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May 17, 2011

Ms. Pam Spaccarotella
Finance Director
City of Omaha
1819 Farnam Street
Omaha, NE 68183

## RE: Actuarial Valuation as of January 1, 2011

Dear Pam:
Enclosed are 12 copies of the written report of our actuarial valuation as of January 1, 2011 for the 2011 plan year for the City of Omaha Public Employees' Retirement System. The actuarial required contribution (ARC) for the City is $\$ 14.6$ million for the 2011 plan year.

Please call if you have any questions.
Sincerely,


Patrice A. Beckham, FSA, EA, FCA, MAAA
Consulting Actuary
Enclosures

S: Omaha Civilians/2011 Valuation Report

# Cavanaugh Macdonald 

CONSULTING, LLC

The experience and dedication you deserve

# The City of Omaha Employees' Retirement System 

Actuarial Valuation as of<br>January 1, 2011



Cavanaugh Macdonald
C ONSULTING, LLC
The experience and dedication you deserve

May 17, 2011
Board of Trustees
City of Omaha Employees' Retirement System
1819 Farnam Street
Omaha, NE 68183

## RE: January 1, 2011 Actuarial Valuation

Members of the Board:
In accordance with your request, we have completed an Actuarial Valuation of the City of Omaha Employees' Retirement System as of January 1, 2011 for the plan year ending December 31, 2011. The major findings of the valuation are contained in this report. The plan provisions and assumptions are the same as the prior valuation.

This is the first valuation prepared by Cavanaugh Macdonald Consulting, LLC (CMC). As part of our transition work, we replicated the January 1, 2010 actuarial valuation. Results were well within acceptable limits, but there were differences in the key valuation results. The normal cost rate determined by CMC was $13.72 \%$ versus $14.13 \%$ by Milliman. The unfunded actuarial liability, calculated by CMC, was very close ( $0.30 \%$ or $\$ 1.2$ million) to that shown in the January 1,2010 actuarial valuation report. These differences are neither unusual nor significant. It is very common for differences in valuation results to occur due to the use of different pension valuation software.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the City's staff. This information includes, but is not limited to, statutory provisions, employee data, and financial information. We found this information to be reasonably consistent and comparable with information provided in prior years. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete, our results may be different and our calculations may need to be revised.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: experience differing from that anticipated by the economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the System's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements.

May 17, 2011
Page 2

Actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the City. Actuarial computations presented in this report under GASB Statements No. 25 and 27 are for purposes of fulfilling financial accounting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the City's funding requirements and goals. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

The consultants who worked on this assignment are pension actuaries. CMC's advice is not intended to be a substitute for qualified legal or accounting counsel.

This is to certify that the independent consulting actuaries are members of the American Academy of Actuaries, have experience in performing valuations for public retirement plans, and meet the qualification standards of the American Academy of Actuaries to render the actuarial opinion contained herein. The valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board and the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures based on the current provisions of the retirement plan and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of the System. The Board of Trustees has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in Appendix B.

We respectfully submit the following report and look forward to discussing it with you.
Sincerely,


Patrice A. Beckham, FSA, EA, FCA, MAAA
Consulting Actuary


Brent A. Banister, PhD, FSA, EA, FCA, MAAA
Senior Actuary
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This report presents the results of the January 1, 2011 actuarial valuation of the City of Omaha Employees' Retirement System. The primary purposes of performing the valuation are:

- to estimate the liabilities for the future benefits expected to be provided by the System;
- to determine the actuarial contribution rate, based on the City's funding policy;
- to measure and disclose various asset and liability measures;
- to monitor any deviation between actual System experience and experience predicted by the actuarial assumptions, so that recommendations for assumption changes can be made when appropriate;
- to analyze and report on any significant trends in contributions, assets and liabilities over the past several years.

The plan provisions and actuarial assumptions reflected in this report are unchanged from last year's report.

This is the first valuation prepared by Cavanaugh Macdonald Consulting, LLC (CMC). As part of our transition work, we replicated the January 1, 2010 actuarial valuation. Results were well within acceptable limits, but there were differences in the key valuation results. The normal cost rate determined by CMC was $13.72 \%$ versus $14.13 \%$ by Milliman. The unfunded actuarial liability, calculated by CMC, was very close ( $0.30 \%$ or $\$ 1.2$ million) to that shown in the January 1, 2010 actuarial valuation report. These differences are neither unusual nor significant. It is very common for differences in valuation results to occur due to the use of different pension valuation software.

The actuarial valuation results provide a "snapshot" view of the System's financial condition on January 1, 2011. The valuation results reflect net favorable experience for the past plan year as demonstrated by an unfunded actuarial liability that was lower than expected based on the actuarial assumptions used in the January 1, 2010 actuarial valuation. Unfavorable experience on the actuarial value of assets resulted in a loss of $\$ 2.6$ million and favorable experience on liabilities resulted in a gain of $\$ 6.1$ million. Net experience was an actuarial gain of $\$ 3.4$ million.

The System uses an asset smoothing method in the valuation process. As a result, the System's funded status and the actuarial contribution rate are based on the actuarial (smoothed) value of assets - not the pure market value. The significant investment losses that occurred in 2008 have still not been completely recognized in the smoothing process. The investment return on the market value of assets during 2010 was about $17.0 \%$, which exceeded the assumed rate of $8.00 \%$. However, due to the magnitude of the deferred investment loss at January 1, 2010 ( $\$ 26.9$ million), the rate of return on the actuarial value of assets was about 7\%. The investment return in 2010 that was in excess of $8.00 \%$ served to decrease the amount of the unrecognized investment loss at January 1, 2011. In addition, part of the remaining loss is recognized in the 2011 valuation by application of the smoothing method. However, as of January 1, 2011, the actuarial value of assets still exceeds the market value by $\$ 7,944,727$ or $3.42 \%$ so deferred investment losses still exist although they are much smaller than in prior years. Actual market returns over the next few years will determine if and how the $\$ 7.9$ million of deferred investment loss is recognized. For example, an estimated return of

## ExECUTIVE SUMMARY

$11.6 \%$ on the market value of assets in 2011 would be necessary to attain a return of $8.00 \%$ on the actuarial value of assets.

The change in the assets, liabilities, and contributions of the System over the last year are discussed in more detail in the following pages.

## ASSETS

As of January 1, 2011, the System had total funds of $\$ 232.3$ million, when measured on a market value basis. This was an increase of $\$ 19.1$ million from the prior year, and represents an approximately $17 \%$ rate of return.

The market value of assets is not used directly in the actuarial calculation of the System's funded status and the actuarial contribution rate. An asset valuation method is used to smooth the effects of market fluctuations. The actuarial value of assets is equal to the expected asset value (based on last year's actuarial value of assets, net cash flows and a rate of return equal to the actuarial assumed rate of $8.00 \%$ ) plus $25 \%$ of the difference between the actual market value and the expected asset value. See Exhibit 2 for the detailed development of the actuarial value of assets as of January 1, 2011. Because part of the deferred investment loss from the 2008 plan year was recognized this year, the rate of return on the actuarial value of assets was about $7 \%$. The deferred asset loss recognized during the calculation of the January 1, 2011 actuarial value of assets resulted in an actuarial loss of $\$ 2.6$ million.

The components of the change in the market value and actuarial value of assets are shown below:

| Net Assets, January 1, 2010 | Market Value (\$M) | Actuarial Value (\$M) |  |
| :--- | :---: | :--- | :--- |
| • City and Member Contributions | $\mathbf{\$}$ | 213.2 | $\$$ |
| • Benefit Payments and Refunds | - | 10.6 | + |
| • Investment Gain/ (Loss) | + | 36.3 | 10.6 |
| Net Assets, January 1, 2011 |  | 232.3 | + |
| Estimated Rate of Return |  | 26.3 |  |

The total investment loss not recognized as of January 1, 2011 is $\$ 7.9$ million, down from $\$ 26.9$ million in last year's valuation. These unrecognized losses will be recognized in the determination of the actuarial value of assets for funding purposes in the next few years, to the extent they are not offset by the recognition of gains derived from future experience. This means that earning the assumed rate of investment return of $8.00 \%$ per year (net of investment expenses) on a market value basis will result in actuarial losses on the actuarial value of assets in the next few years and increasing contribution rates.

## ExECUTIVE SUMMARY

The unrecognized investment losses represent about $3.4 \%$ of the market value of assets (down from $12.6 \%$ in the 2010 valuation). Unless offset by future investment gains or other favorable experience, the recognition of the $\$ 7.9$ million loss is expected to increase the future unfunded actuarial liability and the actuarial contribution rate. If the deferred losses were recognized immediately in the actuarial value assets, the unfunded actuarial liability would increase by $\$ 8$ million to $\$ 177$ million, the funded percentage would decrease from $59 \%$ to $57 \%$ and the actuarial contribution rate would increase from $33.91 \%$ to $34.86 \%$.

A comparison of asset values on both a market and actuarial basis for the last four years is shown below.

|  | 2011 | 2010 | 2009 | 2008 |
| :--- | :--- | :--- | :--- | :--- |
| Market Value of Assets | $\$ 232$ | $\$ 213$ | $\$ 204$ | $\$ 294$ |
| Actuarial Value of Assets | $\$ 240$ | $\$ 240$ | $\$ 245$ | $\$ 283$ |
| Actuarial Value/Market Value | $103 \%$ | $113 \%$ | $120 \%$ | $96 \%$ |



An asset smoothing method is used to mitigate the volatility in the market value of assets. By using a smoothing method, the actuarial (or smoothed) value can be either above or below the pure market value. The significant investment losses in the 2008 plan year resulted in the actuarial value of assets being above the market value for the last three years.

## ExECUTIVE Summary

## LIABILITIES

The first step in determining the actuarial contribution rate for the System is to calculate the liabilities for all expected future benefit payments. These liabilities represent the present value of future benefits (PVFB) expected to be earned by the current System members, assuming that all actuarial assumptions are realized. Thus, the PVFB reflects future service and salary increases that are expected to occur in the future before a benefit becomes payable. The PVFB components can be found in the liabilities portion of the valuation balance sheet (see Exhibit 4).

The other critical measurement of System liabilities in the valuation process is the actuarial liability (AL). This is the portion of the PVFB that will not be paid by the future normal costs (i.e. it is the portion of the PVFB that is allocated to prior service periods). As of January 1, 2011, the actuarial liability for the System was $\$ 409,442,601$.

The following chart compares the Present Value of Future Benefits (PVFB), the Actuarial Liability (AL) and System assets for the current and prior valuation.

|  | As of January 1 |  |
| :--- | :---: | :---: |
|  | $\mathbf{2 0 1 1}$ |  |
| Actuarial Liability (AL) | $\$ 409,442,601$ |  |
| 2010 |  |  |
| Assets at Actuarial Value | $\$ 240,291,310$ |  |
| Unfunded Actuarial Liability (AVA) | $\$ 169,151,291$ |  |
| Funded Ratio (Actuarial Value) | $59 \%$ |  |
|  |  |  |
|  | $\$ 161,309,407,281$ |  |
| Assets at Market Value | $\$ 232,346,583$ |  |
| Unfunded Actuarial Liability (MVA) | $\$ 177,096,018$ |  |
| Funded Ratio (Market Value) | $57 \%$ |  |

## EXPERIENCE FOR THE 2010 PLAN YEAR

The difference between the actuarial liability and the actuarial value of assets at the same date is referred to as the unfunded actuarial liability (UAL). Benefit improvements, experience gains/losses, changes in the actuarial assumptions, and actual contributions made will impact the amount of the unfunded actuarial liability.

The calculation of the unfunded actuarial liability for the System as of January 1, 2011 is shown below:

$$
\begin{array}{ll}
\text { Actuarial Liability } & \$ 409,442,601 \\
\text { Actuarial Value of Assets } & \$ 240,291,310 \\
\text { Unfunded Actuarial Liability } & \$ 169,151,291
\end{array}
$$

Actuarial gains (or losses) result from actual experience that is more (or less) favorable than anticipated based on the actuarial assumptions. These "experience" (or actuarial) gains or losses are reflected in the unfunded actuarial liability and are measured as the difference between the expected unfunded actuarial liability and the actual unfunded actuarial liability, taking into account any changes due to assumption or benefit provision changes. The System experience, in total, was favorable (a lower unfunded actuarial liability than expected). There was an actuarial loss of around $\$ 2.6$ million on the actuarial value of assets and an actuarial gain of about $\$ 6.1$ million on liabilities.

The change in the unfunded actuarial liability between January 1, 2010 and 2011 is shown below (in millions):
Unfunded Actuarial Liability, January 1, 2010 ..... 161

- Expected change in UAL ..... 3
- Contribution shortfall in 2010 ..... 8
- Investment experience ..... 3
- Demographic experience ..... (6)
- Other experience ..... (1)- Change in Actuarial Firms1
- Changes in plan provisions ..... 0
- Change in actuarial assumptions / methods ..... 0
Unfunded Actuarial Liability, January 1, 2011 ..... 169

Due to the use of an asset smoothing method, there are deferred investment losses which have not been recognized in prior valuations. As a result, there was an actuarial loss on investment experience despite a return on the market value of assets of around $17 \%$, which was above the $8 \%$ assumption. This investment experience on the actuarial value of assets increased the unfunded actuarial liability by $\$ 3$ million. It was largely offset by favorable demographic experience ( $\$ 6$ million) which was primarily due to lower salary increases than expected.

## CONTRIBUTION LEVELS

The actuarial contribution rate of the System is composed of two parts:
(1) The normal cost (which is the allocation of costs attributed to the current year's membership service) and
(2) The amortization payment on the Unfunded Actuarial Liability.

The normal cost rate is independent of the System's funded status and represents the cost, as a percent of payroll, of the benefits provided by the System which is allocated to the current year of service. The total normal cost for the System is $13.830 \%$ of pay, or about $\$ 7.6$ million this year.

When offset by the expected employee contributions, the employer portion of the normal cost is $4.505 \%$ of pay, or about $\$ 2.5$ million. The normal cost represents the long-term cost of the benefit structure of the System.

The Plan's total actuarially determined contribution rate (payable as a $\%$ of member payroll) increased by $0.36 \%$ of pay, to $33.91 \%$ on January 1, 2011, from $33.55 \%$ on January 1, 2010. The primary components of this change are as follows:

|  | Rate |  |
| :--- | ---: | ---: |
| Total Actuarial Contribution Rate, January 1, 2010 | 33.55 | $\%$ |
| - Actuarial (Gain) / Loss - Investment Experience | 0.30 |  |
| - Actuarial (Gain) / Loss - Other Experience | $(0.69)$ |  |
| - Change In Actuarial Firms | $(0.21)$ |  |
| - Assumption Changes | 0.00 |  |
| - Contributions Less Than Actuarial Rate | 0.96 |  |
| Total Actuarial Contribution Rate, January 1, 2011 | $33.91 \quad \%$ |  |

As the result of experience during 2010, the System has an unfunded actuarial liability of \$169 million (actuarial liability is greater than actuarial assets). The unfunded actuarial liability is being funded over a closed 30-year period beginning January 1, 2002 of which twenty-one years remain as of the valuation data. The resulting payment is $20.083 \%$ of pay. As a result, the total contribution for 2011 is $33.913 \%$ of pay $(13.830 \%+20.083 \%)$. The City's required contribution rate in the city ordinance for 2011 is $11.025 \%$ and the employees contribute $9.325 \%$, which results in a contribution shortfall for 2011 of $13.563 \%$ of pay or approximately $\$ 8.0$ million.

## Comments

Another year of strong investment performance (17\%) helped reduce the deferred investment loss from the 2008 plan year. However, despite returns in both 2009 and 2010 that were much higher than the expected return of $8 \%$, the actuarial value of assets is still $\$ 8$ million higher than the market value of assets. The funded ratio of the system, on a market value basis, has increased from $52 \%$ in the January 1, 2009 actuarial valuation to $57 \%$ in the January 1, 2011 valuation. Even with the favorable investment experience, the increase in the System's funded status represents only a modest improvement in the long term funding of the System. The System faces a significant challenge based on the contribution shortfall between the actuarial contribution rate and the current fixed member and employer contribution rates.

The actual contributions to the System for 2010 of $18.85 \%$ of pay were significantly below the actuarial contribution rate of $33.55 \%$. This shortfall in the contribution rate of $14.70 \%$ of pay, or about $\$ 9$ million, resulted in an increase in the unfunded actuarial liability. The actuarial contribution rate in the 2011 valuation is $33.47 \%$ compared to the contribution rate in the City ordinance of $20.35 \%$, which results in a shortfall of $13.12 \%$ of pay or $\$ 8$ million. A fundamental principle of sound funding for a defined benefit plan is to consistently pay the actuarial contribution rate. Contributions to the Omaha Employees' Retirement System have been less than the full actuarial contribution rate for the last nine years. As a result, the System's funded status has declined. The impact of the market decline in 2008 exacerbated the System's long term funding challenge and increased the amount of the shortfall.

Absent contributions at the full actuarial contribution rate, the UAL is expected to increase by the shortfall, and the actuarial contribution rate is also expected to increase. The funded status is also expected to decline. Given the currently scheduled contribution rates, the shortfall is expected to increase and the funded status to deteriorate in future years even if all actuarial assumptions are met. Action is necessary soon in order to strengthen the System's funding over the long term. Benefits are paid out of the System from two sources: (1) contributions and (2) investment earnings. In order to improve the System's long term funding, contributions and/or investment earnings must increase, benefit payments must decrease, or both must occur. Increasing contributions or reducing benefits in future years typically take many years before an improvement in the funded ratio can be seen, particularly if the benefit changes only apply to new hires. The other component of the long term funding equation is investment return. If actual returns exceed the $8 \%$ assumption in future years, it will result in higher funded ratios and lower actuarial contribution rates. In fact, due to the size of the assets in comparison to the liabilities, investment returns have the greatest potential to impact the funded ratio in the short term - both positively and negatively. There seems to be little optimism that returns will consistently exceed the $8 \%$ assumption for the next ten years, so this option alone does not appear to be a viable solution to the System's long term funding issue. Therefore, it is likely that contributions will need to increase and/or benefits will need to be reduced. The longer the action to address the funding shortfall is delayed, the more dramatic the changes will have to be, whether they are benefit changes or contribution increases.

## ExECUTIVE SUMMARy

As mentioned earlier in this report, the System uses an asset smoothing method in the actuarial valuation. While this is a very common procedure for public retirement systems, it is important to be aware of the potential impact of the unrecognized investment experience. The System experienced double digit returns in the last two plan years so the difference between the actuarial and market value of assets is much smaller in this valuation, $\$ 8$ million.. However, it is still valuable to compare the key valuation results from the 2011 valuation using both the actuarial and market value of assets (see table below).

## \$ Millions

|  | Using Actuarial <br> Value of Assets | Using Market <br> Value of Assets |
| :--- | :---: | :---: |
| Actuarial Liability | $\$ 409.4$ | $\$ 409.4$ |
| Asset Value | 240.3 | 232.3 |
| Unfunded Actuarial Liability | $\$ 169.1$ | $\$ 177.1$ |
| Funded Ratio | $58.7 \%$ |  |
|  |  | $56.7 \%$ |
| Normal Cost Rate | $13.8 \%$ |  |
| UAL Contribution Rate | $20.1 \%$ | $13.8 \%$ |
| Actuarial Contribution Rate | $33.9 \%$ | $21.0 \%$ |

THE CITY OF OMAHA EMPLOYEES' RETIREMENT SYSTEM
PRINCIPAL VALUATION RESULTS

|  | January 1, 2011 | January 1, 2010 | \% Chg |
| :---: | :---: | :---: | :---: |
| MEMBERSHIP |  |  |  |
| 1. Active Membership |  |  |  |
| - Number of Members | 1,130 | 1,116 | 1.3 |
| - Projected Payroll for Upcoming Fiscal Year | \$59,235,591 | \$56,674,979 | 4.5 |
| - Average Projected Payroll | \$52,421 | \$50,784 | 3.2 |
| - Average Attained Age | 47.4 | 47.8 | -0.9 |
| - Average Entry Age | 36.9 | 37.1 | -0.5 |
| 2. Inactive Membership |  |  |  |
| - Number of Retirees / Beneficiaries | 1,161 | 1,133 | 2.5 |
| - Number of Disabilities | 120 | 124 | -3.2 |
| - Number of Deferred Vesteds | 82 | 83 | -1.2 |
| - Average Annual Benefit | \$21,110 | \$20,491 | 3.0 |
| ASSETS AND LIABILITIES |  |  |  |
| 1. Net Assets |  |  |  |
| - Market Value | \$232,346,583 | \$213,219,632 | 9.0 |
| - Actuarial Value | \$240,291,310 | \$240,109,413 | 0.1 |
| 2. Projected Liabilities |  |  |  |
| - Retired Members and Beneficiaries | \$244,707,123 | \$232,938,727 | 5.1 |
| - Disabled Members | \$23,276,585 | \$23,502,817 | -1.0 |
| - Other Inactive Members | \$6,283,434 | \$6,231,291 | 0.8 |
| - Active Members | \$187,562,174 | \$191,161,885 | -1.9 |
| - Total Liability | \$461,829,316 | \$453,834,720 | 1.8 |
| 3. Actuarial Liability | \$409,442,601 | \$401,416,694 | 2.0 |
| 4. Unfunded Actuarial Liability | \$169,151,291 | \$161,307,281 | 4.9 |
| 5. Funded Ratios |  |  |  |
| Actuarial Value Assets / Actuarial Liability | 58.69\% | 59.82\% | -1.9 |
| Market Value Assets / Actuarial Liability | 56.75\% | 53.12\% | 6.8 |
| CONTRIBUTIONS |  |  |  |
| 1. Normal Cost Rate | 13.830\% | 14.130\% | -2.1 |
| 2. UAL Contribution Rate | 20.083\% | 19.420\% | 3.4 |
| 3. Total Actuarial Contribution Rate (1) + (2) | 33.913\% | $33.550 \%$ | 1.1 |
| 4. Less Employee Contribution Rate | (9.325\%) | (8.575\%) | 8.7 |
| 5. Less City Contribution Rate Per Ordinance | (11.025\%) | (10.275\%) | 7.3 |
| 6. Contribution Shortfall (3) - (4) - (5) | 13.563\% | 14.700\% | -7.7 |

## EXHIBIT 1

# SUMMARY OF FUND ACTIVITY <br> (Market Value Basis) <br> For Year Ended December 31, 2010 

Assets at January 1, 2010

## Receipts:

City Contributions ..... 5,718,420
Employee Contributions ..... 4,858,097
Investment Income ..... 36,449,684
Total Receipts ..... 47,026,201
Disbursements:
Benefits Paid to Members ..... 26,336,846
Investment Fees ..... 1,561,382
Other ..... 1,022
Total Disbursements ..... 27,899,250
Annualized Yield

- Gross ..... 17.8\%
- Net of Expenses ..... 17.0\%


## EXHIBIT 2

## DETERMINATION OF ACTUARIAL VALUE OF ASSETS

The actuarial value of assets is used to minimize the impact of annual fluctuations in the market value of investments on the contribution rate. The current asset valuation method is called the "Expected $+25 \%$ Method".

The "expected value" of assets is determined by applying the investment return assumption to last year's actuarial value of assets and the net difference of receipts and disbursements for the year. The actual market value is compared to the expected value and $25 \%$ of the difference (positive or negative) is added to the expected value to arrive at the actuarial value of assets for the current year.

1. Actuarial Value of Assets as of January 1, 2010
2. Actual Receipts / Disbursements
a. Total Contributions
b. Benefit Payments
c. Net Change
10,576,517
$(26,336,846)$
$(15,760,329)$
\$ 240,109,413
3. Expected Actuarial Value of Assets as of January 1, 2011

242,939,552
$\{(1) * 1.08\}+\left\{(2 \mathrm{c}) * 1.08^{1 / 2}\right\}$
4. Market Value of Assets as of January 1, 2011
5. Excess of Market Value over Expected

Value as of January 1, 2011
6. Preliminary Actuarial Value of Assets as of January 1, 2011

240,291,310
$[(3)+25 \%$ of (5) ]
7. Calculation of $20 \%$ Corridor
a. $80 \%$ of (4)

185,877,266
b. $120 \%$ of (4)

278,815,900
8. Final Actuarial Value of Assets as of January 1, 2011
(6) but not < (7a) nor > (7b)
\$
240,291,310
9. Rate of Return on Actuarial Value of Assets

## EXHIBIT 2 (continued)

A historical comparison of the market and actuarial value of assets is shown below:

| Date | Market Value <br> of Assets (MVA) | Actuarial Value <br> of Assets (AVA) | AVA / MVA |
| :---: | :---: | :---: | :---: |
| $1 / 1 / 2008$ | $294,658,022$ | $283,243,750$ | $96.13 \%$ |
| $1 / 1 / 2009$ | $204,452,506$ | $245,343,007$ | $120.00 \%$ |
| $1 / 1 / 2010$ | $213,219,632$ | $240,109,413$ | $112.61 \%$ |
| $1 / 1 / 2011$ | $232,346,583$ | $240,291,310$ | $103.42 \%$ |



## EXHIBIT 3

## ACTUARIAL BALANCE SHEET

An actuarial statement of the status of the System in balance sheet form as of January 1, 2011 is as follows:

| Assets |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Current assets (actuarial value) |  |  | \$ | 240,291,310 |
| Present value of future normal costs |  |  |  | 52,386,715 |
| Present value of future employer contributions to fund unfunded actuarial liability |  |  |  | 169,151,291 |
| Total Assets |  |  | \$ | 461,829,316 |
| Liabilities |  |  |  |  |
| Present value of future retirement benefits for: |  |  |  |  |
| Active employees | \$ | 174,455,284 |  |  |
| Retired employees, contingent annuitants <br> and spouses receiving benefits $244,707,123$ |  |  |  |  |
| Deferred vested employees |  | 5,927,956 |  |  |
| Inactive employees due refunds |  | 355,478 |  |  |
| Inactive employees - disabled |  | 23,276,585 |  |  |
| Total |  |  | \$ | 448,722,426 |
| Present value of future death benefits payable upon death of active members$2,265,896$ |  |  |  |  |
| Present value of future benefits payable upon <br> termination of active members $10,840,994$ |  |  |  |  |
| Total Liabilities |  |  | \$ | 461,829,316 |

## EXHIBIT 4

## UNFUNDED ACTUARIAL LIABILITY

As of January 1, 2011

The actuarial liability is the portion of the present value of future benefits which will not be paid by future normal costs. The actuarial value of assets is subtracted from the actuarial liability to determine the unfunded actuarial liability.

1. Present Value of Future Benefits
2. Present Value of Future Normal Costs
3. Actuarial Liability
(1) $-(2)$
4. Actuarial Value of Assets
5. Unfunded Actuarial Liability
(3) - (4)
\$ 169,151,291
6. Funded Ratio
(4) $/(3) \quad 58.69 \%$
\$ 461,829,316

52,386,715

409,442,601

240,291,310

## EXHIBIT 5

## CALCULATION OF ACTUARIAL GAIN / (LOSS)

For Plan Year Ending December 31, 2010

## Liabilities

1. Actuarial liability as of January 1, 2010
2. Normal cost as of January 1, 2010
\$ 401,416,694
3. Interest at $8.00 \%$ on (1) and (2) to December 31, 2010

7,758,204
4. Benefit payments during 2010

32,733,992
5. Interest on benefit payments

26,336,846
6. Increase due to change in actuary

1,033,207
7. Expected actuarial liability as of December 31, 2010

969,437
$(1)+(2)+(3)-(4)-(5)+(6)$
8. Actuarial liability as of December 31, 2010

409,442,601

## Assets

9. Actuarial value of assets as of January 1, $2010 \quad$ 240,109,413
10. Contributions during 2010

10,576,517
11. Benefit payments during 2010

26,336,846
12. Interest on items (9), (10) and (11)

18,590,468
13. Expected actuarial value of assets as of December 31, 2010

242,939,552
(9) $+(10)-(11)+(12)$
14. Actual actuarial value of assets as of December 31, 2010

240,291,310

## (Gain) / Loss

15. Expected unfunded actuarial liability / (surplus)
(7) - (13)
$172,568,722$
16. Actual unfunded actuarial liability / (surplus)
(8) $-(14)$

169,151,291
17. Actuarial (Gain) / Loss

$$
\begin{equation*}
(16)-(15) \tag{3,417,431}
\end{equation*}
$$

18. Actuarial (Gain) / Loss on Actuarial Assets

$$
(13)-(14)
$$

$$
2,648,242
$$

19. Actuarial (Gain) / Loss on Actuarial Liability

$$
(8)-(7)
$$

## EXHIBIT 6

## DEVELOPMENT OF 2011 ACTUARIAL CONTRIBUTION RATE

The actuarial cost method used to determine the required level of annual contributions to support the expected benefits is the Entry Age Normal Cost Method. Under this method, the total cost is comprised of the normal cost rate and the unfunded actuarial liability (UAL) payment. The System is financed by contributions from the employees and the city.

1. (a) Normal Cost
(b) Covered Payroll
(c) Normal Cost Rate

$$
\text { (a) } / \text { (b) }
$$

2. Unfunded Actuarial Liability / (Surplus) at Valuation Date
3. Amortization Factor

Level Percent of Payroll over 21 Years*
4. Unfunded Actuarial Liability / (Surplus) Payment $[(2) /(3)] \times 1.08^{1 / 2}$
\$ 11,895,999
5. Total Projected Payroll for the Year
6. Unfunded Actuarial Liability Payment as Percent of Pay (4) / (5)
\$ 59,235,591
20.083\%
7. Total Contribution Rate

$$
(1 \mathrm{c})+(6)
$$

8. Employee Contribution Rate 9.325\%
9. City Ordinance Contribution Rate 11.025\%
10. Contribution Shortfall

$$
(7)-(8)-(9)
$$

*This assumes all actuarial assumptions are met in the future, including a $4 \%$ increase in total covered payroll.

## EXHIBIT 7

## ANALYSIS OF EXPERIENCE

The purpose of conducting an actuarial valuation of a retirement plan is to estimate the costs and liabilities for the benefits expected to be paid from the plan, to determine the annual level of contribution for the current plan year that should be made to support these benefits, and finally, to analyze the plan's experience. The costs and liabilities of this retirement plan depend not only upon the benefit formula and plan provisions but also upon factors such as the investment return on the Fund, mortality rates among active and retired members, withdrawal and retirement rates among active members, rates at which salaries increase and the rate at which the cost of living increases.

The actuarial assumptions employed as to these and other contingencies in the current valuation are set forth in Appendix B of this report.

Since the overall results of the valuation will reflect the choice of assumptions made, periodic studies of the various components comprising the plan's experience are conducted in which the experience for each component is analyzed in relation to the assumption used for that component (experience study). This summary is not intended to be an actual "experience study", but rather an analysis of sources of gain and loss in the past plan year.

## Gain/(Loss) By Source

The System experienced a net actuarial gain on liabilities of $\$ 6,065,673$ during the plan year ended December 31, 2010, which was offset by an actuarial loss on assets of $\$ 2,648,242$. The net actuarial gain was $\$ 3,417,431$. The major components of this net actuarial experience (gain) are shown below:

| Liability Sources |  | Gain/(Loss) |
| :--- | ---: | ---: |
| Salary Increases | $\$$ | $7,878,483$ |
| Mortality |  | 589,606 |
| Terminations | $(1,156,408)$ |  |
| Retirements | $(1,440,199)$ |  |
| Disability | $(345,089)$ |  |
| New Entrants/Rehires | $(217,292)$ |  |
| Miscellaneous | 756,572 |  |
| Total Liability Gain/(Loss) | $\$$ | $6,065,673$ |
|  | $\$$ | $(2,648,242)$ |
| Asset Gain/(Loss) | $\$$ |  |
| Net Actuarial Gain/(Loss) | $\$$ | $3,417,431$ |

## SECTION II

## SYSTEM ACCOUNTING INFORMATION

In an effort to enhance the understandability and usefulness of the pension information that is included in the financial reports of pension plans for state and local governments, the Governmental Accounting Standards Board (GASB) has issued Statement No. 25 - Financial Reporting for Defined Benefit Pension Plans and Statement No. 27 - Accounting for Pension by State and Local Governmental Employers.

GASB Statement No. 25 establishes a financial reporting framework for defined benefit plans. In addition to two required statements regarding plan assets, the statement requires two schedules and accompanying notes disclosing information relative to the funded status of the plan and historical contribution patterns.

- The Schedule of Funding Progress provides historical information about the funded status of the plan and the progress being made in accumulating sufficient assets to pay benefits when due.
- The Schedule of Employer Contributions provides historical information about the annual required contributions (ARC) and the percentage of the ARC that was actually contributed.

GASB Statement No. 27 establishes standards for the measurement, recognition, and display of pension expense and related liabilities. Annual pension cost is measured and disclosed on the accrual basis of accounting. In general, the annual pension cost is equal to the ARC with adjustments for past under-contributions or over-contributions. These adjustments are based on the net pension obligation (NPO) that represents the cumulative difference between the annual pension cost and the actual contributions to the plan. The first adjustment is equal to interest on the NPO which is added to the ARC. The second adjustment is an amortization of the NPO which is deducted from the ARC. Effective January 1, 2005 the System uses the Entry Age Normal method to determine the ARC and the unfunded actuarial liability (or surplus) is amortized as a level percentage of payroll.

## EXHIBIT 8

## SCHEDULE OF EMPLOYER CONTRIBUTIONS

In accordance with Statement No. 25 of the Governmental Accounting Standards Board
\(\left.$$
\begin{array}{cccc}\text { Fiscal } & \begin{array}{c}\text { Annual } \\
\text { Year } \\
\text { Ending }\end{array} & \begin{array}{c}\text { Required } \\
\text { Contribution* } \\
\text { (a) }\end{array} & \begin{array}{c}\text { Total } \\
\text { Employer } \\
\text { Contribution* }\end{array}\end{array}
$$ \begin{array}{c}Percentage <br>
of ARC <br>
Contributed* <br>

(b/a)\end{array}\right]\)| (b) |
| :---: | :---: | :---: | :---: |

*This information was provided by the prior actuary and has not been reviewed or verified by Cavanaugh Macdonald Consulting.

Notes to the Required Schedules:

1. The traditional Entry Age Normal cost method is used.
2. The actuarial value of assets is determined based on a method that smoothes the effects of short term volatility in the market value investments. The actuarial value is equal to the expected value, based on the assumed rate of return, plus $25 \%$ of the difference between market and expected values. A corridor of $80 \%$ to $120 \%$ of market value is also applied.
3. Economic assumptions are as follows: Investment return rate: $8.00 \%$

Salary increase rates: from $10 \%$ at 1 year of service to $4 \%$ at 20 years of service
Inflation rate: 3.5\%
Payroll growth: $4.00 \%$
Post-retirement benefit increases: Applicable after 5 years equal to the lesser of $3 \%$ or $\$ 50$ per month for members (and their beneficiaries)who retired on or before January 28, 1998.
4. The amortization method is a closed 30 year period, level percentage of payroll (the unfunded actuarial liability is amortized over 21 years as of January 1, 2011).

## EXHIBIT 9

## DEVELOPMENT OF THE NET PENSION OBLIGATION IN ACCORDANCE WITH GASB STATEMENT NO. 27

| Fiscal Year End: | $\mathbf{1 2 / 3 1 / 2 0 0 4}$ | $\mathbf{1 2 / 3 1 / 2 0 0 5}$ | $\mathbf{1 2 / 3 1 / 2 0 0 6}$ | $\mathbf{1 2 / 3 1 / 2 0 0 7}$ | $\mathbf{1 2 / 3 1 / 2 0 0 8}$ | $\mathbf{1 2 / 3 1 / 2 0 0 9}$ | $\mathbf{1 2 / 3 1 / 2 0 1 0}$ | $\mathbf{1 2 / 3 1 / 2 0 1 1}$ |
| :--- | :---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
|  |  |  |  |  |  |  |  |  |
| Assumptions and Methods | $7.50 \%$ | $7.50 \%$ | $7.50 \%$ | $8.00 \%$ | $8.00 \%$ | $8.00 \%$ | $8.00 \%$ |  |
| Interest Rate | $4.00 \%$ | $4.00 \%$ | $4.00 \%$ | $4.00 \%$ | $4.00 \%$ | $4.00 \%$ | $4.00 \%$ |  |
| Payroll Growth | 30 | 30 | 30 | 30 | 30 | $3.00 \%$ |  |  |
| Amortization Period (years) | EA Normal | EA Normal | EA Normal | EA Normal | EA Normal | EA Normal | EA Normal | EA Normal |

## Annual Pension Cost

Annual Required Contribution
(ARC)
Interest on NPO

Adjustment to ARC
Annual Pension Cost
Contribution for the Year

| $\$ 6,848,743$ | $\$ 6,877,913$ | $\$ 6,213,801$ | $\$ 8,883,617$ | $\$ 9,212,669$ | $\$ 12,893,331$ | $\$ 14,149,386$ | $\$ 14,564,847$ |
| ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| 255,892 | 433,383 | 607,521 | 807,256 | $1,112,817$ | $1,410,080$ | $2,004,239$ | $2,661,089$ |
| $(288,889)$ | $(489,268)$ | $(685,860)$ | $(896,331)$ | $(1,235,608)$ | $(1,565,673)$ | $(2,225,393)$ | $(2,526,435)$ |
| $\$ 6,815,746$ | $\$ 6,822,028$ | $\$ 6,135,462$ | $\$ 8,794,542$ | $\$ 9,089,878$ | $\$ 12,737,738$ | $\$ 13,928,232$ | $\$ 14,699,501$ |
| $\$ 4,449,203$ | $\$ 4,500,192$ | $\$ 4,145,033$ | $\$ 4,975,039$ | $\$ 5,374,082$ | $\$ 5,310,754$ | $\$ 5,717,610$ | TBD |
|  |  |  |  |  |  |  |  |
| $\$ 3,411,896$ | $\$ 5,778,439$ | $\$ 8,100,275$ | $\$ 10,090,704$ | $\$ 13,910,207$ | $\$ 17,626,003$ | $\$ 25,052,987$ | $\$ 33,263,609$ |
| $6,815,746$ | $6,822,028$ | $6,135,462$ | $8,794,542$ | $9,089,878$ | $12,737,738$ | $13,928,232$ | $14,699,501$ |
| $(4,449,203)$ | $(4,500,192)$ | $(4,145,033)$ | $(4,975,039)$ | $(5,374,082)$ | $(5,310,754)$ | $(5,717,610)$ | TBD |
| $\$ 5,778,439$ | $\$ 8,100,275$ | $\$ 10,090,704$ | $\$ 13,910,207$ | $\$ 17,626,003$ | $\$ 25,052,987$ | $\$ 33,263,609$ | TBD |

Note: All information prior to 2011 in this exhibit was provided by the prior actuary and has not been reviewed or verified by Cavanaugh Macdonald Consulting LLC.

## EXHIBIT 10

## SCHEDULE OF FUNDING PROGRESS

In Accordance with Statement No. 25 of the Governmental Accounting Standards Board

| Actuarial <br> Valuation <br> Date ${ }^{1}$ | Market Value of Assets ${ }^{2}$ <br> (a) | Actuarial Liability (AAL) <br> (b) | $\begin{gathered} \text { Unfunded } \\ \text { AAL } \\ \text { (UAAL) } \\ \text { (b-a) } \end{gathered}$ | Funded Ratio (a/b) | Covered <br> Payroll ( $\mathbf{P} / \mathbf{R}$ ) <br> (c) | UAAL as a <br> Percentage of Covered P/R $[(\mathbf{b}-\mathbf{a}) / \mathbf{c}]$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 12/31/2005 | \$277,100,000 | \$352,000,000 | \$74,900,000 | 78.7\% | \$53,400,000 | 140.3\% |
| 12/31/2006 | 292,000,000 | 361,700,000 | 69,700,000 | 80.7\% | 48,200,000 | 144.6\% |
| 12/31/2007 | 294,700,000 | 369,000,000 | 74,300,000 | 79.9\% | 54,000,000 | 137.6\% |
| 12/31/2008 | 204,500,000 | 387,700,000 | 183,200,000 | 52.7\% | 56,400,000 | 324.8\% |
| 12/31/2009 | 213,200,000 | 402,800,000 | 189,600,000 | 52.9\% | 55,700,000 | 340.4\% |
| 12/31/2010 | 232,400,000 | 414,500,000 | 182,100,000 | 56.1\% | 56,700,000 | 321.2\% |
| 1/1/2011 | 240,291,310 | 409,442,601 | 169,151,291 | 58.7\% | 59,235,591 | 285.6\% |

1. Results prior to 2011 were provided by the prior actuary and were reported at the end of the year rather than the valuation date.
2. The prior actuary reported the market value of assets in column (a). Our understanding of GASB $25 / 27$ is that the valuation methodology should be used for GASB calculations to the extent it complies with GASB 25 parameters. Information reported as of $1 / 1 / 2011$ and later reflects the valuation methodology including the actuarial value of assets.

## EXHIBIT 11

## THREE-YEAR TREND INFORMATION*

| Fiscal Year <br> Ending | Annual Pension <br> Cost (APC) | Percentage of <br> APC Contributed | Net Pension <br> Obligation |
| :---: | :---: | :---: | :---: |
|  |  |  |  |
| $12 / 31 / 2008$ | $\$ 9,089,878$ | $59 \%$ | $\$ 17,626,003$ |
| $12 / 31 / 2009$ | $12,737,738$ | $42 \%$ | $25,052,987$ |
| $12 / 31 / 2010$ | $13,928,232$ | $41 \%$ | $33,263,609$ |

*All information prior to 2011 in this exhibit was provided by the prior actuary and has not been reviewed or verified by Cavanaugh Macdonald Consulting LLC.

## APPENDIX A

## SUMMARY OF PLAN PROVISIONS

Effective Date:
Section 22-21

Active Member:
Section 22 - 24 and 25

Average Final Monthly Compensation:
Section 22-23

Member Contributions:
Section 22 -26(a)

City of Omaha Contributions:
Section 22 -26(e)

Service Credits
Section 22 - 28 and 29

January 1, 1949

All City employees except: policemen, firemen, persons paid on a contractual or fee basis, seasonal, temporary and parttime employees, and elected officials who do not make written application.

The member's highest consecutive 26 pay periods of compensation during the final 130 pay periods of service as a member divided by 12 .

Each member will contribute a percentage of total compensation as shown in the following table. Interest is currently credited at $3.0 \%$ on member contributions.

| Year | Percent Contributed |
| :---: | :---: |
| 2010 | $8.575 \%$ |
| 2011 | $9.325 \%$ |
| 2012 | $10.075 \%$ |

The City will contribute a percentage of each member's total compensation as shown in the following table.

| Year | Percent Contributed |
| :---: | :---: |
| 2010 | $10.275 \%$ |
| 2011 | $11.025 \%$ |
| 2012 | $11.775 \%$ |

The member shall receive membership service credit for each full pay period of employment. Intervening periods of military service in time of emergency shall be counted, provided the member is honorably discharged and returns to work within 90 days after such discharge.

Membership credits shall be earned by those receiving a disability pension. However, the total credited service will not exceed 30, unless more than 30 years were earned as an active member.

## APPENDIX A

## SUMMARY OF PLAN PROVISIONS (continued)

Service Retirement Eligibility:
Section 22-30

Service Retirement Pension:
Section 22-32
Disability Benefits:
Section 22-35

Spouse's Pension:

1. Death of Active Member

Section 22-36
2. Death of a Member Eligible for Retirement or Death of Retired Member Section 22-36

Children's Pension:
Section 22-36

A member is eligible to retire after age 50 if their age plus service is 80 or more. Otherwise, a member is eligible to retire after age 55 and 5 years of service. The pension is reduced $8 \%$ for years prior to age 60 . No reduction applies if age plus service is 80 or more.

A monthly pension equal to $2.25 \%$ of Average Final Monthly Compensation times years of credited service.

If permanently disabled with five years of service, the member shall receive $60 \%$ of final monthly compensation offset by Social Security and workers' compensation benefits. Payment for all medical, surgical and hospital expenses incurred is made if disability is service related. Not payable while full salary continues.

A monthly pension equal to $75 \%$ of the member's accrued pension is paid to the surviving spouse until death or remarriage. The member must have had five years of service or had a service-connected death and six months of service.

If legally married to the member for at least one year, surviving spouse shall be entitled to $75 \%$ of the pension the member was receiving or was eligible to receive at the time of death. Upon the spouse's remarriage, all benefits cease.

Upon the death of an active or retired member, the following benefit will be paid to the surviving children until age 18 or prior to death or marriage, except that if a child is totally disabled, the full pension continues until the cessation of total disability or dependency for support whichever occurs first:

| Number of <br> Dependent Children | Percentage <br> of Accrued Benefit |
| :---: | :---: |
|  | $5 \%$ |
| 2 | $10 \%$ |
| 3 | $15 \%$ |
| 4 or more | $20 \%$ |

## APPENDIX A

# SUMMARY OF PLAN PROVISIONS (continued) 

Lump Sum Death Benefits:

1. Active Member without Eligible Dependents
Section 22-37
2. Retired Member without Eligible Dependents
Section 22-37
Accumulated member's contributions, plus $\$ 5,000$.
3. Active Member with Eligible Dependents: $\$ 5,000$.

Section 22-37
4. Retired Member with Eligible Dependents $\$ 5,000$.

Section 22-37
Vesting:
Section 22-39

Section $22-40$

Supplemental Pension:
Section 22 - 123

Upon severance of employment by a member with less than 5 years of service and prior to obtaining eligibility under Section $22-30$, a refund of such member's accumulated contributions, including credited interest, will be paid.

Upon severance of employment by a member with more than 5 years of service and prior to obtaining eligibility for retirement, the member may elect, in lieu of receiving a refund of contributions, to receive a monthly pension, reduced for early retirement if applicable, commencing at or about age 55. Such deferred pension shall be based on service credited to the date of severance.

Retirees (including widow, widowers and children) receive a supplemental pension (Cost of Living Adjustment - COLA) after five years equal to the lesser of $3 \%$ or $\$ 50$ per month. The COLA is granted for the full remaining period that benefits are payable. No COLA's will be available for members who retire after January 28, 1998.

## APPENDIX B

## ACTUARIAL METHOD AND ASSUMPTIONS

## Actuarial Method

Valuation of the System uses the "entry age-normal" cost method. Under this actuarial method, the value of future costs attributable to future employment of participants is determined. This is called present value of future normal costs. The following steps indicate how this is determined for benefits expected to be paid upon normal retirement.

1. The expected pension benefit at normal retirement is determined for each participant.
2. A normal cost, as a level percent of pay, is determined for each participant assuming that such level percent is paid from the employee's entry age into employment to his normal retirement. This normal cost is determined so that its accumulated value at normal retirement is sufficient to provide the expected pension benefits.
3. The sum of the normal costs for all participants for one year determines the total normal cost of the System for one year.
4. The value of future payments of normal cost in future years is determined for each participant based on his years of service to normal retirement age.
5. The sum of the value of future payments of normal cost for all participants determines the present value of future normal costs.

The value of future costs attributable to past employment of participants, which is called the actuarial liability, is equal to the present value of benefits less the present value of future normal costs. The unfunded actuarial liability is equal to the excess of the actuarial liability over assets. The unfunded actuarial liability is funded as a level percent of payroll over a 30 year closed period that began January 1, 2002.

As experience develops with the System, actuarial gains and losses result. These actuarial gains and losses indicate the extent to which actual experience is deviating from that expected on the basis of the actuarial assumptions. In each year, as they occur, actuarial gains and losses are recognized in the unfunded actuarial liability as of the valuation date.

## APPENDIX B

## ACTUARIAL ASSUMPTIONS <br> (continued)

## Interest:

Inflation:
Salary Increases:
8.00\% per year, net of investment expenses.
$3.5 \%$ per year, net of investment expenses.

|  | Annual Rate of Increase <br> For Sample Years |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |
| Years of <br> Service | $\frac{\text { Inflation }}{3.5 \%}$ | $\frac{\text { Productivity }}{}$ <br> Longevity | Total <br> Increase |  |
| 5 | $3.5 \%$ | $.5 \%$ | $6.0 \%$ | $10.0 \%$ |
| 10 | $3.5 \%$ | $.5 \%$ | $2.5 \%$ | $6.5 \%$ |
| 15 | $3.5 \%$ | $.5 \%$ | $1.0 \%$ | $5.0 \%$ |
| $20+$ | $3.5 \%$ | $.5 \%$ | $0.5 \%$ | $4.5 \%$ |
| 20 |  |  | $0.0 \%$ | $4.0 \%$ |

Payroll Growth Assumption
Service Retirement Age

## Mortality:

Active Members

## Pensioners

| Eligible for Unreduced Retirement |  |  |
| :---: | :---: | :---: |
| Age | 1 <br> st <br> Year | Subsequent <br> Years |
| $50-53$ | $25 \%$ | $\frac{20 \%}{25 \%}$ |
| $54-55$ | $35 \%$ | $25 \%$ |
| $56-57$ | $45 \%$ | $30 \%$ |
| $58-59$ | $50 \%$ | $25 \%$ |
| 60 | $25 \%$ | $25 \%$ |
| 61 |  | $25 \%$ |
| 62 |  | $35 \%$ |
| 63 |  | $25 \%$ |
| 64 |  | $25 \%$ |
| $65-69$ |  | $50 \%$ |
| 70 |  | $100 \%$ |

Members eligible for Early, but not Unreduced Retirement, are assumed to retire at a rate of $5 \%$ per year from age 55 to 59 .

RP-2000 Employee Table with generational improvements using scale AA, set forward one year

RP-2000 Healthy Annuitant Table with generational improvements using scale AA, set forward one year

RP-2000 Disabled Table with generational improvements

## APPENDIX B

## ACTUARIAL ASSUMPTIONS <br> (continued)

## Disability:

| Age | Annual Rate |
| :---: | :---: |
| 20 | $0.11 \%$ |
| 30 | $0.14 \%$ |
| 40 | $0.19 \%$ |
| 50 | $0.41 \%$ |
| 60 | $1.48 \%$ |

## Percent Married at Death 75\% <br> or Retirement:

Number of Children per 0
Married Member
Termination:
SAMPLE RATES

| Years of Service | Annual Rate |
| :---: | :---: |
|  | $15 \%$ |
| 5 | $7 \%$ |
| 10 | $3 \%$ |
| $11+$ | $2.5 \%$ |

Assets:
Actuarial Value of Assets equals $3 / 4$ of Expected Value plus $1 / 4$ of Market Value.

## APPENDIX C

## HISTORICAL SUMMARY OF MEMBERSHIP

The following table displays selected historical data as available.

| Valuation |  | Active Members |  |  |  |  |  | Number |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Number |  |  |  |  |  |  |  |  |
| Date 1-Jan | Total <br> Count |  | Age | $\begin{gathered} \text { Entry } \\ \text { Age } \\ \hline \end{gathered}$ | Average Service | $\begin{aligned} & \text { Annual } \\ & \text { Pay (\$) } \\ & \hline \end{aligned}$ | $\begin{gathered} \text { Pay } \\ \text { Increase } \end{gathered}$ | Vested |  |  |
| 2008 | 2,427 | 1,125 | 47.1 | 35.9 | 11.2 | 46,470 |  | 125 | 79 | 1,098 |
| 2009 | 2,440 | 1,116 | 47.3 | 36.4 | 10.9 | 47,495 | 2.21\% | 122 | 81 | 1,121 |
| 2010 | 2,456 | 1,116 | 47.8 | 37.1 | 10.8 | 49,667 | 4.57\% | 124 | 83 | 1,133 |
| 2011 | 2,493 | 1,130 | 47.4 | 36.9 | 10.5 | 49,030 | (1.28)\% | 120 | 82 | 1,161 |

## MEMBERSHIP DATA FOR VALUATION

The summary of employee characteristics presented below covers the employee group as of January 1, 2011. The schedules at the end of the report show the distribution of the various employee groups by present age along with other pertinent data.

Total number of employees in valuation:
(a) Active employees 1,130
(b) Deferred vested employees 82
(c) Disabled employees 120
(d) Retired employees, spouses and children
receiving benefits
(e) Total employees in valuation 2,493

Average age of employees in valuation:
(a) Active employees
Attained

At Hire 36.9
(b) Deferred vested employees 50.2
(c) Disabled employees 60.2
(d) Retired employees $\quad 67.8$
(e) Spouses and children receiving benefits 74.2

Active employees eligible for vested benefits as of January 1, 2011:
(a) Employees under age 55 with 5 or more years of service -
eligible for deferred vested benefits
(b) Employees age 55 and over with 5 or more years of service -
eligible for early or normal retirement benefits
(c) Employees eligible for refund of contributions only $\quad 379$
(d) Total 1,130

## MEMBERSHIP DATA RECONCILIATION

## January 1, 2010 to January 1, 2011

The number of members included in the valuation, as summarized in the table below, is in accordance with the data submitted by the System for eligible employees as of the valuation date.

|  | Active <br> Members | Deferred Vested | Disabled | Retirees | $\underline{\text { Beneficiaries }}$ | Total |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Members as of 1/1/2010 | 1,116 | 83 | 124 | 881 | 252 | 2,456 |
| New Members | 99 | 0 | 0 | 0 | 0 | 99 |
| Terminations |  |  |  |  |  |  |
| Rehired | 0 | 0 | 0 | 0 | 0 | 0 |
| Refunded | (12) | (2) | 0 | 0 | 0 | (14) |
| Terminated, refund due | (12) | 0 | 0 | 0 | 0 | (12) |
| Deferred Vested | (7) | 8 | (1) | 0 | 0 | 0 |
| LTD | (4) | 0 | 4 | 0 | 0 | 0 |
| Data Corrections (and Benefits Expired) | 0 | 0 | 0 | 6 | (1) | 5 |
| Retirements | (49) | (7) | 0 | 56 | 0 | 0 |
| Deaths |  |  |  |  |  |  |
| With Beneficiary | (1) | 0 | (3) | (15) | 19 | 0 |
| Without Beneficiary | 0 | 0 | (4) | (14) | (23) | (41) |
| Total Members 1/1/2011 | 1,130 | 82 | 120 | 914 | 247 | 2,493 |

## SCHEDULE I

## ACTIVE EMPLOYEES AS OF JANUARY 1, 2011

| Age | Count of Members |  |  | Valuation Salaries of Members |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Males | Females | Total | Males | Females | Total |
| Under 25 | 12 | 5 | 17 | 322,594 | 158,461 | 481,055 |
| 25-29 | 40 | 29 | 69 | 1,613,593 | 1,061,645 | 2,675,238 |
| 30-34 | 55 | 33 | 88 | 2,768,331 | 1,486,663 | 4,254,994 |
| 35-39 | 62 | 29 | 91 | 3,210,029 | 1,381,181 | 4,591,210 |
| 40-44 | 121 | 30 | 151 | 6,618,944 | 1,404,657 | 8,023,602 |
| 45-49 | 126 | 53 | 179 | 6,810,662 | 2,583,819 | 9,394,482 |
| 50-54 | 125 | 71 | 196 | 6,984,259 | 3,593,515 | 10,577,774 |
| 55-59 | 127 | 80 | 207 | 7,383,368 | 4,140,318 | 11,523,686 |
| 60-64 | 67 | 35 | 102 | 4,040,065 | 1,811,207 | 5,851,272 |
| Over 64 | 20 | 10 | 30 | 1,407,506 | 454,773 | 1,862,279 |
| Total | 755 | 375 | 1,130 | 41,159,352 | 18,076,239 | 59,235,591 |



## SCHEDULE I (continued)

## ACTIVE EMPLOYEES AS OF JANUARY 1, 2011



SCHEDULE II
RETIRED PARTICIPANTS AS OF JANUARY 1, 2011

| Age | Count of Retirees |  |  | Current Monthly Benefits |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Males | Females | Total | Males | Females | Total |
| Under 60 | 107 | 56 | 163 | 300,504 | 136,043 | 436,547 |
| 60-64 | 194 | 88 | 282 | 484,513 | 165,614 | 650,127 |
| 65-69 | 119 | 41 | 160 | 242,829 | 66,357 | 309,186 |
| 70-74 | 91 | 34 | 125 | 151,747 | 41,364 | 193,111 |
| 75-79 | 52 | 20 | 72 | 82,669 | 21,102 | 103,771 |
| 80-84 | 45 | 17 | 62 | 69,943 | 16,502 | 86,445 |
| 85-89 | 21 | 14 | 35 | 27,677 | 11,453 | 39,130 |
| Over 89 | 7 | 8 | 15 | 4,872 | 4,589 | 9,461 |
| Total | 636 | 278 | 914 | 1,364,754 | 463,024 | 1,827,778 |




## SCHEDULE III

## BENEFICIARIES RECEIVING BENEFITS AS OF JANUARY 1, 2011

|  | Count of Beneficiaries |  |  | Current Monthly Benefits |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Age | Males | Females | Total | Males | Females | Total |
| Under 60 | 6 | 23 | 29 | 4,416 | 30,638 | 35,054 |
| 60-64 | 5 | 24 | 29 | 4,187 | 29,385 | 33,572 |
| 65-69 | 0 | 21 | 21 | 0 | 26,337 | 26,337 |
| 70-74 | 0 | 46 | 46 | 0 | 54,558 | 54,558 |
| 75-79 | 3 | 39 | 42 | 2,846 | 38,050 | 40,896 |
| 80-84 | 2 | 31 | 33 | 2,040 | 19,531 | 21,571 |
| 85-89 | 2 | 25 | 27 | 1,676 | 16,493 | 18,169 |
| Over 89 | 1 | 19 | 20 | 549 | 8,740 | 9,289 |
| Total | 19 | 228 | 247 | 15,714 | 223,732 | 239,446 |




## SCHEDULE IV

DEFERRED VESTED FORMER EMPLOYEES AS OF JANUARY 1, 2011

| Age | Count of Members |  |  | Expected Monthly Benefit |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Males | Females | Total | Males | Females | Total |
| Under 25 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25-29 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30-34 | 1 | 1 | 2 | 1,026 | 837 | 1,863 |
| 35-39 | 2 | 5 | 7 | 1,315 | 3,142 | 4,457 |
| 40-44 | 7 | 2 | 9 | 5,560 | 3,353 | 8,913 |
| 45-49 | 10 | 6 | 16 | 10,746 | 5,532 | 16,278 |
| 50-54 | 12 | 14 | 26 | 17,177 | 12,804 | 29,981 |
| 55-59 | 12 | 9 | 21 | 12,355 | 8,670 | 21,025 |
| Over 59 | 1 | 0 | 1 | 454 | 0 | 454 |
| Total | 45 | 37 | 82 | 48,633 | 34,338 | 82,971 |

## SCHEDULE V

## DISABLED PARTICIPANTS RECEIVING BENEFITS AS OF JANUARY 1, 2011

| Age | Count of Members |  |  | Current Monthly Benefit |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Males | Females | Total | Males | Females | Total |
| Under 25 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25-29 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30-34 | 0 | 0 | 0 | 0 | 0 | 0 |
| 35-39 | 1 | 0 | 1 | 1,612 | 0 | 1,612 |
| 40-44 | 3 | 0 | 3 | 6,514 | 0 | 6,514 |
| 45-49 | 11 | 1 | 12 | 19,563 | 1,319 | 20,882 |
| 50-54 | 20 | 4 | 24 | 34,607 | 7,459 | 42,066 |
| 55-59 | 18 | 6 | 24 | 32,750 | 9,995 | 42,745 |
| Over 59 | 47 | 9 | 56 | 63,993 | 8,444 | 72,437 |
| Total | 100 | 20 | 120 | 159,039 | 27,217 | 186,256 |

