Richmond City Council

The Voice of the People. *Richmond, Virginia*

OFFICE OF THE CITY AUDITOR

REPORT # 2013-03
AUDIT
Of the

Richmond Retirement System Sustainability

December 2012

OFFICIAL GOVERNMENT REPORT

Richmond City Council
OFFICE OF THE CITY AUDITOR
900 East Broad Street, 8th Floor
Richmond, Virginia 23219

804.646.5616 (tel); 804 646.2230 (fax)

Committed to increasing government efficiency, effectiveness, and accountability on behalf of the Citizens of Richmond.

TABLE OF CONTENTS

Executive Summary

December 3, 2012

The Honorable Members of the Richmond City Council
The Honorable Mayor Dwight C. Jones

Subject: Richmond Retirement System Sustainability Report

The City Auditor's Office has completed an audit of the Richmond Retirement System's (RRS) Pension Fund. The objectives of this audit were to assess the long-term sustainability of the City's pension benefits and the potential impact of increases in pension costs on City operations.

RRS has a seven-member Board of Trustees. The City Council retains the authority to establish or amend benefit provisions. Currently, RRS administers two types of plans as follows:

1. **Defined Benefit Plan:** The members of this plan are guaranteed specific retirement benefits. The City assumes the risk of funding this plan until the death of the covered member and beneficiary. Therefore, this plan results in future liability for the City.
2. **Defined Contribution Plan:** On July 1, 2006, the City discontinued offering the Defined Benefit Plan to new employees in the general employee class with the exception of senior executives. These employees are now offered a non-contributory Defined Contribution 401 (a) Plan. In this plan, once the City contributes funds on the employees' behalf, the employee is responsible for managing his or her retirement portfolio. The City does not have any future liability for the future benefits of these members.

The City Auditor's Office focused their review on the Defined Benefit Plan. The system administers benefits and services for approximately 8,254 members, retirees, and beneficiaries covered under the Defined Benefit Plan.

During the audit, the City Auditor's Office hired an actuary to assist with the review. In addition, reliance was placed on the report dated March 2010, of an investment consultant hired by RRS.

The following are the salient findings of the audit:

- Based on research of other public pension plans nationally, the City's plan appears to be in better financial condition, as the City has already taken significant corrective actions. Although the City has been proactive, further actions to deal with the growing unfunded liability are possible. The RRS' investment consultant expects benefit payments to grow at the rate of 1.7% per year for the next 10 years. In addition, they also project negative cash flow as the benefit payments are expected to exceed contributions.
- The unfunded pension liability at RRS increased from almost zero in FY 2000 to about $370 Million in FY 2012. The City has a total pension liability of $846 million; however, the actuarial value of plan assets is only $476 million, leaving an unfunded liability of $370 million. This means that for every dollar owed in the future, the City has only 56 cents available.
- The contributions to the pension plan, as a percentage of covered payroll have increased significantly since FY 2002 due to the fact that the plan has been closed to general employees. In 2002, the City was contributing an amount equal to about 9% of the covered payroll of the employees. In 2012, this contribution has increased to almost 33% of the covered payroll.
- An increase in retirees and a corresponding decrease in the number of active employees resulted from pension plan changes in 2006 will have an adverse impact on the unfunded pension liability. In 1993, 153 active members were contributing to RRS for every 100 retirees drawing pension from the system. In 2012, there were only 57 active members for every 100 retirees.
- The actual benefit payments have increased from $22 million in 2002 to about $70 million in 2012. The contributions from the City and the employees are not sufficient to cover pension benefit payments and RRS expenditures. This difference is expected to be paid from investment returns. Due to the recent volatility in the market, the investment returns are often insufficient to cover the difference. The investment returns for six of the last 11 years were not sufficient to cover the difference between the cash inflow and the cash outflow.
- Increasing employee contributions may not have a significant impact on the total unfunded liability. In addition, increasing employee contributions to the retirement plan without a corresponding salary increase may cause employee morale issues, since employees have not received salary raises in the past several years.
- Upcoming accounting changes will require additional disclosures and, in certain circumstances, may increase the City's future pension liability. Recently, Moody's (a municipal debt rating agency) Managing Director indicated, "Pension debts are widely acknowledged to be understated." They have proposed several adjustments to enhance their approach to rating state and local government debt. It is not clear what impact the changes suggested by Moody's and Government Accounting Standards Board will have

on the City's bond rating. According to the Government Accountability Office, "*Some municipal bond analysts have reported concerns about state and local governments' creditworthiness in light of the recent economic downturn and continuing pension obligations.*"

- Richmond's defined benefit plan appears to be sustainable, but funding the plan with a more realistic rate of return assumption will ensure a more solid footing. Based on FY 2010 data, the RRS investment consultant indicated that over the next 10 years, the investment returns are expected to remain relatively stable between 5.9% and 6.1%. This rate of return is lower than the assumed rate of return of 7.5%. Therefore, it appears that reducing the assumed rate from 7.5% to a more realistic number would provide a better estimate of the City's unfunded pension liability.
- The City's unfunded liability could be about $120 million in FY 2027 if the rate of return is adjusted to 6.5%.
- Irrespective of the expected rate of return chosen by the City, the future annual pension contribution is expected to peak in 2025 to over $60 million. Prepaying some of these liabilities will reduce the residual liability in FY 2027. In FY 2012, the City Administration has already contributed approximately $493,000 over the required contribution. This is a step in right direction.

The investment consultant has made four recommendations. The RRS Board has carefully considered these recommendations and implemented two of the recommendations. The Board is considering implementing the third recommendation. However, instead of implementing the fourth recommendation, they have chosen to change their policy to address the issue. This report includes four recommendations made by the actuary to RRS, which they will take into consideration. In addition, the City Auditor's Office made one recommendation to the City Council.

The City Auditor's Office appreciates the cooperation and receptiveness of RRS representatives. The responses to the audit report are attached. Please contact me for questions and comments on this report.

Sincerely,

Umesh Dalal

Umesh Dalal, CPA, CIA, CIG
City Auditor

cc: Mr. Byron C. Marshall, CAO
The Richmond City Audit Committee
The members of the Richmond Retirement Board of Trustees

#	*COMPREHENSIVE LIST OF RECOMMENDATIONS*	*PAGE*
1	***Change contribution basis for general employee group from percent of payroll to a stated annual dollar contribution***	32
2	***Reduce amortization period for general employee group to be the average remaining working lifetime (probably 10 to 15 years)***	32
3	***Review the appropriateness of 4% payroll growth assumption for Police & Fire***	32
4	***Consider further decreasing the assumed investment rate of return (will increase required contributions, but may provide more certainty going forward)***	32
5	***Consider making additional annual pension contributions exceeding the ARC by up to $5.5 million to address unfunded pension liability***	32

Glossary

Source: City of San Jose Audit Report

Actuarial Assumptions: *Assumptions representing expectations about future events (e.g. expected investment returns on plan assets, member retirement and mortality rates, future salary increases, or inflation) which are used by actuaries to calculate pension liabilities and contribution rates. Unfunded liabilities (see below) can grow when actuarial assumptions do not hold true.*

Actuarial Valuation: *Technical reports conducted by actuaries that measure retirement plans' assets and liabilities to determine funding progress. They also measure current costs and contribution requirements to determine how much employers and employees should contribute to maintain appropriate benefit funding progress.*

Actuary: *Professionals who analyze the financial consequences of risk by using mathematics, statistics, and financial theory to study uncertain future events, particularly those of concern to insurance and pension programs. Pension actuaries analyze probabilities related to the demographics of the members in a pension plan (e.g., the likelihood of retirement, disability, and death) and economic factors that may affect the value of benefits or the value of assets held in a pension plan's trust (e.g., investment return rate, inflation rate, rate of salary increases).*

Actuarial Accrued Liability (or Pension Liability): *The value today of all past normal costs (see below). Retired employees are no longer accruing benefits, so their actuarial accrued liability is the entire value of their benefit. The liability represents the value of benefits promised to employees and retirees for services already provided. This concept applies to both the pension liability and retiree health care liabilities.*

Annual Required Contribution (ARC): *The amount of money that actuaries calculate the employer needs to contribute to the retirement plan during the current year for benefits to be fully funded over time.*

Experience Gains/Losses: *Gains or losses that arise from the difference between actuarial assumptions about the future and actual outcomes in an organization's pension plan.*

Market Gains/Losses: *Gains or losses that arise from an increase or decrease in the market value of a plan's assets, including stock, real property, and investments.*

Normal Cost: *The portion of the total present value of benefits that actuaries allocate to each year of service. It can be thought of as the annual premium that the employer must contribute to fund the benefit. It is part of the ARC (see above).*

Smoothing of Gains/Losses: *Actuarial method of spreading, or smoothing, market gains and losses over a period of time (five years for both the Police and Fire, and General Employee plans). The purpose of smoothing is to minimize short-term, year-to-year contribution rate fluctuations which may result from market swings. The smoothed asset value is also known as the actuarial value of assets.*

Unfunded Liability: *This is the unfunded pension obligation for prior service costs, measured as the difference between the accrued liability and plan assets. When using the actuarial value of plan assets, it is also referred to as the Unfunded Actuarial Accrued Liability.*

Introduction and Background

Introduction and Background

The City Auditor's Office has completed an audit of the Richmond Retirement System's Pension Fund. The objectives of this audit were to assess the long-term sustainability of the City's pension benefits and the potential impact of increases in pension costs on City operations.

Objectives of the audit were to assess the long term sustainability of the pension plan and to evaluate the impact of pension cost increases

The auditors conducted this performance audit in accordance with Generally Accepted Government Auditing Standards. Those Standards require that the auditors plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for their findings and conclusions based on the audit objectives. The auditors believe that the evidence obtained provides a reasonable basis for their findings and conclusions based on the audit objectives.

Scope

The scope of the audit included a review of the retirement contributions and liability for the period of 1991 through 2012.

Methodology

Auditors employed the following procedures to complete this audit:

- Reviewed relevant records, polices and regulations;
- Contracted an independent actuary to provide financial forecasting. The actuary's report is included in Appendix B of this report;
- Conducted interviews; and
- Performed other audit procedures, as deemed necessary.
- Reviewed report dated March 10, 2010 issued by the investment consultant hired by RRS

Note: The actuary and investment consultants referred in this report mean the actuary hired by the City Auditor during this audit and the investment consultants hired by RRS, respectively.

Background

The Richmond Retirement System (RRS, referred to as "The System") was initially established by City Council enactment on February 1, 1945. The Virginia General Assembly Legislative Acts of 1998, 2005, and 2010 reestablished the System through the City of Richmond Charter (Chapter 5B.01). RRS has a seven-member Board of Trustees. The City Council retains the authority to establish or amend benefit provisions. The system administers benefits and services for approximately 8,254 members, retirees, and beneficiaries covered under the Defined Benefit Plan.

Benchmarking

Most local governments in Virginia participate in the Virginia Retirement System. The City Auditor's Office compared Richmond's performance with several other selected localities that do not participate in the Virginia Retirement System. The table below depicts FY 2011 data since FY 2012 data was not available for some of the localities.

Richmond had the lowest funded ratio amongst several other selected localities

Locality	Funded Ratio	Rate of Return (1 Year)
Arlington	95.0%	23.1%
Danville	89.7%	23.2%
Newport News	87.7%	21.2%
Roanoke	86.3%	25.2%
Norfolk	78.0%	21.2%
Charlottesville	60.6%	22.6%

Richmond	58.6%	23.1%

Source: CAFR for each locality

The data above indicates that Richmond had the lowest funded ratio in FY 2011 amongst several other localities. However, the City's rate of return in FY 2011 was comparable with these localities.

Pension Plans across the Country are Experiencing Difficulties

In December 2010, ABC news reported, "An analysis by Robert Novy-Marx of the University of Rochester and Joshua Rauh of the Kellogg School of Management finds that public pension plans for America's 50 biggest cities and counties are underfunded by $382 billion--or $14,000 for every household in those same cities."

Nationwide, public retirement plans in various jurisdictions are experiencing difficulties due to market conditions and lack of proper funding

This situation may be alarming, but is common amongst government retirement funds in recent times. Dwindling investment returns due to an unfavorable economic market has taken a toll on the funded status of retirement plans across the country. According to Pew Center, a research group, the states collectively had an unfunded liability of approximately $1.38 trillion in fiscal year 2010. In 2010, only Wisconsin had a fully funded pension plan. Thirty-four other states' pension plans were funded at 80% or less.

Richmond Retirement Plans

Employee Groups	Eligibility for Retirement	Benefit Formula
Police and Fire Defined Benefit	**Employee Contributions** 1 ½ % of creditable compensation	The sum of:

Plan	**Vesting** Earlier of: five years of creditable service or attainment of age 60 **Normal Retirement** Attainment of age 60. Employees can retire with an early service retirement with reduced benefits upon attainment of age 50 provided they are vested or at any age with unreduced benefits upon attainment of 25 years of creditable service.	a. 1.65 % of the member's average final compensation, multiplied by the number of years of such member's creditable service up to a maximum of 35 years, and b. A supplement payable until attainment of the age of 65 equal to 0.75% of the member's average final compensation, multiplied by the number of years of such member's creditable service as a public safety member up to a maximum of 25 years.
Police and Fire Enhanced Defined Benefit Plan	**Employee Contributions** 5.45 % of creditable compensation **Vesting** Earlier of: five years of creditable service or attainment of age 60 **Normal Retirement**: Attainment of age 60. Employees can retire with an early service retirement with reduced benefits upon attainment of age 50 provided they are vested or at any age with unreduced benefits upon attainment of 20 years of creditable service.	The sum of: a. 1.65 % of the member's average final compensation, multiplied by the number of years of such member's creditable service up to a maximum of 35 years, and b. a supplement payable until attainment of the age of 65 equal to 0.75% of the member's average final compensation, multiplied by the number of years of such member's creditable service as a public safety member up to a maximum of 25 years.
General Employees with Defined Benefit Plan	**Employee Contributions** 1% of creditable compensation **Vesting** Earlier of: five years of creditable service or attainment of age 65. **Normal Retirement** Attainment of age 65. Employees can retire with an early service retirement with reduced benefits at age 55 provided they are vested or at any age with unreduced benefits upon attainment of 30 years of creditable service.	The annual amount of any monthly retirement allowance payments shall be 1.75 percent of the member's average final compensation, multiplied by the number of years of such member's creditable service up to a maximum of 35 years.
General Employees with	**Employee Contributions** 4.57% of creditable compensation	The annual amount of any monthly retirement allowance payments shall be 2 percent of the

Enhanced Defined Benefit Plan	**Vesting** Earlier of: five years of creditable service or attainment of age 65. **Normal Retirement** Attainment of age 65. Employees can retire with an early service retirement with reduced benefits at age 55 provided they are vested or at any age with unreduced benefits upon attainment of 30 years of creditable service.	member's average final compensation, multiplied by the number of years of such member's creditable service up to a maximum of 35 years.
Employees with Defined Contribution Plan	**Employee Contributions** None **Vesting** Five years of creditable service or attainment of normal retirement age (general employees – age 65; public safety employees – age 60)	Employees receive City contributions based on the following schedule: the member's years of creditable service and a percentage of the member's creditable compensation as follows: a. Less than five years: Five percent; b. Five through nine years: Six percent; c. Ten through 14 years: Eight percent; and d. 15 years or more: Ten percent.

Source: Chapter 78 of the City Code

***Note 1**: Sworn public safety officers and members of the senior executive group are given a one-time election at the time of employment with the City to participate in the defined benefit, enhanced defined benefit or defined contribution plans. General employees hired or rehired on or after July 1, 2006 are enrolled in the defined contribution plan.*

***Note 2**: Members of the senior executive group as defined in City Code Section 78-341(k) are eligible to participate in the Directors' 2-for-1 plan and are eligible to receive 2 years of creditable service for each year worked up to a maximum of 15 years. Members electing to participate in this plan pay an additional contribution rate of 3.06% (general executives) or 5.49% (public safety executives).*

RRS has two participating employers, the City of Richmond and the Richmond Behavioral Health Authority, which provide pension benefits for their full-time permanent employees, with the exception of certain elected officials and those persons eligible for membership in the State Judicial Retirement System.

On July 1, 2006, the City discontinued offering the Defined Benefit Plan to new employees in the general employee class with the exception of senior executives. These employees are now offered a non-contributory Defined Contribution 401 (a) Plan.

This report focuses on the Defined Benefit plan

The City Auditor's Office focused their review on the Defined Benefit Plan because the City assumes the risk of funding this plan until the death of the covered member and beneficiary, whereas the Defined Contribution Plan passes the risk to the employee. The City Auditor hired an independent actuary to evaluate appropriateness of the City's actuarial assumptions and funding of the pension plan.

The actuary found several of RRS assumptions to be reasonable

The actuary hired by the City Auditor found the following economic and demographic assumptions to be deemed reasonable:

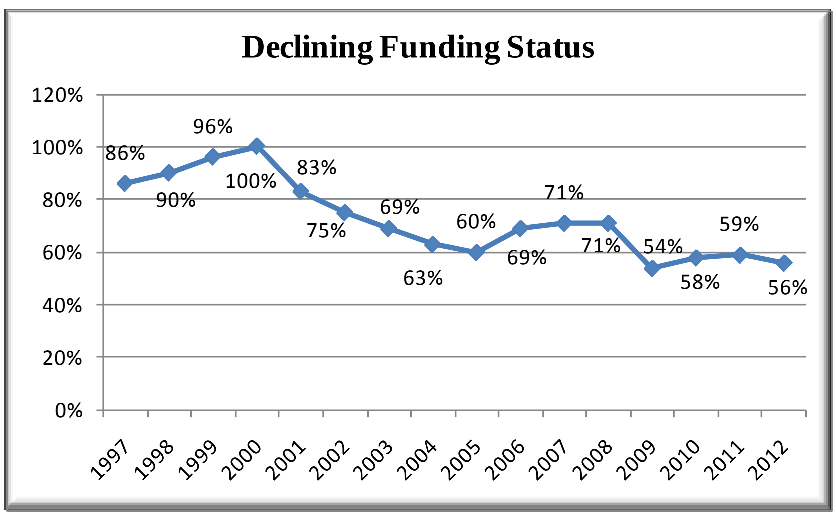
- Inflation
- Withdrawal
- Disability
- Retirement
- Salary Increases

Observations and Recommendations

Over the Past Decade the City's Unfunded Retirement Liability has Increased Substantially

The Unfunded Pension Liability at RRS Increased from Almost Zero in FY 2000 to About $370 Million in FY 2012

The funded status of the Defined Benefit Plan decreased from almost 100% (4% unfunded) in FY 2000 to about 56% (44% unfunded) in 2012 as depicted in the following graph:



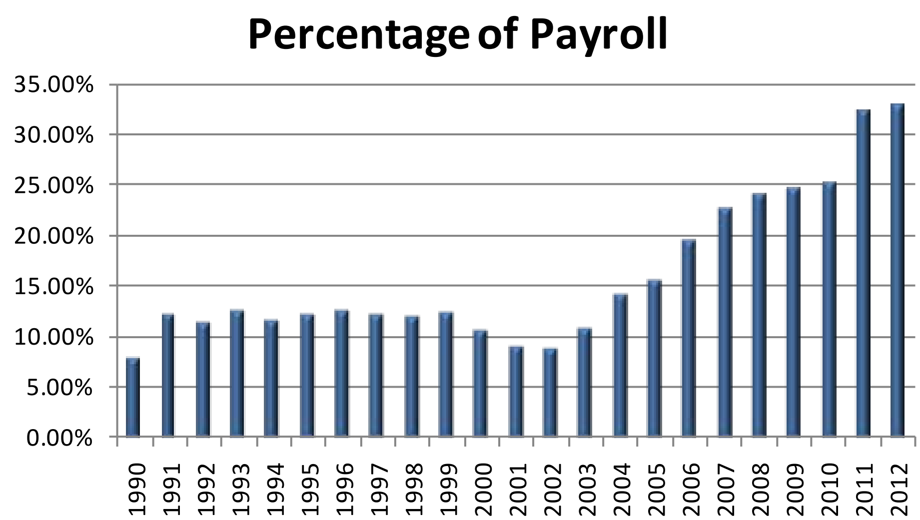
Source: CAFR's

For every dollar owed in the future pension liability, the City has only 56 cents available

The above chart is significant because it shows that for every dollar owed in the future, the City has only 56 cents available. For total pension liabilities of $846 million, the plan has assets with an actuarial value of $476 million, leaving an unfunded liability of $370 million.

The contributions to the pension plan as a percentage of covered payroll has increased significantly since FY 2002 due to the fact that the plan has been closed for the general employees

The City and the members of the Defined Benefit Plan have been contributing more to RRS to meet the required annual contributions since FY 2002. The following graph depicts that the total contribution has increased as a percentage of covered payroll since 1990:



Source: CAFR's

The following table depicts a dramatic increase in the pension contributions as a percentage of payroll relevant to the pension liability:

Pension contributions have increased substantially since FY 2002

Year	Relevant Payroll (in millions)	Pension Contributions (in Millions)	Liability as % of Payroll
2002	$167	$15	8.77%
2003	$172	$19	10.84%
2004	$158	$22	14.05%
2005	$159	$25	15.53%
2006	$163	$32	19.53%

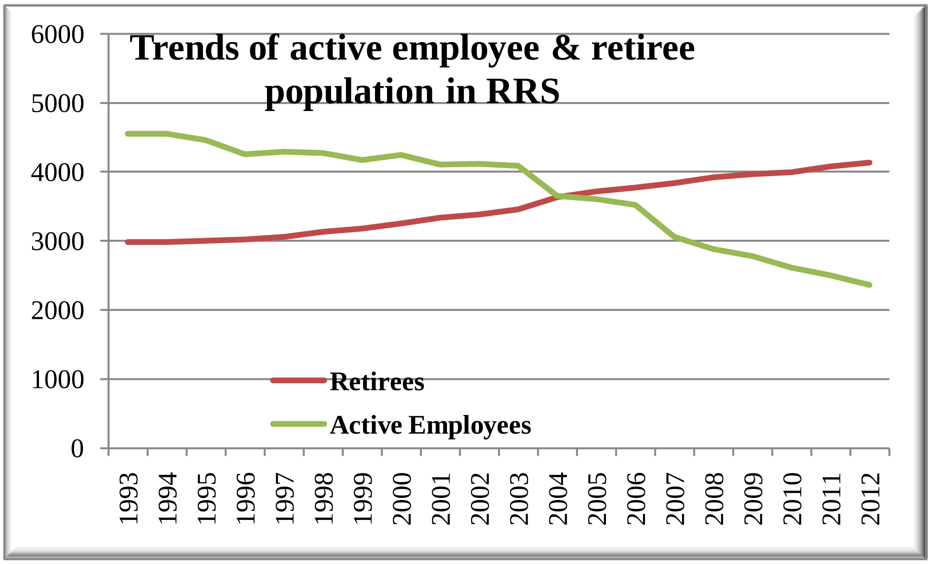
2007	$148	$33	22.61%
2008	$145	$35	24.05%
2009	$146	$36	24.56%
2010	$137	$35	25.18%
2011	$131	$42	32.21%
2012	$125	$41	32.89%

Source: CAFR’s

One of the primary reasons the relevant payroll has decreased is that there are very fewer participants in the Defined Benefit Plan for the general employee class. If the above trend continues, there is a potential that the rising pension liability could cause more significant cash outlay, which may require diverting resources from the City’s operations. The Defined Benefit Plan was closed to general employees hired or rehired on or after July 1, 2006. Contribution amounts have increased due to shortening of the amortization of the unfunded actuarial liability and subsequent changes in the unfunded actuarial liability.

An increase in retirees and a corresponding decrease in active employee counts will have an adverse impact on the unfunded pension liability

The eligible active employee base will continue to decline in the future. At the same time, the number of retirees drawing a pension will continue to increase. This occurrence will further strain an already underfunded system. The following graph depicts the trend:



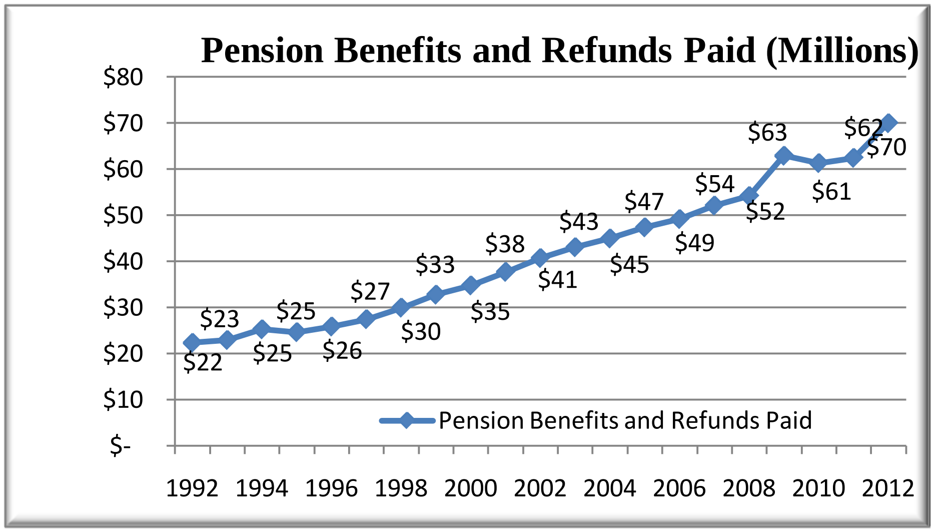
Source: CAFR's

In FY 2012, a substantially less number of active members existed for every 100 retirees

In 1993, 153 active members were contributing to RRS for every 100 retirees drawing pension from the system. In 2012, there were only 57 active members for every 100 retirees. The retirement benefits paid out to the newly retired employees increase payouts and adversely impact cash flow of RRS, thereby requiring additional contribution from the City.

For an underfunded system such as RRS, the number of retirees drawing a pension exceeding the number of active, contributing members could be detrimental

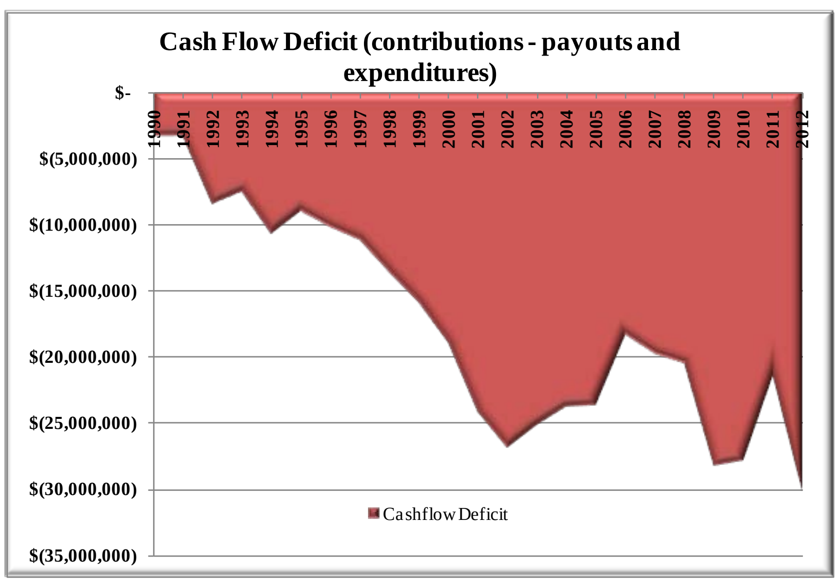
When a pension system is fully funded, the above trend may not matter much, as the funding needed for the future payout is already provided. However, for an underfunded system such as RRS, the number of retirees drawing a pension, which exceed the number of active, contributing members, could be detrimental as more retirees begin to draw pension benefits rather than contribute to RRS. The gap between the number of active employees and the number of retirees is expected to grow wider with time. The above trend has contributed to the total benefit payments to rise over time as follows:



Source: CAFR's

Since 1992, the pension payments and refunds have more than tripled.

Currently, the deficit between cash inflow (the city and employee contributions) and cash outflow (the benefits payout and RRS expenditures) must be paid from investment income



Source: CAFR's

The investment returns for six of the last 11 years were not sufficient to cover the cash deficit

The contributions from the City and the employees are not sufficient to cover pension benefit payments and RRS expenditures. This difference is expected to be paid from investment returns. Due to the recent volatility in the market, the investment returns are often insufficient to cover the difference. The investment returns for six of the last 11 years were not sufficient to cover the difference between the cash inflow and the cash outflow.

Increasing employee contributions without a corresponding salary increase may lead to employee morale issues

Prior to FY 2006, the employees in the general class (with exception to the employees in the Enhanced Defined Benefit Plan and the Senior Executive Group) were not required to make contributions to the Defined Benefit Plan. Since FY 2006, all eligible employees are required to make contributions to the plan. Currently, the employee contribution represents 5% of the total contribution. Increasing employee contributions may not have a significant impact on the total unfunded liability. In addition, increasing employee contributions to the retirement plan without a corresponding salary increase may cause employee morale issues, as they have not received salary raises in the past several years. Therefore, in the future, the City's contributions will have to increase to make up the deficit.

Although less than expected return on investments was the primary reason, there were other factors contributing to the current conditions

When the actual rate of return exceeds the City's expected rate of return, the funded status of pension plan improves. However, any shortfall in the expected returns would reduce the funded status.

According to the actuary, there were additional causes for the increased unfunded liabilities were:

Cause	% Increase
Changes in actuarial assumptions	10%
Low returns on plan assets	70%
COLA increases	9%
Losses on actuarial liabilities	3%
Plan amendments	3%
Negative amortization	3%
Lag in contributions	2%
Total	100%

Source: Actuary Hired by City Auditor

Change in Actuarial Assumptions

The City appropriately changed the expected rate of return from 8% to 7.5%, which increased the City's unfunded pension liability

Currently, RRS assumes an expected investment return on the assets of the Defined Benefit Plan of 7.5%. In FY 2011, the expected return was revised from 8% to 7.5%. The actuary estimated an increase in the City's unfunded pension liability by 10% due to this change. Using the investment consultant's assumptions based on FY 2010 data, the actuary computed a 40% probability of achieving an investment return of 7.5 % over the next 20 years. This means that there is a 60% probability that the City may not achieve the expected return. Therefore, the unfunded liability in future years should be projected using a lower rate of return after considering recent actions of the Retirement Board.

Low Asset Returns

According to the actuary hired by the City Auditor, the average time weighted rate of return on RRS plan assets were:

Poor investment returns during the past decade has resulted in a substantial unfunded pension liability

FY Time Period	Time Weighted Rate of Return
1992-2000	15.2%
2001-2012	3.1%

The negative deviation of the actual rate of return from the assumed rate of return can have a significant impact on the plan's unfunded liability. For example, the plan's actual rate of return for FY 2012 was 0.6% as compared to the assumed rate of return of 7.5%. This deviation increased the plan's unfunded liability by $22.3 million.

Cost of Living Adjustments (COLA)

The City Code does not mandate COLA payments in addition to the retirement benefits. However, the City granted COLA to retirees over the period from Fiscal Years 2001 through 2009 as follows:

Non-mandated COLA payments since 2001 has contributed to the increased unfunded pension liability

Fiscal Year	COLA Granted
2001	3.5%
2002	2.6%
2003	1.4%
2004	1.9%
2007	0.8%
2009	1.5%

Source: Actuary Hired by City Auditor

These increases added approximately 9% of additional unfunded liabilities. With a large unfunded liability of $370 million looming, granting non-mandated allowances to be paid from retirement fund would further increase the unfunded liability.

Losses on Actuarial Liability

Actuaries make several assumptions during their analysis. These are their projections based on the available information at the time of performing their analysis. This is a standard industry practice. The actual results may vary from the expected performance. This variance results in actuarial gains or losses that impact the City's unfunded liabilities.

Plan Amendments

Two plan amendments have increased the unfunded liability

- In 2004, the City adopted an amendment to the plan by introducing an enhanced benefit program. This program allowed the participating general employee group to pay an additional premium of 3% (3.57% after September 1, 2006) of his or her creditable compensation to be eligible for retirement benefits at the rate of 2% (instead of 1.75% without this program). The participating public safety employees were required to pay an additional premium of 3.95%, after September 1, 2006, of his or her creditable compensation to be eligible for unreduced retirement benefits after 20 years of creditable service (25 years of creditable service for unreduced benefits without this program) (Source 78-207 of the City Code).
- During the same period, the plan was amended to introduce a deferred retirement option program (DROP) for the public safety employees. According to the amendment, any public safety member, upon reaching unreduced retirement eligibility or anytime thereafter, may elect to participate in the DROP. Upon the election to participate in the DROP, the participating member will be considered a retired member for all purposes related to the system.

However, while participating in the DROP, the member's unreduced monthly retirement allowance shall be paid to a DROP account in lieu of being paid to the member. At the end of the DROP period, the member shall terminate employment with the City, and the account balance shall be paid to the member and the member shall be classified as a retiree (*Source §78-208 of the City Code*).

The combined effect of both these amendments increased the actuarial unfunded liability by approximately $13 million.

- In September 2006, the City started requiring employees to pay increased contributions for employees in the Enhanced Defined Benefit Plan, and required employees participating in the Defined Benefit Plan to begin making contributions. The City also allowed transfers to the newly adopted Defined Contribution Plan. This action reduced the actuarial liability by about $3 million.

Negative Amortization

Amortization refers to the standard actuarial practice adopted for retirement plans to spread the unfunded liabilities due to a variety of reasons, including the impact on gains and losses attributed to investment returns, over multiple years. A shortfall in the total cash inflow in a particular year to meet unfunded liabilities allocated to that year results in negative amortization. This deficit cumulatively has caused a 3% increase in the City's unfunded pension liabilities.

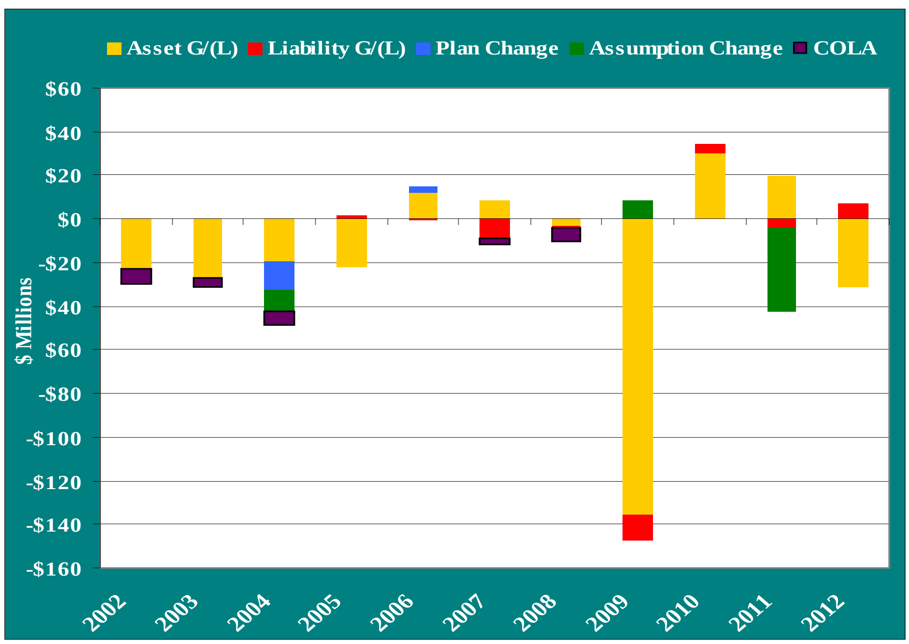
Lag in Contributions

Generally, actuarial valuation determines the contribution the City needs to make for the plan year immediately succeeding the valuation.

However, for budgeting purposes, the City defers the contributions for one year following the valuation.

This practice is very common amongst public sector employers. Additionally, in the years when the contribution is rising, the contribution set aside based on the previous year's valuation are less than the actual contribution required for a year. These factors result in an increased unfunded liability.

The impact on the above changes and a less than expected return on investments are depicted in the following graph:



Source: Actuary Hired by City Auditor

Other Concerns Expressed by the Actuary

- One of the actuary's assumptions expect public safety employees' payroll to increase by 4% annually. If the payroll growth is not achieved, amortization payments will fall short of amounts expected. In the actuary's opinion, lowering the long-term individual salary increase assumptions would decrease the actuarial liability.

- As described earlier in this report, the City adopted DROP benefits for public safety employees in 2004. The DROP participants are treated similar to other Defined Benefit Plan participants who do not/cannot participate in DROP, however, the DROP rates are not segregated from the rates used for retirement. Although this approach is not uncommon, it makes it difficult to segregate DROP costs from normal retirement costs. Stating DROP as a separate assumption and tracking costs accordingly would provide a better breakdown of retirement costs.

Several Developments are on the Horizon that can be a Cause of Concern for Richmond's Defined Benefit Plan.

Accounting Changes

Upcoming accounting changes will require additional disclosures and, in certain circumstances, may increase the City's future pension liability

Two new accounting changes will change the accounting and financial reporting of pensions. GASB Statement 67 will be effective for financial statements beginning in FY 2014, while GASB Statement 68 will be effective for FY 2015. These changes will require the unfunded liability to be stated on the City's overall financial statements. Currently, this liability is only presented on the Retirement Funds' CAFR. The financial disclosures will not necessarily affect determination of the recommended contribution to the plan.

In addition to having to report the unfunded liability in the financial statements, the new accounting changes will alter the way in which unfunded liabilities are recorded. Currently, unfunded liabilities are reported using the actuary's discount rate. Going forward, the City may have to use a more conservative rate under certain circumstances as discussed below. By using a more conservative rate, the City will have a larger unfunded liability. This change will not affect the amount of promised benefits to plan participants.

Other key requirements of these accounting changes include:

- Pension expenses will be immediately recognized for service costs and changes in plan benefit terms such as COLAs, retirement-age eligibility changes and projected salary adjustments;
- The City will have to recognize pension expenses for changes in key assumptions over a newly defined period and account for differences between those assumptions and actual results;
- Plan asset values will no longer be smoothed over time since they will be reported at fair value at the time of financial reporting;
- The long-term rate of return expected on plan investments must be changed to a 20-year general obligation municipal bond index rate if the expected plan's combined net position and contribution payments become insufficient to cover projected benefits; and
- Financial disclosures will include notes that are more extensive and required supplementary information regarding key funding ratios, a history of actual contributions made to pension liabilities, and sources of changes to the overall funded position over time.

Proposed Changes by Moody's Investors Service

Moody's Investors Service is one of the three government debt-rating agencies. The rating assigned by these agencies can determine the quality of underlying government debt such as bonds. The higher the quality of bonds, the lower the interest rate the government will pay on the bond. A lower rating could cost a government additional interest expense. Therefore, the rating assigned by these agencies is important.

It is not clear what impact the changes suggested by Moody's and GASB will have on the City's bond rating

Recently, Moody's Managing Director indicated, "Pension debts are widely acknowledged to be understated." They have proposed the following adjustments enhancing their approach to rating state and local government debt. It is not clear what impact the changes suggested by Moody's and GASB will have on the City's bond rating.

The actuary hired by the City Auditor's Office has reviewed and concurred with the impact of these adjustments on RRS as identified by the auditors as follows:

Proposed Adjustment	Impact on the City
Multiple-employer cost-sharing plan liabilities will be allocated to specific government employer	This type of adjustment if made may not have any impact on RRS or the City's financial statement as the only other employer participating in RRS is Richmond Behavioral Health Authority, which is a component unit of the City.
Accrued actuarial liabilities will be adjusted based on a high-grade long-term corporate bond index discount rate, which was 5.5% for 2010 and 2011	The Moody's adjustment to the unfunded liability will not show up on any actuarial report or financial statement but will only be used for rating purposes.

Asset smoothing will be replaced with reported market or fair value as of the actuarial reporting date	Smoothing is an accepted technique to spread the impact on market volatility over several years. This adjustment will reflect market volatility in the asset values annually, which could cause significant changes in unfunded liabilities from year-to-year.
Annual pension contributions will be adjusted to reflect the foregoing changes, as well as a common amortization period	The City's pension contribution may have to be increased if the City wants to match Moody's benchmark level.

Moody's has not formally adopted these adjustments. Currently, they are inviting comments on these changes. They will make a decision after they have reviewed and considered these comments.

According to the Government Accountability Office, "***Some municipal bond analysts have reported concerns about state and local governments' creditworthiness in light of the recent economic downturn and continuing pension obligations.***"

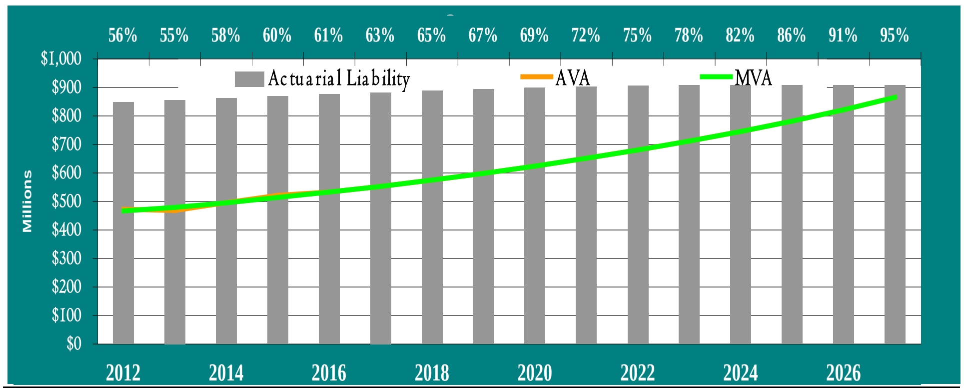
There is a potential for a rising unfunded pension liability to impact the City's bond rating, requiring further action by the City

Based on the concerns expressed by Moody's and other municipal bond analysts, it appears that the rising unfunded pension liability has the potential to affect the City's credit rating in the future. The City will have to take actions discussed subsequently to mitigate this situation.

Richmond's defined benefit plan appears to be sustainable, but funding the plan with a more realistic rate of return assumption will ensure more solid footing

The plan will be 94% funded in FY 2027 if all the assumptions are realized, which may not be likely

The actuary used a 15-year window for their projections as the plan is closed for new general employees since 2006. The actuary expressed that if all the assumptions of the Defined Benefit Plan are realized, the City's pension liability would be 94% funded by the year 2027. At that time, the City's unfunded liability is projected to be about $41 million, which is manageable to deal with in the future budgets. The actuary's projections are depicted in the following graph:



Source: Actuary Hired by City Auditor

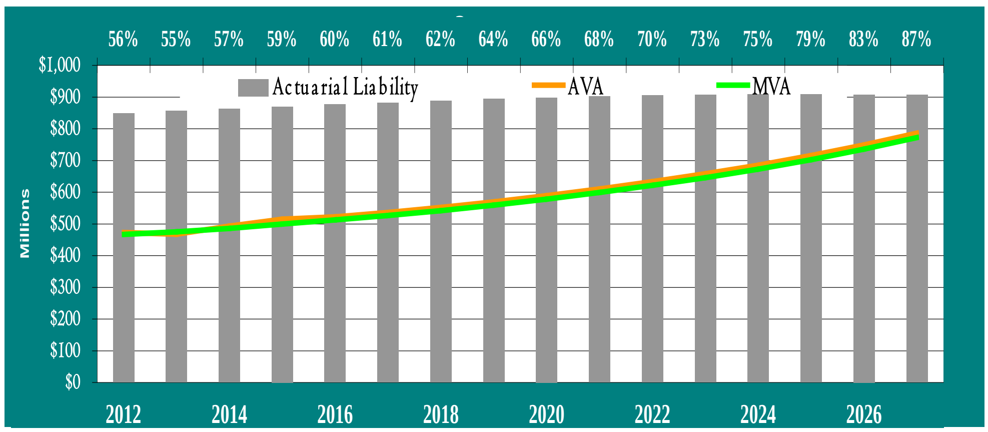
One of the major assumptions currently used by the City is that they will earn a rate of return of 7.5% over next 30 years. This assumption is largely validated by the investment consultant's report dated in March 2012. However, if the window of the retirement projections is narrowed to 15 years due to closure of the plan for general employees, this assumption may be overstating the expected rate of return.

The investment consultant hired by RRS projects a lower rate of return over the next 10 years

The RRS investment consultant indicated that over the next 10 years, the investment returns are expected to remain relatively stable between 5.9% and 6.1%. This projection is lower than the City's expected rate of return. Therefore, in the next 10 years, the funded status will decrease. The investment consultant projects the funded status to decrease from 58.3% in 2011 to 48.6% in 2020. However, the investment consultant indicated the plan would be fully funded over a 30-year period. It appears that for a closed plan, 30 years may be a longer than desirable timeframe. Therefore, it appears that reducing the assumed rate from 7.5% to a more realistic number would provide a better estimate of the City's unfunded pension liabilities.

The City's unfunded liability could be about $120 million in FY 2027 if the rate of return is adjusted to 6.5%

Using the above information, the actuary projected the future unfunded liability at the expected rate of return of 6.5% and estimated the unfunded liability in 2027 to be about $120 million as follows:



Source: Actuary Hired by City Auditor

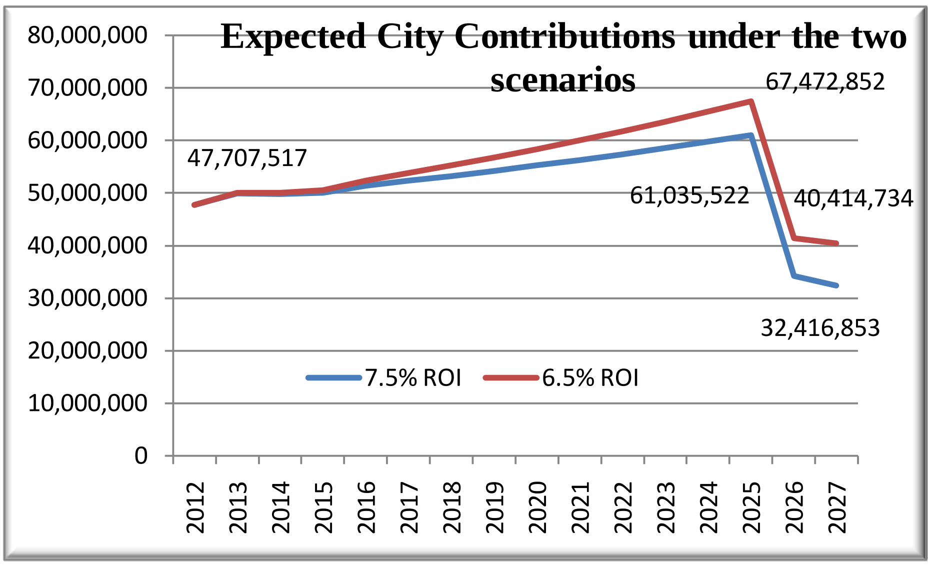
In order to accomplish either of the above two scenarios, the City will have to increase its annual contribution substantially, as depicted in the following table:

The City is expected to make a substantially higher contribution to the pension plan in the next 15 years

Year	**City Contributions**	
	7.5% ROI	**6.5% ROI**
2012	47,707,517	47,707,517
2013	49,981,791	50,057,017
2014	49,812,472	50,069,953
2015	50,008,282	50,556,407
2016	51,385,196	52,331,177
2017	52,327,439	53,776,817
2018	53,259,180	55,240,598
2019	54,234,215	56,771,404
2020	55,241,546	58,358,790

2021	56,297,336	60,020,430
2022	57,401,954	61,758,203
2023	58,553,395	63,571,830
2024	59,768,502	65,480,095
2025	61,035,522	67,472,852
2026	34,213,634	41,411,979
2027	32,416,853	40,414,734

Source: Actuary Hired by City Auditor



Source: Actuary Hired by City Auditor

It will be necessary to divert funds currently used for City operations to support the increased contributions to the pension plan

Under both scenarios, the City's contribution begins at about $48 million and peaks in 2025, exceeding $60 million. Revising the expected rate of return for the retirement projection purposes is a more conservative approach and will provide for better funding to retirement liabilities. In either case, expected additional cash outlays will impact City operations as up to $20 million in additional payments over the current contribution level will have to be made. The following two issues are relevant for this discussion:

The investment consultants expect the City's funding ratio to drop to 48% in FY 2020

1. Based on FY 2010 data, the RRS' investment consultant estimated that the City's pension liability is expected to grow at 2% per year. They are predicting that the funding ratio is expected to drop to 48% in FY 2020. According to the consultant, asset allocation decisions after considering relevant risk levels will not significantly improve the funded ratio, but reducing volatility should result in a lower unfunded liability over long-term. This is because the focus will be on preserving the capital at the sacrifice of investment returns. If the City experiences similar losses that it suffered in recent years, it may be difficult to recover without an additional investment. Recently, the Retirement Board addressed this issue by making certain policy changes.

2. As discussed before, stricter rating guidelines have been proposed by one of the three bond rating agencies. This means that the unfunded pension liabilities may not be viewed favorably when assigning a future rating to the City's debt. In addition, GASB has promulgated accounting standards, which will require expanded disclosure of this liability. Proactive measures such as accelerated funding to prevent significant future liability may help the situation.

   At the City Auditor's request, the actuary projected that if the City contributes the following annual contribution under the two scenarios, in addition to the contributions listed in the above table, it will have a fully funded pension plan by FY 2027:

Expected Rate of Return	Additional annual contribution amount
7.5%	$1.8 million
6.5%	$5.5 million

Having a plan for accelerated contributions spreads the burden of future liability payments more evenly over a period.

Based on research of other public pension plans, the City's plan appears to be in better shape, as the City has already taken significant corrective actions

The City has been proactive in limiting exposure to growing liabilities. Without these actions, the City's unfunded liabilities could have been even larger. The City's actions are discussed below:

1. **The City has been disciplined in making annual required contributions (ARC)**

   Some of the underfunding by other governments as described earlier in this report resulted from deferring contribution to the retirement plans. However, Richmond City Code requires the City to contribute equal to the City's accrued retirement liability. The City has consistently complied with this requirement. However, the downturn in the stock market in 2008 has reduced the value of retirement fund assets that resulted in a substantial unfunded liability for RRS.

The City is in compliance with its Code requirements related to the ARC

2. **In FY 2006 and 2012, the City contributed an additional amount**

The City contributed an additional $1,000,000 in FY 2006 and $493,529 in FY 2012 in excess of the required contribution. These actions were a step in the right direction towards reducing the unfunded pension liability.

3. **The City closed the Defined Benefit Plan for new employees hired in the general employee class**

Changes in pension plans for new employees in the general employee class has slowed the unfunded liability growth

The City had the foresight to take preventive actions to address market risks long before the market downturn in 2008. In 2006, the City discontinued offering the Defined Benefit Plan to newly hired employees in the general employee class. This action limited the City's liability to then current and terminated vested employees, and newly hired public safety and executive employees. Accordingly, the growth in the unfunded liability is slowed.

4. **The City reduced the expected interest rate from 8% to 7.5%**

A reduction in the expected rate of return has brought the unfunded liability estimates closer to reality

A reduction in the expected rate brought the unfunded liability estimates closer to reality. This action resulted in a more conservative estimate of the unfunded liability. As discussed elsewhere in this report, there is a need for further reduction in the expected interest rate.

5. **The City changed its policy for amortization of the pension liability for the employees in the general class**

Prior to 2006, the amortization (spreading of payments over a period) of unfunded liability was based wholly on percentage of pay, which did not always satisfy the liability, resulting in negative amortization. Starting in 2006, with closing of the general employee portion of the plan to new members, the general employee unfunded liability was changed to level dollar, eliminating negative amortization for general employees.

6. **RRS changed its policy related to COLA and the City is funding COLA separately**

   The RRS Board changed its policy in March 2012 to discontinue making recommendations to City Council for COLA's until the plan is at least 70% funded. In addition, the City Council has made additional COLA appropriations for each Fiscal Year 2010 through 2012.

Further action may be needed to deal with the rising unfunded liability

Although the City has been proactive, it is possible to take further actions to deal with the growing unfunded liability. The RRS' investment consultant expects benefit payments to grow at the rate of 1.7% per year for the next 10 years. In addition, they also project negative cash flow as the benefit payments are expected to exceed contributions. The RRS investment consultant made several recommendations in 2012. These recommendations are listed below, as well as the actions taken by RRS.

Recommendations

RRS Investment Consultant Recommendations:

- ***Reduce investment mix volatility for a more efficient portfolio.*** *RRS implemented this recommendation by reducing the target allocations to domestic equity and fixed income from 32% to 27% and 34.5% to 30.5% respectively. They also added more alternative assets (target allocation was increased from 17% to 26%) to create a risk adjusted portfolio. Finally, one underperforming equity manager was terminated and four alternative asset managers were hired.*
- ***Increase exposure to emerging markets.*** *This recommendation was implemented in May of 2012, when the target allocation for emerging international markets was increased from 5% to 7%.*
- ***The GAA (Global Asset Allocation)/Risk Parity may play a role in creating a more efficient portfolio and lower unfunded liability over the long-term.*** *The RRS Board carefully considered this recommendation, but did not adopt the strategy. However, they decided to focus on expanding the alternative assets of the fund.*
- ***Monitor expected negative cash flow, since it could be detrimental to future performance.*** *RRS has been researching this issue in recent months and will present their findings to the Board in November of 2012. In addition, the investment consultant and the Board are closely monitoring RRS' monthly liquidity needs while expanding into alternative assets.*

The following are recommendations made by the actuary and the City Auditor's Office for purposes of this audit report:

Actuary's Recommendations to RRS:

1. ***Change the contribution basis for the general employee group from percent of payroll to a stated annual dollar contribution.***
2. ***Reduce the amortization period for the general employee group to be the average remaining working lifetime (probably 10 to 15 years).***
3. ***Review the appropriateness of 4% payroll growth assumption for Police & Fire.***
4. ***Consider further decreasing the assumed investment rate of return (will increase required contributions, but may provide more certainty going forward).***

City Auditor Recommendations to City Council:

5. ***Consider making additional annual pension contributions up to $5.5 million exceeding the ARC to address the unfunded pension liability.***

MANAGEMENT RESPONSE FORM

Richmond Retirement System Audit 2013-03

Recommendations to RRS

#	RECOMMENDATION	CONCUR Y-N	ACTION STEPS
1	***Change contribution basis for general employee group from percent of payroll to a stated annual dollar contribution***	Take under consideration	Actuarial assumptions and methods are reviewed by the Board of Trustees every 5 years upon completion of an experience study. The next study is due to be completed for the 5-year period ended June 30, 2013. Based on information currently available, the covered payroll for General Employees has declined approximately 7% per year for the first 4 years of the experience period. Since contribution rates calculated as of a valuation date are actually applied to the following budget year, the decline in payroll has led to a lower than expected contribution. A move to a stated annual dollar contribution could be made but consideration might also be given to a move to a level percent of payroll contribution that anticipates future payroll decline. This would result in a higher annual contribution rate than a stated annual dollar contribution in the early years. The amortization method will be reviewed in conjunction with the 2013 experience study.
	TITLE OF RESPONSIBLE PERSON		**TARGET DATE**
	IF IN PROGRESS, EXPLAIN ANY DELAYS		**IF IMPLEMENTED, DETAILS OF IMPLEMENTATION**
#	**RECOMMENDATION**	**CONCUR Y-N**	**ACTION STEPS**
2	***Reduce amortization period for general employee group to be the average remaining working lifetime (probably 10 to 15 years)***	Take under consideration	The current 20 year amortization period is well within GASB amortization guidelines which allow for amortization up to 30 years. As of June 30, 2012, 67% of the actuarial liability was related to retirees and terminated vested members, so consideration might be given to tying the amortization period to a blend of average remaining working lifetime as well as average life expectancy for the retirees. The ultimate choice of amortization period should be based on the City's timeline for improving the System's funded status to a target level. The amortization period will be reviewed in conjunction with the 2013 experience study.
	TITLE OF RESPONSIBLE PERSON		**TARGET DATE**
	IF IN PROGRESS, EXPLAIN ANY DELAYS		**IF IMPLEMENTED, DETAILS OF IMPLEMENTATION**
#	**RECOMMENDATION**	**CONCUR Y-N**	**ACTION STEPS**
3	***Review the appropriateness of 4% payroll growth assumption for Police & Fire***	Take under consideration	Based on information currently available, the covered payroll for Police & Fire has remained fairly level for the first 4 years of the experience period. If that pattern continues, the likely recommendation would be that the future payroll growth assumption should be 0% and amortization should be level dollar versus level percent of pay. The payroll growth assumption will be reviewed in conjunction with the 2013 experience study.
	TITLE OF RESPONSIBLE PERSON		**TARGET DATE**
	IF IN PROGRESS, EXPLAIN ANY DELAYS		**IF IMPLEMENTED, DETAILS OF IMPLEMENTATION**

#	RECOMMENDATION	CONCUR Y-N	ACTION STEPS
4	***Consider further decreasing the assumed investment rate of return (will increase required contributions, but may provide more certainty going forward)***	Take under consideration.	This will result in an increase in the unfunded liability, a decrease in the funded status and an increase in the projected contribution stream which will go back to the question of whether the COR can afford such amounts. This recommendation will be reviewed and discussed by the Board of Trustees, its actuary and investment consultant over the coming months.
	TITLE OF RESPONSIBLE PERSON		**TARGET DATE**
	IF IN PROGRESS, EXPLAIN ANY DELAYS		**IF IMPLEMENTED, DETAILS OF IMPLEMENTATION**

Recommendations to City Council

#	RECOMMENDATION	CONCUR Y-N	ACTION STEPS
5	***Consider making additional annual pension contributions exceeding the ARC by up to $5.5 million to address unfunded pension liability***	Y	Localities in the nation are facing increasing retirement costs and decreasing revenues being put into the system. Richmond is no different. City Council and administration must work together to create a plan that will ensure that the dollars needed to fund our retirement plan will be in place to pay the city's obligations to the retirees. This will probably result in additional funding of the system from the general fund as we move forward, but, based on the audit, it is a discussion that cannot be delayed.
	TITLE OF RESPONSIBLE PERSON		**TARGET DATE**
	IF IN PROGRESS, EXPLAIN ANY DELAYS		**IF IMPLEMENTED, DETAILS OF IMPLEMENTATION**

CHEIRON CLASSIC VALUES, INNOVATIVE ADVICE

APPENDIX B

City of Richmond, Virginia

Retirement Sustainability Audit of the Richmond Retirement System

Presented By

Stephen T. McElhaney, FSA, FCA

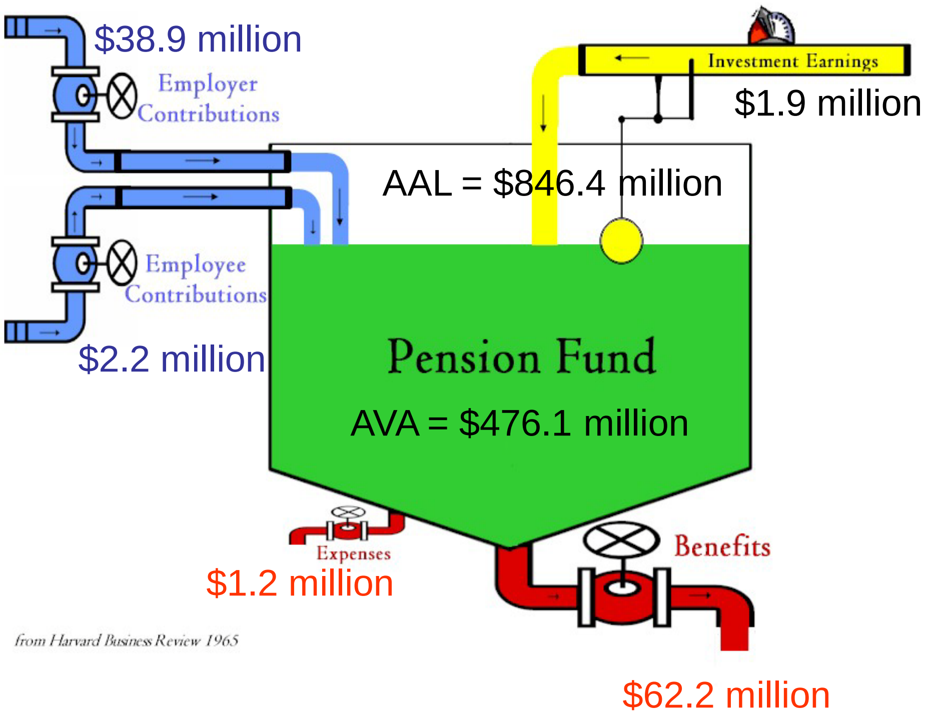
November, 2012

Discussion Topics

- The Actuarial Valuation Process
- Executive Summary
- Current and Past Funded Status of Richmond Retirement System
- Actuarial Assumption and Method Review
- Projections of Future Funded Status

The Actuarial Valuation Process

1. Collect data
   - Participants
   - Plan provisions
   - Financial
2. Make assumptions
   - Demographic
   - Economic
3. Project all future benefit payments
4. Determine a present value = tank
5. Compare to assets
6. Calculate employer contribution



- Values as of July 1, 2012
- Investment earnings assume 7.5% return on MVA

Executive Summary

Funded Status of RRS

- Funded status has declined from near 100% in 2000 to 56% in 2012
- Unfunded liability was $370 million in 2012
- Contribution rates for the City have increased from 9% of payroll in 2001 to over 35% of payroll in 2012
  - Employee contributions are currently less than 2% of payroll and will not significantly help improve funded status

Causes for Increase of Unfunded Liability

- 70% of increase due to low asset returns from 2000 to 2011
- 10% of increase due to changes in actuarial assumptions (mostly the reduction in assumed rate of return)
- 9% of increase due to COLA increases for retirees
- 11% due to various miscellaneous reasons

Review of Actuarial Assumptions

- Investment return rate (7.5%)
  - Very reasonable compared to other public retirement systems
  - Higher than projected returns provided by RSS investment consultant
  - Negative cash flow of RRS will likely result in lower future returns than otherwise expected

Review of Actuarial Assumptions

- Annual payroll increase for Fire & Police of 4% is high compared to inflation assumption of 2.5%
- Most other assumptions appear to be generally reasonable

Review of Actuarial Methods

- Cost method – Projected Unit Credit
  - Not as common as Entry Age Normal method but is often used by public retirement systems
  - GASB will require Entry Age Normal method for accounting starting in FY 2014 (will not necessarily affect funding)
- Asset smoothing method
  - Five year smoothing of gains and losses is very common

Amortization of Unfunded Liability

- Prior to 2006, amortizations of unfunded liability were over 30 year periods
- Since 2006 each year's gain or loss is amortized over a separate 20-year period
  - For General Employee group (closed since 2006) to new members, amortization is in level dollar amounts
  - For Fire & Police group, amortization is a level percentage of future payroll assumed to increase at 4% per year
- COLA changes since 2006 have been amortized over relatively short periods (less than seven years)

Comments on 2006 Changes

- General Employee group closed to new hires (they go into a defined contribution plan)
- Amortization periods shortened
- These changes combined with lowering of assumed investment return in 2011 should result in improved funded status for RRS over long term assuming full funding by the City of annual recommended contributions

Projected Results

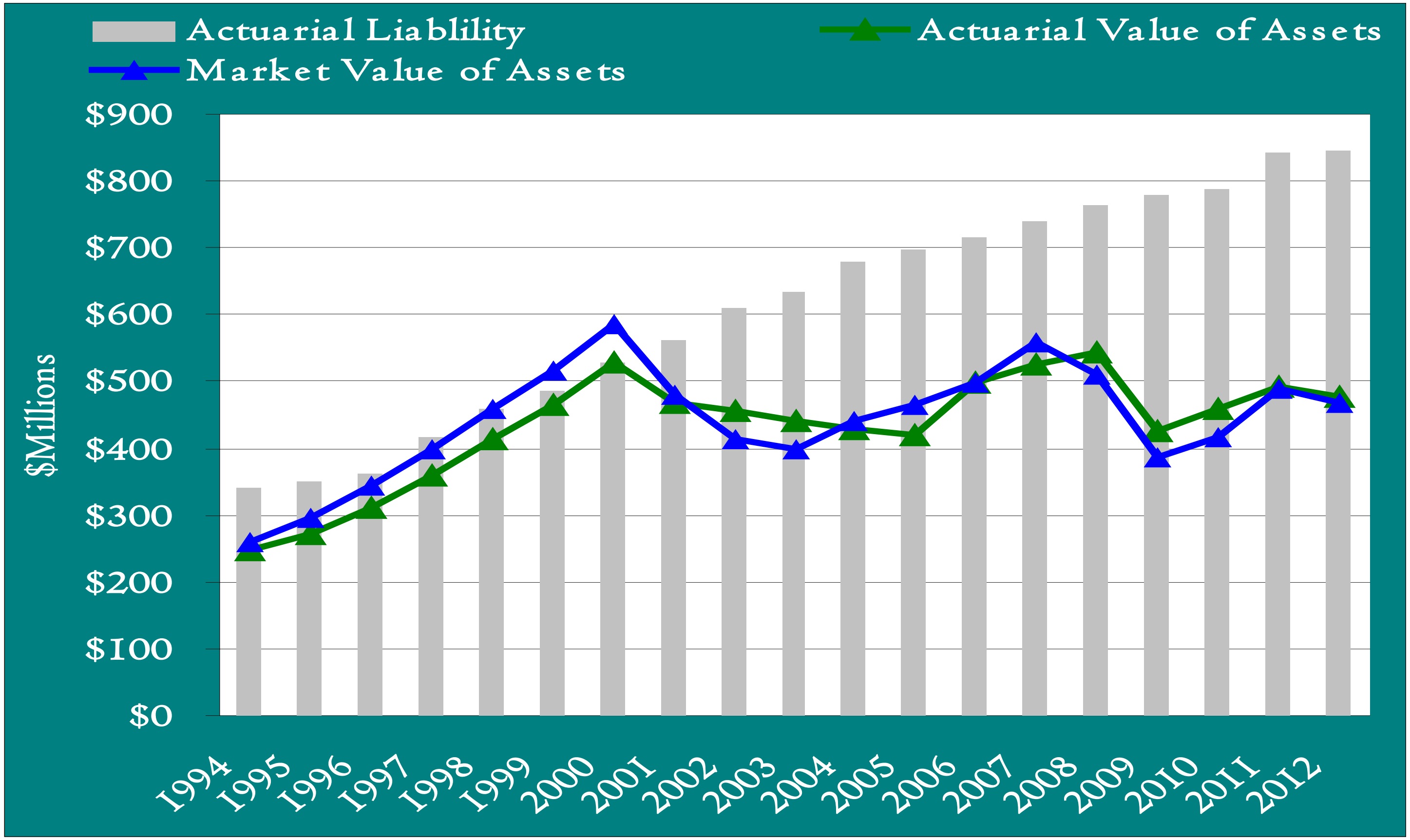
- If current funding polices are continued and if all actuarial assumptions are realized:
  - Funded ratio would increase to 95% in 15 years
  - For Police & Fire group, City contribution rate would stabilize around 39% of payroll
  - For General Employee group, City contribution would stabilize around $25 million, but would increase as a percentage of payroll as the closed group payroll decreases
  - Contributions are expected to decrease sharply after 14 years as 2006 unfunded liability becomes fully amortized

Recommendations

- Change contribution basis for General Employee group from percent of payroll to a stated annual dollar contribution
- Reduce amortization period for General Employee group to be the average remaining working lifetime (probably 10 to 15 years)
- Review 4% payroll growth assumption for Police & Fire
- Consider further decreasing the assumed investment rate of return (will increase required contributions, but may provide more certainty going forward)

Current and Past Funded Status of RRS

Historical Funded Status

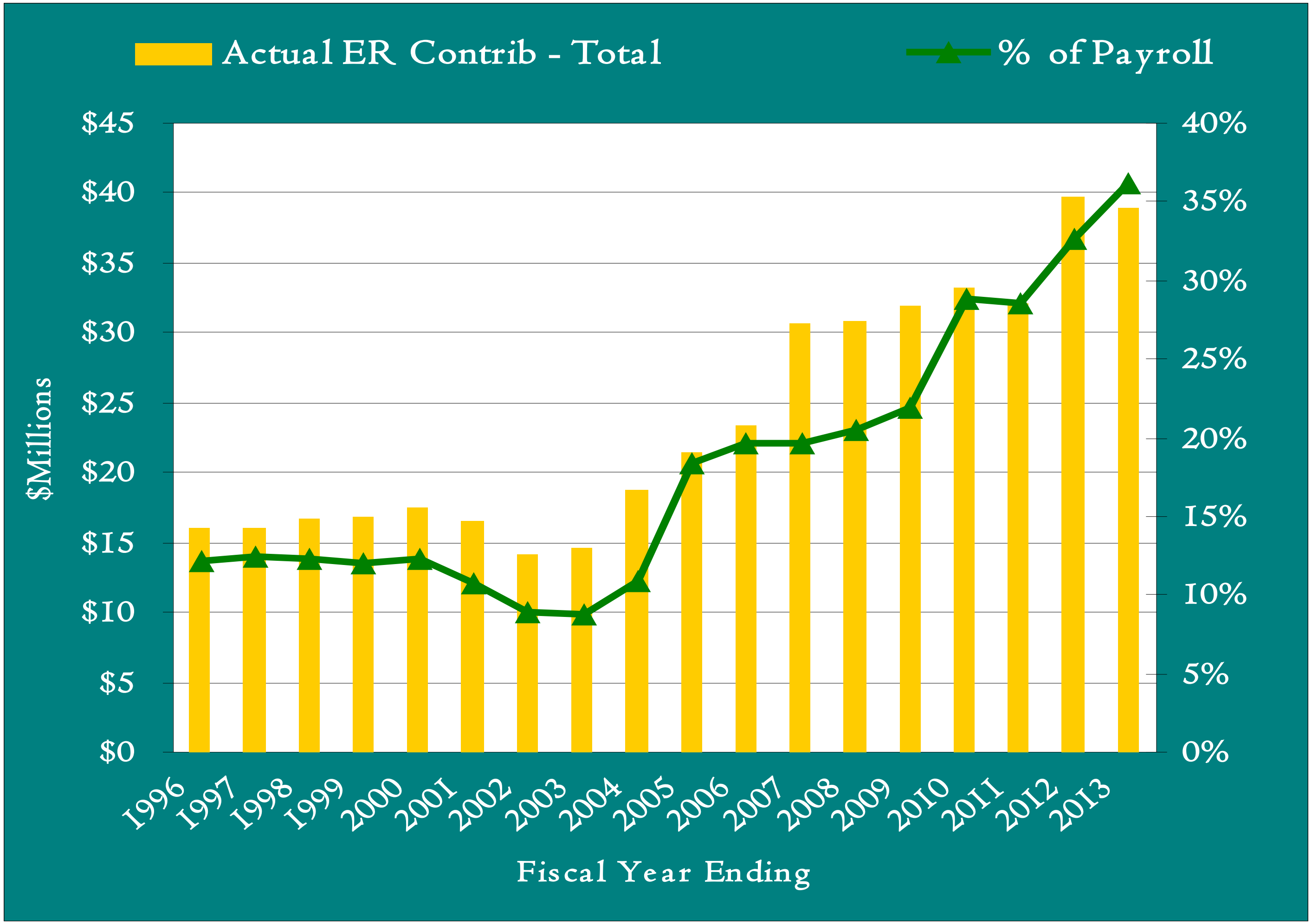


Valuation Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Funded Ratio	84%	73%	78%	86%	86%	90%	96%	100%	83%	75%
Valuation Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Funded Ratio	69%	63%	60%	69%	71%	71%	54%	58%	59%	56%

Comments on Funded Status

- System funded status is generally measured as the ratio of the actuarial value of assets (i.e. smoothed asset value) to the actuarial liabilities
- Funded status steadily grew throughout the 1990s reaching 100% at June 30, 2000
- Funded status has declined since 2000 and was 56% at June 30, 2012
- Unfunded liability increased from almost zero in 2000 to over $370 million in 2012

Funded Status Affects Contribution Rates



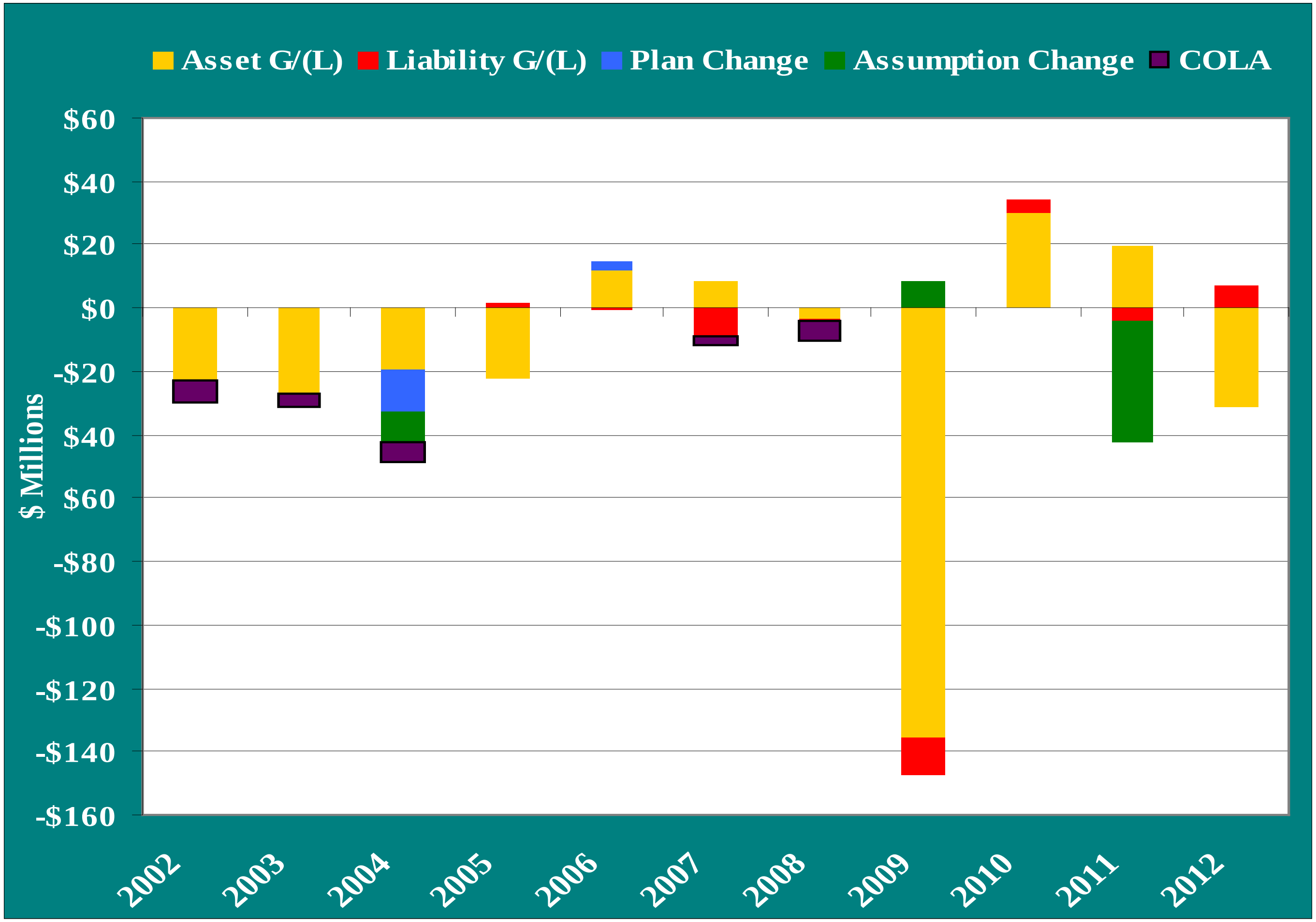
Comments on Contribution Rates

- Contribution rates declined from 12% of payroll in 1991 to 9% of payroll in 2001
- Contribution rates have increased after 2001 to over 35% of payroll at the 2012 actuarial valuation
- Employee contributions are averaging less than 2% of payroll and will not significantly help improve future funded status

What Caused the Increase in Unfunded Liability?

Source	Percent of Total
Low Asset Returns	70%
Losses on Actuarial Liability	3%
Plan Amendments	3%
COLA increases	9%
Assumption Changes	10%
Negative amortization	3%
Lag in Contributions	2%
Total	100%

Gains and Losses Since 2001



Asset Return by Period

- Average time weighted rates of return on plan assets:
  - 1992 to 2000: 15.2%
  - 2000 to 2012: 3.1%
  - 1992 to 2012: 8.1%

- Low returns from 2000 to 2012 contributed about 70% of the increase in unfunded liability

Losses on the Actuarial Liability

- Differences between actual and expected experience give rise to gains or losses on the actuarial liability
- Actuarial losses since 2004 contributed about 5% toward the increase in unfunded liability (experience prior to 2004 was not available)

Plan Amendments

- 2004: Enhanced plan and DROP adopted – increased actuarial liability by $13 million
- 2007: Increased employee contributions and allowed transfers to new defined contribution plan – decreased actuarial liability by $3 million
- Combined effect of plan amendments contributed 3% to increase in unfunded liability

Cost-of-Living Adjustments (COLA)

- COLAs granted since 2001:
  - 2001: 3.5%
  - 2002: 2.6%
  - 2003: 1.4%
  - 2004: 1.9%
  - 2007: 0.8%
  - 2009: 1.5%

- COLAs contributed 9% of the increase in unfunded liability

- Future COLAs will increase UAL

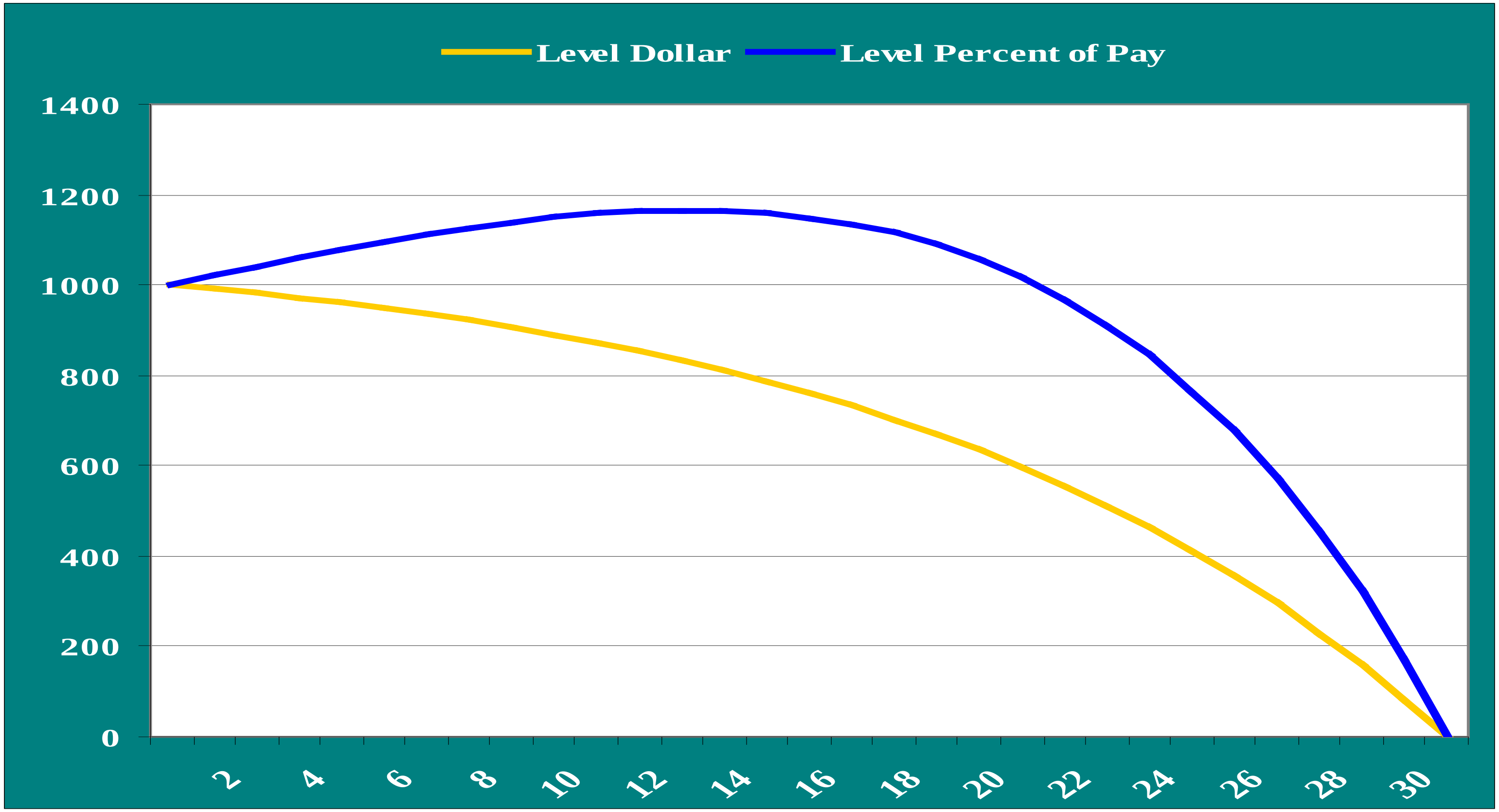
Actuarial Assumption Changes

- Assumptions generally changed following multi-year experience studies
- Assumption changes occurred in 2004 (increase in liability), 2009 (decrease in liability) and 2011 (increase in liability)
- The 2011 assumption change was to decrease the assumed rate of return from 8% to 7.5%
- Cumulative effect of all assumption changes contributed 10% to increase in unfunded liability

Negative Amortization

- Amortization of unfunded liabilities can be either:
  - Level dollar, or
  - Level percent of pay (i.e. an increasing amount in dollar terms)
- In the early years, level percent of pay amortization results in an increasing unfunded liability, sometimes called “negative amortization”

Illustration of Amortization Over 30 Years



CHEIRON

Negative Amortization Comments

- Prior to 2006, amortization of unfunded liability was based wholly on percentage of pay, which resulted in negative amortization
- Starting in 2006, with closing of general employee portion of plan to new members, the general employee unfunded liability was changed to level dollar, eliminating negative amortization for general employees
- Net effect of negative amortization for all years after 2001, contributed about 3% of the unfunded liability

Lag in Contributions

- A particular valuation determines required contributions for the plan year following the valuation date
- For budgeting purposes, the City defers payment for one year following the valuation date
  - Use of a one year “lag” is very common for public sector employers
  - When contributions are rising, the contributed amount for a year tends to be less than the amount determined for that year’s valuation, thus increasing the unfunded liability
- Contribution lag contributed about 2% to the unfunded liability growth since 2001

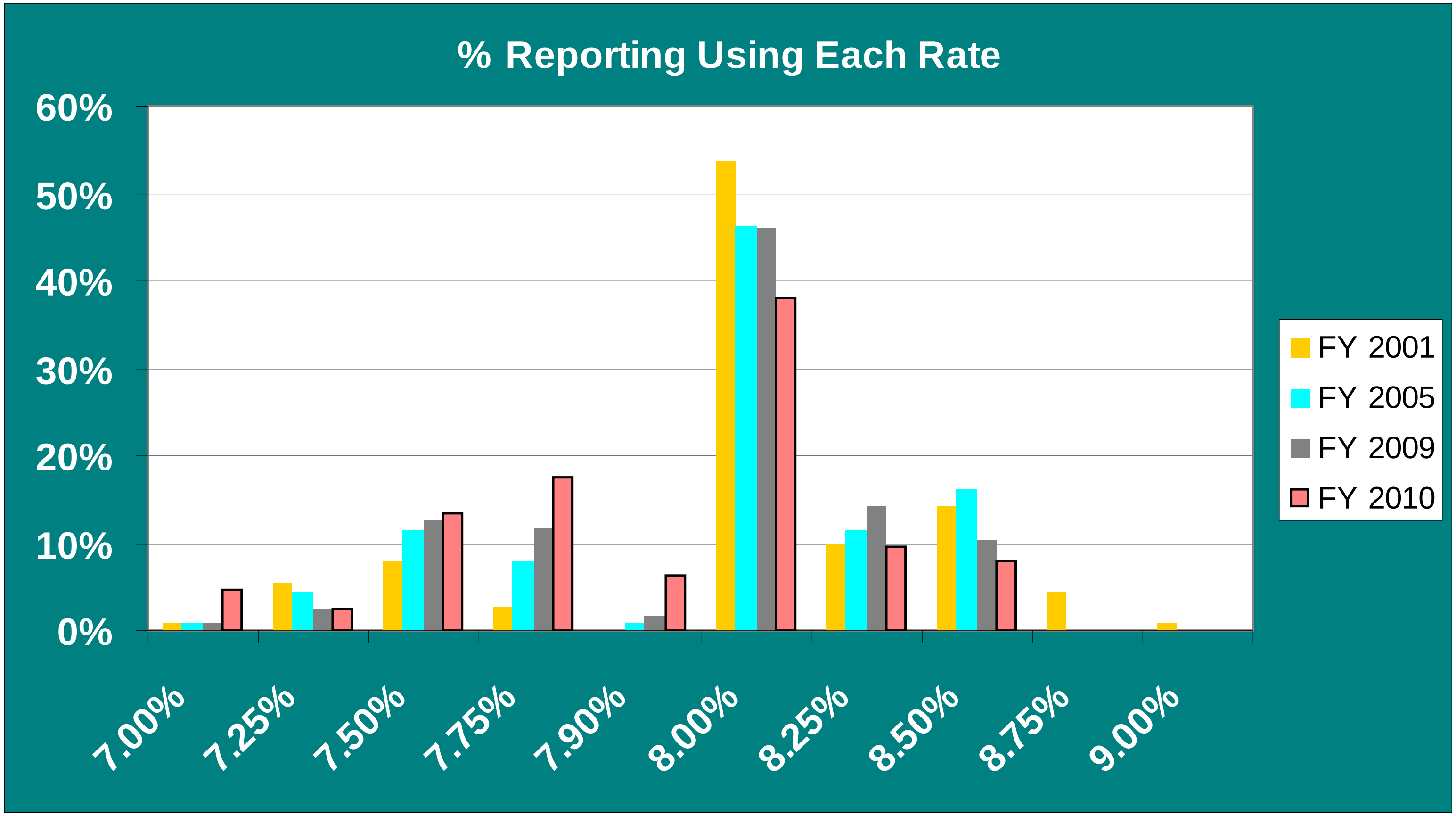
Actuarial Assumption and Method Review

Assumption Review

Economic Assumptions

- Investment return rate
- Total payroll increase
- Inflation
- Administrative expenses

Investment Return Rate
NASRA Survey



Investment Return Rate

Virginia Systems

Rate of Return	Locality
7.00%	Danville VRS
7.50%	Alexandria Arlington Co. Charlottesville Fairfax Falls Church Norfolk Richmond
7.75%	Newport News Roanoke

CHEIRON

Comments on Surveys

- NASRA
  - Average has remained close to 8% over the last 10 years
  - Clear trend in lowering the assumed rate
- Virginia Systems
  - Most other systems are at same assumed rate as RRS – 7.5%

Investment Return Rate

- Investment consultant expected returns
  - NEPC (2012): 6.5% over 5-7 years and 7.4% over 30 years

- Comments
  - Index returns are gross of fees
  - Returns do not reflect active management
  - Wide range of expected returns seen from different investment consulting firms
  - Projected returns are not dollar weighted (dollar weighted returns would likely be lower)

Analysis of Investment Return Rate

- Adjust for expenses
  - Administrative expenses of 0.26% of assets for year ending June 30, 2011
  - Assume 0.20% for investment expenses to be consistent with passive investment returns

Distribution of Future Expected Returns

Percentile	Expected Distribution				
	Years				
	1	5	10	20	30
5%	-9.04%	-0.53%	1.61%	3.14%	3.83%
25%	0.07%	3.81%	4.72%	5.37%	5.65%
50%	6.94%	6.94%	6.94%	6.94%	6.94%
59.34%	9.46%	8.06%	7.73%	**7.50%**	7.40%
75%	14.28%	10.16%	9.21%	8.54%	8.25%
95%	25.73%	14.97%	12.56%	10.88%	10.15%

Negative Cash Flow Issues

- For most recent year:
  - Employer and employee contributions were $41 million
  - Benefit payments were $62 million
  - Net cash flow was a negative $21 million

- Effect on long-term rate of return
  - With volatile assets, negative cash flow will generally result in long-term rates of return lower than those projected on the preceding page

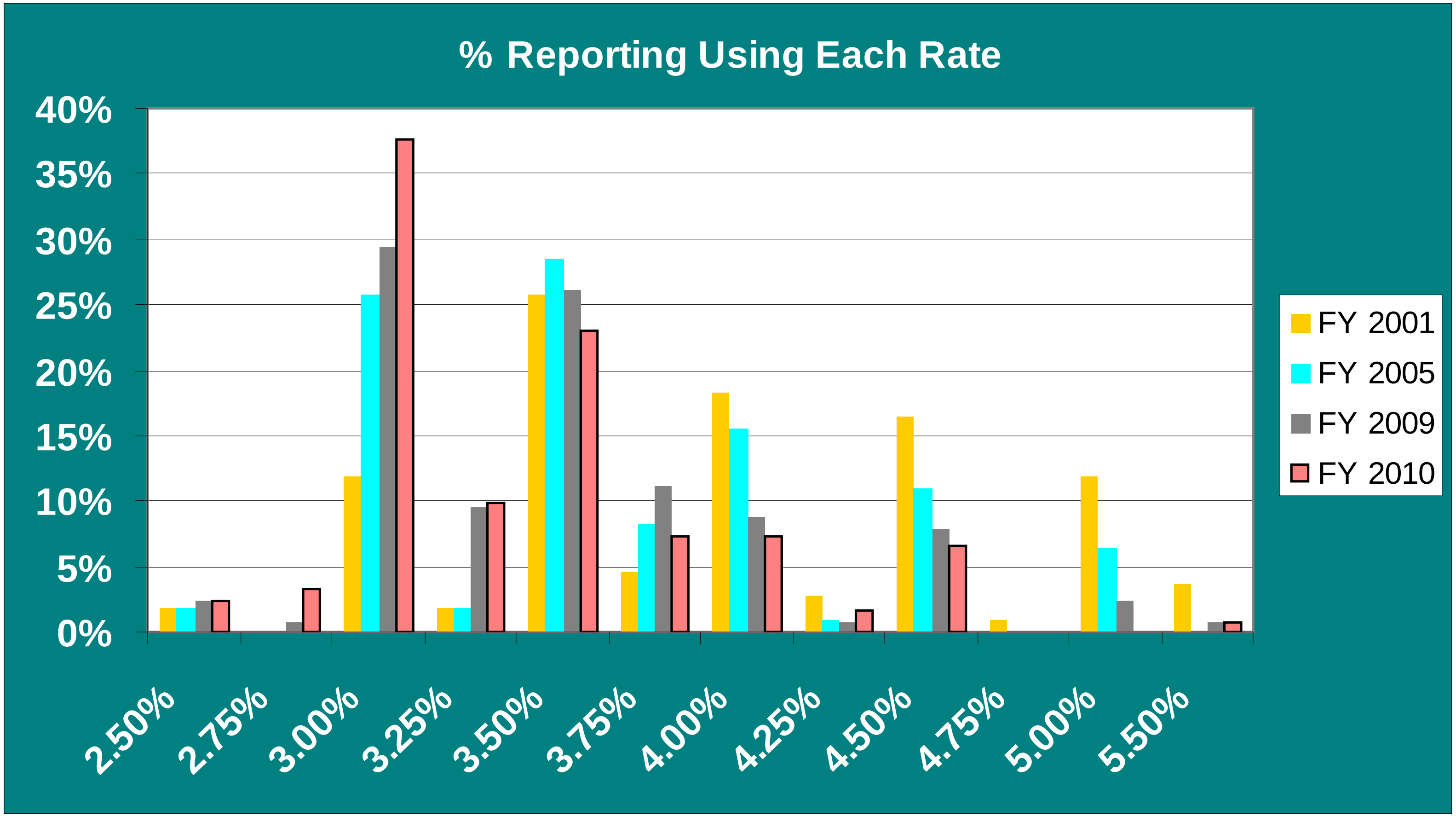
Investment Return Rate

- Overall opinion
  - 7.50% is well within the reasonable range compared to other public retirement systems
  - Using NEPC's assumptions, about a 40% probability that return will be achieved disregarding effects of negative cash flow
  - Lowering the assumed rate would reduce the risk that contributions will need to be increased in the future

Active Member Payroll

- For Fire & Police, it is assumed that total payroll will increase by 4% each year for purposes of amortizing the unfunded actuarial liability
- With inflation assumption of 2.5%, real assumed payroll increase is 1.5%
- If payroll growth is not achieved, amortization payments will fall short of amounts expected
- This assumption is on the high side compared to other public plans, especially in real terms
- To the extent lowering the rate also would lower the long term individual salary increase assumptions, there would be a decrease in the actuarial liability

Inflation
NASRA Survey



CHEIRON

Inflation

- Comments
  - Current assumption is 2.5%
  - At low end of rates in the NASRA survey
  - Trends recently toward lower inflation rates
  - Assumed rate is more consistent with most economic forecasts of inflation compared to survey
  - We consider the current assumption to be reasonable

Administrative Expenses

- No specific assumption stated
- Administrative expenses are implicitly netted from assumed investment return
- Not clear to what extent the level of administrative expense impacted the most recent decision regarding lowering the assumed investment return to 7.5%

CHEIRON

Assumption Review

Demographic Assumptions

- Mortality
- Withdrawal
- Disability
- Retirement
- Salary increases
- DROP

Service Retirement Mortality

- Current Assumption
  - General Employees: RP-2000 Mortality Table with 2-year set forward for males and no set forward or setback for females
  - Police & Fire Employees: RP-2000 Mortality Table for males and females with no set forward or setback
- Comments
  - Tables were adopted based upon results of last experience study
  - No disclosure of mortality improvement as required under revised ASOP No. 35
  - Tables appear to be reasonable subject to review of expected mortality improvement

Disabled Retirement Mortality

- Current assumption
  - General Employees: PBGC disabled mortality for retirees receiving Social Security
  - Police & Fire Employees: PBGC disabled mortality for retirees not receiving Social Security
- Comments
  - These tables are widely used for disabled mortality
  - Assumptions appear to be reasonable

Demographic Assumptions

- Based upon a review of the experience study, we consider all of the following assumptions to be reasonable and have no material comments
  - Withdrawal
  - Disability
  - Retirement
  - Salary increases

DROP Assumptions

- DROP participants are treated the same as retired participants
- Rates of retirement include rates of persons electing DROP
- This approach is widely used; however, it makes it difficult to segregate the true costs of the DROP
- An alternative approach would treat DROP election as a separate assumption and value DROP benefits directly

Assumptions Not Indicated

- Marriage: Plan provides for annuity to surviving spouses after death of an active member eligible for early or normal retirement. The following assumptions are not disclosed in the report (assumptions being used shown in parenthesis):
  - Percent married (70%)
  - Age difference between members and spouses (husbands three years older than wives)

- Unused sick leave: Creditable service is granted for 50% unused sick leave at time of retirement. No assumptions stated for whether or not this is included in valuation

Assumptions Not Indicated (continued)

- Purchase of prior service: Members may purchase certain service (for example service with another public sector employer) at the rate of 10% of salary for each year purchased.
  - To the extent this rate is not actuarially equivalent to the additional benefits purchased, actuarial losses might occur.
  - If losses are expected to be material, a specific assumption should be made in the valuation.

Actuarial Asset Method

- Current method
  - Adjusts market value by spreading asset gains and losses over five years
  - Corridor of 90% to 110% around market value

- Comments
  - This is a commonly used method that we consider reasonable for the valuation
  - Corridor is narrower than most other plans and could cause volatility in contributions during times of volatile returns

Actuarial Cost Method

- Current method is Projected Unit Credit
- While this method is used by many other public retirement systems, it is not the most commonly used method (Entry Age Normal is the most commonly used)
- We consider the Projected Unit Credit method to be reasonable although it will cause increasing normal costs as percentage of pay for the closed General employee group
- GASB changes to pension accounting standards will require use of Entry Age Normal for accounting disclosures, but not necessarily cause a change for funding

Amortization Method

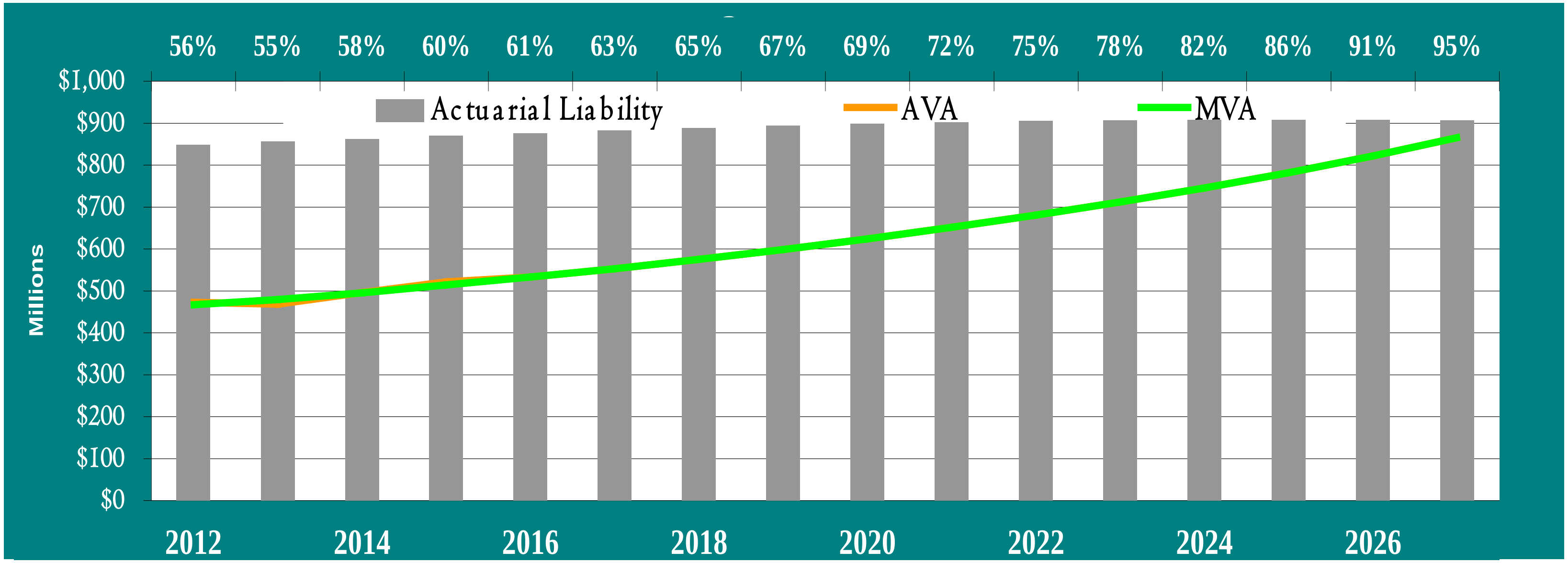
- 20-year "layered" amortization periods starting with the unfunded actuarial liability at July 1, 2006
- Level dollar amortization for General Employees since Plan is closed to new entrants
- Level percent of pay amortization for Police & Fire Employees
- COLA changes after 2006 have been amortized over relatively short periods (less than seven years)
- We consider this method to be reasonable (subject to having reasonable pay growth assumption for Police & Fire)

Projections of Future Funded Status

Baseline Projections

- Liabilities projected from July 1, 2011 actuarial valuation
- Actual asset return applied for year ending June 30, 2012
- Assumes returns of 7.5% for all future years starting at July 1, 2012
- All other actuarial assumptions exactly realized
- No changes in actuarial assumptions

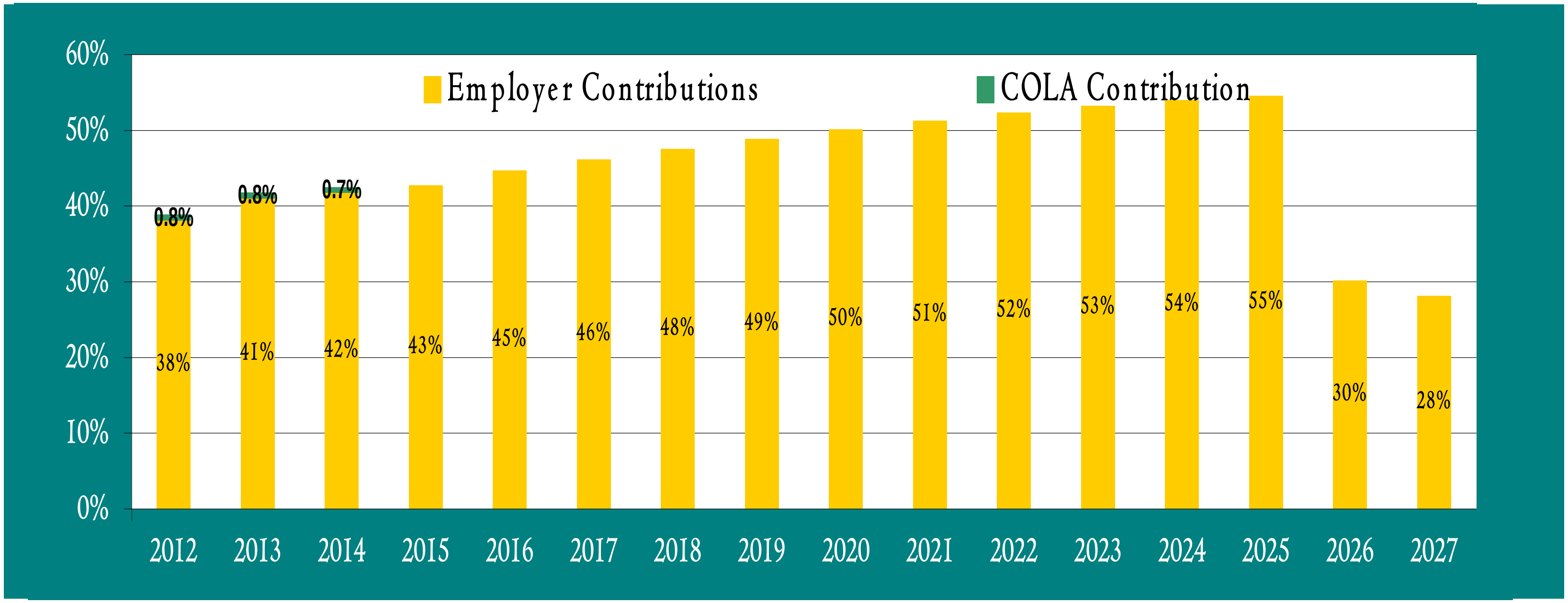
Baseline Projection of Funded Status Projected 7.5% Return



CHEIRON

Baseline Projection of Contributions

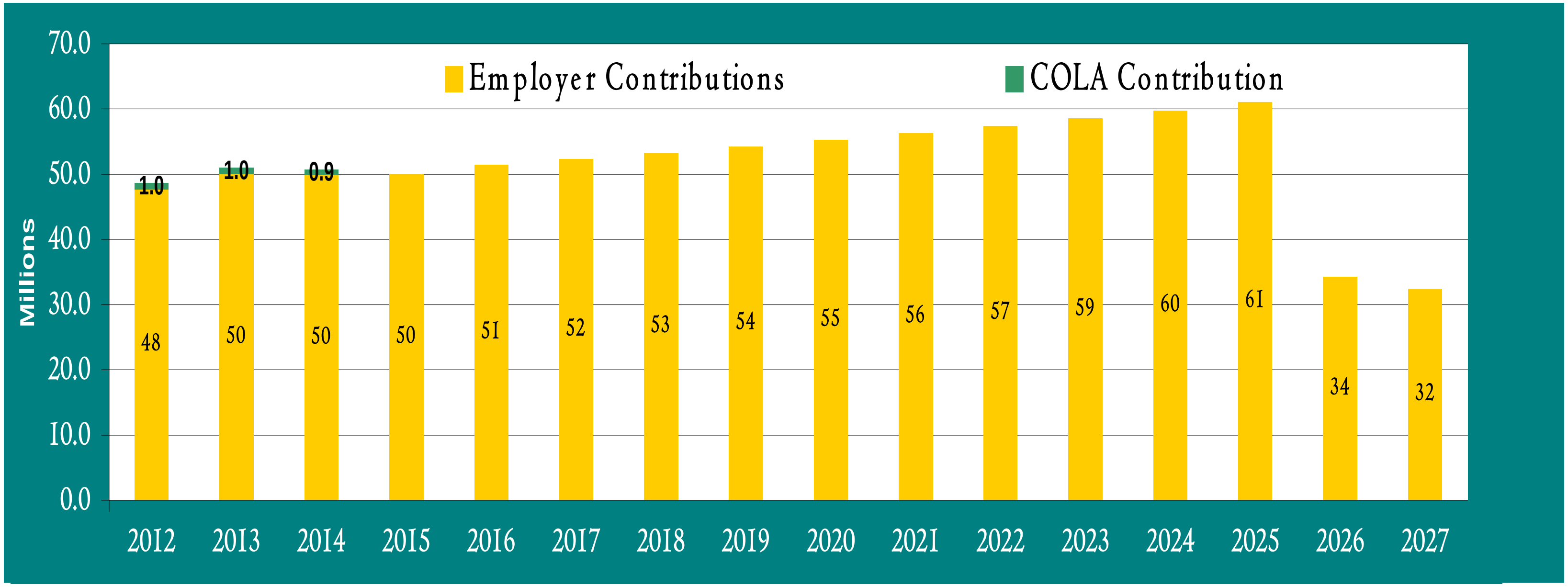
Total Plan – Percent of Payroll
Projected 7.5% Rate of Return



Baseline Projection of Contributions

Total Plan – Dollars (Millions)

Projected 7.5% Rate of Return



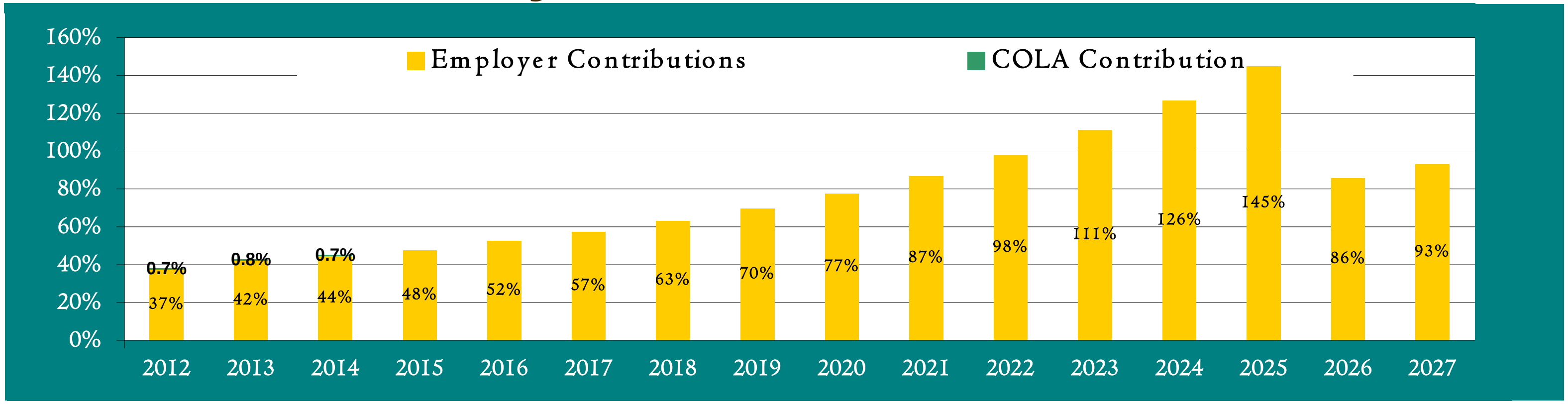
CHEIRON

Baseline Projection of Contributions

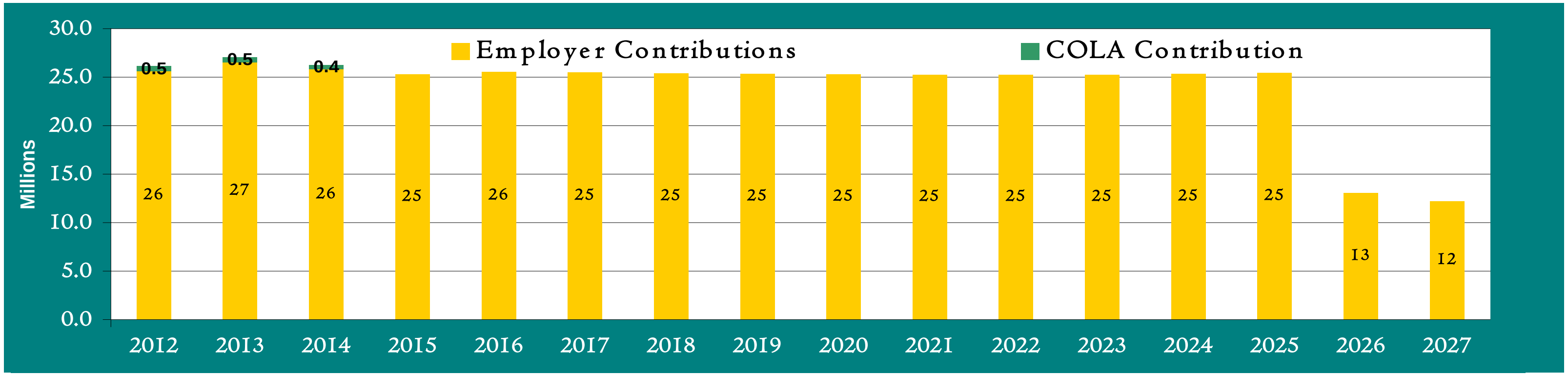
General Employees

Projected 7.5% Rate of Return

Percent of Payroll



Dollars (millions)

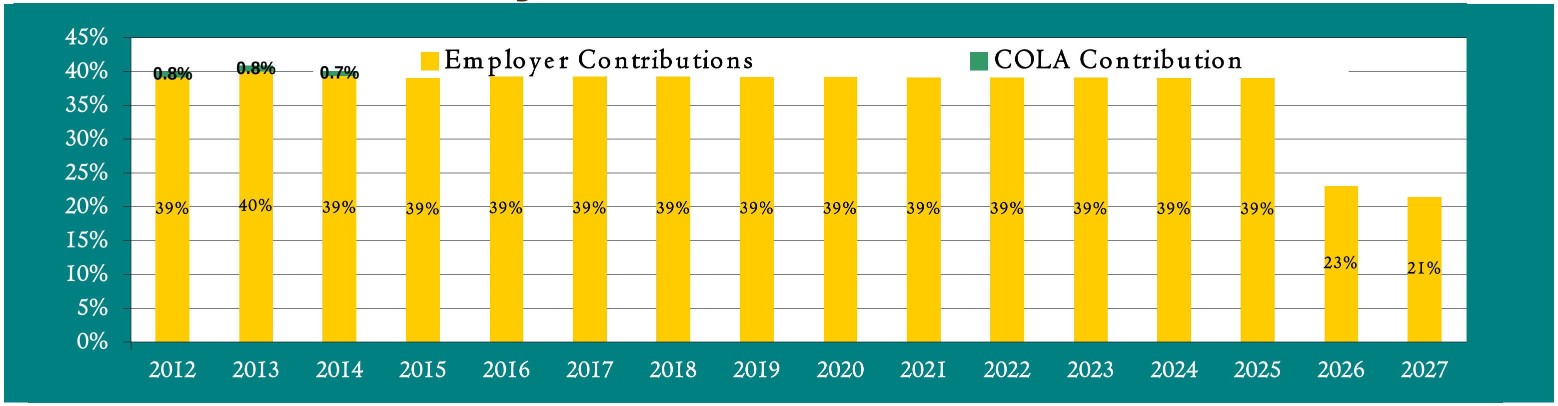


Baseline Projection of Contributions

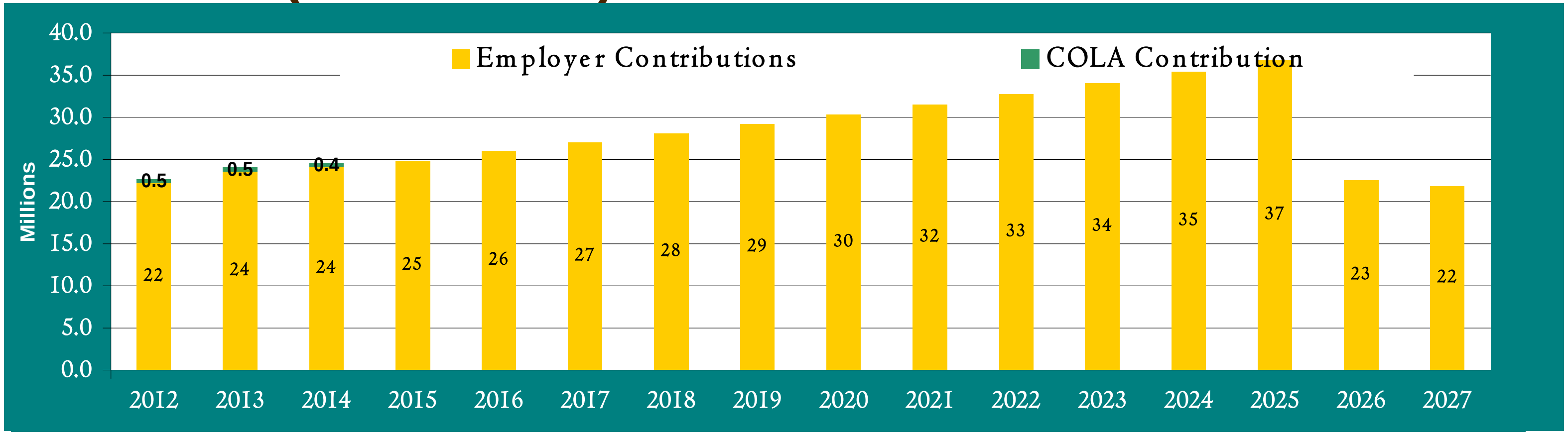
Police & Fire Employees

Projected 7.5% Rate of Return

Percent of Payroll



Dollars (millions)

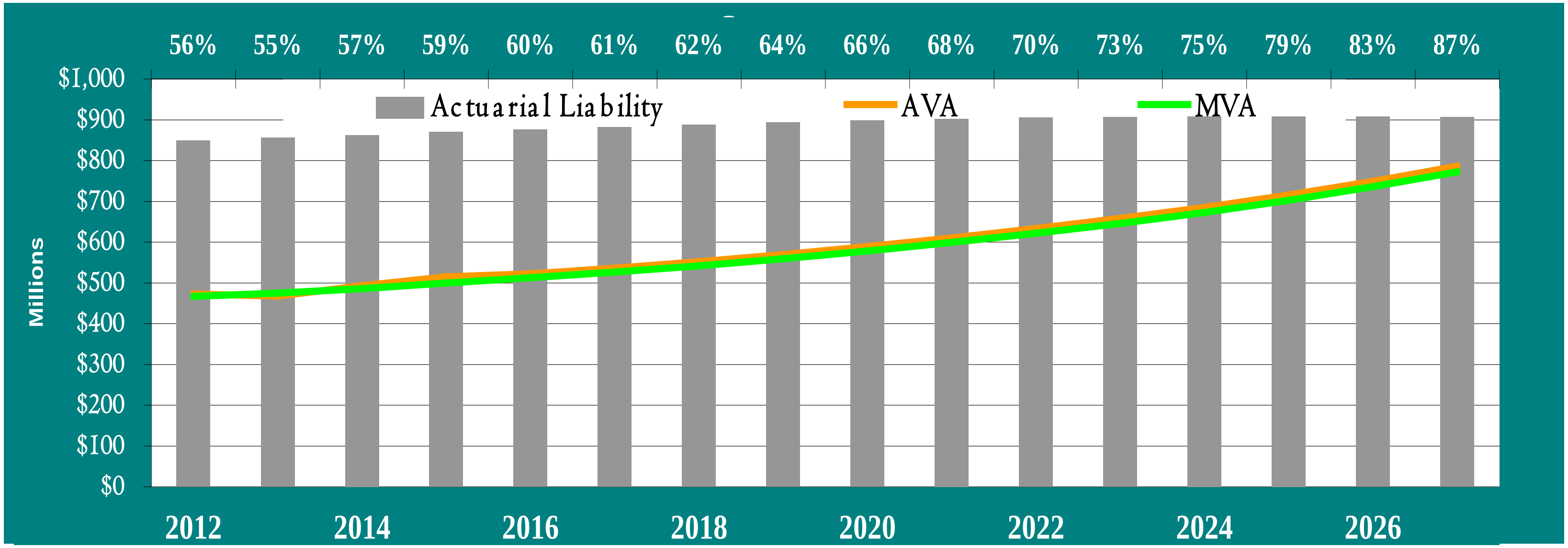


CHEIRON

Pessimistic Projections

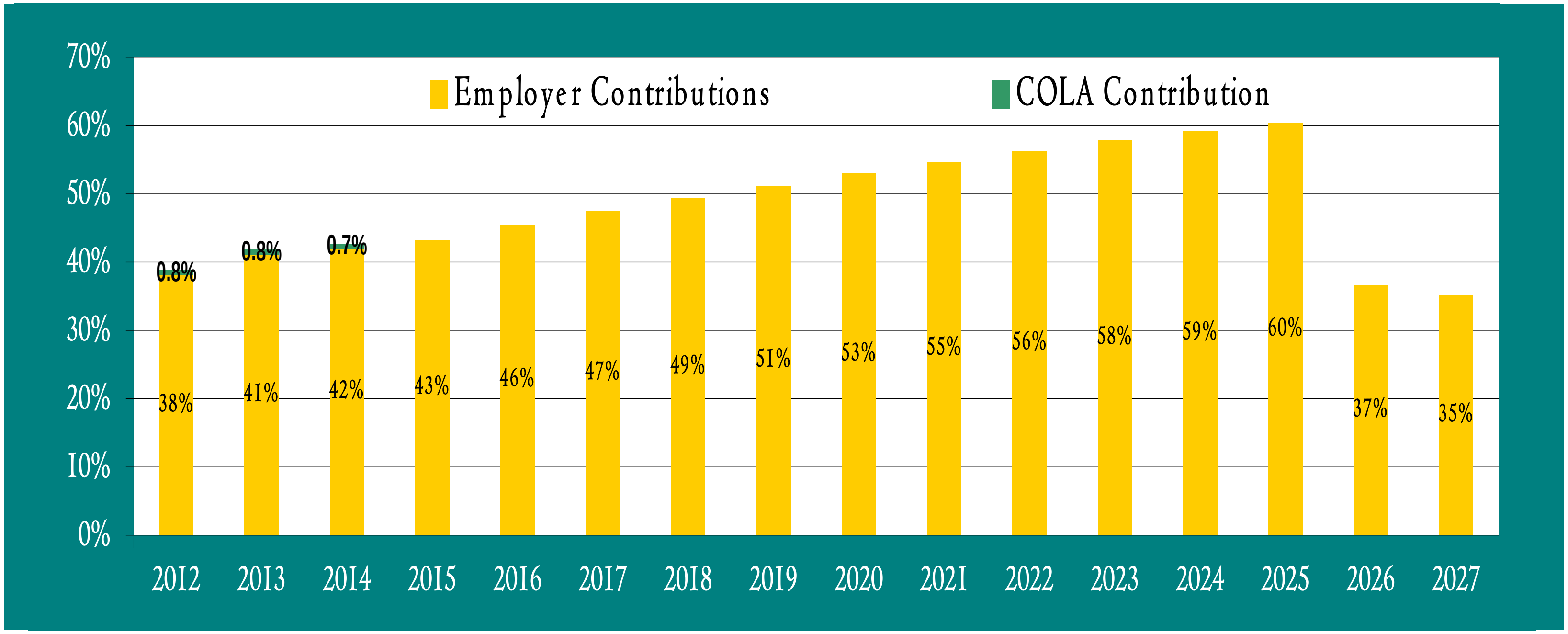
- Liabilities projected from July 1, 2011 actuarial valuation
- Actual asset return applied for year ending June 30, 2012
- Assumes returns of 6.5% for all future years starting at July 1, 2012 (i.e., 1.0% below assumed rate)
- All other actuarial assumptions exactly realized
- No changes in actuarial assumptions

Baseline Projection of Funded Status
Projected 6.5% Return

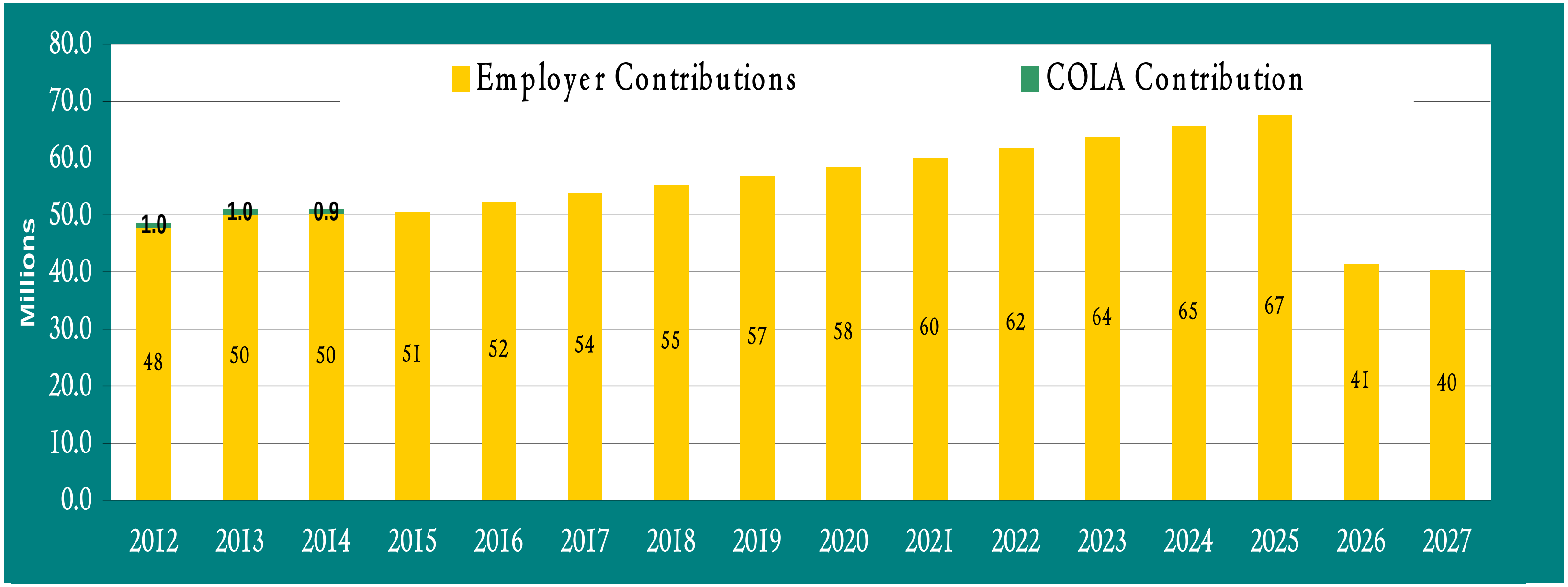


Baseline Projection of Contributions

Total Plan – Percent of Payroll
Projected 6.5% Rate of Return



Baseline Projection of Contributions
Total Plan – Dollars (Millions)
Projected 6.5% Rate of Return

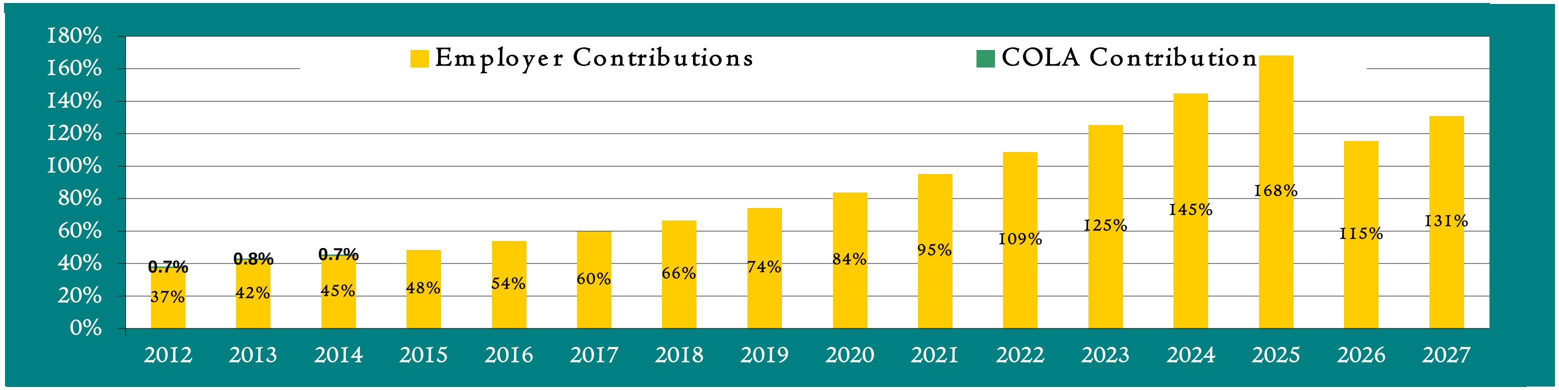


Baseline Projection of Contributions

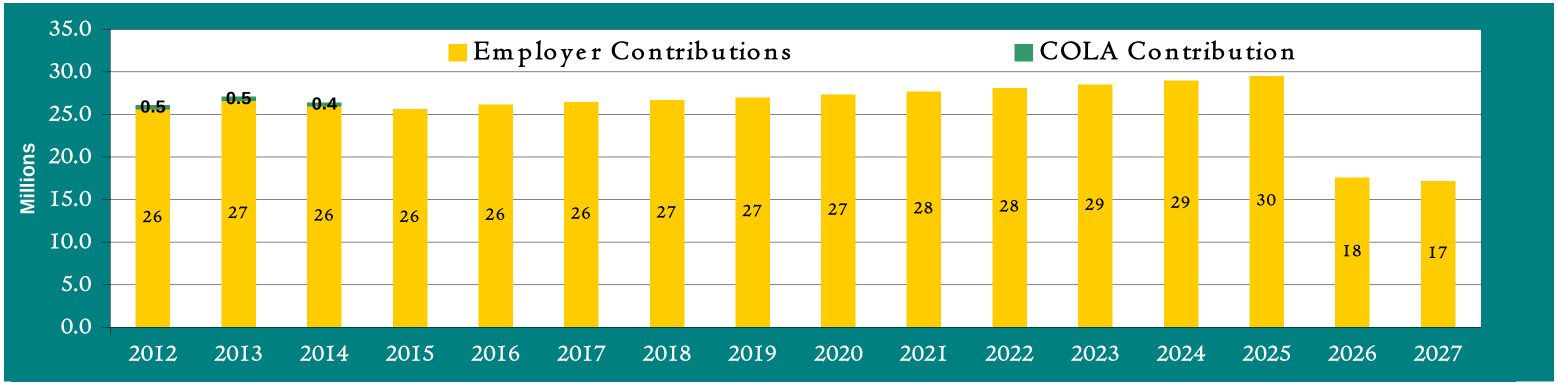
General Employees

Projected 6.5% Rate of Return

Percent of Payroll



Dollars (millions)

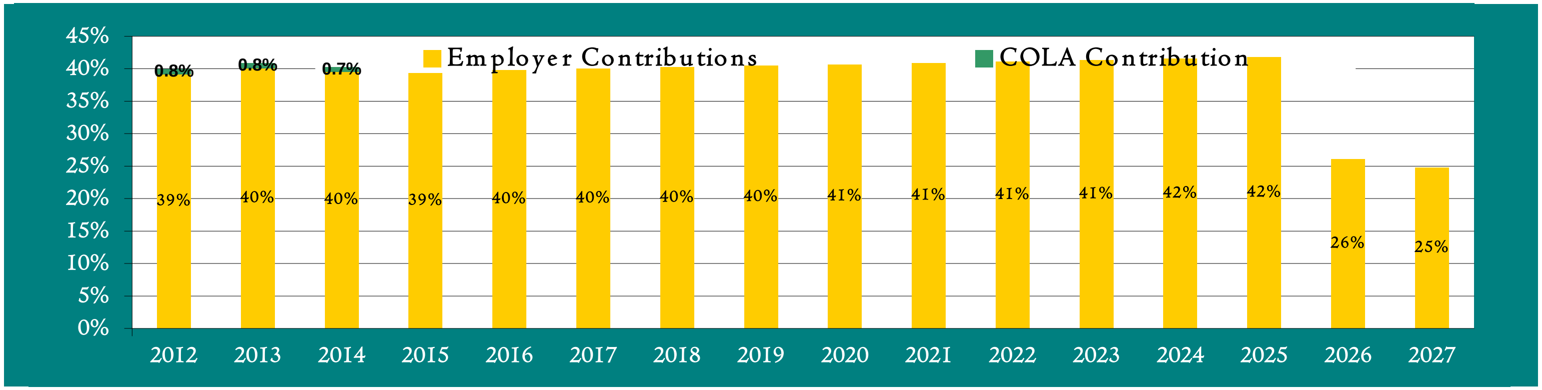


Baseline Projection of Contributions

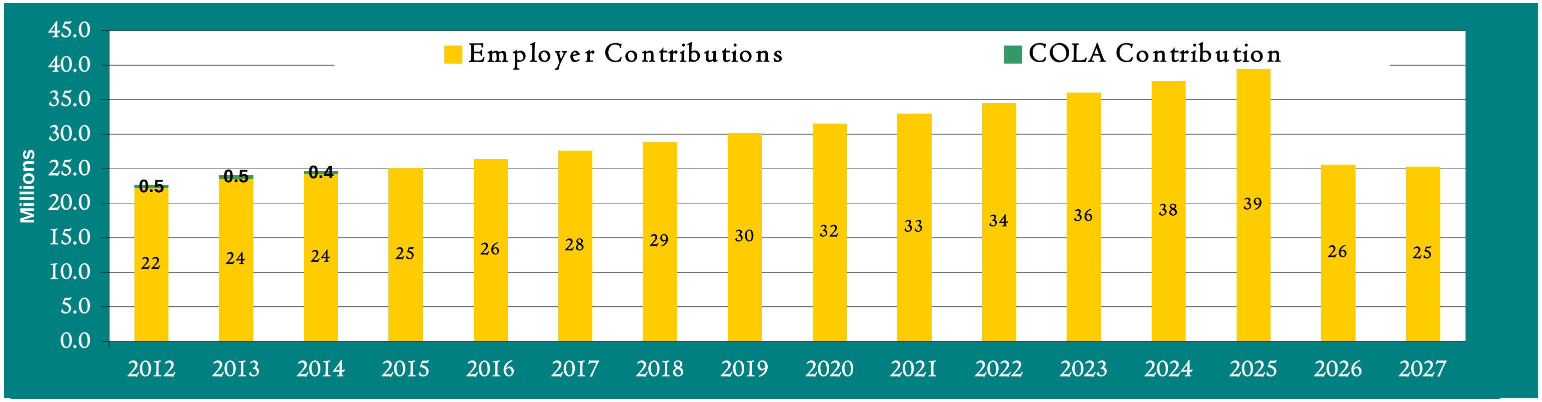
Police & Fire Employees

Projected 6.5% Rate of Return

Percent of Payroll



Dollars (millions)



CHEIRON

Comments

- Current funding policy
  - Appears reasonable with regard to funding the plan over the long-term
  - Expect funded ratio of 95% in 15 years if all assumptions are realized
  - Current layered approach of amortizing each year's gain or loss over a 20-year period assures funding of gains or losses in reasonable time period
  - Initial unfunded liability in 2006 will be fully amortized in 2026, thus causing sharp decrease in contributions for year beginning in 2026
  - Funding COLAs over relatively short periods prevents long-term negative effects on the funded ratio

Comments (continued)

- General employee group
  - Since General employee group is closed to new entrants, consider reducing period for amortization of gains and losses to be approximately equal to expected working lifetime (probably 10 to 15 years)
  - Since General employee payroll is decreasing, contributions should be expressed in dollar terms rather than as a percent of payroll

Comments (continued)

- Police & Fire employee group
  - Amortization of unfunded liability depends upon payroll growth meeting assumed rate of 4%
  - Recommend that assumption be reviewed compared to City's expectations for payroll growth

CHEIRON

Comments (continued)

- Assumed rate of return
  - Meeting long-term funding goals is dependent upon achieving the actuarial rate of return
  - Lowering assumed rate of return will increase current contributions but will remove some risk regarding the level of future contributions
  - With the Plan closed to new General employees, negative cash flow could become more of an issue in the future and could result in a more conservative investment policy. This in turn would require a lowering of the discount rate

Required Disclosures

In preparing this presentation, we relied without audit, on information supplied by the City of Richmond Office of the Auditor, the Richmond Retirement System and SageView Consulting Group.

I certify that, to the best of my knowledge, this presentation and its contents, which are work products of Cheiron, Inc., have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. Furthermore, as a credentialed actuary, I meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this presentation. This presentation does not address any contractual or legal issues. I am not an attorney and our firm does not provide any legal services or advice.

Cheiron's presentation was prepared exclusively for the City of Richmond for a specific and limited purpose. It is not for the use or benefit of any third party for any purpose. The term third party does not include the Client's auditor, attorney, third party administrator or other professional, when providing professional services to the Client, or any governmental agency to which this certification is required to be submitted by law or regulation. Any third party recipient of Cheiron's work product who desires professional guidance should not rely upon Cheiron's work product, but should engage qualified professionals for advice appropriate to its own specific needs.

Stephen T. McElhaney, FSA, FCA
Principal Consulting Actuary