04%
b.	Change in assumptions	0.89%	0.00%
c.	Change in benefit provisions	0.00%	0.00%
d.	Impact of contributing less/(more) than calculated rate	(0.40%)	(0.37%)
e.	Recognition of asset losses (gains)	0.11%	(0.17%)
f..	Effect of payroll growth	0.09%	(0.44%)
g.	Benefit adjustment granted as of October 1 (3.00% in 2015, 3.00% in 2014)	0.12%	0.09%
h.	Resetting Funding Period to 30 Years	0.09%	0.09%
i.	Actuarial (gain) loss from other liability sources	(0.45%)	(0.43%)
j.	Total Change	0.38%	(1.19%)
3.	Recommended contribution rate as of this valuation	5.26%	4.88%

Summary of Historical Valuation Results
As of the Valuation date January 1,

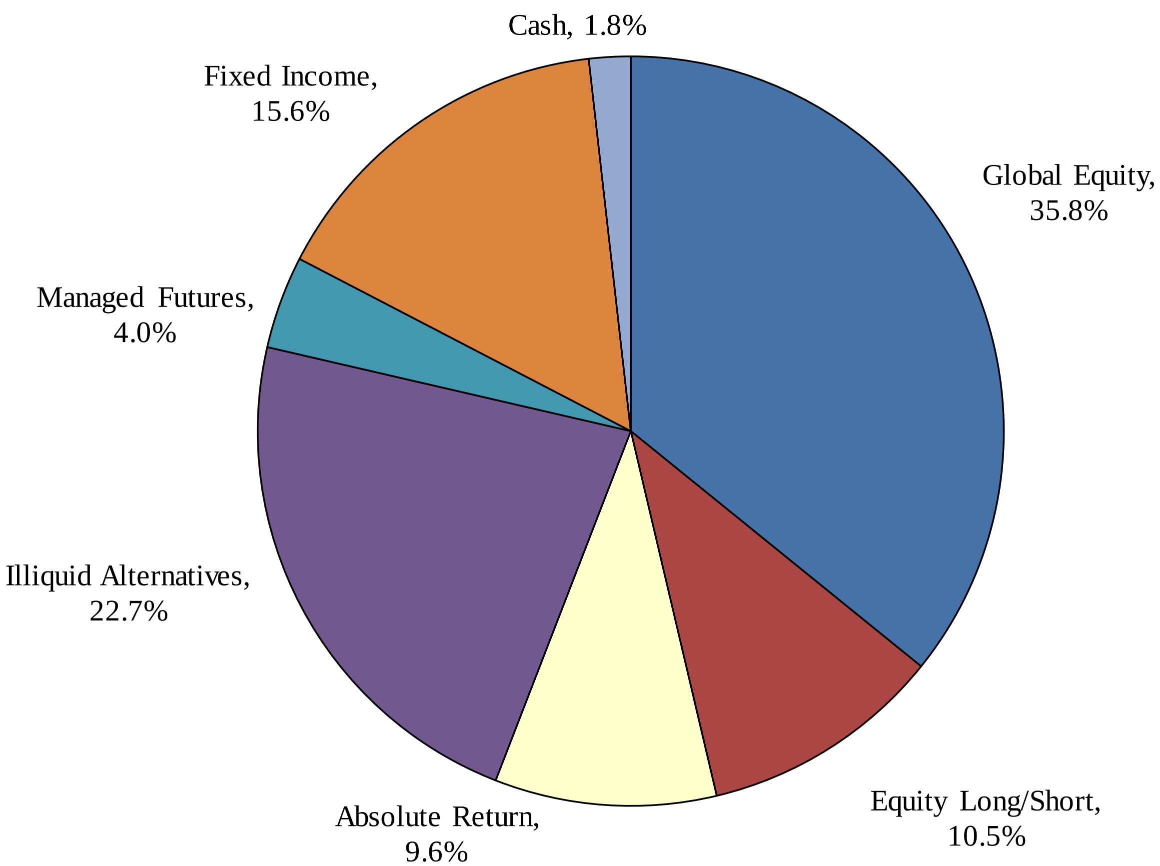
		2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
1.	Number of Members										
	a. Active	160	156	170	172	171	121	126	114	115	63
	b. Retired/DROP/Beneficiaries	34	25	19	16	14	10	6	6	4	3
	c. Inactive members	22	18	11	7	6	7	8	11	2	0
	d. Total	216	199	200	195	191	138	140	131	121	66
2.	Covered payroll (prior year)	$ 12,830,741	$ 12,140,184	$ 12,937,791	$ 12,958,335	$ 11,650,031	$ 8,462,937	$ 8,622,865	$ 7,338,959	$ 6,988,987	$ 4,257,723
3.	Average compensation	$ 80,192	$ 77,822	$ 76,105	$ 75,339	$ 68,129	$ 69,942	$ 68,435	$ 64,377	$ 60,774	$ 67,583
4.	Covered payroll for upcoming year	$ 13,622,258	$ 12,904,715	$ 13,818,988	$ 13,905,802	$ 12,637,009	$ 9,186,706	$ 9,456,360	$ 8,059,809	$ 7,690,109	$ 4,495,268
5.	Actuarial value of assets	$ 47,344,971	$ 39,772,760	$ 34,476,002	$ 29,758,000	$ 23,666,933	$ 18,107,030	$ 15,373,546	$ 13,642,709	$ 14,075,984	$ 9,624,239
6.	Market value of assets	$ 46,309,805	$ 41,037,152	$ 36,323,815	$ 29,743,999	$ 22,688,412	$ 18,169,731	$ 14,650,779	$ 11,368,924	$ 14,241,929	$ 10,056,739
7.	Present value of benefits										
	a. Retired/Beneficiaries	$ 12,016,162	$ 9,318,306	$ 6,523,497	$ 5,328,780	$ 4,796,966	$ 2,763,051	$ 1,738,422	$ 1,705,118	$ 1,021,361	$ 869,103
	b. Terminations	2,334,738	1,584,754	1,188,810	524,247	483,564	383,892	265,824	244,632	226,062	0
	c. Actives	32,069,946	28,868,639	30,202,694	29,820,602	25,611,533	17,788,639	17,826,490	15,395,251	14,878,447	8,017,492
	d. Total	$ 46,420,846	$ 39,771,699	$ 37,915,001	$ 35,673,629	$ 30,892,063	$ 20,935,582	$ 19,830,736	$ 17,345,001	$ 16,125,870	$ 8,886,595
8.	Total contribution										
	a. Amount	$ 1,839,005	$ 1,619,542	$ 1,734,283	$ 1,779,943	$ 1,636,493	$ 1,047,284	$ 1,082,753	$ 902,699	$ 812,268	$ 460,765
	b. Percent of pay	13.50%	12.60%	12.50%	12.60%	13.00%	11.30% *	11.50%	11.40%	11.00%	10.25%
	c. Effective date	July 1	July 1	July 1	July 1	July 1	July 1	July 1	July 1	August 1	August 1

**11.30% rate effective July 1, 2011 through December 31, 2012. 12.90% rate effective January 1, 2012 through June 30, 2012.*

Allocation of Plan Assets at Fair Value

	January 1, 2016	Target Allocation
1. Global Equity	35.8%	37.0%
2. Equity Long/Short	10.5%	10.0%
3. Absolute Return	9.6%	11.0%
4. Illiquid Alternatives	22.7%	20.0%
5. Managed Futures	4.0%	4.0%
6. Fixed Income	15.6%	16.0%
7. Cash	1.8%	2.0%
	100.0%	100.0%

Asset Allocation as of January 1, 2016



Reconciliation of Plan Net Assets

			Year Beginning January 1, 2015	Year Beginning January 1, 2014
1.	Market value of assets at beginning of year		$ 41,037,152	$ 36,323,815
2.	Revenue for the year			
	a.	Contributions		
		i. Member contributions	$ 4,327,382	$ 1,765,286
		ii. Employer contributions	1,316,896	1,237,843
		iii. SWDD roll to normal contributions	0	0
	b.	Net investment income		
		i. Interest	$ 109,760	$ 85,887
		ii. Dividends	375,636	388,049
		iii. Net change in accrued income	6,997	(7,524)
		iv. Unrealized gain/(loss)	(1,148,222)	610,501
		v. Realized gain/(loss)	1,339,521	1,463,751
		vi. Investment expense	(368,981)	(288,219)
		vii. Other Income	358,807	322,030
	c.	Total revenue	$ 6,317,796	$ 5,577,604
3.	Expenditures for the year			
	a.	Refunds	$ (18,365)	$ (43,962)
	b.	Benefit payments	(953,099)	(752,330)
	c.	Administrative expense	(73,679)	(67,975)
	d.	Total expenditures	$ (1,045,143)	$ (864,267)
4.	Increase in net assets (Item 2c - Item 3d)		$ 5,272,653	$ 4,713,337
5.	Market value of assets at end of year (Item 1 + Item 4)		$ 46,309,805	$ 41,037,152

Development of Actuarial Value of Assets

1.	Actuarial value of assets at beginning of year	$	39,772,760
2.	Net new investments		
	a. Contributions and Affiliations		5,644,278
	b. Benefits paid		(953,099)
	c. Refunds		(18,365)
	e. Subtotal		4,672,814
3.	Assumed investment return rate for fiscal year		7.5%
4.	Assumed investment return for fiscal year	$	3,158,188
5.	Expected Actuarial Value at end of year	$	47,603,762
6.	Market value of assets at end of year	$	46,309,805
7.	Excess return (6-5)	$	(1,293,957)

8. Development of amounts to be recognized as of December 31, 2015:

Fiscal Year End	Remaining Deferrals of Excess (Shortfall) of Investment Income	Offsetting of Gains/(Losses)	Net Deferrals Remaining	Years Remaining	Recognized for this valuation	Remaining after this valuation
	(1)	(2)	(3) = (1) + (2)	(4)	(5) = (3) / (4)	(6) = (3) - (5)
2011	$ 0	$ 0	$ 0	1	$ 0	$ 0
2012	0	0	0	2	0	0
2013	1,264,392	(1,264,392)	0	3	0	0
2014	0	0	0	4	0	0
2015	(2,558,349)	1,264,392	(1,293,957)	5	(258,791)	(1,035,166)
Total	$ (1,293,957)	$ 0	$ (1,293,957)		$ (258,791)	$ (1,035,166)

9.	Actuarial value of assets as of December 31, 2015 (Item 6 - Item 8)	$	47,344,971
10.	Ratio of actuarial value to market value		102.2%

Amounts in column (1) for fiscal years ending 2011 through 2014 are from the prior valuation. The column (1) amount for fiscal year 2015 is developed using item 7 less the total of column (1) for fiscal years ending 2011 through 2014. To the extent possible, the 2015 excess or shortfall is used to reduce prior bases. In this case, a portion of the 2015 base is used to offset the remaining 2013 base, and then the net remaining 2015 base is amortized over five years. The first base was established in fiscal year 2013, and prior bases for fiscal years 2011 and 2012 were not established. The fiscal year 2014 base is $0 because the entire base was used to offset the 2013 loss in a prior valuation.

Investment Yields

Item	Market Value	Actuarial Value
1. Assets as of January 1, 2015 (A)	$ 41,037,152	$ 39,772,760
2. Contributions during FY15	5,644,278	5,644,278
3. Benefit payments made during FY15	953,099	953,099
4. Refunds of contributions during FY15	18,365	18,365
5. Transfers to member's DROP accounts during FY15	0	0
6. Investment return during FY15	599,839	2,899,396
7. Assets as of January 1, 2016 (B): (1 + 2 - 3 - 4 - 5 + 6)	$ 46,309,805	$ 47,344,971
8. Approximate rate of return on average invested assets		
a. Net investment income (I)	$ 599,839	$ 2,899,396
b. Estimated return based on (2I / (A + B - I))	1.38%	6.89%

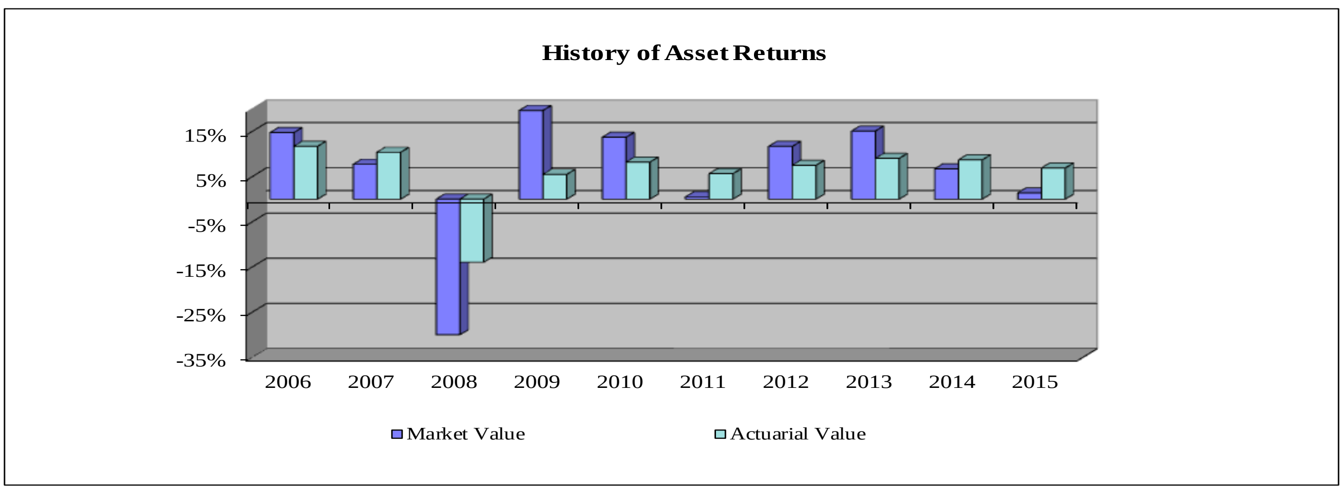
Gain/(Loss) on Actuarial Value of Assets

Item	Valuation as of January 1, 2016	Valuation as of January 1, 2015
1. Actuarial assets, prior valuation	$ 39,772,760	$ 34,476,002
2. Total contributions since prior valuation	$ 5,644,278	$ 3,003,129
3. Benefits and refunds since prior valuation	$ (971,463)	$ (796,292)
4. Assumed net investment income at actuarial rate %*		
a. Beginning assets	$ 2,982,957	$ 2,585,700
b. Contributions	211,660	112,617
c. Benefits and refunds paid	(36,430)	(29,861)
d. Total	$ 3,158,187	$ 2,668,456
5. Expected actuarial assets (1 + 2 + 3 + 4)	$ 47,603,762	$ 39,351,295
6. Actual actuarial assets, this valuation	$ 47,344,971	$ 39,772,760
7. Asset gain (loss) since prior valuation (6 - 5)	$ (258,791)	$ 421,465
	Loss	Gain

**7.5% beginning at January 1, 2012.*

History of Investment Return Rates

For Fiscal Year Ending	Market Value	Actuarial Value
December 31, 2006	14.71%	11.69%
December 31, 2007	7.70%	10.36%
December 31, 2008	(30.00%)	(13.96%)
December 31, 2009	19.62%	5.48%
December 31, 2010	13.69%	8.19%
December 31, 2011	0.50%	5.63%
December 31, 2012	11.67%	7.48%
December 31, 2013	15.07%	9.00%
December 31, 2014	6.70%	8.68%
December 31, 2015	1.38%	6.89%
Average Returns:		
Last 5 Years	6.91%	7.53%
Last 10 Years	5.09%	5.69%



Schedule of Funding Progress

Date	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AAL)	Unfunded Actuarial Accrued Liability (UAAL) (3) - (2)	Funded Ratio (2)/(3)	Annual Payroll	UAAL as % of Payroll (4)/(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
January 1, 2007	$ 9,624,239	$ 6,299,422	$ (3,324,817)	152.8%	$ 4,391,954	(75.7%)
January 1, 2008	14,075,984	9,774,906	(4,301,078)	144.0%	7,342,967	(58.6%)
January 1, 2009	13,642,709	10,648,712	(2,993,997)	128.1%	7,726,670	(38.7%)
January 1, 2010	15,373,546	12,107,329	(3,266,217)	127.0%	9,026,182	(36.2%)
January 1, 2011	18,107,030	13,658,025	(4,449,005)	132.6%	8,770,187	(50.7%)
January 1, 2012	23,666,933	18,832,849	(4,834,084)	125.7%	12,195,940	(39.6%)
January 1, 2013	29,758,000	23,313,204	(6,444,795)	127.6%	13,384,707	(48.2%)
January 1, 2014	34,476,002	26,123,656	(8,352,346)	132.0%	13,246,537	(63.1%)
January 1, 2015	39,772,760	29,177,530	(10,595,230)	136.3%	12,462,773	(85.0%)
January 1, 2016	47,344,971	35,776,922	(11,568,049)	132.3%	13,118,579	(88.2%)

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. With regard to any funded status measurements presented in this report:

(1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

(2) The measurement alone is inappropriate for assessing the need for or the amount of future employer contributions.

(3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

Solvency Test

	Aggregated Accrued Liabilities for				Portion of Accrued Liabilities Covered by Reported Assets		
Valuation Date	Active Members Contributions	Retirees Beneficiaries and Vested Terminations	Members (Employer Financed Portion)	Actuarial Value of Assets	(5)/(2)	[(5)-(2)]/(3)	[(5)-(2)-(3)]/(4)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
January 1, 2005	$ 4,796,229	$ 0	$ (760,335)	$ 5,040,067	100.0%	100.0%	100.0%
January 1, 2006	6,565,089	0	(1,198,177)	7,998,356	100.0%	100.0%	100.0%
January 1, 2007	6,372,113	869,103	(941,794)	9,624,239	100.0%	100.0%	100.0%
January 1, 2008	9,263,435	1,249,679	(738,208)	14,075,984	100.0%	100.0%	100.0%
January 1, 2009	7,488,207	2,201,593	958,912	13,642,709	100.0%	100.0%	100.0%
January 1, 2010	7,717,567	2,233,942	2,155,820	15,373,546	100.0%	100.0%	100.0%
January 1, 2011	7,303,256	3,146,943	3,207,826	18,107,030	100.0%	100.0%	100.0%
January 1, 2012	9,883,610	5,280,530	3,668,709	23,666,933	100.0%	100.0%	100.0%
January 1, 2013	12,049,328	5,853,027	5,410,849	29,758,000	100.0%	100.0%	100.0%
January 1, 2014	11,990,004	7,712,307	6,421,345	34,476,002	100.0%	100.0%	100.0%
January 1, 2015	10,736,366	10,903,060	7,538,104	39,772,760	100.0%	100.0%	100.0%
January 1, 2016	12,829,719	14,350,900	8,596,303	47,344,971	100.0%	100.0%	100.0%

Cash Flow Analysis

		Expenditures During the Year							
Year Ending December 31,	Contributions for the Year	Benefit Payments	Refund of Contributions	Identified Receipts	Expenses	Total	External Cash Flow for the Year	Market Value of Assets	External Cash Flow as Percent of Market Value
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2004	$ 4,796,245	$ 0	$ 0	$ 0	$ (6,300)	$ (6,300)	$ 4,789,945	$ 5,144,011	93.1%
2005	2,384,615	0	(36,779)	0	(46,372)	(83,151)	2,301,465	8,156,421	28.2%
2006	697,112	(42,481)	(2,108)	0	(60,873)	(105,462)	591,650	10,056,739	5.9%
2007	3,502,835	(95,405)	(122,503)	0	(82,933)	(300,841)	3,201,994	14,241,929	22.5%
2008	1,880,763	(155,143)	(78,716)	0	(108,949)	(342,808)	1,537,955	11,368,924	13.5%
2009	1,384,791	(195,627)	(232,027)	(12)	(97,983)	(525,649)	859,142	14,650,779	5.9%
2010	1,253,552	(89,965)	252,487	0	(126,643)	35,879	1,289,431	18,169,731	7.1%
2011	4,749,092	(317,469)	(14,990)	0	(154,432)	(486,891)	4,262,201	22,688,412	18.8%
2012	4,617,459	(449,818)	(3,097)	0	(154,432)	(607,347)	4,010,112	29,743,999	13.5%
2013	2,513,695	(525,814)	(36,845)	0	(314,953)	(877,613)	1,636,082	36,323,815	4.5%
2014	3,003,129	(752,330)	(43,962)	0	(356,794)	(1,153,086)	1,850,043	41,037,152	4.5%
2015	5,644,278	(953,099)	(18,365)	0	(442,660)	(1,414,123)	4,230,154	46,309,805	9.1%
2016*	1,777,705	(1,233,706)	(19,119)	0	(458,153)	(1,710,978)	66,727	49,852,269	0.1%
2017*	1,903,370	(1,489,653)	(19,788)	0	(474,188)	(1,983,630)	(80,260)	53,507,920	-0.1%
2018*	1,969,988	(1,646,054)	(20,481)	0	(490,785)	(2,157,320)	(187,332)	57,326,657	-0.3%

* Results for 2016, 2017, & 2018 are based on expected contributions, expected benefit payments, and assumed investment return of 7.5%
Expected contributions are based on combined employee and employer rate of 13.5% and 3.5% annual payroll growth
Expected benefit payments are based on 3% benefit adjustment and expected retirements, terminations, and mortality
Assets are assumed to increase at the annual return of 7.5% with all cash flow occurring in the middle of the year

Membership Data

	January 1, 2016	January 1, 2015	January 1, 2014
1. Active members			
a. Number	160	156	170
b. Total payroll	$ 12,830,741	$ 12,140,184	$ 12,937,791
c. Average annual salary	$ 80,192	$ 77,822	$ 76,105
d. Average age	46.1	46.1	45.6
e. Average service	12.2	11.5	10.8
2. Inactive members			
a. Vested	4	2	1
b. NonVested	18	16	10
3. Service retirees			
a. Number	34	25	19
b. Total annual benefits	$ 1,089,295	$ 863,911	$ 597,652
c. Average annual benefit	$ 32,038	$ 34,556	$ 31,455
d. Average age	62.4	61.5	61.2
4. Beneficiaries and spouses			
a. Number	0	0	0
b. Total annual benefits	$ 0	$ 0	$ 0
c. Average annual benefit	$ 0	$ 0	$ 0
d. Average age	0.0	0.0	0.0

Historical Summary of Active Member Data

Valuation Date	Active Count	Average Age	Average Service	Covered Payroll	Average Annual Salary	Percent Change in Average Salary
2006	67	42.4	9.8	3,967,889	59,222	(16.76%)
2007	63	41.7	10.3	4,257,723	67,583	14.12%
2008	115	40.9	8.5	6,988,987	60,774	(10.08%)
2009	114	41.2	8.8	7,338,959	64,377	5.93%
2010	126	42.7	8.9	8,622,865	68,435	6.30%
2011	121	43.4	9.7	8,462,937	69,942	2.20%
2012	171	44.5	8.9	11,650,031	68,129	(2.59%)
2013	172	45.3	10.3	12,958,335	75,339	10.58%
2014	170	45.6	10.8	12,937,791	76,105	1.02%
2015	156	46.1	11.5	12,140,184	77,822	2.26%
2016	160	46.1	12.2	12,830,741	80,192	3.05%

Distribution of Active Members by Age and by Years of Service
As of December 31, 2015

	Years of Credited Service												
Attained Age	Less than 1 Count & Avg. Comp.	1-2 Count & Avg. Comp.	2-3 Count & Avg. Comp.	3-4 Count & Avg. Comp.	4-5 Count & Avg. Comp.	5-9 Count & Avg. Comp.	10-14 Count & Avg. Comp.	15-19 Count & Avg. Comp.	20-24 Count & Avg. Comp.	25-29 Count & Avg. Comp.	30-34 Count & Avg. Comp.	35 & Over Count & Avg. Comp.	Total Count & Avg. Comp.
Under 25	1 $41,513												1 $41,513
25-29	2 $49,826		1 $51,402	1 $67,512									4 $54,642
30-34	1 $51,043		2 $77,357	1 $53,893		4 $60,601	2 $59,791						10 $62,163
35-39	3 $67,082	1 $49,080	1 $55,987		3 $85,788	6 $72,262	5 $77,582	1 $29,216		1 $60,420			21 $70,228
40-44	1 $89,549			1 $85,378	4 $84,332	9 $74,779	11 $81,528	6 $85,405					32 $81,079
45-49	2 $91,114				5 $97,808	5 $71,406	6 $81,449	8 $84,571	7 $89,388	1 $98,996	2 $75,841		36 $85,276
50-54	1 $102,023				4 $87,080	7 $79,884	2 $74,938	6 $74,927	3 $90,050	5 $85,134	1 $130,247		29 $83,967
55-59					3 $110,095	6 $80,317		3 $78,277		2 $88,214	2 $73,093		16 $85,602
60-64				1 $68,173	2 $117,602	1 $56,494	1 $108,883		1 $125,799		1 $78,670	2 $73,448	9 $91,124
65 & Over	1 $105,112				1 $79,864								2 $92,488
Total	12 $72,697	1 $49,080	4 $65,526	4 $68,739	22 $94,427	38 $73,779	27 $79,695	24 $79,276	11 $92,879	9 $84,612	6 $84,464	2 $73,448	160 $80,192

Average:			Number of participants:				
	Age:	46.1		Fully vested:	117	Males:	149
	Service:	12.2		Not Vested:	43	Females:	11

Schedule of Retirants & Annuitants Added to & Removed from Rolls

	Added to Rolls*		Removed from Rolls		Rolls-End of Year			
Year Ended	Number	Annual Benefits	Number	Annual Benefits	Number	Annual Benefits	% Increase in Annual Benefits	Average Annual Benefits
December 31, 2004	0	$ 0	0	$ 0	0	$ 0	N/A	$ 0
December 31, 2005	0	0	0	0	0	0	N/A	0
December 31, 2006	3	83,287	0	0	3	83,287	N/A	27,762
December 31, 2007	1	13,802	0	0	4	97,089	16.57%	24,272
December 31, 2008	2	59,330	0	0	6	161,905	66.76%	26,984
December 31, 2009	0	4,858	0	0	6	166,763	3.00%	27,794
December 31, 2010	4	90,509	0	0	10	257,272	54.27%	25,727
December 31, 2011	4	174,855	0	0	14	432,126	67.96%	30,866
December 31, 2012	2	54,220	0	0	16	486,346	12.55%	30,397
December 31, 2013	3	111,306	0	0	19	597,652	22.89%	31,455
December 31, 2014	6	266,259	0	0	25	863,911	44.55%	34,556
December 31, 2015	9	225,384	0	0	34	1,089,295	26.09%	32,038

* Includes benefit adjustments

Summary of Members and Adjusted Payroll by Employer

City Code	City Name	Police No.	Police Earnings	Fire No.	Fire Earnings	Total No.	Total Earnings
10	AURORA FIRE	-	$ -	43	$ 3,837,192	43	$ 3,837,192
29	BUENA VISTA POLICE	2	137,167	-	-	2	137,167
33	CANON CITY POLICE	1	61,283	-	-	1	61,283
740	CARBONDALE AND RURAL FPD ADMIN	-	-	1	84,406	1	84,406
79	EVANS	25	1,568,968	-	-	25	1,568,968
76	ENGLEWOOD POLICE	3	232,076	-	-	3	232,076
89	FOUNTAIN FIRE	-	-	1	66,078	1	66,078
102	GRANADA POLICE	1	29,664	-	-	1	29,664
137	LAFAYETTE POLICE	4	316,432	-	-	4	316,432
593	LAKE DILLON FPD	-	-	4	332,041	4	332,041
149	LITTLETON FIRE	-	-	13	1,158,481	13	1,158,481
163	MILLIKEN POLICE	1	54,981	-	-	1	54,981
532	NORTH METRO FIRE RESCUE	-	-	1	130,247	1	130,247
196	PLATTEVILLE POLICE	1	68,173	-	-	1	68,173
524	SNOWMASS WILDCAT FPD	-	-	2	147,500	2	147,500
232	STERLING FIRE	-	-	1	83,926	1	83,926
542	SABLE-ALTURA FPD	-	-	1	56,494	1	56,494
220	SHERIDAN POLICE	1	85,378	-	-	1	85,378
240	TRINIDAD FIRE	-	-	3	166,479	3	166,479
595	UPPER PINE RIVER FPD	-	-	1	90,000	1	90,000
534	WEST METRO FPD	-	-	42	3,437,683	42	3,437,683
252	WESTMINSTER FIRE	-	-	8	686,091	8	686,091
	Totals	39	$ 2,554,123	121	$ 10,276,618	160	$ 12,830,741

SECTION IV

APPENDICES

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

I. Valuation Date

The valuation date is January 1st of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

II. Actuarial Cost Method

The actuarial valuation uses the Entry Age Normal actuarial cost method. Under this method, the employer contribution rate is the sum of (i) the employer normal cost rate, and (ii) a rate that will amortize the unfunded actuarial liability.

1. The valuation is prepared on the projected benefit basis. The present value of each participant's expected benefit payable at retirement or termination is determined, based on age, service, sex, compensation, and the interest rate assumed to be earned in the future (7.5%). The calculations take into account the probability of a participant's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his terminating with a service benefit. Future salary increases are also anticipated. The present value of the expected benefits payable on account of the active participants is added to the present value of the expected future payments to retired participants and beneficiaries to obtain the present value of all expected benefits payable from the Plan on account of the present group of participants and beneficiaries.

2. The employer contributions required to support the benefits of the Plan are determined following a level funding approach, and consist of a normal contribution and an accrued liability contribution.

3. The normal contribution is determined using the Entry Age Normal method. Under this method, a calculation is made to determine the average uniform and constant percentage rate of employer contribution which, if applied to the compensation of each new participant during the entire period of his anticipated covered service, would be required in addition to the contributions of the participant to meet the cost of all benefits payable on their behalf.

4. The unfunded accrued liability contributions are determined by subtracting the actuarial value of assets from the actuarial accrued liability and amortizing the result over 30 years from the valuation date. It is assumed that payments are made monthly throughout the year.

III. Actuarial Value of Assets

Effective January 1, 2013, the actuarial value of assets is equal to the market value of assets less a five-year phase in of the excess (shortfall) between expected investment return and actual income. The actual calculation is based on the difference between actual earnings and expected earnings each year, and recognizes the cumulative excess return (or shortfall) over at a minimum rate of 20% per year. The speed of the recognition will increase if the Plan continues to be in the same net deferred position (net gain or net loss) from one year to the next. This is intended to ensure the smoothed value of assets will converge towards the market value in a reasonable amount of time. In addition, a gain or loss that is in the opposite direction of the current net position will be immediately recognized.

Expected earnings are determined using the assumed investment return rate and the beginning of year actuarial value of assets (adjusted for receipts and disbursements during the year). The returns are computed net of administrative and investment expenses.

IV. Actuarial Assumptions

The current assumptions were adopted by the Board in 2015 for first use in this valuation following a regularly scheduled experience study. The rationale for all of the current assumptions is included in that report, dated June 1, 2015.

A. Economic Assumptions

1. Investment return: 7.50% per annum, compounded annually, composed of an assumed 2.50% inflation rate and a 5.00% real rate of return. This rate represents the assumed return, net of all investment and administrative expenses.

2. Salary increase rate: Inflation rate of 2.50%, plus productivity component of 1.50%, plus step-rate/ promotional component as shown on the following page:

Years of Service	Annual Step-rate/ Promotional Rate	Total Annual Rate of Increase Including 2.50% Inflation Component and 1.50% Productivity Component
(1)	(2)	(4)
1	10.00%	14.00%
2	8.50%	12.50%
3	8.00%	12.00%
4	7.50%	11.50%
5	2.50%	6.50%
6	1.50%	5.50%
7	1.50%	5.50%
8	1.00%	5.00%
9	0.75%	4.75%
10	0.50%	4.50%
11	0.50%	4.50%
12	0.50%	4.50%
13	0.25%	4.25%
14	0.25%	4.25%
15	0.00%	4.00%

Salary increases are assumed to occur once a year, on January 1. Therefore the pay used for the period between the valuation date and the first anniversary of the valuation date is equal to the reported pay for the prior year, annualized if necessary, and then increased by the salary increase assumption.

3. Payroll growth rate: In the amortization of the unfunded actuarial accrued liability, payroll is assumed to increase 3.50% per year. This increase rate is primarily due to the effect of inflation on salaries, with no allowance for future membership growth.

B. <u>Demographic Assumptions</u>

1. Healthy retirees and beneficiaries: For ages less than 55, RP-2014 Mortality Tables for Blue Collar Employees. For ages 65 and older, RP-2014 Mortality Tables for Blue Collar Healthy Annuitants. For ages 55 through 64, a blend of the previous tables. All tables are projected with Scale BB.

	Annual Rate per 1,000 Members				
Attained Age in 2016	Males	Females	Attained Age in 2016 (cont.)	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)
50	2.17	1.23	70	19.10	13.63
55	3.68	1.97	75	30.57	22.42
60	7.24	4.62	80	50.31	37.25
65	12.31	8.52	85	84.25	63.46

The following table provides the life expectancy for an individual age 55 at retirement in a given year based on the assumption with full generational projection:

	Year of Retirement			
Gender	2016	2021	2026	2031
Male	30.2	30.7	31.3	31.9
Female	32.8	33.3	33.7	34.2

2. Mortality rates (active members) – RP-2014 Mortality Tables for Blue Collar Employees, projected with Scale BB, 55% multiplier for off-duty mortality. Increased by 0.00020 for on-duty related Fire and Police experience. Sample rates are shown below:

	Annual Rate per 1,000 Members				
Attained Age in 2016	Males	Females	Attained Age in 2016 (cont.)	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)
20	0.49	0.30	40	0.64	0.44
25	0.54	0.31	45	0.89	0.60
30	0.52	0.33	50	1.39	0.88
35	0.57	0.38	55	2.17	1.22

3. Disability rates: Sample rates are shown below by age and disability type.

	Annual Rate per 1,000 Members	
Age	Occupational Disability Rates	Total Disability Rates
(1)	(2)	(3)
25	0.29	0.02
30	1.35	0.17
35	1.82	0.34
40	2.67	0.52
45	3.29	0.72
50	4.89	0.94
55	6.88	1.17

Disability rates are turned off at eligibility for normal retirement.

4. Termination rates (for causes other than death, disability or retirement): Termination rates are based on service. Termination rates are not applied after a member becomes eligible for a retirement benefit. Rates at selected ages are shown:

	Annual Rate per 1,000 Members				
Service	Rates	Service (cont.)	Rates	Service (cont.)	Rates
0	98.5	8	25.5	16	9.4
1	84.6	9	21.3	17	9.1
2	72.3	10	17.9	18	8.8
3	61.4	11	15.3	19	8.5
4	51.9	12	13.3	20	8.1
5	43.6	13	11.7	21	7.5
6	36.5	14	10.7	22	6.5
7	30.5	15	9.9	23	5.2

5. Retirement rates:

Age-Based Retirement rates

Age	Annual Rate per 100 Members
55	60
56-59	50
60	100

Service-Based Retirement rates*

Service	Annual Rate per 100 Members
5-10	4
11	5
12	6
13	7
14	8
15	9
16	10
17	11
18	12
19	13
20	15
21	20
22-24	25

*Rates first applied at age 55; 100 percent retirement assumed at age 70.

C. Other Assumptions

1. Administrative expenses: An explicit administrative expense equal to the prior year actual expenses.
2. Percent married: 85% of employees are assumed to be married or in a civil union.
3. Age difference: Male members are assumed to be two years older than their spouses, and female members are assumed to be two years younger than their spouses.
4. Post-retirement benefit adjustments: 0%.
5. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an annuity.
6. Percent electing deferred termination benefit: Vested terminating members are assumed to elect a refund or a deferred benefit, whichever is more valuable at the time of termination.
7. There will be no recoveries once disabled.
8. No surviving spouse will remarry and there will be no children's benefit.
9. Assumed age for commencement of deferred benefits: Members electing to receive a deferred benefit are assumed to commence receipt at the first age at which unreduced benefits are available.

10. Pay increase timing: Beginning of (fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.

11. Decrement timing: Decrements of all types are assumed to occur mid-year.

12. Eligibility testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.

13. Decrement relativity: Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.

14. Incidence of Contributions: Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.

15. Benefit Service: All members are assumed to accrue 1 year of service each year. Exact fractional service is used to determine the amount of benefit payable.

16. Inactive Population: All members included in the inactive non-vested population with at least 10 years of service are valued using two times member contributions.

D. <u>Participant Data</u>

Participant data was supplied on electronic files in the form of spreadsheets. There were separate tabs for (i) active and non-vested inactive members, and (ii) members and beneficiaries receiving benefits or vested inactives.

The data for an active members included birthdate, sex, service, salary and employee contribution account balance. For retired members and beneficiaries, the data included date of birth, sex, spouse's date of birth (where applicable), amount of monthly benefit, date of retirement, and a form of payment code.

Salary supplied for the current year was based on the earnings for the year preceding the valuation date adjusted for service accrued during the year. In cases where the earnings for the year two years prior to the valuation date was higher, this higher amount was used. This salary was adjusted by the salary increase rate for one year.

Assumptions were made to correct for missing, bad, or inconsistent data. These had no material impact on the results presented.

E. Changes to the assumptions and methods

Since the prior valuation, the Board adopted new assumptions based on the 2015 Experience Study. The changes from the prior assumption set are summarized below:

Economic Assumptions

1. Reduce the inflation assumption from 3.00% to 2.50%.
2. Increase the real rate of return assumption from 4.50% to 5.00%, resulting in no overall change to the nominal return assumption of 7.50%.
3. Add an explicit assumption for administrative expenses in the contribution determination.
4. Increase the productivity component of the salary scale assumption from 1.00% to 1.50%. Combining with the inflation rate of 2.50% creates ultimate salary scale assumption of 4.00%, which is unchanged from the current assumption.
5. Slightly modify the service-based promotional/longevity component of the salary scale.

Mortality Assumptions

6. Update the post-retirement mortality tables for non-disabled retirees to a table based on the RP-2014 generational mortality tables with blue collar adjustment. In addition, update the projected rate of improvement in longevity from Scale AA to the more recently published Scale BB.
7. Update the occupationally disabled post-retirement mortality assumption to be the same table as used for the healthy annuitants, except with a three year set-forward.
8. Update the pre-retirement non-duty mortality tables to 55% of the RP-2014 mortality tables for active employees. Make no adjustment to the current duty mortality rate of 0.00020.

Other Demographic Assumptions

9. Slightly increase the pattern of retirement.
10. Combine the termination assumption for police and fire.
11. Increase the rates of both occupational and total disability to reflect higher incidence of disability observed during the study period than expected.

Actuarial Methods and Policies

12. Recommend no change to the use of the 5-year smoothing technique to determine the actuarial value of assets, used for determining the annual employer contribution rates.
13. Recommend continued use of the Entry Age Actuarial Cost Method.

SUMMARY OF BENEFIT PROVISIONS

Plan Description
The Fire & Police Pension Association Defined Benefit System – Statewide Hybrid Plan ("Plan") was established January 1, 2004 as a cost-sharing multiple-employer pension plan covering full-time firefighters and police officers from departments that elect coverage. The Plan may also cover clerical staff or other fire district personnel whose services are auxiliary to fire protection. The Plan is comprised of two components: Defined Benefit and Money Purchase. With the latter component, members have the option of choosing among various mutual funds offered by an outside investment manager.

Employers may not withdraw from the Plan once affiliated. The Plan assets for the Defined Benefit Component are included in the Fire & Police Members' Benefit Investment Fund and Plan assets associated with the Money Purchase Component and the Deferred Retirement Option Plan "DROP" are included in the Fire & Police Members' Self-Directed Investment Fund.

Plan Year
A twelve-month period ending December 31.

Members Included
Members included are active employees who are full-time salaried employees of a participating municipality, fire protection district, fire authority, or county improvement district normally serving at least 1,600 hours in a calendar year and whose duties are directly involved with the provision of police or fire protection. The Plan may include clerical and other personnel from fire districts whose service are auxiliary to fire protection.

Compensation Considered (Base Salary)
Base salary means the total base rate of pay including Member Contributions to the Defined Benefit System which are "picked up" by the employer. The definition of Base Salary is subject to the following conditions:

1) The definition of Base Salary shall also include longevity pay, sick leave pay taken in the normal course of employment, vacation leave pay taken in the normal course of employment, shift differential, and mandatory overtime that is part of the Member's fixed, periodic compensation.

2) Accumulated vacation leave pay shall also be included if a Member completes his/her service requirement for purposes of normal retirement while exhausting accumulated vacation leave.

3) Base salary shall not include overtime pay (except as noted in (1) above), step-up pay or other pay for temporarily acting in a higher rank, uniform allowances, accumulated sick leave pay, accumulated vacation leave pay (except as noted in (2) above), and other forms of extra pay (including Member Contributions which are paid by the employer and not deducted from the Member's salary). A member is deemed to be temporarily acting in a higher rank if the appointment to the rank is anticipated to last less than six months.

4) In the event an employer has established or does establish a Deferred Compensation Plan in addition to the Defined Benefit System, the amount of the Member's salary that is deferred shall be included in the Member's base salary.

5) Any amounts voluntarily contributed to an Internal Revenue Code Section 125 "Cafeteria Plan" shall be included in the Member's base salary.

Contribution Rates

The Plan sets contribution rates at a level that enables all benefits to be fully funded at the retirement date of all members. The members of this Plan and their employers are currently each contributing at the rate determined by the individual employer, however, the rate for both employer and members must be at least 8 percent of the member's base salary. The amount allocated to the Defined Benefit Component is set annually by the Fire & Police Pension Association Board of Directors. Excess contributions fund the Money Purchase Component of the Plan. The Defined Benefit Component of the total contribution rate for this Plan was as follows:

Effective Date	Defined Benefit Component of the Total Contribution
7/1/2015 - 6/30/2016	12.60%
7/1/2014 - 6/30/2015	12.50%
7/1/2013 - 6/30/2014	12.60%
7/1/2012 - 6/30/2013	13.00%
1/1/2012 - 6/30/2012	12.90%
7/1/2011 - 12/31/2012	11.30%
7/1/2010 - 6/30/2011	11.50%
7/1/2009 - 6/30/2010	11.40%
8/1/2008 - 6/30/2009	11.00%
8/1/2007 - 7/31/2008	10.25%
8/1/2006 - 7/31/2007	11.00%

Within the Money Purchase Component, members are always fully vested in their own contributions, as well as the earnings on those contributions. Vesting in the employer's contributions within the Money Purchase Component, and earnings on those contributions occurs according to the vesting schedule set by the Plan document at 20 percent per year after the first year of service to be 100 percent vested after 5 years of service. Employer and member contributions are invested in funds at the discretion of members.

A member may elect to make voluntary after-tax contributions to the Money Purchase Component of the Plan.

Highest Average Salaries (HAS)
The average of the member's highest three annual base salaries.

Normal Retirement Date
A member's Normal Retirement Date shall be the date on which the member has completed at least twenty-five years of credited service and has attained the age of 55.

Normal Retirement Benefit
The annual Normal Retirement Benefit of the Defined Benefit Component is 1.5 percent of the average of the member's highest three years base salary for each year of credited service.

Benefits of the Defined Benefit Component are paid as a monthly life annuity. Optional forms of payment are available.

Early Retirement Benefit
A member shall be eligible for an Early Retirement Benefit within the Defined Benefit Component after completion of thirty years of service or attainment of age 50 with at least five years of credited service. The Early Retirement Benefit shall be the reduction of the Normal Retirement Benefit on an actuarially equivalent basis.

Benefits of the Defined Benefit Component are paid as a monthly life annuity. Optional forms of payment are available.

Deferred Retirement Benefit

Members who qualify for a Normal or Vested Retirement within the Defined Benefit Component may defer the receipt of their defined benefit pension to as late as age 65 and receive the actuarial equivalent of the benefit.

Benefits of the Defined Benefit Component are paid as a monthly life annuity. Optional forms of payment are available.

Terminated Vested Benefit

A member who terminates with at least five years of active service credit is vested. A vested member who does not withdraw their contributions from the Plan is eligible for a vested benefit within the Defined Benefit Component, payable at age 55. The annual vested benefit is equal to 1.5 percent of the average of the member's highest three years base salary for each year of credited service. Both the highest average salary and service credits are determined at the time the member leaves active employment or enters the Deferred Retirement Option Plan (DROP). Benefits may commence at age 55.

Benefits of the Defined Benefit Component are paid as a monthly life annuity. Optional forms of payment are available.

Severance Benefit

All members with contributions in the Defined Benefit Component and leaving covered employment with less than five years of service credit are eligible. Optionally, vested members (those with five or more years of service credit) may withdraw their accumulated contributions from the Defined Benefit Component in lieu of the benefits otherwise due.

The member receives a lump-sum payment equal to the sum of their member contributions. Five percent as interest is credited on these contributions. In addition, upon termination, the vested account balance within the Money Purchase Component is available to the member.

Death Benefit of Active Members

Death must have occurred while an active or an inactive, non-retired member.

Upon the death of an active, unmarried member with no spouse, no dependent children, and no beneficiary, a refund of the member's contributions is paid to the member's estate. If the member was eligible for retirement, a joint and survivor annuity may be paid to the beneficiary when the member would have been age 55.

Survivors (spouse or dependent children) of active members who die prior to retirement eligibility are covered by the benefits provided by the Statewide Death & Disability Plan. For purposes of the Statewide Death & Disability Plan, a spouse includes a partner in a civil union.

Optional Forms of Payment

In addition to a monthly life annuity, the Plan offers members these optional forms of payment on an actuarially equivalent basis:

Option 1 (Joint and 100% Survivor) - A life annuity payable while either the member or his or her beneficiary is alive.

Option 2 (Joint and 50% Survivor) - A life annuity payable to the member while the member is alive, reducing to 50 percent of this amount and payable to the member's beneficiary upon the member's death.

Option 3 (Joint and 50% Last Survivor) - A life annuity payable to the member while both the member and beneficiary are alive, reducing to 50 percent of this amount if either the member or the beneficiary dies.

Option 4 (Joint and 100% Survivor with "Pop Up") – 100 percent of the reduced retirement income payable for the life of the beneficiary upon the death of the retiring member, with the provision that, should the beneficiary predecease the participant, the monthly annuity will revert to the amount that would have been payable under the normal form of payment.

Option 5 (Joint and 50% Survivor with "Pop Up") –50 percent of the reduced retirement income payable for the life of the beneficiary upon the death of the retiring participant, with the provision that, should the beneficiary predecease the member, the monthly annuity will revert to the amount that would have been payable under the normal form of payment.

Survivor benefits are paid according to the payment option elected by the member at the time of retirement or entry into DROP. Actuarial equivalence is based on tables adopted by the Board.

Benefit Adjustments for Benefits in Pay Status

Benefits to members and beneficiaries may be increased annually on October 1. The amount is based on the Fire & Police Pension Association Board of Directors discretion and can range from 0 percent to 3 percent. Benefit adjustment may begin once the retired member has been receiving retirement benefits for at least 12 calendar months prior to October 1.

Deferred Retirement Option Plan (DROP)

A member may elect to participate in the DROP after reaching eligibility for normal retirement, early retirement or vested retirement and age 55. A member continues to work while participating in the DROP, but must terminate employment within 5 years of entry into the DROP. The member's percentage of retirement benefit is frozen at the time of entry into the DROP. The monthly payments that begin at entry into the DROP are accumulated until the member terminates service, at which time the DROP accumulated benefits can be paid as periodic installments, a lump sum, or if desired a member may elect to convert the DROP to a lifetime monthly benefit with survivor benefits. The member continues to make contributions, which are credited to the DROP. The member shall self-direct the investments of their DROP funds.