

# Employees' Retirement System and Retiree Health Care Benefits Plan

## Independent Review of Actuarial Valuations as of June 30, 2005



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## Executive Summary

Under a contract agreement with the City, EFI Actuaries (EFI) has conducted an independent actuarial review of the valuations as of June 30, 2005 of the City's Employees' Retirement System and Retiree Health Care Benefits Plan. The purpose of this study was to independently review and evaluate the actuarial valuations of these plans performed by the City's consulting actuary, and to describe any shortcomings or errors present therein, and make any necessary recommendations.

A summary of our findings and recommendations is as follows:

- Overall, the actuarial methods and assumptions used in the valuations have been determined by EFI Actuaries to be within acceptable standards of actuarial practice. The ultimate medical inflation assumption is however, somewhat optimistic. We recommend the assumed ultimate rate of healthcare inflation be one percent to one-and-a-half percent higher than that used in the valuation of the Retiree Health Care Benefits Plan (4.5% - 5.0% rather than 3.5%). Using this higher rate would result in an increase in cost of approximately 2.5% to 4.1% of payroll, a material difference.
- Although we did identify some differences in methodology, our independent calculations of liabilities and normal costs were within 5% of those in the actual valuations in aggregate. All of the discrepancies found were reconcilable and do not represent material differences between the valuation and the independent review. The liabilities and costs computed in the valuations as of June 30, 2005 are reasonably accurate and were computed in accordance with generally accepted actuarial principles. Further discussion on this can be found in the Reconciliation of Results section.
- The projections shown in the valuation reports appear reasonable, and have been based on appropriate assumptions. One of the main purposes of a projection study should be for the plan sponsor to gain a better understanding of their plan's future costs and liabilities. To that end, we would recommend showing multiple scenarios, especially variations in the future asset returns.
- Upon review of several individual calculations, we determined that the benefits appear to have been calculated correctly, and that assumptions and methods were applied properly. Aside from a few differences in methodology, we found no material discrepancies between the individual calculations produced by the City's actuary and EFI's independent versions of same.
- With the exception of a few minor discrepancies, we were able to verify that the information shown in the valuation reports accurately represents the member data actually used for the actuarial calculations.
- Upon review of the valuation reports, we discovered two errors:
  1. The present value of future benefits for active members of the Retiree Health Care Benefits Plan was reported as \$99 million; this value was corrected by the City's Actuary to \$78 million during the course of EFI's audit.
  2. The mortality assumption used for the projection shown in the Employees Retirement System report is listed as the 1994 projection of the 1971 Group Annuity Mortality Table; however the City's actuary confirmed that this was erroneous and that the table used for both the valuation and projection was 1983 Group Annuity Mortality.

Neither of these errors represents a material discrepancy in terms of their effects on the calculation of required contributions.

## **Purpose and Scope of the Review**

The two primary objectives of our review were to: determine if the plan's actuary used appropriate actuarial methods and assumptions, and determine if they were applied properly.

The scope of our review included an analysis of each of the following:

- Based on member data that was collected from the City's actuary, we evaluated the demographic information shown in valuation reports
- We reviewed and evaluated the actuarial methods and assumptions displayed in the valuation reports.
- We reviewed the age-related medical premium rates and the aging factors used to produce them.
- We collected and reviewed benefit and liability calculations for individual plan participants. This included members from each group (General, Police, and Fire), both active and inactive. Calculations were reviewed for each benefits plan, as well as each benefit within the plans (e.g. disability).
- We independently determined liabilities for each plan and compared them to those presented in the valuation reports.
- We independently determined the normal cost for each plan, and compared it to the normal costs shown in the valuation reports.
- We collected asset information from the City and independently calculated the actuarial value of assets (also known as "valuation assets").
- Using our independently determined liabilities and normal costs, we calculated the total required contribution (cost) for each plan, and compared them to those presented in the valuation reports.
- Aside from the assets, liabilities, and costs shown in the valuation reports, we also reviewed the content for completeness and compliance with actuarial standards of practice.
- We reviewed several aspects of the projection results for each plan including population projections, new hire profiles, and projection assumptions.

## Methodology

In order to accomplish the objectives of the review, we proceeded as follows:

### 1. Review of Participant Data

In preparing our independent valuations, we relied on member and asset data supplied by the actuary's staff. This data was neither audited nor independently verified (i.e. no raw data was collected from the City for purposes of the review). We did, however, verify that the member data provided to us was properly summarized and represented in the valuation reports.

### 2. Review of Actuarial Methods and Assumptions

The actuarial methods and assumptions employed in the valuations were reviewed by EFI in order to establish whether they meet acceptable standards of actuarial practice and comply with applicable accounting standards, and whether they are appropriate and properly applied.

### 3. Review of Individual Calculations

In order to determine if methods and assumptions as well as plan provisions were being applied properly, approximately twenty individual calculations were reviewed. These individual calculations are not part of the valuation report, but are a standard component of the valuation process.

There were essentially two aspects of this review. First, the benefit amounts for each benefit were independently calculated. Secondly, the present value of such benefits and related liability and normal cost calculations were independently determined. In each case, our independent calculations were compared with those provided by the City's actuary, and any discrepancies were further investigated.

### 4. Review of Liability and Cost Calculations

In order to evaluate the accuracy of calculations in the valuations, EFI conducted independent valuations using its own actuarial models. These independent valuations determined whether EFI's aggregate results were in reasonable agreement with those computed by the City's actuary. Specific methodology is described later in this report.

### 5. Reconciliation of Results

In the event that a material discrepancy was detected, a reconciliation was initiated. This reconciliation was comprised of three steps:

- Establishing that the same member data has been used by EFI and by the City's actuary;
- Researching methodological differences between the EFI and the City's actuary approaches to computing liabilities and costs; and
- Comparing additional individual calculations to uncover subtle differences in approach that may result in material differences in liabilities and costs.

## 6. Review of Valuation Reports

We conducted a comprehensive review of each valuation report, with the following in mind:

- Does the report comply with actuarial standards of practice?
- Does the report state its purpose and serve that purpose?
- Is the report complete?
- Is the information in the report accurate?
- Is the report internally consistent?
- Are the projection assumptions and results reasonable?

## **Review of Participant Data**

As part of the valuation process, the City's actuary has the responsibility of ensuring that the data collected is reasonable and is reconciled from the prior valuation. With this in mind, we were able to determine an appropriate method for this part of our independent review. We collected the final data that was used by the City's actuary for each valuation, and conducted an independent summarization of the information therein. We determined the average age, service, and pay for active members and the average age and benefit amount for inactive members.

We then reviewed the age-service, age-benefit charts, and data summary information shown in the reports to determine if our independent data summary would produce the same results. With the exception of a few minor discrepancies, we were able to verify that the data information shown in the valuation reports accurately represents the data actually used for the actuarial calculations. More detailed information regarding member data comparison is shown in the Appendix of this report.

## **Review of Actuarial Methods and Assumptions**

### ***Overview***

To conduct an actuarial valuation, it is necessary to select and use a set of actuarial methods and assumptions. The assumptions involve economic factors such as how the plan assets will grow, as well as demographic factors such as when people will retire. Actuarial methods affect how asset values are determined and how liabilities are allocated to various parts of a member's career.

The methods and assumptions that were taken into consideration for this review are as follows:

- Actuarial Cost Method – is the method acceptable and appropriate for the intended purpose?
- Economic Assumptions:
  - Rate of expected return on plan assets – Does the rate reasonably represent the expected return based on the plans asset mix? Is it overly aggressive or conservative?
  - Rates of salary increase and inflation – Are the salary increase rates reasonable with respect to the populations? Is the rate of inflation within a reasonable range? Is the rate of real return (expected return less inflation) reasonable?
- Healthcare Assumptions:
  - Healthcare inflation – Are the assumed rates in line with broad expectations? Are the initial and ultimate rates reasonable?
  - Age-related premiums – Do the age related premiums represent a reasonable spread of costs based upon age?
- Demographic Assumptions – Do the rates of termination from active service due to retirement, withdrawal, disability, and death, follow reasonable patterns?
- Asset Valuation Method – is the method appropriate and compliant with accounting and actuarial standards?

### ***Actuarial Cost Method***

The actuarial cost method used by the actuary to value the City's benefits plans is the Entry Age Normal Actuarial Cost method. This method spreads costs evenly over the members' careers as a level percentage of pay. This is an acceptable and appropriate cost method, and is accurately described within the valuation reports.

### ***Economic Assumptions - Return***

The rate of expected return on assets used for the valuations was 7.0%. This rate represents a reasonable yet conservative outlook for the expected long-term return. The rate of future inflation assumed for the plans is 3.5%, implying a real return of 3.5% (7.0 % minus 3.5%), which is a reasonable expectation.

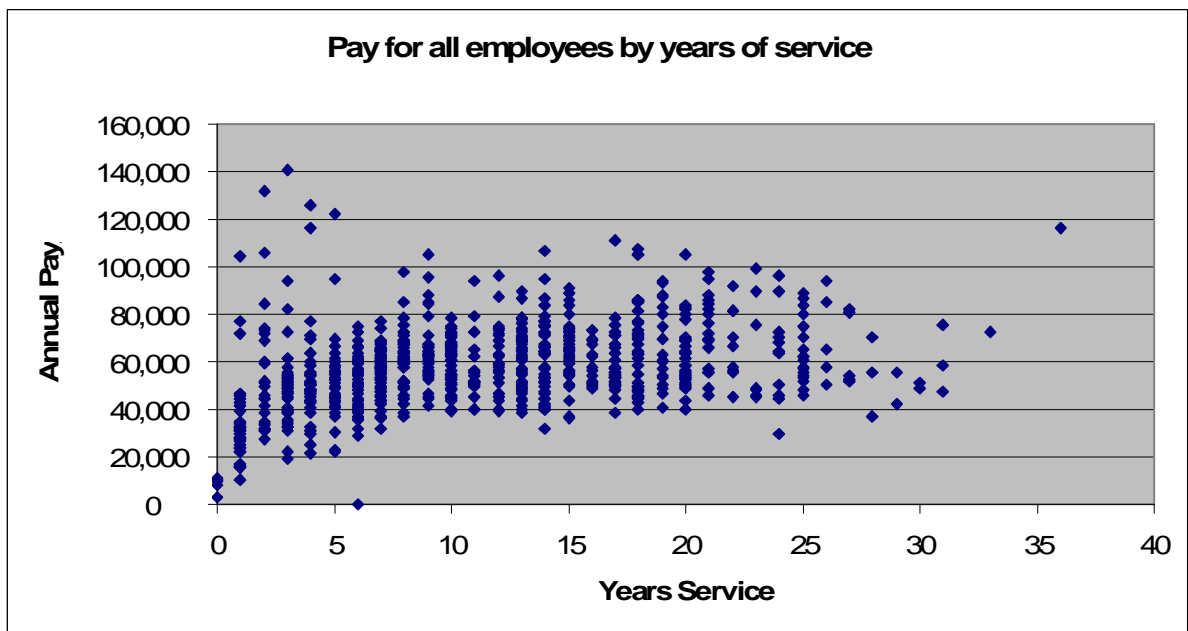
In order to compare these assumptions with other public plans, we looked to the 2005 Public Fund Survey published by the National Association of State Retirement Administrators. Although this survey represents large (mostly state) public retirement systems, it serves as a useful benchmark for most public plans. Of the survey respondents, less than one-percent indicated an expected return assumption of 7.0%. It was also the

lowest return assumption reported. The most common inflation assumption according to the survey was 3.5%. The median assumption was 4.0%, and the median real return assumption was 4.5%, both of which are higher than the City's assumptions. It is important to note that although this is the most recently available study, the rates correspond to fiscal year 2005 when expected returns were generally slightly higher than one year later. Nonetheless, the City's return and inflation assumptions appear to be conservative, though still within an acceptable range.

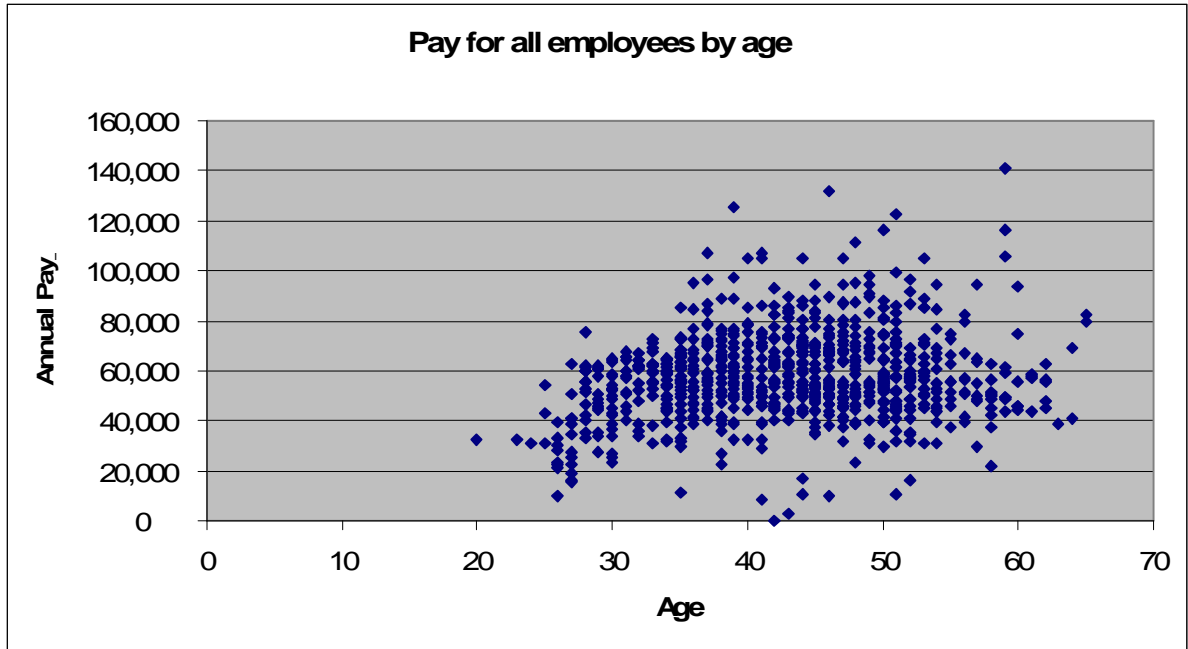
It is important to note that in the near future, the City will need to implement Governmental Accounting Standard numbers 43 and 45. This will require a review, and possible decrease of the assumed return for the Retiree Health Care Benefits Plan, depending upon the City's funding policy. The return assumption specified by the standards is required to correspond with the assets used to support the benefits. For a fully funded plan - one in which the funding policy is to consistently contribute the full amount of the required contribution - the expected return on plan assets may be used. For an unfunded plan, the City's rate of return on general funds will be required. For a partially funded plan - one in which a portion of the required contribution is to be paid - a blended rate will be required.

### ***Economic Assumptions – Salary Increases***

Rates of salary increase used for the valuations were based on age, with higher increases assumed at younger ages. This is a typical pattern for pay increases among public pension plans, and thus appears to be a reasonable assumption; however we recommend the use of service-based salary increases. Upon review of the pay information, we concluded that there is a stronger correlation between the *service* of a participant and their respective pay as compared with the relationship between the *age* of a participant and their respective pay (See Illustrations below).



The graph above shows the valuation pay for each active employee (all plans combined), plotted against their respective service as of June 30, 2005. An increasing pattern can be identified for roughly the first seven years, with more gradual increases in subsequent years. This pattern is not easily discernable in the graph below, which shows the valuation pay for each active employee plotted against their respective ages as of June 30, 2005.



Both graphs display a positive relationship between the two variables; however in the pay versus service chart the data points appear to be grouped more closely than in the pay versus age chart. A statistical analysis confirms that there is a stronger correlation of pay to service, which also holds true for each of the groups individually.

A summary of the correlation coefficients is shown below (a higher coefficient indicates a stronger correlation).

Group	Correlation of Age to Pay	Correlation of Service to Pay
General	.299	.314
Police	.529	.568
Fire	.615	.724
All Groups	.179	.364

### ***Healthcare Assumptions – Inflation***

The assumptions used for the valuation of the Retiree Health Care Benefits Plan are the same as those used for the pension valuation. There are however, several additional assumptions that specific to healthcare benefits. These assumptions are discussed below.

There were three sets of healthcare inflation rates shown in the valuation report representing optimistic, pessimistic, and valuation assumptions. In each case, a decreasing pattern of future healthcare inflation was assumed. We found the initial rates and decreasing trends to be reasonable. The ultimate rates however, were the same in all three cases (3.5%, presumably to match assumed general inflation). While we agree with the cost estimates under all three scenarios (calculations were done correctly), we would recommend using higher ultimate rates of healthcare inflation, specifically 4.5% to 5.0% for the valuation basis and 5.5% for the pessimistic scenario.

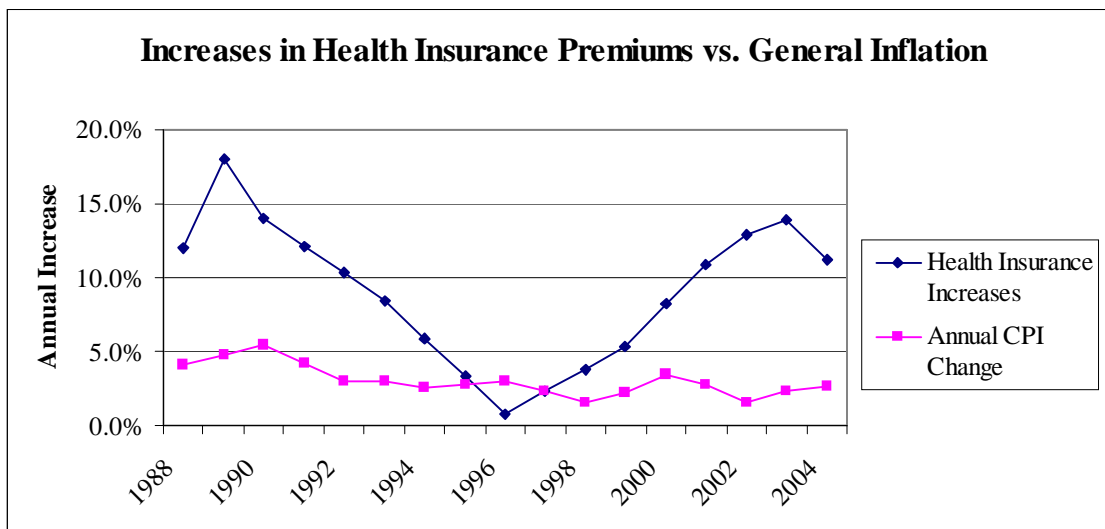
Future healthcare inflation is an area of much speculation and uncertainty, and there is no universal

acceptance of any of these sets of assumptions. However, there are several reasons for our recommendation of a higher ultimate rate of healthcare inflation:

- The prevailing rates used for valuation of retiree healthcare plans and Medicare have been in the 4.5% to 5.5% range

According to the 2005 Annual Report of the Boards of Trustees of the Federal Hospital Insurance Trust Fund and the Federal Supplementary Medical Insurance Trust Fund, medical inflation is expected to exceed general inflation by about 1% per year indefinitely. Additionally, in a recent survey of healthcare assumptions used for corporate benefit plans, only a small proportion (less than 10%) of respondents indicated an ultimate healthcare inflation assumption below 5% for Fiscal Year 2005.

- Medical inflation has exceeded CPI almost every year for the past two decades (see Figure 1).
- Increases in gross medical costs often lead to higher increases in employer medical cost due to cost sharing arrangements. This is due to the fact that copays and deductibles are unlikely to increase on an annual basis while premiums and gross medical costs are prone to increase each year.
- A more conservative approach decreases the likelihood of future losses due to high healthcare inflation.



An independent analysis of the effects of the recommended rate was conducted by EFI. The estimated liabilities of costs resulting from the use of higher ultimate healthcare inflation rates are shown in the table below.

<b>Effect on:</b>	<b>Valuation Results</b>	<b>4.5% Ultimate Rate</b>	<b>5.0% Ultimate Rate</b>
Accrued Liability	\$ 166,800,000	\$ 179,300,000	\$ 186,800,000
Normal Cost (Percent of Pay)	7.2%	8.3%	9.0%
Total Cost (Percent of Pay)	20.5%	23.0%	24.6%

Under the pessimistic scenario, use of a 5.5% ultimate healthcare inflation assumption would have resulted in a total cost of 35.1%, rather than the 28.4% shown in the valuation report.

***Healthcare Assumptions – Age-based Costs***

To determine the cost of a retiree healthcare benefits plan, it is a common practice to use age-related premiums rather than simply using the nominal premium amounts. The age-related premiums account for differing medical costs as people age (higher cost for older participants). The most common method to determine these age-related premiums is to assign assumed aging factors to various ages, which essentially account for the fact that medical costs are marginally higher (typically a few percentage points) for successive ages. This was the method employed by the actuary.

Upon review of retiree healthcare age-related premiums, we found that the tables represent a reasonable set of rates\*. The primary assumption implicit in the age-related rates shown in the valuation report is the set of aging factors, which was obtained from the actuary during the course of the review. The aging rates range from 0.2% to 3.5% for females and 0.5% to 6.4% for males. In both cases, the higher rates were used (appropriately) for younger ages. Aging for males and females above age 80 were assumed to be less than one percent per year, also a reasonable expectation.

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\* In a research paper published in the North American Actuarial Journal in 2005, decreasing aging rates in the 0% to 5% per year range were shown to be generally reasonable.

### ***Demographic Assumptions***

A review of the most recent experience study was not part of the scope of this audit; however EFI did examine rates of termination from active service for overall reasonableness.

Rates of assumed retirement increase with age, with spikes at ages 60 and 65 for general employees, and at 25 years of service for police and fire employees. These spikes are to be expected based on the retirement eligibility provisions of the plan, and therefore appear to be reasonable. Rates of assumed disability for the valuations exhibit several characteristics. First, the rates are very low at younger ages, and increase as employees approach retirement eligibility. Secondly, the rates for police employees are higher than those for general employees. Both of these represent typical characteristics for disabilities, and appear reasonable.

Assumed rates of voluntary withdrawal are higher during the first five years of employment, and are also higher for general employees than for police or fire employees. These two characteristics are reasonable and have been observed in many public pension plans. Assumed mortality for the valuations was based on a standard mortality table, which is a reasonable approach considering that the experience of the City is not adequate to warrant a customized table. Mortality rates assumed for disabled participants are higher than for healthy participants (i.e. those disabled will die earlier on average), which is also a reasonable expectation.

### ***Asset Valuation Method***

The method used to determine the actuarial value of assets (i.e. valuation assets) is a smoothed value, whereby gains and losses are gradually recognized over a period of five years. This is considered an acceptable method (complies with actuarial standards of practice and accounting standards); however it is important to note that there has recently been a movement (more so in the private sector) towards the use of market rates with little or no smoothing.

### ***Conclusion***

In general, the actuarial methods and assumptions used in the valuations have been determined by EFI Actuaries to be within acceptable standards of actuarial practice. Our recommendations in this area are:

- The current ultimate medical inflation assumption is somewhat optimistic. An increased rate in the range 4.5% to 5.0% is suggested.
- The salary increase assumptions currently in use should be reviewed to determine if service-based rates are more appropriate.

## Review of Individual Calculations

EFI collected from the City's actuary and reviewed several individual calculations for the purpose of evaluating the appropriateness of benefit determinations and application of methods and assumptions. We examined several individual calculations from each group of employees, and verified the determinations of each type of benefit.

Using the demographic information previously collected, we determined benefit amounts for several individuals from the General, Police, and Fire populations. The benefit determinations were based on the plan provisions described in the valuation reports. Each benefit – retirement, disability, termination, retiree healthcare, and death – was computed at each future age and compared with those computed by the actuary. Using the actuarial methods and assumptions from the valuation reports, we also independently computed and compared the present values of these benefits at current age and at hire age (a necessary component of the normal cost calculation).

In addition to the active member calculations described above, we determined and compared present values for inactive participants. This calculation involves estimating benefit amounts to be paid each year in the future, and discounting each of these payments for mortality (the probability the participant will be alive to collect the benefit) and interest (the assumption that plan assets will earn returns for a certain number of years prior to the payment).

In reviewing the calculations, we focused on the following:

- Determination of benefit amounts for retirement, termination, disability, death, and retiree healthcare
- Application of rates of decrement from active service
- Application of mortality and interest discounting

Upon review of several individual calculations, we determined that all benefits were calculated correctly, and that the assumptions and methods were applied properly. There was a slight difference in methodology between EFI's calculations and those done by the City's actuary. This difference involves the computation of the present value of future pay and affects only determination of active liabilities and normal costs (not total present value of future benefits). In order to properly apply the Entry Age Normal cost method, future normal costs are determined and expressed as a percentage of future pay. Therefore, differences in determination of present value of future pay result in differences in normal cost and accrued liabilities.

To determine the present value of future pay, several factors need to be taken into account: future pay increases, discounting for the time value of money (i.e. interest), and discounting for mortality and termination. There are several reasonable approaches for each of these which would each result in slightly different normal costs and accrued liabilities. Through a thorough analysis of the individual calculations, we were able to identify differences in approach between the actuary's valuation model and the EFI model. In order to assess the materiality of differences in methodology between EFI's approach and the actuary's approach, we created two separate valuation models and compared the liabilities and normal costs from each model to the valuation results. The first model, which replicated the actuary's approach, was used to determine the accuracy of the computations shown in the valuation report. Through this model, we were able to verify the consistency of the reported liabilities and normal costs with this approach. The second model adjusted the present value of future pay calculation, and was used for the remainder of the independent review. Although, results vary between the two models, the overall differences were not deemed to be material. Both approaches are within acceptable actuarial practice.

## **Review of Asset, Liability, and Cost Calculations**

### ***Overview***

The process used to determine reasonableness of valuation results was as follows:

1. Simplified independent valuations were performed. Valuation models were created based on the plan provisions and assumptions shown in the report.
  - Input data was based on the summary information shown in the demographic tables of the report
  - Results based on these models were compared with the results shown in the reports; broken down by status (active versus inactive).
2. If the independently determined liabilities or normal costs for any given group were not within 5% of those shown in the valuation reports, further investigation was initiated, including:
  - Use of actual individual data to determine liabilities
  - Full replication of all or part of the valuation
3. Liabilities and normal costs were compared for each plan, for active and inactive participants, and for general, police, and fire employees.
4. The actuarial values of assets were independently determined by EFI and compared to the values shown in the valuation reports
5. Contribution rates were determined based on our independent calculations, and compared to those presented in the valuation reports.

Further detail pertaining to each of these can be found in the Appendix

***Liability and Cost Comparison***

The following is a summary of major results for each valuation.

<b>Measure</b>	<b>Actual Valuation</b>	<b>EFI Independent Review</b>	<b>Ratio of Independent Review to Valuation</b>
<b>Employees' Retirement System</b>			
Present Value of Future Benefits	\$ 459,066,064	\$ 460,521,622	100.3%
Actuarial Accrued Liability	\$ 384,368,595	\$ 384,217,170	100.0%
Normal Cost (% of Pay)	13.31%	13.84%	104.0%
Total Cost (% of Pay)	9.96%	10.45%	104.9%
<b>Retiree Health Care Benefits Plan</b>			
Present Value of Future Benefits	\$214,645,430†	\$ 187,579,620	87.4%
Actuarial Accrued Liability	\$ 166,823,954	\$ 160,571,808	96.3%
Normal Cost (% of Pay)	7.17%	7.24%	101.0%
Total Cost (% of Pay)	20.50%	19.88%	97.0%

***Conclusion***

Our independent calculations of liabilities and normal costs were in aggregate within 5% of those determined by the actuary.

† The corrected number provided by the actuary during EFI's independent audit was \$193,603,980.

## **Reconciliation of Calculations**

There were several calculations for which a discrepancy was determined during the course of EFI's independent review (as defined by a calculation value falling outside of the pre-determined tolerance). In this section, we describe these items, and discuss the materiality of each.

1. The present value of future benefits shown on page A-8 of the Retiree Health Care Benefits Plan report is significantly higher than that determined independently by EFI.

To determine the cause of this, a thorough review was conducted. It was discovered through this review that the present value shown in the report for active members was incorrect, and that it should have been much lower. The actuary acknowledged this error and indicated that the inaccuracy "would not reproduce itself in any other report except by extraordinary coincidence."

The error was deemed by the actuary to be immaterial since it had no bearing on the cost calculation (represents future accruals rather than past or current accruals). We agree with this conclusion; however the number in the report could mislead the reader into concluding that the total value of the retiree healthcare benefits is larger than it really is.

2. The present value of future employee contributions determined by EFI was more than 5% higher than that determined by the actuary. Upon comparison of methodologies, it was determined that this discrepancy was primarily due to slight differences in approach. Both approaches were deemed to be within acceptable actuarial practice.
3. While the aggregate costs for each plan were independently computed to be within 5% of the actual valuation costs, one component of the cost for the Retiree Health Care Benefits Plan, the amortization of the unfunded accrued liability, was slightly outside of the acceptable range of tolerance.

This is not due to a material discrepancy, but to the sensitive nature of this part of the cost calculation. Since the unfunded accrued liability is smaller than the accrued liability, a minor discrepancy in the accrued liability leads to an exaggerated difference in the unfunded accrued liability, and thus the amortization of such.

### ***Conclusion***

Of the discrepancies found, all were reconcilable and do not represent material differences between the valuation and the independent review.

## **Review of Valuation Reports**

In general, we found the valuation reports to be complete. We do however; have several comments regarding the content of the reports. None of these items would have an impact, material or otherwise, on the actual valuation results, but would simply improve the value and usefulness of the reports.

### ***Employees Retirement System***

To allow for a deeper understanding of the valuation, we recommend inclusion/revision of the following items.

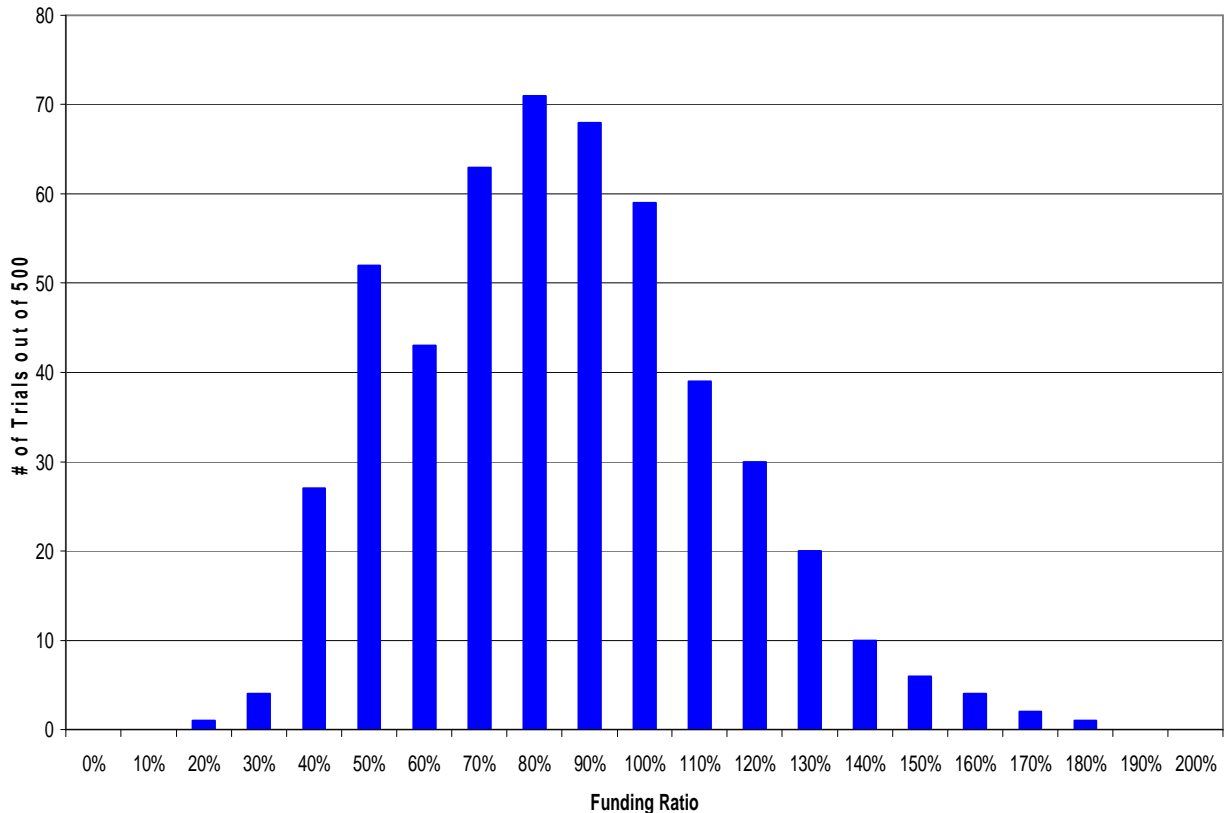
- A complete description of amortization bases and their corresponding annual payments.
- A more thorough description of the “Lump Sum Redemption Factors” shown in Section E. The application and significance of these factors is unclear.
- A provision of the plan bases retiree increases on actuarial gains. This is mentioned in Section D of the actuarial report, but is not discussed in detail. If actuarial gains (returns in excess of 7%) are consistently diverted from the funding of pension plan liabilities, then these gains are not available to offset future losses. As a result, the rate of return actually realized by retirement plan assets is lower than 7%, and a decreased return assumption is appropriate.

There are two other key issues regarding this provision that warrant more discussion and analysis:

- o If retiree increases are granted by the Board on an ad-hoc basis, then the funding ratio is likely taken into account (i.e. no increase would be likely if the Plan had a very low funding ratio). It is important to note in this context that the funding ratio shown in the actuarial report is only an estimate: It is computed assuming future returns will exactly equal 7%, an impossibility.

We have studied the accuracy of the funding ratio. A plan that is nominally 100% funded may be anywhere from 50% to 150% funded, depending on future investment returns.

The graph below shows a distribution of funding ratios for a plan that is nominally 80% funded. Therefore, an apparent 5% or 10% surplus may not be there at all, but may instead be consumed by future investment losses. Unfortunately, many plans experienced this in the late 1990's: Surpluses disappeared as the market declined. Accordingly, the Board should exercise great caution in granting benefit increases based on an apparent surplus of plan assets.



Distribution of Funding Ratios as of January 1, 2006 based on 500-trial stochastic simulation

- o Currently funds are also being diverted from the pension fund to the VEBA. This, combined with gain-sharing retiree increases, creates an asymmetric risk: Assets flow out of the pension plan when there is a surplus, but are not replaced when there is a funding deficiency. One of the chief strengths of a defined benefit plan is the ability to pool risk. Mortality and demographic risks are pooled by including many active and inactive members in the plan. Investment risks are pooled over time: Actuarial gains from investments are used to offset actuarial losses, past and future. If investment gains are diverted for alternate uses, then there is no mechanism to make up for losses, and the plan cost will inevitably increase.

***Retiree Health Care Benefits Plan***

Upon implementation of GASB Statements 43 and 45, there will undoubtedly be enhancements made to the Retiree Health Care Benefits Plan report. We also suggest the following:

- More demographic information to allow the reader a better understanding of the population for whom benefits are being provided. For example: average ages, number of people covered.
- A more thorough description of the determination of age-related healthcare premiums.

We found that the data summaries and information presented in the report accurately reflect the data that was used for the valuations. Data summaries constructed by EFI were in accordance with the reports in terms of number of participants in each group, average pay, average service, and benefit amounts. A suggestion we

propose regarding data summaries is to show a side-by-side comparison of prior year data to current year data. While not specifically required by an actuarial standard of practice, this allows the reader to quickly evaluate population changes and their possible effects on current and future valuation results.

### ***Review of Projection Results***

Contained within each report was a section with projections of costs, liabilities, benefit payments, and/or population. There are no specific rules or guidelines for determining such projections, but we have reviewed the reasonableness of the projection assumptions and results. The following were reviewed:

- Projection assumptions
- Projection of current active population
- New entrant profiles
- Projected healthcare benefit payments

### ***Projection Assumptions***

For purposes of the projections, valuation assumptions were used, with the exception of asset returns. A higher rate of return was used for the projection to demonstrate the effects of funding retiree healthcare benefits with excess pension earnings. This assumption is reasonable for the projection; however we would recommend looking at alternate sets of assumptions through multiple scenario projections, including assuming no asset gains throughout the forecast. This would provide the City with a better idea of the future risks and uncertainty present in their benefit plans.

The mortality assumption is listed as the “present valuation assumption, the 1994 projection of the 1971 Group Annuity Mortality Table.”; however the assumption used for the valuation was 1983 Group Annuity Mortality. The City’s actuary verified during the course of EFI’s review that the 1983 table was used for the projection.

### ***Projection of Current Active Population and New Entrant Profiles***

Using the assumed rates of termination, retirement, disability, and mortality, EFI was able to verify the population projection shown in Section B of the valuation report for the Retiree Health Care Benefits Plan. Upon review of the new entrant profiles shown in the same section, we determined that they are reasonable based on recent hiring patterns of the City.

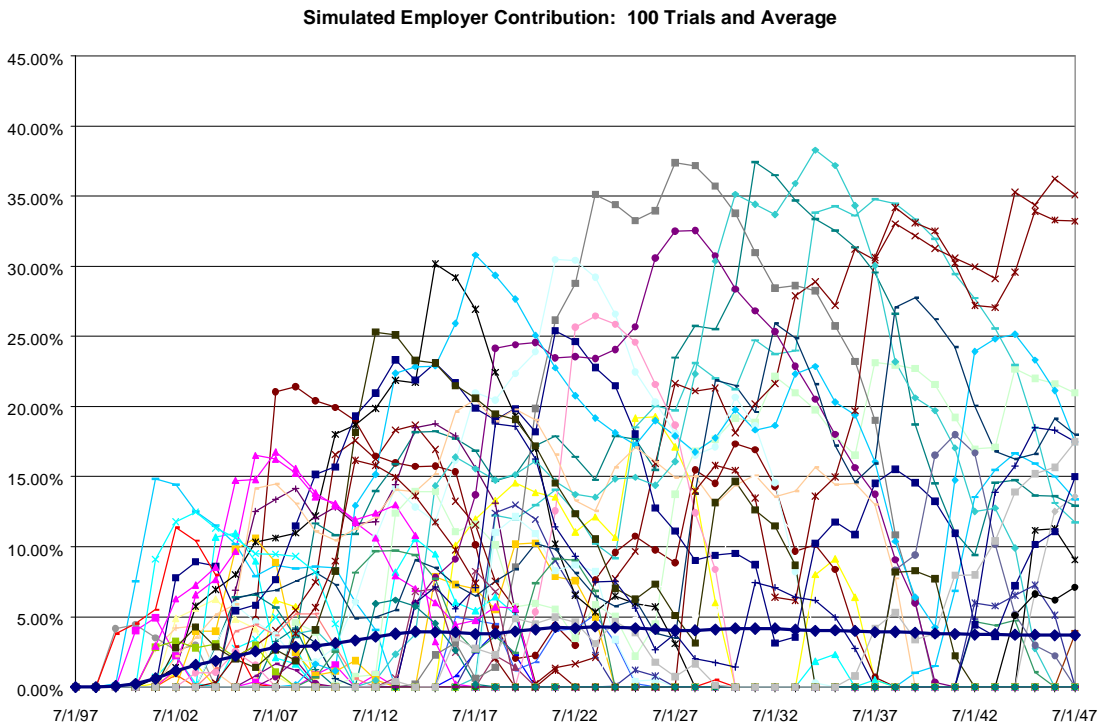
### ***Projected Healthcare Benefit Payments***

Based on the current active and inactive populations as well as the valuation assumptions and retiree healthcare plan provisions, the expected benefit payments in the Retiree Health Care Benefits Plan report represent a reasonable level and pattern. It is important, however to note that this projection can vary depending on future experience, especially healthcare inflation.

**Conclusion**

The projections shown in the valuation reports are based on reasonable assumptions and appear to have been properly computed. One of the main purposes of a projection study should be for the plan sponsor to gain a better understanding of their plan's future costs and liabilities. To that end, we would recommend showing multiple scenarios, especially variations in the future asset returns.

An illustration of one such projection done on a stochastic basis is shown below. The advantage of this type of analysis is that it demonstrates not only the expected cost, but the expected cost *variability*.



Each line in the graph represents a sequence of possible future contributions over a fifty year period based on different sets of stochastically modeled future asset returns. Note that the expected cost (bold line) alone does not adequately illustrate the potentially extreme future contribution variability.

**Appendix 1: Participant Data Comparison**

	<u>June 30, 2005 Valuation</u>	<u>EFI Independent Review</u>	<u>Ratio</u>
<b>Active Participants - General</b>			
Count	571	571	100.0%
Average Age	44.3	44.3	100.0%
Average Service	11.0	11.0	100.0%
Average Pay	\$ 53,272	\$ 53,272	100.0%
<b>Active Participants - Police</b>			
Count	152	152	100.0%
Average Age	38.9	39.0	100.3%
Average Service	12.4	12.4	100.0%
Average Pay	\$ 71,571	\$ 71,571	100.0%
<b>Active Participants - Fire</b>			
Count	91	91	100.0%
Average Age	40.1	40.1	100.0%
Average Service	12.6	12.5	99.2%
Average Pay	\$ 65,136	\$ 65,136	100.0%
<b>Inactive Participants</b>			
Count terminated vested	97	97	100.0%
Average Age	Not shown in report	47.9	N/A
Average Monthly Benefit	\$ 781	\$ 781	100.0%
Count Receiving Benefits	770	770	100.0%
Average Age	Not shown in report	65.9	N/A
Average Monthly Benefit	\$ 2,351	\$ 2,351	100.0%

**Appendix 2: Individual Plan Liability and Cost Comparison – Pension**

	<b>June 30, 2005 Valuation</b>	<b>EFI Independent Review</b>	<b>Ratio</b>
<b><u>Liabilities</u></b>			
Present Value of Projected Benefits			
Active Participants - General	119,763,699	119,773,266	100.0%
Active Participants - Police	62,732,931	62,585,895	99.8%
Active Participants - Fire	33,465,337	33,250,615	99.4%
<u>Inactive Participants</u>	<u>243,104,097</u>	<u>244,920,097</u>	100.7%
Total	459,066,064	460,529,873	100.3%
Actuarial Accrued Liabilities			
Active Participants - General	81,626,928	81,253,538	99.5%
Active Participants - Police	38,762,913	37,834,573	97.6%
Active Participants - Fire	20,874,657	20,217,212	96.9%
<u>Inactive Participants</u>	<u>243,104,097</u>	<u>244,920,097</u>	100.7%
Total	384,368,595	384,225,420	100.0%
<b><u>Assets</u></b>			
Market Value of Assets (MVA)	388,019,601	388,019,601	100.0%
Actuarial Value of Assets (AVA)	398,690,350	398,690,349	100.0%
<b><u>Present Value of Future Employee Contributions</u></b>			
Active Participants - General	11,977,629	12,532,485	104.6%
Active Participants - Police	5,165,952	5,473,635	106.0%
<u>Active Participants - Fire</u>	<u>2,911,813</u>	<u>3,098,718</u>	106.4%
Total	20,055,394	21,104,838	105.2%
<b><u>Cost Calculations</u></b>			
Unfunded Accrued Liability (UAL)	(14,321,755)	(14,464,929)	101.0%
Amortization of UAL	(1,695,959)	(1,712,913)	101.0%
Amortization of UAL (% of pay)	(3.35)%	(3.39)%	101.0%
Normal Cost (Net of Employee Contributions)			
General	10.92%	11.34%	103.9%
Police	18.20%	18.79%	103.2%
<u>Fire</u>	<u>16.62%</u>	<u>17.41%</u>	104.8%
Total (Weighted Average)	13.31%	13.84%	104.0%
Total Cost	9.96%	10.45%	104.9%

### Appendix 3: Individual Plan Liability and Cost Comparison - VEBA

	<b>June 30, 2005 Valuation</b>	<b>EFI Independent Review</b>	<b>Ratio</b>
<b><u>Liabilities</u></b>			
Present Value of Projected Benefits			
Active Participants	99,039,056*	76,081,391	76.8%
Participants Receiving Benefits - Health	114,224,410	110,105,264	96.4%
<u>Participants Receiving Benefits - Life</u>	<u>1,381,964</u>	<u>1,392,965</u>	100.8%
Total	214,645,430	187,579,620	87.4%
Actuarial Accrued Liabilities			
Active Participants	51,217,580	49,073,578	95.8%
Participants Receiving Benefits - Health	114,224,410	110,105,264	96.4%
<u>Participants Receiving Benefits - Life</u>	<u>1,381,964</u>	<u>1,392,965</u>	100.8%
Total	166,823,954	160,571,807	96.3%
<b><u>Assets</u></b>			
Market Value of Assets (MVA)	44,963,340	44,963,340	100.0%
Actuarial Value of Assets (AVA)	45,256,279	45,256,278	100.0%
<b><u>Cost Calculations</u></b>			
Unfunded Accrued Liability (UAL)	121,567,675	115,315,530	94.9%
Amortization of UAL	6,745,488	6,398,572	94.9%
Amortization of UAL (% of pay)	13.33%	12.64%	94.9%
Normal Cost	7.17%	7.24%	101.0%
Total Cost	20.50%	19.88%	97.0%

\* The corrected number provided by the actuary during EFI's independent audit is \$77,997,606 (for a total of \$193,603,980).