Takoma Park City Council Meeting – November 9, 2016
Agenda Item 2

Work Session
Presentation of the Police Employees' Retirement Plan Actuarial Valuation as of July 1, 2016

Recommended Council Action
Hear presentation by Bolton Partners, Inc.

Context with Key Issues
In 2001, the City of Takoma Park established a pension plan (Police Employees' Retirement Plan) for its sworn police officers. Prior to that time, police officers were covered by the State of Maryland pension plan along with other City employees, which provides for retirement after 30 years of service.

The Police Employees' Retirement Plan (the Plan) allows for full retirement after 25 years of service or at age 62 with five years of service. The earlier retirement is more typical for public safety employees and enables the City to be more competitive in attracting and retaining officers.

Bolton Partners, Inc. provides actuarial services for the Plan and prepares an annual valuation based on participant data and asset information. The July 1, 2016 valuation is setting the employer contribution for the fiscal year ending on June 30, 2018.

Thomas Lowman, FSA, will present the actuarial report. Following the presentation, he will be available to respond to questions from Council.

Council Priority
Fiscally Sustainable Government

Environmental Impact of Action
N/A

Fiscal Impact of Action
The valuation provides the recommendation for the employer contribution for FY 2018. During the budget setting process, the Council has always adhered to the recommendation and has, the past two years, provided for an additional contribution.

Attachments and Links

- Actuarial Valuation as of July 1, 2016

Prepared by: Suzanne R. Ludlow, City Manager

City of Takoma Park Police Employees' Retirement Plan

Actuarial Valuation as of July 1, 2016 to Determine the City's Contribution for the Fiscal Year Ending June 30, 2018

BOLTON PARTNERS
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BOLTON PARTNERS

September 2, 2016

Ms. Suzanne Ludlow
City Manager
City of Takoma Park
7500 Maple Avenue
Takoma Park, MD 20912

Re: City of Takoma Park Police Employees' Retirement Plan Valuation

Dear Suzanne:

The following sets forth the actuarial valuation of the City of Takoma Park Police Employees' Retirement Plan as of July 1, 2016. Section 1 of the report provides a summary and an actuarial certification while Sections 2 through 6 contain the development of the City's contribution for the 2018 fiscal year along with a summary of the census and asset data, plan provisions, assumptions and actuarial methods. Section 7 provides a glossary of many of the terms used in this report. The appendices of the report provide information on plan funding as well as a 10-year projection of benefit payments.

We are available to answer any questions on the material in this report or to provide explanations or further details as appropriate. The undersigned credentialed actuaries meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report. We are not aware of any direct or material indirect financial interest or relationship, including investments or other services that could create a conflict of interest, which would impair the objectivity of our work.

Respectfully submitted,

BOLTON PARTNERS, INC.

Thomas Lowman, FSA, EA, MAAA

Mark Kelbaugh, ASA

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Actuarial, Benefit and Investment Consultant

Section I. Executive Summary

Background

Bolton Partners, Inc. has prepared the following report that sets forth the actuarial valuation of the City of Takoma Park Police Employees' Retirement Plan as of July 1, 2016.

Actuarially Determined Contributions (ADC)

The actuarially determined contribution (ADC) amount increased this year. The primary cause of the change is the adoption of assumption changes described in Section 6. This increase was largely offset by the continued recognition of investment gains from prior years.

	FY2016	FY2017	FY2018
ADC	$1,095,976	$1,182,541	$1,240,514
Percent of Total Payroll	42.65%	41.59%	44.67%

It is anticipated that the contribution will be paid in December 2017 and will equal 44.67% of the rate of pay for covered employees at that time. Details of the determination of the City's contribution for FY2018 are shown in Section 2 of this report.

Funding Measures

Funding Measures	7/1/2015	7/1/2016	Percent Change
1. Actuarial Accrued Liability			
a. Active	$ 9,249,070	$ 9,918,417	7.24%
b. Retired/Disabled	11,902,914	12,874,704	8.16%
c. Term Vested	9,371	32,113	242.68%
d. Total	$ 21,161,355	$ 22,825,234	7.86%
2. Market Value of Assets	$ 11,311,412	$ 12,077,718	6.77%
3. Funded Ratio if Market Value of Assets was Used (2 / 1.d.)	53.45%	52.91%	
4. Actuarial Value of Assets	$ 11,141,355	$ 12,575,165	12.87%
5. Funded Ratio if Actuarial Value of Assets was Used (4 / 1.d.)	52.65%	55.09%	

Section I. Executive Summary

Risk Measures

The risks that a plan sponsor incurs from a defined benefit plan are primarily the risk of substantial increases in annual contributions. These increases occur most frequently due to variation in the investment returns. This valuation reflects the smoothing of asset returns, which reduces the risk of wide year-by-year contribution changes, but does not ultimately reduce the risk inherent in a defined benefit plan. The following table shows three commonly used measures of the relative riskiness of a pension plan, relative to the plan sponsor and the employee group covered by the plan. Additional information is shown in Appendix 3.

Risk Measure	FY2014	FY2015	FY2016	Conservative Measures
Retiree Liability as a Percent of Total Liability	54%	56%	56%	<50%
Assets to Payroll	3.8	3.9	4.5	<5
Liabilities to Payroll	8.0	7.4	8.2	<5
Benefit Payments to Contributions	0.6	0.6	0.5	1-3

Section I. Executive Summary

Experience Analysis

The following factors affected the City's contribution as a percentage of payroll:

- Investment returns during FY2016 were about $0.8 million lower than expected.
- The 2016 COLA of 0.73% was significantly lower than the assumed annual increase of 3.00%.
- Pay for returning employees increased approximately 2.9% over the prior year; lower than what was expected.
- Total participant payroll decreased by 2.3% over the prior year; less than the assumption of a 4.0% increase per year.

Changes in Method, Assumptions, and Plan Amendments

The expected rates of future mortality were changed to the RP2014 healthy Blue Collar tables with generational projection using scale MP2015. These rates of current mortality and expectations for future improvements are representative of general mortality experienced by pension plans. We also note that a similar set of assumptions has been adopted by the Maryland State Retirement and Pension System.

There were no plan amendments adopted that affect benefits since the prior valuation.

Projection of Expected Benefit Payments

The projection of expected benefit payments for current participants is shown in Appendix 2.

Sources of Information

The July 1, 2016 participant data and market value of assets were provided by or at the direction of the City of Takoma Park. While we have reviewed this data for consistency and completeness, we have not audited this data.

Section I. Executive Summary

Actuarial Certification

This actuarial valuation sets forth our calculation of an estimate of the liabilities of the City of Takoma Park Police Employees' Retirement Plan (the Plan), together with a comparison of these liabilities with the value of the plan assets, as submitted by City of Takoma Park Government (the City). This calculation and comparison with assets is applicable for the valuation date only. The future is uncertain, and the plan may become better funded or more poorly funded in the future. This valuation does not provide any guarantee that the plan will be able to provide the promised benefits in the future.

This is a deterministic valuation in that it is based on a single set of assumptions. This set of assumptions is one possible basis for our calculations. Other assumptions may be equally valid. The future is uncertain and the plan's actual experience will differ from those assumptions; these differences may be significant or material because these results are very sensitive to the assumptions made and, in some cases, to the interaction between the assumptions. We may consider that some factors are not material to the valuation of the plan and may not provide a specific assumption for those factors. We may have used other assumptions in the past. We will likely consider changes in assumptions at a future date.

Different assumptions or scenarios within the range of possibilities may also be reasonable and results based on those assumptions would be different. As a result of the uncertainty inherent in a forward looking projection over a very long period of time, no one projection is uniquely "correct" and many alternative projections of the future could also be regarded as reasonable. Two different actuaries could, quite reasonably, arrive at different results based on the same data and different views of the future. A "sensitivity analysis" shows the degree to which results would be different if you substitute alternative assumptions within the range of possibilities for those utilized in this report. We have not been engaged to perform such a sensitivity analysis and thus the results of such an analysis are not included in this report. At the City's request, Bolton Partners, Inc. is available to perform such a sensitivity analysis.

The City is responsible for selecting the plan's funding policy, actuarial valuation methods, asset valuation methods, and assumptions. The policies, methods and assumptions used in this valuation are those that have been so prescribed and are described in this report. The City is solely responsible for communicating to Bolton Partners, Inc. any changes required thereto.

The City could reasonably ask how the valuation would change if we used a different assumption set or if plan experience exhibited variations from our assumptions. This report does not contain such an analysis. This type of analysis would be a separate assignment.

Section I. Executive Summary

Actuarial Certification (cont.)

In addition, decisions regarding benefit improvements, benefit changes, the trust's investment policy, and similar issues should not be based on this valuation. These are complex issues and other factors should be considered when making such decisions. These other factors might include the anticipated vitality of the local economy and future growth expectations, as well as other economic and financial factors.

The cost of this plan is determined by the benefits promised by the plan, the plan's participant population, the investment experience of the plan and many other factors. An actuarial valuation is a budgeting tool for the City. It does not affect the cost of the plan. Different funding methods provide for different timing of contributions to the plan. As the experience of the plan evolves, it is normal for the level of contributions to the plan to change. If a contribution is not made for a particular year, either by deliberate choice or because of an error in a calculation, that contribution can be made in later years. We will not be responsible for contributions that are made at a future time rather than an earlier time. The plan sponsor is responsible for funding the cost of the plan.

We make every effort to ensure that our calculations are accurately performed. These calculations are complex. Despite our best efforts, we may make a mistake. We reserve the right to correct any potential errors by amending the results of this report or by including the corrections in a future valuation report.

Because modeling all aspects of a situation is not possible or practical, we may use summary information, estimates, or simplifications of calculations to facilitate the modeling of future events in an efficient and cost-effective manner. We may also exclude factors or data that are immaterial in our judgment. Use of such simplifying techniques does not, in our judgment, affect the reasonableness of valuation results for the plan.

This report is based on plan provisions, census data, and asset data submitted by the City. We have relied on this information for purposes of preparing this report, but have not performed an audit. The accuracy of the results presented in this report is dependent upon the accuracy and completeness of the underlying information. The plan sponsor is solely responsible for the validity and completeness of this information.

The City is solely responsible for selecting the plan's investment policies, asset allocations and individual investments. Bolton Partners, Inc.'s actuaries have not provided any investment advice to the City.

Section I. Executive Summary

Actuarial Certification (cont.)

The information in this report was prepared for the internal use of the City and its auditors in connection with our actuarial valuations of the pension plan. It is neither intended nor necessarily suitable for other purposes. Bolton Partners, Inc. is not responsible for the consequences of any other use or the reliance upon this report by any other party.

The only purpose of this report is to:

- Provide the recommended employer contribution for the 2018 fiscal year

This report may not be used for any other purpose; Bolton Partners, Inc. is not responsible for the consequences of any unauthorized use.

The calculation of actuarial liabilities for valuation purposes is based on a current estimate of future benefit payments. The calculation includes a computation of the "present value" of those estimated future benefit payments using an assumed discount rate; the higher the discount rate assumption, the lower the estimated liability will be. For purposes of estimating the liabilities (future and accrued) in this report, you selected an assumption based on the expected long-term rate of return on plan investments. Using a lower discount rate assumption, such as a rate based on long-term bond yields, could substantially increase the estimated present value of future and accrued liabilities.

Because valuations are a snapshot in time and are based on estimates and assumptions that are not precise and will differ from actual experience, contribution calculations are inherently imprecise. There is no uniquely "correct" level of contributions for the coming plan year.

This report provides certain financial calculations for use by the auditor. These values have been computed in accordance with our understanding of generally accepted actuarial principles and practices and fairly reflect the actuarial position of the Plan. The various actuarial assumptions and methods which have been used are, in our opinion, appropriate for the purposes of this report.

Section I. Executive Summary

Actuarial Certification (cont.)

The report is conditioned on the assumption of an ongoing plan and is not meant to present the actuarial position of the Plan in the case of Plan termination. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions, changes in economic or demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status), and changes in plan provisions or applicable law.

The City should notify Bolton Partners, Inc. promptly after receipt of this report if the City disagrees with anything contained in the report or is aware of any information that would affect the results of the report that has not been communicated to Bolton Partners, Inc. or incorporated therein. The report will be deemed final and acceptable to the City unless the City promptly provides such notice to Bolton Partners, Inc.

The undersigned credentialed actuaries meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. We are currently compliant with the Continuing Professional Development Requirement of the Society of Actuaries. We are not aware of any direct or material indirect financial interest or relationship, including investments or other services, which could create a conflict of interest that would impair the objectivity of our work.

We are available to answer any questions on the material in this report to provide explanations or further details as appropriate.

Bolton Partners, Inc.

Thomas Lowman, FSA, EA, MAAA

Mark Kelbaugh, ASA

Section II. Determination of City Contributions

Derivation of Liabilities

Below is a summary of the actuarial accrued liability of the future benefits expected to be paid from the plan.

Unfunded Liability	7/1/2015	7/1/2016
1. Valuation Discount Rate	7.50%	7.50%
2. Number of Participants		
a. Active Participants	41	39
b. Retired Participants	24	26
c. Vested Terminated Participants	1	3
d. Total	66	68
3. Active Payroll	$ 2,843,149	$ 2,777,426
4. Actuarial Accrued Liability		
a. Active Participants	$ 9,249,070	$ 9,918,417
b. Retired Participants and Beneficiaries	5,581,575	5,943,870
c. Disabled Participants	6,321,339	6,930,834
d. Vested Terminated Participants	9,371	32,113
e. Total	$ 21,161,355	$ 22,825,234
5. Actuarial Value of Assets	11,141,355	12,575,165
6. Unfunded Actuarial Liability (4.e.- 5.)	$ 10,020,000	$ 10,250,069
7. Amortization of Unfunded Liability	679,477	719,812
8. Amortization of Unfunded as a Percentage of Payroll (7. / 3.)	23.90%	25.92%
9. Employer Normal Cost	503,064	520,702
10. Employer Normal Cost as a Percentage of Payroll (9. / 3.)	17.69%	18.75%
11. Total Employer Contribution (7. + 9.)	1,182,541	1,240,514
12. Total Employer Contribution as a Percentage of Payroll (11. / 3.)	41.59%	44.67%

Section II. Determination of City Contributions

Schedule of Amortization Bases

Below is a schedule of the amortization bases as of July 1, 2016.

Description	Date Established	Remaining Years	Amount to be Amortized	Payment / (Credit)
Original	7/1/2013	19	$ 11,988,452	$ 836,126
Actuarial Loss/(Gain)	7/1/2014	20	$ (1,290,719)	$ (86,793)
Actuarial Loss/(Gain)	7/1/2015	21	$ (656,670)	$ (42,677)
Actuarial Loss/(Gain)	7/1/2016	22	$ (542,286)	$ (34,136)
Assumption Change	7/1/2016	22	$ 751,292	$ 47,292
Totals			**$ 10,250,069**	**$ 719,812**

The July 1, 2016 amortization payment of $719,812 is sufficient to cover the interest on the plan's unfunded liability.

Section III. Valuation of Assets

Reconciliation of Assets

Below is a reconciliation of assets (unaudited) from July 1, 2014 through June 30, 2016.

	FY2015	FY2016
1. Beginning of Year Assets	$ 10,436,237	$ 11,311,412
2. Additions		
a. Employer Contributions	$ 1,101,564	$ 1,296,482
b. Employee Contributions	178,132	194,455
c. Other Receipts	0	0
d. Investment Income & Dividends	217,683	305,479
e. Realized Gain/(Loss)	66,133	36,439
f. Unrealized Gain/(Loss)	156,918	(252,183)
g. Total Receipts	$ 1,720,430	$ 1,580,672
3. Deductions		
a. Benefit Payments	$ 785,604	$ 757,205
b. Administrative Expenses	59,651	57,161
c. Total Disbursements	$ 845,255	$ 814,366
4. Net Increase (2.g. – 3.c.)	$ 875,175	$ 766,306
5. Net Assets (1. + 4.)	$ 11,311,412	$ 12,077,718
6. Rate of Return Net of Investment Fees (2I / [A + B – I] Method)	4.1%	0.8%

Section III. Valuation of Assets

Development of Actuarial Asset Value

The actuarial asset value as of July 1, 2016 is determined by spreading the asset gain or loss for each year over a five-year period. The asset gain or loss is the amount by which the actual asset return differs from the expected asset return.

					7/1/2016
1. Market Value of Assets				$	12,077,718
2. Spreading of Investment (Gain)/Loss					
BOY	EOY	(Gain)/Loss	% Deferred		Amount Deferred
2015	2016	$ 783,992	80%	$	627,194
2014	2015	358,275	60%		214,965
2013	2014	(688,289)	40%		(275,316)
2012	2013	(346,979)	20%		(69,396)
a. Total Deferred					497,447
3. Actuarial Value of Assets (1+2.a.)				$	12,575,165

Section IV. Participant Information

Participant Summary

The following table summarizes the counts, ages and benefit information for plan participants used in this valuation.

	July 1, 2015	July 1, 2016
1. Actives		
a. Number	41	39
b. Average Age	38.57	39.40
c. Average Service	10.12	11.05
d. Average Salary	$ 69,345	$ 71,216
2. Service Retirements and Beneficiaries		
a. Number	24	26
b. Average Age	56.94	57.56
c. Total Annual Benefits	$ 752,207	$ 796,764
3. Vested Terminations		
a. Number	1	3
b. Average Age	35.83	30.17
c. Total Annual Benefits	$ 9,371	$ 32,113

Section IV. Participant Information

Active Age/Service Distribution Including Compensation

Shown below is the distribution of active participants based on age and service. The compensation shown is the average expected earnings for the twelve months following the valuation date.

	Years of Service as of 07/01/2016										
	Under 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Up	Total
Under 25	1	1	-	-	-	-	-	-	-	-	2
	53,917	54,039	-	-	-	-	-	-	-	-	53,978
25 - 29	-	6	-	-	-	-	-	-	-	-	6
	-	58,013	-	-	-	-	-	-	-	-	58,013
30 - 34	-	2	2	-	-	-	-	-	-	-	4
	-	58,832	66,230	-	-	-	-	-	-	-	62,531
35 - 39	-	1	3	3	1	-	-	-	-	-	8
	-	62,582	68,554	69,643	65,494	-	-	-	-	-	67,834
40 - 44	-	-	1	2	2	-	-	-	-	-	5
	-	-	64,413	70,557	71,444	-	-	-	-	-	69,683
45 - 49	-	1	-	2	1	3	3	-	-	-	10
	-	60,650	-	66,417	87,260	86,004	93,052	-	-	-	81,791
50 - 54	-	-	1	-	2	-	-	-	-	-	3
	-	-	65,068	-	87,680	-	-	-	-	-	80,143
55 - 59	-	1	-	-	-	-	-	-	-	-	1
	-	121,845	-	-	-	-	-	-	-	-	121,845
60 - 64	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
65 - 69	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
70 & Up	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
Totals	1	12	7	7	6	3	3	-	-	-	39
	53,917	63,738	66,801	68,983	78,500	86,004	93,052	-	-	-	71,216

Averages	
Age	39.4
Service	11.1

Section IV. Participant Information

Participant Reconciliation

Shown below is the reconciliation of participants between the prior and current valuation date.

		Inactive Participants		
	Active Participants	Retirees & Beneficiaries	Terminated Vested	Total
Participants in Last Valuation	41	24	1	66
New	1	0	0	1
Terminated Vested	0	0	0	0
Terminated (Owed Refunds)	(2)	0	2	0
Terminated (Paid Refunds)	0	0	0	0
Retired	(1)	1	0	0
Deceased	0	0	0	0
Beneficiaries	0	0	0	0
Data Adjustments	0	1	0	1
Participants in This Valuation	39	26	3	68

Section V. Summary of Plan Provisions

Plan Year

July 1 – June 30.

Normal Retirment Date or Unreduced Early Retirment Date

25 years of service, or age 62 with 5 years of service, if earlier.

Normal Form of Benefit

Single Life Annuity with death benefit of undistributed employee contributions plus accumulated interest at retirement. Other forms are the actuarial equivalent.

Post Retirement Cost of Living Increases

CPI index, but no more than would cause the participant's benefit to exceed an amount equal to the original benefit compounded at 3% per year.

Average Compensation

Average of base pay for 36 highest consecutive months.

Service

Service includes:

1. Time as an active member contributing to the plan.
2. Unused sick leave (22 days = 1 month).
3. Service prior to July 1, 2001 under the State plan that was transferred to this plan at its inception.
4. For employees hired before July 1, 2001, up to five years of pre-employment military service if eligible under the State plan. If not eligible under the State plan, up to five years of pre-employment military service may be credited after 10 years of credited service with the plan.

Employee Contributions

7% of base pay.

Section V. Summary of Plan Provisions

Benefit Formula

2% of average compensation for each year of service earned. Total service is limited to 30 years.

The above amount will be increased by 2% of average compensation for each year of service attributable to unused sick leave (limited to 2 years.)

Note: prior to the latest plan amendment effective 7/1/2009, each year of service earned prior to 7/1/2000 was credited with 1.5% of average compensation. Total service was limited to 25 years.

Early Retirement Benefit

Age 55 with at least 15 years of service. Benefit is reduced actuarially from normal retirement date.

Termination Prior to Retirement

Return of employee contributions with 5% interest or if vested (after five years of service) an annuity beginning age 62 (or at the early retirement date, actuarially reduced).

Line of Duty Disability Benefit

Catastrophic Disability

The greater of:
(a) the benefit due to employee contributions or
(b) 66 2/3% of base pay.

Non-Catastrophic Disability

The greater of:
(a) the benefit due to employee contributions or
(b) 50% of base pay.

Note: prior to the latest plan amendment effective 7/1/2009, those hired before 7/1/2001 received the greater of (a) and 66 2/3% of base pay.

Section V. Summary of Plan Provisions

Ordinary Disability

5 Years of Service is required for this benefit.

The benefit is equal to the accrued benefit, without actuarial reduction.

If a participant is under age 62, or has earned less than 25 years of credited service as of the disability date, the years of credited service are projected. They include both the actual years of credited service, plus any credited service which would have otherwise been earned as of the earlier of the participant's 62nd birthday or the date the participant would have earned 25 years of credited service.

Line of Duty Pre-Retirement Death Benefit

If the participant is unmarried at his date of death, his beneficiary is entitled to receive a refund of the participant's contributions with interest, plus a single lump sum equal to the participant's compensation as of the date of death.

If the participant is married or has a registered domestic partner at the date of death and is eligible for normal or early retirement, his surviving spouse or partner may receive the benefit described above, or an annuity for the spouse's or partner's lifetime or earlier remarriage/re-registration, equal to a 66 2/3% of base pay. Upon the death or remarriage/re-registration of the surviving spouse or domestic partner, a benefit equal to 50% of base pay will be paid to the surviving children.

If the participant is not married and has designated one or more child as the primary beneficiary, the surviving children will receive an aggregate annuity equal to 50% of base pay. This benefit ceases upon the attainment of age 18, or 23 if a full-time student.

Section V. Summary of Plan Provisions

Ordinary Pre-Retirement Death Benefit

If the participant is unmarried at his date of death, his beneficiary is entitled to receive a refund of the participant's contributions with interest, plus a single lump sum equal to the participant's compensation as of the date of death.

If the participant is married or has a registered domestic partner at the date of death and is eligible for normal or early retirement, his surviving spouse or partner may receive the benefit described above, or an annuity for the spouse's or partner's lifetime, equal to the Joint and 100% Survivor benefit that would have been payable upon the participant's death.

Changes Since Prior Valuation

None.

Section VI. Actuarial Methods and Assumptions

Funding Method

Projected Unit Credit. Costs are determined as a percentage of payroll based on the assets and liabilities on the valuation date. The liability for disability benefits is fully accrued for participants hired before July 1, 2003. Disability attribution method for those hired on or after July 1, 2003 is linear to decrement.

The Unfunded Actuarial Accrued Liability as of July 1, 2013 was amortized as a level percent of payroll over a fixed period of 22 years (closed amortization). Actuarial gains or losses after June 30, 2013 are also amortized over a fixed period of 22 years.

Asset Method

Five year smoothed asset value. Investment returns above or below the assumed rate of return are recognized at a rate of 20% per year over five years.

Interest

7.50% net of investment related expenses, compounded annually. This assumption is based on the plan's investment policy and the long-term expectation of each investment class, based upon the recommendations of the plan's investment advisor. Details of the investment policy and long-term expectations are available in the plan's financial statements.

Payroll Growth

4% compounded annually.

Post Retirement COLA Increases

3% compounded annually, no limit.

Mortality

RP2014 Blue Collar adjusted to 2006 table with fully generational projection using scale MP2015. For disabled participants, the table is set forward three years.

Projection to the year of the valuation is assumed to be current mortality experience. Generational projection beyond the valuation date is assumed to account for future mortality improvements.

Section VI. Actuarial Methods and Assumptions

Salary Increases

5.5% compounded annually.

Disability

Sample rates are:

Age	Rates
25	0.55%
35	1.02%
45	2.64%

Half the disability benefits are assumed to be line-of-duty. One-third of the line-of-duty disabilities are assumed to be catastrophic and two-thirds are considered non-catastrophic

Turnover

Sample rates are:

	Rates by Service		
Age	0 – 9	10 - 14	15 and over
25	6.179%	4.634%	1.236%
35	5.021%	3.766%	1.004%
45	3.180%	2.385%	0.636%

Rates are 75% of the initial rates between 10 and 15 years of service and 20% of the initial rates after 15 years. Employees that quit before age 50 are assumed to withdraw their contributions

Section VI. Actuarial Methods and Assumptions

Retirement

Probabilities of retirement are: 70% at 25 years, 10% at 26-29 years, and 100% at 30 years or age 62.

Sick Leave

Accrued benefit loaded 3.4% for unused sick leave credit.

Pay Limit

None.

Pre-Employment Military Service

Actual service credit as provided in census.

Marriage Assumption

80% of participants are assumed to be married. Husbands 3 years older.

Compensation

Compensation provided to us was assumed to be base pay for the 12 months ending on the valuation date.

Administrative Expenses

Employer normal cost includes assumed administrative expenses equal to the average of the actual expenses of the two fiscal years preceding the date of the valuation.

Changes Since Prior Valuation

The expected rates of future mortality were changed to the RP2014 healthy Blue Collar tables with generational projection using scale MP2015. These rates of current mortality and expectations for future improvements are representative of general mortality experienced by pension plans. We also note that a similar set of assumptions has been adopted by the Maryland State Retirement and Pension System.

Section VII. Glossary

Actuarial Accrued Liability (AAL)

The difference between the Actuarial Present Value of Future Benefits and the Actuarial Present Value of Future Normal Costs or the portion of the present value of future benefits allocated to service before the valuation date in accordance with the actuarial cost method. Represents the present value of benefits expected to be paid from the plan in the future allocated to service prior to the date of the measurement.

Actuarial Asset Valuation Method

The method of determining the value of the assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets or a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the actuarially determined contribution (ADC).

Actuarial Cost Method

A procedure for allocating the Actuarial resent Value of Future Benefits and the actuarial Present Value of Future Normal costs and the Actuarial Accrued Liability. Also known as the "funding method". Examples of actuarial cost methods include Aggregate, Entry Age Normal, Projected Unit Credit, and Pay-as-you-go.

Section VII. Glossary

Actuarial Present Value of Future Benefits (APVFB)

The Actuarial Present Value of amounts which are expected to be paid at various future times to active members, retired members, beneficiaries receiving benefits, and inactive, non-retired members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.

Aggregate Cost Method

An actuarial cost method that spreads the cost of all future benefits in excess of plan assets as a level percentage of future salary or service. The actuarial accrued liability is set to the value of assets in this method.

Annual Determined Contributions of the Employer(s) (ADC)

The employer's periodic determined contributions to a pension plan, calculated in accordance with the assumptions and methods used by the plan actuary. The ADC replaced the actuarially required contribution (ARC), with the replacement of GASB 27 with GASB 68.

Cost-of-Living Adjustment (COLA)

An annual increase in the amount of a retired participant's benefit intended to adjust the benefit for inflation.

Covered Group

Plan members included in actuarial valuation.

Section VII. Glossary

Deferred Retirement Option Program (DROP)

A program allowing a participant eligible to retire to continue working for a fixed period of time, while accumulating the benefit payments he would have received if he had retired on his entry to DROP.

Demographic Assumption

Assumptions regarding the future population of pension participants, including retirement, termination, disability and mortality assumptions.

Economic Assumption

Assumptions regarding future economic factors, including COLA, salary improvement, change in average wages, changes in Social Security benefits and investment returns.

Employer's Contributions

Contributions made in relation to the actuarially determined contributions of the employer (ADC). An employer has made a contribution in relation to the ADC if the employer has (a) made payments of benefits directly to or on behalf of a retiree or beneficiary, (b) made premium payments to an insurer, or (c) irrevocably transferred assets to a trust, or an equivalent arrangement, in which plan assets are dedicated to providing benefits to retirees and their beneficiaries in accordance with the terms of the plan and are legally protected from creditors of the employer(s) or plan administrator.

Section VII. Glossary

Entry Age Normal (EAN) Cost Method	An actuarial cost method that spreads the cost for each individual's expected benefits over their career, either as a level percentage of pay or service. The actuarial accrued liability is the accumulated value of all past normal cost, and the unfunded accrued liability (surplus) is the excess of the AAL over the value of assets.
Expenses	Plan expenses paid by the plan are divided into administrative and investment related expenses.
Funded Ratio	The actuarial value of assets expressed as a percentage of the plan's actuarial accrued liability.
GASB	Government Accounting Standards Board.
GASB No. 25 and GASB No. 27	These are the government accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 27 sets the accounting rules for the employers that sponsor or contribute to public retirement systems while Statement No. 25 sets the rules for the systems themselves.
GASB No. 67 and GASB No. 68	These are the government standards that replace GASB 25 and 27 They are effective for plan years beginning after June 14, 2013 and employer fiscal years beginning after June 14, 2014.
Investment Return Assumption or Investment Rate of Return (Discount Rate)	The rate used to adjust a series of future payments to reflect the time value of money.

Section VII. Glossary

Level Percentage of Projected Payroll Amortization Method

Amortization payments are calculated so that they are a constant percentage of the projected payroll of active plan members over a given number of years. The dollar amount of the payments generally will increase over time as payroll increases due to inflation; in dollars adjusted for inflation, the payments can be expected to remain level.

Normal Cost or Normal Actuarial Cost

That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

Pay-as-you-go (PAYG)

A method of financing a benefits plan under which the contributions to the plan are generally made at about the same time and in about the same amount as benefit payments and expenses becoming due.

Payroll Growth Rate

An actuarial assumption with respect to future increases in total covered payroll attributable to inflation; used in applying the level percentage of projected payroll amortization method.

Plan Liabilities

Obligations payable by the plan at the reporting date, including, primarily, benefits and refunds due and payable to plan members and beneficiaries, and accrued investment and administrative expenses. Plan liabilities do not include actuarial accrued liabilities for benefits that are not due and payable at the reporting date.

Section VII. Glossary

Plan Members

The individuals covered by the terms of a Pension or OPEB plan. The plan membership generally includes employees in active service, terminated employees who have accumulated benefits but are not yet receiving them, and retired employees and beneficiaries currently receiving benefits.

Projected Unit Credit (PUC) Funding Method

An actuarial cost method that spreads the employee's benefit over their career, as a level percentage of service. The normal cost is the present value of the portion of the benefit assigned to the current year. The actuarial accrued liability is the accumulated value of all past normal cost, and the unfunded accrued liability (surplus) is the excess of the AAL over the value of assets.

Post-Employment

The period between termination of employment and retirement as well as the period after retirement.

Salary Improvement

An actuarial assumption regarding the increase in employees' salaries, reflecting cost-of-living, merit and longevity increases.

Select and Ultimate Rates

Actuarial assumptions that contemplate different rates for successive years. Instead of a single assumed rate with respect to, for example, the investment return assumption, the actuary may apply different rates for the early years of a projection and a single rate for all subsequent years. For example, if an actuary applies an assumed investment return of 8 percent for year 2000, 7.5 percent for 2001, and 7 percent for 2002 and thereafter, then 8 percent and 7.5 percent are select rates, and 7 percent is the ultimate rate.

Section VII. Glossary

Unfunded Actuarial Accrued Liabilities

The excess of the present value of prospective pension benefits, as of the date of a pension plan valuation, over the sum of (1) the actuarial value of the assets of the plan and (2) the present value of future normal costs determined by any of several actuarial cost methods. For plans that define an accrued liability, this amount equals the excess of the accrued liability over plan assets.

Vested Plan Benefits

All benefits to which current participants have a vested right based on pay and service through the valuation date. A participant has a vested right to a benefit if he/she would still be eligible to receive that benefit if employment terminated on the valuation date.

Appendix 1

Summary of Funding Progress

Valuation Date	(1) Actuarial Value of Assets	(2) Actuarial Accrued Liability	(3) Percentage Funded (1) / (2)	(4) Unfunded Actuarial Accrued Liability (2) - (1)	(5) Annual Covered Payroll	(6) Unfunded Actuarial Accrued Liability as a Percentage of Covered Payroll (4) / (5)
7/1/2006	$3,371,139	$9,609,655	35.1%	$6,238,516	$1,961,026	318.1%
7/1/2007	$4,287,464	$10,772,448	39.8%	$6,484,984	$2,204,862	294.1%
7/1/2008	$4,500,963	$13,402,672	33.6%	$8,901,709	$2,383,190	373.5%
7/1/2009	$4,035,510	$14,355,855	28.1%	$10,320,345	$2,671,071	386.4%
7/1/2010	$5,058,336	$15,094,744	33.5%	$10,036,408	$2,713,518	369.9%
7/1/2011	$6,795,093	$16,397,138	41.4%	$9,602,045	$2,774,501	346.1%
7/1/2012	$7,808,944	$19,146,415	40.8%	$11,337,471	$2,673,827	424.0%
7/1/2013	$8,700,353	$20,508,708	42.4%	$11,808,355	$2,849,563	414.4%
7/1/2014	$9,867,595	$20,487,736	48.2%	$10,620,141	$2,570,207	413.2%
7/1/2015	$11,141,355	$21,161,355	52.6%	$10,020,000	$2,843,149	352.4%
7/1/2016	$12,575,165	$22,825,234	55.1%	$10,250,069	$2,777,426	369.0%

Analysis of the dollar amounts of net assets available for benefits, actuarial accrued liability, and unfunded actuarial accrued liability in isolation can be misleading. Expressing the net assets available for benefits as a percentage of the actuarial accrued liability provides one indication of funding status on a going-concern basis. Analysis of this percentage over time indicates whether the plan is becoming financially stronger or weaker. Generally, the greater this percentage, the stronger the plan. Trends in unfunded actuarial accrued liability and annual covered payroll are both affected by inflation. Expressing the unfunded actuarial accrued liability as a percentage of annual covered payroll approximately adjusts for the effects of inflation and aids analysis of City of Takoma Park's progress made in accumulating sufficient assets to pay benefits when due. Generally, the smaller this percentage, the stronger the plan.

Appendix 1

Summary of Contributions

Year Ended June 30	Actuarially Determined Contribution	Percentage Contributed
2012	923,331	100.0%
2013	1,044,504	100.0%
2014	1,101,564	100.0%
2015	1,296,482	100.0%

The information presented in the required supplementary schedules was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest actuarial valuation follows.

Actuarial cost method	Projected unit credit
Amortization Method	Level percentage of payroll (closed)
Remaining amortization period	Remaining periods range from 19 to 22 years
Asset valuation method	5-year smoothed method
Actuarial assumptions:	
Investment rate of return	7.50%
Projected salary increase	5.5% compounded annually
Future payroll growth	4%

Appendix 2

Benefit Payment Projection

The following table shows the estimated benefit payments from July 1, 2016 through June 30, 2026 based on existing members of the plan.

Fiscal Year	Benefits
2017	880,000
2018	949,000
2019	1,150,000
2020	1,257,000
2021	1,354,000
2022	1,414,000
2023	1,511,000
2024	1,618,000
2025	1,745,000
2026	1,827,000

Appendix 3

Risk Metrics

The City contributions will vary over time based on the experience of the plan's investments and participants. As the value of the plan's assets and liabilities increase relative to the participant payroll, there is a greater risk of large changes to the City's contribution expressed as a percentage of participant payroll.

The Asset Volatility Ratio (AVR) is equal to the market value of assets (MVA) divided by payroll. A higher AVR implies that the plan is exposed to greater contribution volatility. The current AVR of 4.3 indicates that a 1% asset gain/loss can be related to about 4.3% of the annual payroll. The plan currently amortizes asset gains/losses over a period of 20 years. This would result in a change in the City's contribution of about 0.3% of payroll for each 1.0% change in market assets.

The Liability Volatility Ratio (LVR) is equal to the Actuarial Accrued Liability (AAL) divided by payroll. A higher LVR implies that the plan is exposed to greater contribution volatility due to changes in liability measurements. The current LVR of 8.2 indicates that a 1% liability gain/loss can be related to about 8.2% of the annual payroll. The plan currently amortizes liability gains/losses over a period of 20 years. This would result in a change in the City's contribution of about 0.5% of payroll for each 1.0% change in AAL. As the plan approaches a 100% funded level, the AVR will converge to the LVR.

	2013	2014	2015	2016
AVR	3.1	3.8	3.9	4.3
LVR	7.2	8.0	7.4	8.2