GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

# OHIO STATE HIGHWAY PATROL RETIREMENT SYSTEM
# ANNUAL ACTUARIAL VALUATION REPORT
# DECEMBER 31, 2011

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August 31, 2012

The Retirement Board
Ohio State Highway Patrol Retirement System
Columbus, Ohio

Ladies and Gentlemen:

The results of the regular annual actuarial valuation as of December 31, 2011 of the Ohio State Highway Patrol Retirement System (HPRS), as established by Chapter 5505 of the Revised Code, are presented in this report.

The purposes of the valuation are as follows:

Measure the financial position of HPRS,
Assist the board in establishing employer and employee contribution rates necessary to fund the benefits provided by HPRS,
Determine the number of years required to amortize the pension unfunded actuarial accrued liabilities based upon established contribution rates,
Provide actuarial reporting and disclosure information for the System's financial report, and analyze the experience of the System over the past year.

This report was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the System only in its entirety and only with the permission of the Board.

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

Your Executive Director furnished the member statistical data required for the valuation, together with pertinent data on financial operations. We checked for internal and year-to-year consistency, but did not otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided.

Your attention is directed particularly to the summary of results, comments and recommendations on pages 3 through 7.

The actuarial calculations were performed in accordance with accepted actuarial procedures. The calculations were based upon provisions of the Retirement System described in Section A.

The financial assumptions used in making the valuations are shown in Section F of this report. Assumptions concerning future experience are needed for computing employer contribution rates. As time passes and actual experience develops, assumed and actual experiences are compared. From time to time one or more of the assumptions about the future are changed by the Board after consulting with the actuary. The assumptions used in performing the 2011 valuation were adopted by the Board in conjunction with a five year experience investigation for the period ending December 31, 2009.

The cooperation of the Executive Director and staff in furnishing materials requested for this valuation, and the complete and excellent condition of the records, is acknowledged with appreciation.

The signing actuaries are independent of the plan sponsor.

The actuaries submitting this report are Members of the American Academy of Actuaries (MAAA), and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,

Brian B. Murphy

Brian B. Murphy, FSA, MAAA

Mita Drazilov

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BBM:MDD

Ohio Revised Code Section 5505.15 provides in part as follows:

> (B) The state shall annually pay into the employer accumulation fund, in monthly or less frequent installments as the state highway patrol retirement board requires, the employer contribution. The employer contribution shall be an amount equal to twenty-six and one-half percent of the total salaries paid to contributing members.

Elsewhere, the Code provides that members shall contribute 10% of pay to the system. The purpose of this report is to provide information on the results of the December 31, 2011 actuarial valuation. That information will be helpful to the Board in forming an opinion on whether or not the statutory employer contribution rate of 26.50% of payroll, when combined with the 10.00% employee rate is sufficient to fund the Pension and Health Benefits provided by the system. The information will also help the Board determine whether or not any change should be made to the portion of the total contribution that is allocated to funding the health plan.

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The **total employer contribution rate** for the two-year period beginning July 1, 2013 is 26.50%, as established by the Board and Statute based upon the results of the December 31, 2011 actuarial valuation. Based upon preliminary December 31, 2011 actuarial valuation results, the Board at its August, 2012 meeting voted to continue to allocate 24.75% of payroll to the pension program. In addition, the figures in this report are based upon a continuation of the member rate at its present (10%) level, since legislation to increase the member rate by 1% has not yet been enacted. The breakdown between employer, employee, pension and health is shown below. This breakdown produces an infinite amortization period for pensions.

| | Contribution Rates Expressed As a % of Active Payroll | | |
|---|---|---|---|
| | Retirement, Survivor & Disability Allowances | Post Retirement Health Care | Totals |
| Employer | 24.75% | 1.75% | 26.50% |
| Employee | 10.00% | 0.00 % | 10.00% |
| Totals | 34.75% | 1.75% | 36.50% |

Items of significant importance for the December 31, 2011 actuarial valuation include:

1. The rate of market value investment return for the calendar year was less than the actuarial assumed investment return rate of 8.0%. The market value rate of return for calendar year 2011 was approximately (2.7)%. This figure will generally differ from other reported return figures due to restated audited asset figures, approximate formulas and treatment of System expenses. The funding value rate of return was also lower than the assumed investment return rate. The funding value rate of return for calendar year 2011 was approximately 3.1%.
2. The funding value of assets currently exceeds the market value of assets by approximately $23 million. (This is primarily due to the unrecognized portion of the investment loss from calendar year 2011.)
3. Experience in the retiree health plan was unfavorable this year, leading to a decrease of a few months in the projected solvency period.
4. In the December 31, 2008 valuation, it was reported that the then current contribution rates were not sufficient to fund the benefits in accordance with the statutory 30 year requirement. The Board subsequently developed a plan for restoring funding to 30 years and presented such plan to the legislature on September 9, 2009. The plan involved changes to the COLA provisions, changes in the member contribution rate, and a reallocation of contribution rate from the health plan to the pension plan. None of the changes in the plan have been enacted at the time of this writing. The effect of the changes is not included in this valuation.

**This valuation indicates that** a total employer contribution rate of 26.50% with an employee rate of 10.00% produces an infinite amortization period for the pension program, based upon a 1.75% employer rate allocation to the retiree health program and based upon the Funding Value of Assets. An infinite amortization period means that the unfunded actuarial accrued liability cannot be amortized given the contribution rate structure. If all assumptions are met exactly and contribution rates and benefit provisions continue at their present levels, both the pension program and the health program will run out of money.

## Comment on Post Retirement Health Care:

With regard to the retiree health plan, higher contributions are required to extend the solvency of the fund. The benefit payout rate is approximately 12% of payroll, approximately six times the contribution income. This situation cannot continue indefinitely. **Changes to the retiree health plan and/or further increases in contribution rates will need to be a part of the future.**

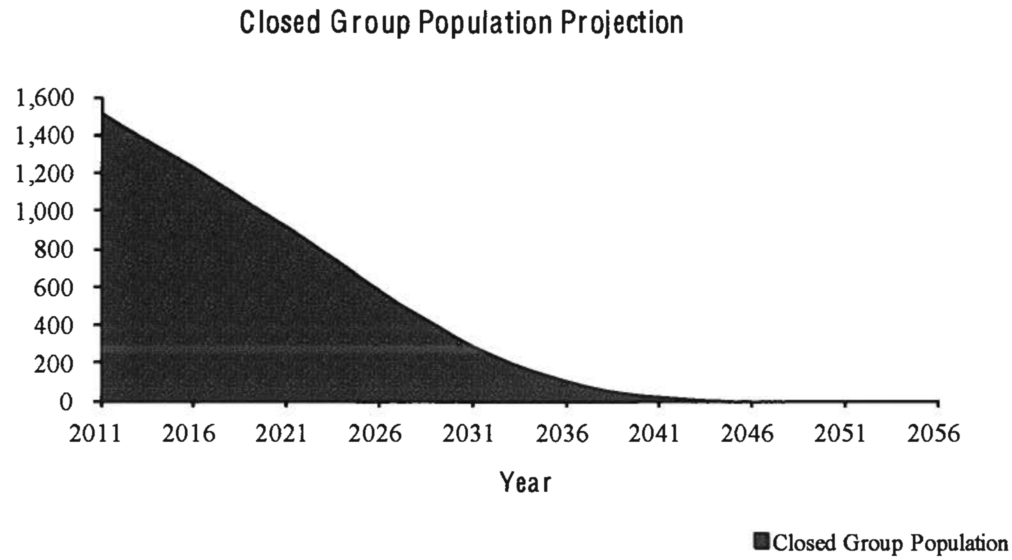
**Recommendation:** The following reserve transfers are recommended as of December 31, 2011:

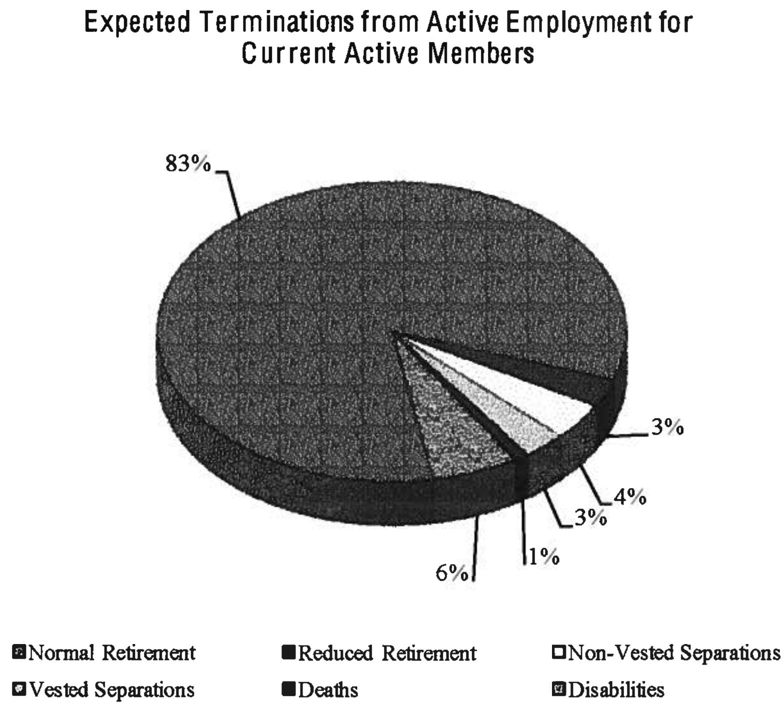
| Transfer To (From) | Total Amount |
|---|---|
| Pension Reserve Fund: | $181,312,276 |
| Survivor Benefit Fund: | 4,141,395 |
| Total | $185,453,671 |

The reserve funds from which the transfers are made are determined as follows: First, the accumulated contributions of members who retired or died with survivor benefits payable prior to January 1, 2012 should be transferred from the Employees' Savings Fund if this has not already been done. The remainder of the transfer should then be taken from the Income Fund or the Employer's Accumulation Fund, as the Board deems appropriate. The purpose of these transfers is to ensure that all pension benefits that have come into pay status since January 1, 1966 are fully funded by the appropriate reserve funds. Benefits effective prior to January 1, 1966 represent a closed group and are paid from the Employer Accumulation Fund.

**Conclusion:** Based upon the results of the December 31, 2011 regular annual actuarial valuation, in the absence of future actuarial gains, the Ohio State Highway Patrol Retirement System will require contribution increases or benefit changes to the pension program to successfully amortize the unfunded actuarial accrued liabilities over a 30-year period. With regard to the Retiree Health Plan, solvency to 2022 is a relatively unfavorable result, since most people presently near retirement will live beyond that date. In addition, given the volatility of health care costs, the Plan may become insolvent sooner than 2022. A combination of contribution increases and continued cost containment measures including plan redesign will be important for the Retiree Health Plan.

# EXPECTED DEVELOPMENT OF PRESENT POPULATION
# DECEMBER 31, 2011




The charts above show the expected future development of the present population in simplified terms. The retirement system presently covers 1,520 active members. Eventually, 4% of the population is expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. 89% of the present population is expected to receive monthly retirement benefits either by retiring directly from active service, or by separating from service without withdrawing contributions. 7% of the present population is expected to become eligible for death-in-service or disability benefits. Within 14 years, over half of the covered membership is expected to consist of new hires.

# SECTION A

## RETIREMENT, SURVIVOR, AND DISABILITY ALLOWANCES

# RETIREMENT, SURVIVOR, AND DISABILITY ALLOWANCES
# BENEFITS AND CONDITIONS VALUED
# DECEMBER 31, 2011

*Age & Service Pension*: A member may retire at age 52 to age 60, provided he has 20 or more years of service, or at age 48 with 25 or more years of contributing service. The member's pension equals the sum of 2-1/2% of final average salary (average of salaries during highest 3 years) times years of service not in excess of 20, 2-1/4% of final average salary times years of service in excess of 20 but not in excess of 25 and 2% of final average salary times years of service in excess of 25. The maximum pension payable is 79.25% of the member's final average salary. A member must retire upon attainment of age 60 or completion of 20 years of service, whichever occurs later.

*Reduced Retirement*: A member who has acquired at least 20 but less than 25 years of service and is between the ages of 48 and 52 is eligible to receive a Pension computed in the same manner as an Age & Service pension but reduced as follows:

| Age | Percent of Age & Service Pension |
|---|---|
| 48 | 75% |
| 49 | 80 |
| 50 | 86 |
| 51 | 93 |
| 52 | 100 |

*Deferred Pension*: A member who has acquired 20 years of service and retires is eligible to receive a pension computed in the same manner as an Age & Service Pension at the attainment of age 52. A reduced benefit is payable if the retirant elects to receive a benefit after age 48 and prior to age 52. The reduction is waived for members with 25 or more years of service. A member, who has acquired 15 years of service and who voluntarily resigns or is discharged, is eligible to receive a pension equal to 1-1/2% of final average salary multiplied by total service. The pension shall begin the first month after attainment of age 55, provided the member does not withdraw his accumulated contributions from the employees' savings fund.

*Disability Pension*:

A. **On-Duty:** A member who is permanently disabled with a duty-related injury is eligible to receive a pension that is the largest of (i) 61.25% of average final salary, or (ii) the Age & Service Pension.

B. **Off-Duty:** A member who is permanently disabled with a non-duty related injury or illness is eligible to receive a pension that is the larger of (i) 50% of average annual salary, or (ii) the Age & Service Pension.

*Survivor's Benefits*: The spouse of a deceased retirant (other than a deferred retirant) is eligible to receive a pension of $900 a month, or 50% of the computed monthly pension the retirant was receiving, whichever is greater. The surviving spouse of an active member or of a deferred retirant who *was not* yet eligible for an immediate pension benefit is eligible to receive a pension of $900 per month. The surviving spouse of an active member or of a deferred retirant who *was* eligible for an immediate pension benefit is eligible to receive $900 per month or 50% of the immediate benefit for which the retiree was eligible, whichever is greater. The benefit terminates upon death. Each surviving child of a deceased member or retirant is eligible for a pension of $150 a month until attainment of age 18, marriage, or death. The benefit may be continued to age 23 if the child is a full-time student. Each surviving child regardless of age, who was totally dependent upon the deceased member or retirant at his death because of physical or mental disability is eligible to receive a pension of $150 per month until his death or recovery from the disability. If there is no spouse or surviving children, each dependent parent is eligible to receive a pension of $154 a month. Additionally, a $5,000 lump sum benefit is payable upon the death of the retirant.

*Minimum Benefit*: All members who retired with an Age & Service Pension or Disability Benefit are eligible to receive a minimum benefit of $1,050 per month.

*Members' Contributions to the Fund*: Members contribute 10.0% of salary to the employees' savings fund. A member who leaves the employ of the State Highway Patrol before a benefit is payable may withdraw the accumulated contributions, without interest, in lieu of any other system provided benefit.

*State Contributions*: The state contributes the remaining amount necessary to finance the Retirement System on an actuarial basis. By statute, the state's contribution rate can be neither less than the member contribution rate, nor more than three times the member rate.

*Post-Retirement Increases*: The basic benefit for all retirants is increased by 3 percent each year after age 53. The retirant must have also been receiving monthly benefits for at least twelve months. Benefit recipients receiving survivor benefits are eligible for the increase after receiving benefits for twelve months. Benefit recipients receiving disability benefits are eligible for the increase after receiving benefits for sixty months or age 53 whichever occurs first.

*PLUS:* A qualified member may elect a partial lump sum benefit of not less than 6 times the monthly amount payable to the member as a single lifetime pension and not more than 60 times that amount.

*Deferred Retirement Option Program (DROP):* Members are eligible for a one-time election to "DROP in" upon attainment of unreduced retirement eligibility. The primary features of the DROP include:

a) During participation in the DROP, members continue to make contributions based upon the 10% member contribution rate. While participating in the DROP, 100% of members' contributions are deposited to their DROP account.

b) 100% of the member's computed benefit (based upon service and salary at time of DROP), including any scheduled 3% post-retirement increases, is credited to the member's DROP account.

c) The DROP account is credited with interest annually based upon a rate of return earned on a selected group of fixed income type investments (assumed to be 3% for actuarial valuation purposes).

*Deferred Retirement Option Program (DROP) (Continued):*

d) A member who "DROPs in" must stay in the DROP for a minimum period of time based on age at time of "DROPing in". A minimum participation period of 3 years for members who "DROP in" prior to age 52 and 2 years for members who "DROP in" on or after age 52. After a maximum of 8 years in the DROP program or attaining age 60, the member who entered the DROP program must retire.

e) If the member "DROPs in", the member's annual benefit when the member "DROPs out" (i.e. retires) is based upon the benefit calculations at time of the "DROP in", including any post-retirement increases that may have accrued during the DROP participation period.

f) If, during participation in the DROP, a member becomes disabled due to a duty related injury/illness, the member can choose to 1) have a disability pension benefit calculated based on the assumption that participation in the DROP did not occur, or 2) the member can elect to accept the age/service pension benefit achieved through DROP participation plus the accumulation in the DROP account. Duty disability benefit recipients will not suffer the loss of accumulated interest for early departure from the DROP.

g) Once a member elects to participate in the DROP, their contributions are committed for the minimum period (2 or 3 years). If the member voluntarily discontinues DROP participation prior to the minimum participation period, the member will not receive any interest accumulated in the DROP account but will receive all accumulated pension benefits and pension contributions deposited into the DROP account at the end of the minimum participation period.

# Sample Benefit Computation for Members

*Assumed data in connection with this sample retirement is shown below:*

| | Data | Description |
|---|---|---|
| A. | $40,000 | Final Average Compensation |
| B. | 27 | Years of Credited Service |
| C. | 50 | Age of Retirant |
| D. | 50% | Percentage to continue to spouse after retirant's death (this is automatic) |

## Sample Computation Steps

| | | |
|---|---|---|
| E. Benefit Formula: | 0.0250 x 20 x $40,000 = | $20,000 |
| | 0.0225 x 5 x $40,000 = | $4,500 |
| | 0.0200 x 2 x $40,000 = | $1,600 |
| | | $26,100 |

## Benefit Payable to:

| | |
|---|---|
| F. Retirant while spouse is alive (E) | $26,100 |
| G. Spouse after retirant's death (D x E) | $13,050 |
| H. Retirant after spouse's death (E) | $26,100 |

## Projected Benefits to Member

| Year Ended December 31 | Amount Payable |
|---|---|
| 2012 | $ 26,100 |
| 2013 | 26,100 |
| 2014 | 26,100 |
| 2015 | 26,883 |
| 2016 | 27,666 |
| 2017 | 28,449 |
| 2018 | 29,232 |
| 2019 | 30,015 |
| 2020 | 30,798 |

Benefits for years 2021 and later increase by $783 over the previous year's amount.

## Retirement Survivor & Disability Allowances
## Computed Employer Contributions To Support Benefits

| Contributions for | Contributions Expressed as Percents of Payroll | |
|---|---|---|
| Valuation Date - December 31 | 2011 | 2010 |
| Normal Cost: | | |
| Age & Service Benefits | 17.00% | 16.94% |
| Disability Benefits | 2.98% | 2.95% |
| Survivor Benefits | 0.20% | 0.20% |
| Separation Benefits | 0.87% | 0.88% |
| Purchase of Military Service | 0.75% | 0.75% |
| Total Normal Cost | 21.80% | 21.72% |
| Less Member Contributions | 10.00% | 10.00% |
| Employer Normal Cost | 11.80% | 11.72% |
| Unfunded Actuarial Accrued Liabilities | 12.95% | 13.03% |
| Amortization Period | N/A | N/A |
| PENSION EMPLOYER CONTRIBUTION RATE | 24.75% | 24.75% |

The amortization period is the period of years over which the employer contribution rate and the employee contribution rate will finance the unfunded liabilities.

# RETIREMENT, SURVIVOR, & DISABILITY ALLOWANCES
# METHOD OF FINANCING FUTURE BENEFITS FOR PRESENT ACTIVE MEMBERS
# DECEMBER 31, 2011

*Normal cost* and the allocation of present values between service rendered before and after the valuation date were determined using an individual entry-age actuarial cost method having the following characteristics:

(i) The annual normal costs for each individual active member, payable from the date of employment to the date of retirement, are sufficient to accumulate the value of the member's benefit at the time of retirement;

(ii) each annual normal cost is a constant percentage of the member's year-by-year projected covered pay.

*Actuarial Accrued Liabilities*, $1,047,699,686, less pension assets of $623,360,121 resulted in unfunded actuarial accrued liabilities of $424,339,565, which were amortized as a level percent of payroll over an infinite period. The characteristics of this method are illustrated on the following page. Actuarial accrued liabilities represent the portion of present values not covered by future normal cost contributions.

# Retirement, Survivor, and Disability Allowances Financing Unfunded Actuarial Accrued Liabilities Which Were Calculated Using an Inflation Assumption of 4.00% and an Investment Return Assumption of 8.00% Compounded Annually

## Level % of Payroll Amortization: Closed Amortization ($ Thousands)

| Year | Active Employee Payroll | Unfunded Actuarial Accrued Liability | Annual Contributions Dollars | Annual Contributions % of Payroll | UAAL as % of Payroll |
|---|---|---|---|---|---|
| | $ 96,852 | $ 424,340 | $ 12,542 | 12.95% | 438.1% |
| 1 | 100,726 | 445,253 | 13,044 | 12.95% | 442.0% |
| 2 | 104,755 | 467,317 | 13,566 | 12.95% | 446.1% |
| 3 | 108,945 | 490,604 | 14,108 | 12.95% | 450.3% |
| 4 | 113,303 | 515,190 | 14,673 | 12.95% | 454.7% |
| 5 | 117,835 | 541,157 | 15,260 | 12.95% | 459.2% |
| 6 | 122,548 | 568,591 | 15,870 | 12.95% | 464.0% |
| 7 | 127,450 | 597,586 | 16,505 | 12.95% | 468.9% |
| 8 | 132,548 | 628,241 | 17,165 | 12.95% | 474.0% |
| 9 | 137,850 | 660,662 | 17,852 | 12.95% | 479.3% |
| 10 | 143,364 | 694,963 | 18,566 | 12.95% | 484.8% |
| 11 | 149,099 | 731,266 | 19,308 | 12.95% | 490.5% |
| 12 | 155,063 | 769,701 | 20,081 | 12.95% | 496.4% |
| 13 | 161,266 | 810,409 | 20,884 | 12.95% | 502.5% |
| 14 | 167,717 | 853,538 | 21,719 | 12.95% | 508.9% |
| 15 | 174,426 | 899,250 | 22,588 | 12.95% | 515.5% |
| 16 | 181,403 | 947,716 | 23,492 | 12.95% | 522.4% |
| 17 | 188,659 | 999,120 | 24,431 | 12.95% | 529.6% |
| 18 | 196,205 | 1,053,660 | 25,409 | 12.95% | 537.0% |
| 19 | 204,053 | 1,111,547 | 26,425 | 12.95% | 544.7% |
| 20 | 212,215 | 1,173,009 | 27,482 | 12.95% | 552.7% |
| 21 | 220,704 | 1,238,290 | 28,581 | 12.95% | 561.1% |
| 22 | 229,532 | 1,307,651 | 29,724 | 12.95% | 569.7% |
| 23 | 238,713 | 1,381,373 | 30,913 | 12.95% | 578.7% |
| 24 | 248,262 | 1,459,757 | 32,150 | 12.95% | 588.0% |
| 25 | 258,192 | 1,543,126 | 33,436 | 12.95% | 597.7% |
| 26 | 268,520 | 1,631,829 | 34,773 | 12.95% | 607.7% |
| 27 | 279,261 | 1,726,238 | 36,164 | 12.95% | 618.1% |
| 28 | 290,431 | 1,826,754 | 37,611 | 12.95% | 629.0% |
| 29 | 302,048 | 1,933,808 | 39,115 | 12.95% | 640.2% |
| 30 | 314,130 | 2,047,863 | 40,680 | 12.95% | 651.9% |

An increasing "UAAL as a % of Payroll" indicates that the amortization payment is insufficient to amortize the unfunded actuarial accrued liability (UAAL) and the fund is expected to run out of money at some point. A decreasing "UAAL as a % of Payroll" indicates that the amortization payment is sufficient to amortize the UAAL. A level "UAAL as a % of Payroll" indicates that the amortization payment is sufficient only to pay the "real" interest on the UAAL.

# RETIREMENT, SURVIVOR, AND DISABILITY ALLOWANCES
# ACTUARIAL PRESENT VALUE OF FUTURE BENEFITS
# PRESENT RETIRED LIVES AND VESTED DEFERRED CASES
# DECEMBER 31, 2011

| Benefits Payable | Number | Monthly Amount | Actuarial Value |
|---|---|---|---|
| **From Employer Accumulation Fund:** | | | |
| Regular Retirements Effective Before 1/1/66 | 0 | $ 0 | $ 0 |
| Disability Retirements Effective Before 1/1/66 | 0 | 0 | 0 |
| Total Benefits Payable from Employer Accumulation Fund | 0 | 0 | 0 |
| **From Pension Reserve Fund:** | | | |
| Regular Retirements Effective After 1/1/66 | 1,087 | 3,654,953 | 532,591,226 |
| Disability Retirements Effective After 1/1/66 | 118 | 303,891 | 49,478,264 |
| Total Benefits Payable from Pension Reserve Fund | 1,205 | 3,958,844 | 582,069,490 |
| **From Survivor Benefit Fund:** | | | |
| Surviving Spouses, Dependent Children & Dependent Parents | 260 | 311,963 | 32,527,952 |
| Total Benefits Payable from Survivor Benefit Fund | 260 | 311,963 | 32,527,952 |
| Total Retirement Benefits Payable | 1,465 | 4,270,807 | 614,597,442 |
| Total Vested Deferred Benefits Payable | 14 | 36,909 | 4,386,631 |
| Grand Total | 1,479 | $ 4,307,716 | $ 618,984,073 |

# RETIREMENT, SURVIVOR, AND DISABILITY ALLOWANCES
# DEVELOPMENT OF ACTUARIAL ACCRUED LIABILITIES
# DECEMBER 31, 2011

| Actuarial Present Value, December 31, of | (1) Total Actuarial Present Value | (2) Portion Covered By Future Normal Cost Contributions | (3) Actuarial Accrued Liabilities (1) - (2) |
|---|---|---|---|
| Age & service allowances based on service rendered before and likely to be rendered after valuation date | $ 580,421,674 | $ 159,373,810 | $ 421,047,864 |
| Disability allowances likely to be paid to present active members who become totally and permanently disabled | 33,224,060 | 26,804,822 | 6,419,238 |
| Survivor benefits likely to be paid to spouses and children of present active members who die before retiring | 2,973,194 | 1,704,077 | 1,269,117 |
| Separation benefits (refunds of contributions and deferred allowances likely to be paid on behalf of present active members) | 7,600,118 | 7,620,724 | (20,606) |
| Retirement benefits likely to be paid to current retirants and beneficiaries and to present inactive members | 618,984,073 | 0 | 618,984,073 |
| Total | $ 1,243,203,119 | $ 195,503,433 | $ 1,047,699,686 |
| Member portion | 192,080,470 | 89,311,476 | 102,768,994 |
| Employer portion | $ 1,051,122,649 | $ 106,191,957 | $ 944,930,692 |

# Retirement, Survivor, and Disability Allowances
# Summary Statement of System Resources and Obligations
# December 31, 2011

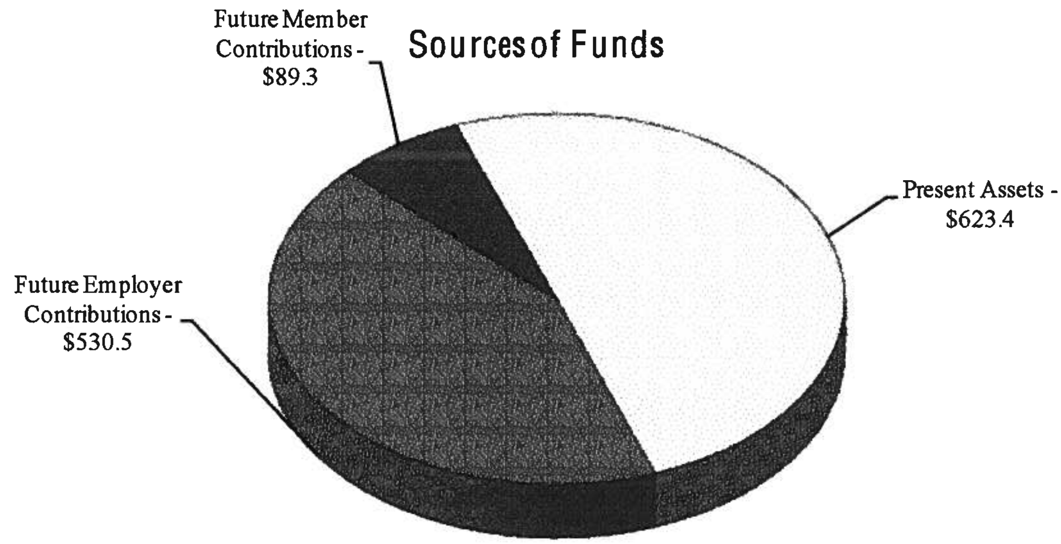
## Present Resources and Expected Future Resources

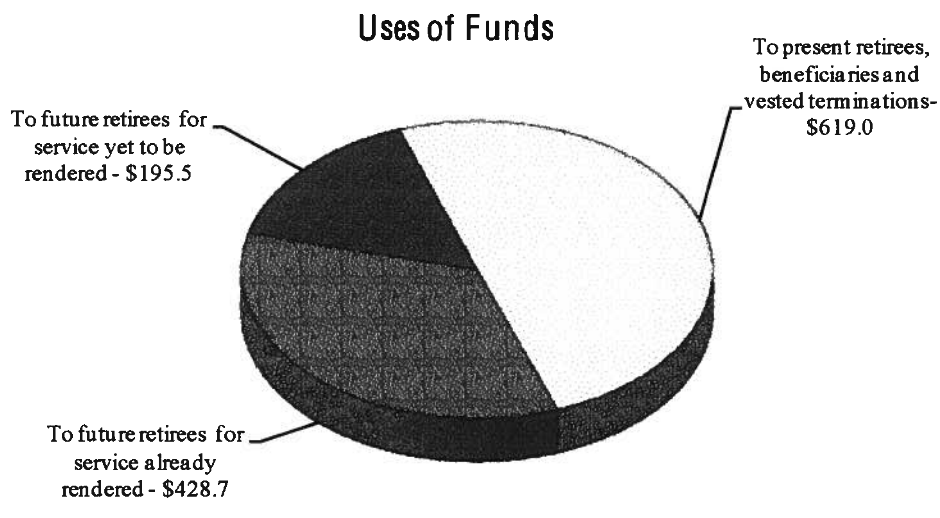
| | | |
|---|---|---|
| A. Present valuation assets | | |
| 1. Net assets from system financial statements | $ 699,257,968 | |
| 2. Market value adjustment | 23,103,909 | |
| 3. Health assets | 99,001,756 | |
| 4. Valuation assets: 1 + 2 - 3 | | $ 623,360,121 |
| B. Actuarial present value of expected future Employer contributions | | |
| 1. For normal costs | 106,191,957 | |
| 2. For unfunded actuarial accrued liability | 424,339,565 | |
| 3. Total | | 530,531,522 |
| C. Actuarial present value of expected future member contributions | | 89,311,476 |
| D. Total Present and Expected Future Resources | | $ 1,243,203,119 |

## Actuarial Present Value of Expected Future Benefit Payments

| | |
|---|---|
| A. To retirants and beneficiaries | $ 614,597,442 |
| B. To terminated members | 4,386,631 |
| C. To present active members | |
| 1. Allocated to service rendered prior to valuation date (actuarial accrued liability) | 428,715,613 |
| 2. Allocated to service likely to be rendered after valuation date | 195,503,433 |
| 3. Total | 624,219,046 |
| D. Total Actuarial Present Value of Expected Future Benefit Payments | $ 1,243,203,119 |

# RETIREMENT, SURVIVOR, AND DISABILITY ALLOWANCES
# FINANCING $1,243.2 MILLION OF BENEFIT PROMISES
# DECEMBER 31, 2011



# Retirement, Survivor, and Disability Allowances
## Comparative Statement

| Valuation Date | | Annual | Actuarial Accrued Liabilities | | | Unfunded/ | % | Funding |
|---|---|---|---|---|---|---|---|---|
| December 31 | No. | Payroll | Total | Funded | Unfunded | Payroll | Funded | Years |
| 1996 | 1,375 | $ 59,239,349 | $ 454,514,187 | $ 411,316,254 | $ 43,197,933 | 0.7 | 90.5% | 16 |
| 1997 | 1,445 | 62,233,299 | 487,392,406 | 460,667,112 | 26,725,294 | 0.4 | 94.5% | 9 |
| 1997 * | 1,445 | 62,233,299 | 496,917,335 | 460,667,112 | 36,250,223 | 0.6 | 92.7% | 17 |
| 1998 | 1,446 | 65,153,864 | 532,956,745 | 509,859,924 | 23,096,821 | 0.4 | 95.7% | 10 |
| 1999 | 1,445 | 66,017,381 | 564,672,560 | 546,510,779 | 18,161,781 | 0.3 | 96.8% | 7 |
| 1999 * | 1,445 | 66,017,381 | 577,010,085 | 546,510,779 | 30,499,306 | 0.5 | 94.7% | 20 |
| 2000 | 1,489 | 69,028,285 | 607,411,320 | 569,858,387 | 37,552,933 | 0.5 | 93.8% | 26 |
| 2000 # | 1,489 | 69,028,285 | 594,222,603 | 570,039,631 | 24,182,972 | 0.4 | 95.9% | 8 |
| 2001 | 1,520 | 76,344,002 | 636,715,458 | 551,279,438 | 85,436,020 | 1.1 | 86.6% | 31 |
| 2002 # | 1,548 | 78,997,065 | 668,605,932 | 492,430,826 | 176,175,106 | 2.2 | 73.7% | 32 |
| 2003 | 1,542 | 81,737,962 | 702,799,017 | 545,981,513 | 156,817,504 | 1.9 | 77.7% | 32 |
| 2004 | 1,562 | 81,757,707 | 737,867,378 | 569,858,387 | 168,008,991 | 2.1 | 77.2% | 37 |
| 2004 * | 1,562 | 81,757,707 | 734,464,371 | 569,858,387 | 164,605,984 | 2.0 | 77.6% | 34 |
| 2005 | 1,573 | 83,408,155 | 766,741,437 | 591,922,200 | 174,819,237 | 2.1 | 77.2% | 37 |
| 2005 # | 1,573 | 83,408,155 | 773,856,164 | 591,922,200 | 181,933,964 | 2.2 | 76.5% | 35 |
| 2006 * | 1,592 | 85,878,329 | 807,760,712 | 653,493,046 | 154,267,666 | 1.8 | 80.9% | 28 |
| 2007 | 1,597 | 93,752,908 | 866,255,394 | 700,860,707 | 165,394,687 | 1.8 | 80.9% | 27 |
| 2008 | 1,544 | 94,301,538 | 904,522,377 | 603,265,803 | 301,256,574 | 3.2 | 66.7% | N/A |
| 2009 | 1,547 | 94,824,789 | 940,084,346 | 620,356,505 | 319,727,841 | 3.4 | 66.0% | N/A |
| 2010 | 1,537 | 94,767,852 | 981,351,514 | 630,971,500 | 350,380,014 | 3.7 | 64.3% | N/A |
| 2010 # | 1,537 | 94,767,852 | 1,017,770,449 | 630,971,500 | 386,798,949 | 4.1 | 62.0% | N/A |
| 2011 | 1,520 | 93,126,449 | 1,047,699,686 | 623,360,121 | 424,339,565 | 4.6 | 59.5% | N/A |

* *Plan amended.*

\# *Revised actuarial assumptions or methods.*

While no one or two numeric indices can fully describe the financial condition of a retirement plan, *the ratio of unfunded actuarial accrued liabilities* ***to active member payroll ("Unfunded/Payroll" above) is significant***. Unfunded actuarial accrued liabilities represent a kind of debt, while active member payroll represents the Plan's capacity to collect contributions to pay toward debt --- thus *the ratio is a relative index of condition. The lower the ratio, the greater the financial strength, and vice-versa.*

## CHANGES IN AVERAGE PAY

| Year | Number of Members | Total Payroll | Average Pay | % Change from Prior Year in Average Pay | N.A.E.+ | CPI |
|---|---|---|---|---|---|---|
| 1997 | 1,445 | $62,233,299 | $43,068 | 0.0% | 5.8% | 1.7% |
| 1998 | 1,446 | 65,153,864 | 45,058 | 4.6% | 5.2% | 3.4% |
| 1999 | 1,445 | 66,017,381 | 45,687 | 1.4% | 5.6% | 2.7% |
| 2000 | 1,489 | 69,028,285 | 46,359 | 1.5% | 5.5% | 3.4% |
| 2001 | 1,520 | 76,344,002 | 50,226 | 8.3% | 2.4% | 1.6% |
| 2002 | 1,548 | 78,997,065 | 51,032 | 1.6% | 1.0% | 2.4% |
| 2003 | 1,542 | 81,737,962 | 53,008 | 3.9% | 2.4% | 1.9% |
| 2004 | 1,562 | 81,757,707 | 52,342 | (1.3)% | 4.6% | 3.3% |
| 2005 | 1,573 | 83,408,155 | 53,025 | 1.3% | 3.7% | 3.4% |
| 2006 | 1,592 | 85,878,329 | 53,944 | 1.7% | 4.6% | 2.6% |
| 2007 | 1,597 | 93,752,908 | 58,706 | 8.8% | 4.5% | 4.1% |
| 2008 | 1,544 | 94,301,538 | 61,076 | 4.0% | 2.3% | 0.1% |
| 2009 | 1,547 | 94,824,789 | 61,296 | 0.4% | (1.5)% | 2.7% |
| 2010 | 1,537 | 94,767,852 | 61,658 | 0.6% | 2.4% | 1.5% |
| 2011 | 1,520 | 93,126,449 | 61,267 | (0.6)% | 4.4% * | 3.0% |
| | | 10 Year Average | | 2.0% | 2.8% | 2.5% |

*+ National Average Earnings published by the Social Security Administration.*
** Estimated National Average Earnings published by the Social Security Administration.*

Over long periods of time, the change in average pay is an approximate measure of the impact of inflation and "Across the Board" pay increases on member pays. In years when the number of members decreases, the change in average pay may tend to be greater than actual pay increases experienced by members. In years when the number of members increases the change in average pay may tend to be less than actual pay increases experienced by members.

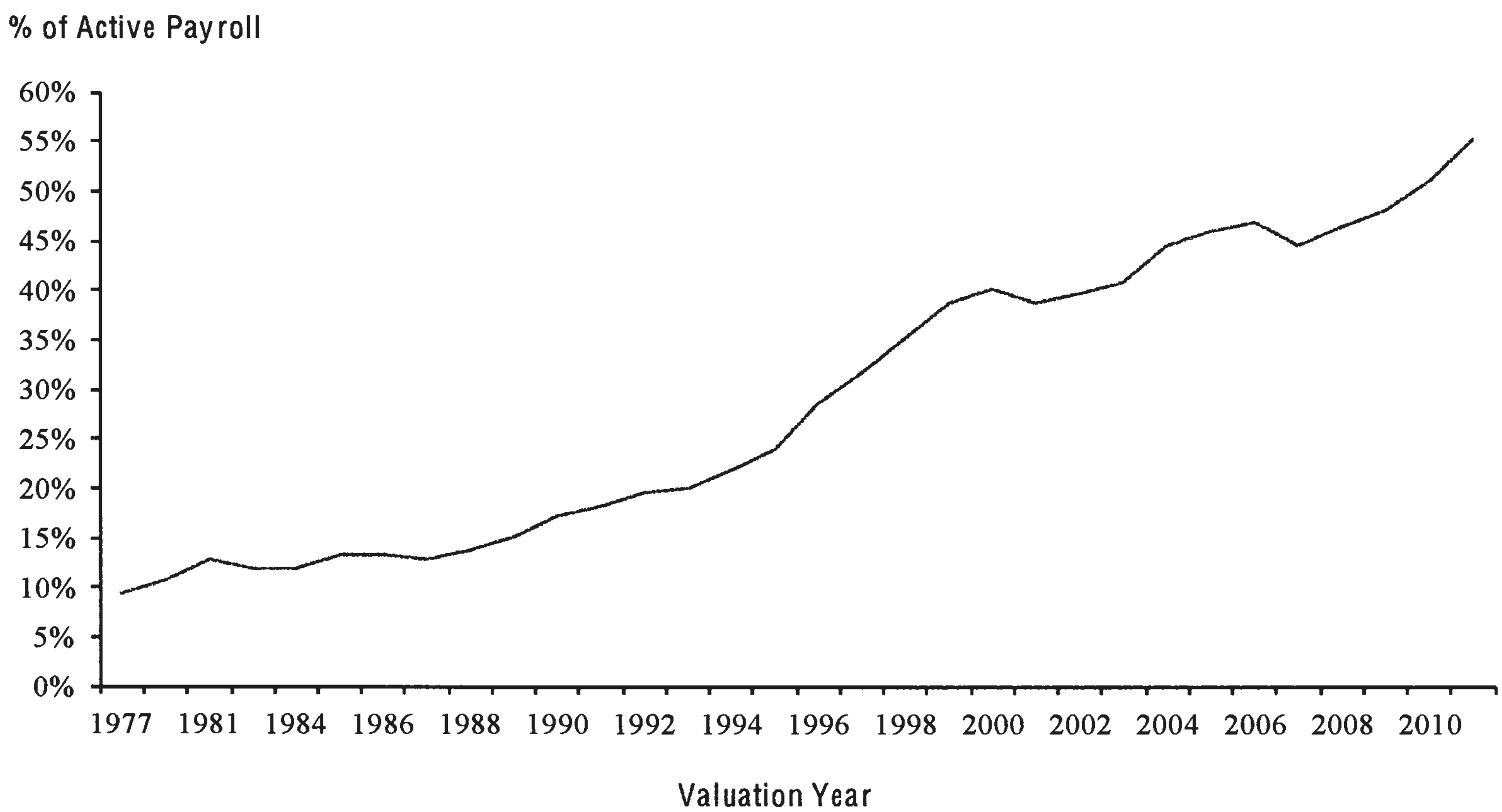
# RETIREMENT, SURVIVOR, AND DISABILITY BENEFITS IN PAY STATUS
## COMPARATIVE STATEMENT

| Valuation Date December 31 | Number of People | Monthly Pensions | Active Payroll | Average Amount | % of Active Member Pays |
|---|---|---|---|---|---|
| 1981 * | 445 | $ 250,287 | $ 23,539,234 | $ 562 | 12.8% |
| 1983 | 488 | 299,519 | 30,234,935 | 614 | 11.9% |
| 1984 | 504 | 319,789 | 32,020,914 | 635 | 12.0% |
| 1985 # | 530 | 359,208 | 32,500,428 | 678 | 13.3% |
| 1986 | 544 | 382,419 | 34,757,277 | 703 | 13.2% |
| 1987 *# | 558 | 427,132 | 39,938,921 | 765 | 12.8% |
| 1988 | 575 | 466,519 | 40,674,634 | 811 | 13.8% |
| 1989 | 599 | 544,631 | 43,053,057 | 909 | 15.2% |
| 1990 *# | 654 | 660,112 | 45,679,355 | 1,009 | 17.3% |
| 1991 | 675 | 732,576 | 48,488,406 | 1,085 | 18.1% |
| 1992 | 706 | 819,869 | 50,235,996 | 1,161 | 19.6% |
| 1993 * | 723 | 927,168 | 55,781,585 | 1,282 | 19.9% |
| 1994 # | 764 | 1,057,577 | 58,116,787 | 1,384 | 21.8% |
| 1995 *# | 826 | 1,184,405 | 59,825,356 | 1,434 | 23.8% |
| 1996 | 911 | 1,402,909 | 59,239,349 | 1,540 | 28.4% |
| 1997 * | 984 | 1,645,613 | 62,233,299 | 1,672 | 31.7% |
| 1998 | 1,060 | 1,914,091 | 65,153,864 | 1,806 | 35.3% |
| 1999 * | 1,123 | 2,123,471 | 66,017,381 | 1,891 | 38.6% |
| 2000 # | 1,174 | 2,300,464 | 69,028,285 | 1,960 | 40.0% |
| 2001 | 1,207 | 2,460,308 | 76,344,002 | 2,038 | 38.7% |
| 2002 | 1,231 | 2,603,108 | 78,997,065 | 2,115 | 39.5% |
| 2003 | 1,253 | 2,770,149 | 81,737,962 | 2,211 | 40.7% |
| 2004 | 1,282 | 3,023,341 | 81,757,707 | 2,358 | 44.4% |
| 2005 # | 1,301 | 3,177,731 | 83,408,155 | 2,443 | 45.7% |
| 2006 * | 1,337 | 3,341,805 | 85,878,329 | 2,499 | 46.7% |
| 2007 | 1,359 | 3,470,329 | 93,752,908 | 2,554 | 44.4% |
| 2008 | 1,371 | 3,628,092 | 94,301,538 | 2,646 | 46.2% |
| 2009 | 1,385 | 3,793,054 | 94,824,789 | 2,739 | 48.0% |
| 2010 # | 1,424 | 4,011,554 | 94,767,852 | 2,817 | 50.8% |
| 2011 | 1,465 | 4,270,807 | 93,126,449 | 2,915 | 55.0% |

* *Plan amended.*
\# *Revised actuarial assumptions or methods.*

Pensions expressed as a % of payroll exceed contribution income by a considerable margin. This is a normal and expected condition in a funded plan such as HPRS, but it does have implications for cash flow and investment planning.

# Retirement, Survivor, and Disability Allowances Being Paid Expressed as a % of Active Member Payroll December 31, 2011



## SHORT-TERM SOLVENCY TEST

The HPRS financing objective is to pay for the benefits through contributions that remain approximately level from year to year as a percent of member payroll. If the contributions to the system are level in concept and soundly executed, the system will *pay all promised benefits when due – the ultimate test of financial soundness.*

Short-term solvency test is one means of checking a system's progress under its funding program. In a short-term solvency test, the plan's present assets (cash and investments) are compared with: 1) Active member contributions on deposit; 2) The liabilities for future benefits to present retired lives; 3) The liabilities for service already rendered by active members. In a system that has been following the discipline of level percent financing, the liabilities for active member contributions on deposit (1) and the liabilities for future benefits to present retired lives (2) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by active members (3) will be partially covered by the remainder of the present assets. Generally, if the system has been using level cost financing, the funded portion of column 3 will increase over time.

### *Accrued Liabilities and Assets Allocated to Retirement, Survivor and Disability Allowances*

| Valuation Year | (1) Active Member Contributions | (2) Retirants, Beneficiaries & Vested Deferreds | (3) Active Members (Employer Financed Portion) | Valuation Assets | Portion of Accrued Liabilities Covered By Reported Assets (1) | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 1994 # | $47,947,979 | $156,363,745 | $169,695,043 | $330,787,044 | 100% | 100% | 75% |
| 1995 *# | 50,547,938 | 189,010,261 | 184,793,495 | 370,425,462 | 100% | 100% | 71% |
| 1996 | 52,297,873 | 218,164,080 | 184,052,234 | 411,316,254 | 100% | 100% | 77% |
| 1997 * | 53,264,614 | 260,095,357 | 183,557,364 | 460,667,112 | 100% | 100% | 80% |
| 1998 | 53,797,385 | 291,066,407 | 188,092,953 | 509,859,924 | 100% | 100% | 88% |
| 1999 * | 55,558,145 | 333,340,728 | 188,111,212 | 546,510,779 | 100% | 100% | 84% |
| 2000 # | 59,455,707 | 358,422,165 | 176,344,731 | 570,039,631 | 100% | 100% | 86% |
| 2001 | 63,969,216 | 374,228,361 | 198,517,881 | 551,279,438 | 100% | 100% | 57% |
| 2002 # | 68,794,904 | 391,098,788 | 203,176,113 | 527,604,456 | 100% | 100% | 33% |
| 2003 | 73,358,075 | 412,818,959 | 216,621,983 | 545,981,513 | 100% | 100% | 28% |
| 2004 * | 77,100,466 | 445,084,791 | 212,279,114 | 569,858,387 | 100% | 100% | 22% |
| 2005 # | 77,779,569 | 463,476,318 | 232,600,277 | 591,922,200 | 100% | 100% | 22% |
| 2006 * | 82,720,940 | 482,998,754 | 242,041,018 | 653,493,046 | 100% | 100% | 36% |
| 2007 | 89,279,853 | 509,179,659 | 267,795,882 | 700,860,707 | 100% | 100% | 38% |
| 2008 | 94,749,356 | 511,626,943 | 298,146,078 | 603,265,803 | 100% | 99% | 0% |
| 2009 | 101,131,517 | 528,087,050 | 310,865,779 | 620,356,505 | 100% | 98% | 0% |
| 2010 # | 104,503,065 | 583,714,389 | 329,552,995 | 630,971,500 | 100% | 90% | 0% |
| 2011 | 104,701,161 | 618,984,073 | 324,014,452 | 623,360,121 | 100% | 84% | 0% |

* *Plan amendment.*
\# *Assumption or method change.*

## SUMMARY OF UNFUNDED ACTUARIAL ACCRUED LIABILITIES

Each time a new benefit is added which applies to service already rendered, an "unfunded actuarial accrued liability" is created. Also, if actual financial experiences are less favorable than assumed financial experiences, the difference is added to unfunded actuarial accrued liabilities.

In an inflationary economy, the value of the dollar is decreasing. This environment results in employee pays increasing in dollar amounts resulting in unfunded actuarial accrued liabilities increasing in dollar amounts, all at a time when the actual substance of these items may be decreasing. Looking at just dollar amounts of unfunded actuarial accrued liabilities can be misleading. Unfunded actuarial accrued liabilities divided by active employee payroll provides an index, which aids understanding. The smaller ratio of unfunded liabilities to active member payroll, the stronger the system. Observation of this relative index over a period of years will give an indication of whether the system is becoming financially stronger or weaker.

### *Summary of Assets and Actuarial Accrued Liabilities for Retirement, Survivor, and Disability Allowances*

| Valuation Year | Actuarial Accrued Liability (AAL) | Valuation Assets | Unfunded Actuarial Accrued Liability (UAAL) | Ratio of Assets to AAL | Active Member Payroll | UAAL as a % of Active Member Payroll |
|---|---|---|---|---|---|---|
| 1996 | $454,514,187 | $411,316,254 | $43,197,933 | 90.5% | $59,239,349 | 72.9% |
| 1997 * | 496,917,335 | 460,667,112 | 36,250,223 | 92.7% | 62,233,299 | 58.2% |
| 1998 | 532,956,745 | 509,859,924 | 23,096,821 | 95.7% | 65,153,864 | 35.4% |
| 1999 * | 577,010,085 | 546,510,779 | 30,499,306 | 94.7% | 66,017,381 | 46.2% |
| 2000 # | 594,222,603 | 570,039,631 | 24,182,972 | 95.9% | 69,028,285 | 35.0% |
| 2001 | 636,715,458 | 551,279,438 | 85,436,020 | 86.6% | 76,344,002 | 111.9% |
| 2002 # | 663,069,805 | 527,604,456 | 135,465,349 | 79.6% | 78,997,065 | 171.5% |
| 2003 | 702,799,017 | 545,981,513 | 156,817,504 | 77.7% | 81,737,962 | 191.9% |
| 2004 * | 734,464,371 | 569,858,387 | 164,605,984 | 77.6% | 81,757,707 | 201.3% |
| 2005 # | 773,856,164 | 591,922,200 | 181,933,964 | 76.5% | 83,408,155 | 218.1% |
| 2006 * | 807,760,712 | 653,493,046 | 154,267,666 | 80.9% | 85,878,329 | 179.6% |
| 2007 | 866,255,394 | 700,860,707 | 165,394,687 | 80.9% | 93,752,908 | 176.4% |
| 2008 | 904,522,377 | 603,265,803 | 301,256,574 | 66.7% | 94,301,538 | 319.5% |
| 2009 | 940,084,346 | 620,356,505 | 319,727,841 | 66.0% | 94,824,789 | 337.2% |
| 2010 | 981,351,514 | 630,971,500 | 350,380,014 | 64.3% | 94,767,852 | 369.7% |
| 2010 # | 1,017,770,449 | 630,971,500 | 386,798,949 | 62.0% | 94,767,852 | 408.2% |
| 2011 | 1,047,699,686 | 623,360,121 | 424,339,565 | 59.5% | 93,126,449 | 455.7% |

* *Plan amendment.*
\# *Assumption or method change.*

The figures on this page do not include liabilities and assets related to post-retirement Health Care and Medicare reimbursement.

## GASB STATEMENT NO. 25
## SCHEDULE OF EMPLOYER CONTRIBUTIONS

| Year Ended December 31 | Actual Contributions | Percent of Required Contributed |
|---|---|---|
| 1999 | $13,569,730 | 100% |
| 2000 | 13,210,189 | 100% |
| 2001 | 13,901,313 | 100% |
| 2002 | 14,923,893 | 100% |
| 2003 | 16,361,339 | 100% |
| 2004 | 17,205,610 | 100% |
| 2005 | 18,467,789 | 100% |
| 2006 | 19,263,941 | 98% |
| 2007 | 19,956,700 | 92% |
| 2008 | 20,302,216 | 96% |
| 2009 | 20,453,914 | 102% |
| 2010 | 21,211,944 | 93% |
| 2011 | 22,966,338 | 85% |

This information is presented in draft form for review by the System's auditor. Please let us know if there are any changes so that we may maintain consistency with the System's financial statements.

The amounts reported in this schedule do not include contributions for post-employment Health Care benefits.

## GASB STATEMENT NO. 25
## ANNUAL REQUIRED CONTRIBUTION

For purposes of Governmental Accounting Standards Board (GASB) Statement No. 25, the System's Annual Required Contribution for the plan year December 31, 2012 will be ½ of the employer contribution for the period from July 1, 2011 to June 30, 2012 (29.50% of payroll, based upon an amortization period of 30 years) plus ½ of the employer contribution for the period from July 1, 2012 to June 30, 2013 (34.00% of payroll, based upon an amortization period of 30 years). The System's Annual Required Contribution for the plan year ending December 31, 2013 will be ½ of the employer contribution for the period from July 1, 2012 to June 30, 2013 (34.00% of payroll, based upon an amortization period of 30 years) plus ½ of the employer contribution for the period from July 1, 2013 to June 30, 2014 (36.68% of payroll, based upon an amortization period of 30 years).

# GASB Statement No. 25
# Notes to Trend Data

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

| | |
|---|---|
| Valuation Date | December 31, 2011 |
| Actuarial Cost Method | Entry Age |
| Amortization Method | Level Percent Open |
| Remaining Amortization Period | 30 years for retirement allowances in determining the Annual Required Contribution |
| Asset Valuation Method | 4 year smoothed market<br>20 % Corridor |
| Actuarial Assumptions: | |
| Investment Rate of Return | 8.0% |
| Projected Salary Increases | 4.3% - 14.0% |
| Includes Wage Inflation at | 4.0% |

# Other Requested CAFR Information

As of December 31, 2011, the actuarial present value of credited projected benefits for current employees is shown below:

| | Actuarial Present Value of Credited Projected Benefits |
|---|---|
| Current Employees | |
| Accumulated employee contributions including allocated investment income | $ 104,701,161 |
| Employer - financed vested | 208,653,733 |
| Employer - financed non-vested | 56,987,920 |

As of December 31, 2011, there were 634 vested active members and 886 non-vested active members.

# SECTION B

## POST-RETIREMENT HEALTH CARE AND MEDICARE REIMBURSEMENT

# POST-RETIREMENT HEALTH CARE AND MEDICARE REIMBURSEMENT PROVISIONS EVALUATED AND/OR CONSIDERED

## Benefits Provided

Since July 1, 1974, the Retirement System has made Health Care available for every benefit recipient and eligible dependents under a hospitalization and health care policy administered by Aetna Life & Casualty Company and Medical Mutual of Ohio. This Plan is secondary to Medicare or any other Health Care coverage. Depending on Medicare coverage, members are enrolled in either the fully-insured Medicare Advantage plan or the self-insured plan. Each year the Board establishes participant premium rates, any necessary co-payments for the retirant, spouse, or dependent children, and any other changes in plan design for the following calendar year. The premium for 2011 applicable to retirees without Medicare A & B is $39 per month and $10 for retirees with Medicare A & B. The premium for 2011 applicable to spouses without Medicare A & B is $97 per month and $15 for spouses with Medicare A & B. The dependent child premium is $22 for each child ($44 maximum per family).

Basic Plan coverage provides for payment of 100% of all reasonable and customary hospital expenses. All hospital admissions must be pre-certified prior to an elective admission. Emergency confinements require notification within 48 hours following admission. If a covered person is in a network area, he or she must use a preferred provider for the maximum benefit.

All other medical expenses are covered at the rate of 80% of reasonable and customary charges.

Designated surgical procedures require a second opinion. Designated outpatient procedures must be pre-certified. For in-network activity, the annual out-of-pocket maximum is $1,500 per individual or $1,500 per family (out of network amounts are $5,000 and $10,000, respectively). Each covered person not eligible for Medicare must meet a $25 annual deductible. Members in the insured Medicare Advantage plan do not have a deductible requirement. If the covered person is in a network area and uses non-network providers, the annual deductible for the individual is $1,500.

A mail-order prescription drug plan is also available. Each 90-day prescription submitted via mail order has a co-payment of $10.00 for generic, $30.00 for brands, and $90.00 for non-formulary drugs. Each 3-day prescription has a co-payment of $5.00 for generic, $15.00 for brands and $45.00 for non-formulary drugs.

# POST-RETIREMENT HEALTH CARE AND MEDICARE REIMBURSEMENT PROVISIONS EVALUATED AND/OR CONSIDERED (CONCLUDED)

**Administration:** The medical program is administered by the AETNA and Medical Mutual of Ohio for hospital-medical-surgical coverage and by ESI for retail/mail order prescription drug coverage.

**Stop Loss Coverage:** The non-Medicare population is fully self-insured and stop loss coverage is maintained.

**Medicare Premiums:** The Medicare Part B (no cap) basic premium amount is reimbursed to eligible benefit recipients upon proof of coverage.

**Dental/Vision:** Premiums for benefit recipients are deducted from benefit payments.

# POST-RETIREMENT HEALTH CARE AND MEDICARE REIMBURSEMENT

| Year | Covered Lives | Amounts Paid to Vendors (Including Medicare Part B) Medical | Drugs | Medicare Part B | Dental | Vision | Wellness | Total | Retiree/Spouse Premiums and Other Adjustments | Net Paid by OHPRS | Per Covered Life | Valuation Payroll | % of Payroll |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 | 697 | $ 427,361 | $ 60,015 | $ 28,272 | | | | $ 515,648 | | $ 515,648 | $ 740 | $ 32,500,428 | 1.6% |
| 1986 | 715 | 787,245 | 80,911 | 30,457 | | | | 898,613 | | 898,613 | 1,257 | 34,757,277 | 2.6% |
| 1987 | 731 | 559,832 | 115,544 | 38,037 | | | | 713,413 | | 713,413 | 976 | 39,938,912 | 1.8% |
| 1988 | 761 | 522,747 | 145,847 | 57,461 | | | | 726,055 | | 726,056 | 954 | 40,674,634 | 1.8% |
| 1989 | 810 | 1,043,650 | 186,795 | 77,869 | | | | 1,308,314 | $ 97,864 | 1,406,178 | 1,736 | 43,053,057 | 3.3% |
| 1990 | 925 | 1,009,153 | 213,716 | 77,363 | | | | 1,300,232 | (94,251) | 1,205,981 | 1,304 | 45,679,355 | 2.6% |
| 1991 | 976 | 1,267,327 | 251,004 | 86,740 | | | | 1,605,071 | 180,583 | 1,785,654 | 1,830 | 48,488,406 | 3.7% |
| 1992 | 1,045 | 1,643,276 | 298,493 | 97,117 | | | | 2,038,886 | 76,046 | 2,114,932 | 2,024 | 50,235,996 | 4.2% |
| 1993 | 1,081 | 1,553,628 | 299,410 | 118,109 | | | | 1,971,147 | (90,525) | 1,880,622 | 1,740 | 55,781,585 | 3.4% |
| 1994 | 1,133 | 1,239,008 | 320,360 | 141,384 | | | | 1,700,752 | 3,314 | 1,704,066 | 1,504 | 58,116,787 | 2.9% |
| 1995 | 1,225 | 1,512,523 | 364,096 | 149,440 | | | | 2,026,059 | (66,834) | 1,959,225 | 1,599 | 59,825,356 | 3.3% |
| 1996 | 1,379 | 1,353,932 | 491,525 | 155,769 | | | | 2,001,226 | 21,382 | 2,022,608 | 1,467 | 59,239,349 | 3.4% |
| 1997 | 1,499 | 1,623,640 | 849,321 | 166,743 | | | | 2,639,704 | (140,526) | 2,499,178 | 1,667 | 62,233,299 | 4.0% |
| 1998 | 1,602 | 2,147,334 | 1,122,248 | 171,223 | | | | 3,440,805 | (311,917) | 3,128,888 | 1,953 | 65,153,864 | 4.8% |
| 1999 | 1,772 | 3,315,914 | 1,364,990 | 197,606 | | | | 4,878,510 | 619,894 | 5,498,404 | 3,103 | 66,017,381 | 8.3% |
| 2000 | 1,848 | 3,190,885 | 1,684,300 | 203,157 | | | | 5,078,342 | (358,082) | 4,720,260 | 2,554 | 69,028,285 | 6.8% |
| 2001 | 1,900 | 3,730,167 | 1,960,825 | 231,046 | | | | 5,922,038 | 138,317 | 6,060,355 | 3,190 | 76,344,002 | 7.9% |
| 2002 | 1,943 | 4,147,534 | 2,431,297 | 260,772 | $194,893 | $80,909 | | 7,115,405 | (200,021) | 6,915,384 | 3,559 | 78,997,065 | 8.8% |
| 2003 | 1,912 | 4,256,046 | 2,681,414 | 290,506 | 209,429 | 82,097 | | 7,519,492 | (507,642) | 7,011,850 | 3,667 | 81,737,962 | 8.6% |
| 2004 | 1,928 | 4,074,972 | 2,710,367 | 347,585 | 230,994 | 84,136 | | 7,448,054 | (641,707) | 6,806,347 | 3,530 | 81,757,707 | 8.3% |
| 2005 | 1,958 | 6,015,277 | 2,980,755 | 422,045 | 364,139 | 124,658 | | 9,906,874 | (552,570) | 9,354,304 | 4,777 | 83,408,155 | 11.2% |
| 2006 | 2,078 | 4,999,822 | 2,832,743 | 503,034 | 408,667 | 127,266 | | 8,871,532 | (198,141) | 8,673,391 | 4,174 | 85,878,328 | 10.1% |
| 2007 | 2,085 | 6,580,455 | 3,513,662 | 572,127 | 464,402 | 130,029 | | 11,260,675 | (980,539) | 10,280,136 | 4,931 | 93,752,908 | 11.0% |
| 2008 | 2,103 | 5,087,073 | 3,274,896 | 632,293 | 453,002 | 121,599 | $ 79,679 | 9,648,542 | (784,381) | 8,864,161 | 4,215 | 94,301,538 | 9.4% |
| 2009 | 2,095 | 4,983,739 | 3,430,089 | 673,450 | 495,272 | 133,296 | 86,007 | 9,801,853 | (902,320) | 8,899,533 | 4,248 | 94,824,789 | 9.4% |
| 2010 | 2,166 | 6,380,294 | 3,709,855 | 713,317 | 453,276 | 133,141 | 57,747 | 11,447,630 | (911,076) | 10,536,554 | 4,865 | 94,767,852 | 11.1% |
| **2011** | **2,269** | **6,755,757** | **4,053,343** | **770,183** | **528,824** | **157,600** | **95,210** | **12,360,917** | **(1,268,402)** | **11,092,515** | **4,889** | **93,126,449** | **11.9%** |

Separate information for dental and vision was not available for years prior to 2002.


Historical Trend of Employer Paid Amounts
12.0%
10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
% of Payroll
1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011
Year

# Assumptions for Health Care Coverages
## December 31, 2011

*Development of Health Care Rates:* Based on the 2011 retired life data, the HPRS portion of the total health care rates was developed as follows:

| | Age/Gender Weighted HPRS Monthly Rates | | | |
|---|---|---|---|---|
| | This Year | | | Prior Year |
| | Gross Rate | Member Paid | Net Rate | Net Rate |
| A. One person without Medicare | $487.16 | $39.00 | $448.16 | $385.12 |
| B. One person with Medicare* | 175.86 | 10.00 | 165.86 | 169.68 |
| C. Two persons without Medicare | 974.32 | 136.00 | 838.32 | 712.24 |
| D. Two persons with Medicare* | 351.72 | 25.00 | 326.72 | 334.36 |
| E. Child | 104.14 | 22.00 | 82.14 | 53.00 |
| F. Medicare Part B Reimbursement | 96.40 | 0.00 | 96.40 | 96.40 |

** Does not include Medicare Part B monthly premium of $96.40.*

The above rates are estimates that are suitable for the purpose of this valuation. Use of the above rates for any other purpose would require review. Pre-Medicare rates are lower than would be expected when compared with other retired groups. This may be attributable to a higher than average amount of coordination of benefit claims for younger HPRS retirees. Many younger retirees likely have other employment. Please see page B-6 for age specific rates used for valuation purposes. Employment related primary coverage for recipients and dependents have been reflected in the age based specific premium rates.

# ASSUMPTIONS FOR HEALTH CARE COVERAGES
## AGE SPECIFIC HPRS MONTHLY GROSS RATES

| Age | Gross Rate | | Age | Gross Rate | | Age | Gross Rate | |
|---|---|---|---|---|---|---|---|---|
| | Male | Female | | Male | Female | | Male | Female |
| 16 | $ 123.77 | $ 193.10 | 51 | $ 339.04 | $ 374.85 | 86 | $ 346.88 | $ 304.31 |
| 17 | 125.01 | 195.03 | 52 | 361.80 | 391.46 | 87 | 348.45 | 304.89 |
| 18 | 126.26 | 196.98 | 53 | 385.24 | 409.09 | 88 | 348.45 | 304.89 |
| 19 | 127.52 | 198.95 | 54 | 409.55 | 427.51 | 89 | 348.45 | 304.89 |
| 20 | 128.80 | 200.94 | 55 | 434.67 | 446.68 | 90 | 348.45 | 304.89 |
| 21 | 130.09 | 202.95 | 56 | 460.56 | 466.58 | 91 | 348.45 | 304.89 |
| 22 | 131.39 | 204.98 | 57 | 487.16 | 487.16 | 92 | 348.45 | 304.89 |
| 23 | 132.70 | 207.03 | 58 | 512.61 | 505.34 | 93 | 348.45 | 304.89 |
| 24 | 134.03 | 209.10 | 59 | 538.43 | 523.89 | 94 | 348.45 | 304.89 |
| 25 | 135.37 | 211.19 | 60 | 564.55 | 542.76 | 95 | 348.45 | 304.89 |
| 26 | 136.72 | 213.30 | 61 | 590.91 | 561.91 | 96 | 348.45 | 304.89 |
| 27 | 138.09 | 215.43 | 62 | 617.41 | 581.28 | 97 | 348.45 | 304.89 |
| 28 | 139.47 | 217.59 | 63 | 643.65 | 601.14 | 98 | 348.45 | 304.89 |
| 29 | 140.87 | 219.76 | 64 | 669.86 | 621.12 | 99 | 348.45 | 304.89 |
| 30 | 142.27 | 221.96 | 65 | 241.79 | 222.66 | 100 | 348.45 | 304.89 |
| 31 | 143.70 | 224.18 | 66 | 249.59 | 228.50 | 101 | 348.45 | 304.89 |
| 32 | 145.13 | 226.42 | 67 | 257.23 | 234.25 | 102 | 348.45 | 304.89 |
| 33 | 146.59 | 228.69 | 68 | 264.68 | 239.90 | 103 | 348.45 | 304.89 |
| 34 | 148.05 | 230.97 | 69 | 271.91 | 245.42 | 104 | 348.45 | 304.89 |
| 35 | 149.53 | 233.28 | 70 | 278.90 | 250.79 | 105 | 348.45 | 304.89 |
| 36 | 151.03 | 235.62 | 71 | 285.64 | 255.99 | 106 | 348.45 | 304.89 |
| 37 | 152.54 | 237.97 | 72 | 292.09 | 261.01 | 107 | 348.45 | 304.89 |
| 38 | 154.06 | 240.35 | 73 | 298.26 | 265.83 | 108 | 348.45 | 304.89 |
| 39 | 155.60 | 242.75 | 74 | 304.11 | 270.43 | 109 | 348.45 | 304.89 |
| 40 | 157.16 | 245.18 | 75 | 309.63 | 274.79 | 110 | 348.45 | 304.89 |
| 41 | 168.34 | 253.11 | 76 | 314.81 | 278.90 | 111 | 348.45 | 304.89 |
| 42 | 180.58 | 261.74 | 77 | 319.65 | 282.75 | 112 | 348.45 | 304.89 |
| 43 | 193.89 | 271.12 | 78 | 324.13 | 286.33 | 113 | 348.45 | 304.89 |
| 44 | 208.28 | 281.27 | 79 | 328.24 | 289.63 | 114 | 348.45 | 304.89 |
| 45 | 223.76 | 292.20 | 80 | 331.99 | 292.63 | 115 | 348.45 | 304.89 |
| 46 | 240.33 | 303.93 | 81 | 335.36 | 295.34 | 116 | 348.45 | 304.89 |
| 47 | 257.98 | 316.48 | 82 | 338.37 | 297.74 | 117 | 348.45 | 304.89 |
| 48 | 276.69 | 329.85 | 83 | 341.02 | 299.84 | 118 | 348.45 | 304.89 |
| 49 | 296.46 | 344.03 | 84 | 343.31 | 301.63 | 119 | 348.45 | 304.89 |
| 50 | 317.25 | 359.04 | 85 | 345.26 | 303.12 | 120 | 348.45 | 304.89 |

*Eligibility for Medicare Coverage:* All benefit recipients were assumed to be eligible for Medicare on attainment of age 65.

*Health Care Inflation:* If the price for any product or service were to increase faster than wages for an indefinite period, eventually that product or service would be priced out of the market and either the product or service would not be offered or substituted with an affordable product or service. For this reason, health care inflation was assumed to equal wage inflation in the long term. The assumed point in time when health care inflation reduces to wage growth inflation is uncertain. Our assumptions are based on an approximate 5 to 10-year horizon. Short-term assumptions are described on page B-9.

Retiree health valuations require an assumption about how the health costs that the System is absorbing will change over the years. This assumption includes more than just "health inflation". It includes the impact of:

The introduction of new procedures and medications and how they are priced.

The utilization of services and products by covered retirees and their dependents and how that utilization changes over the years.

Retiree health valuations use a health cost trend assumption that changes over the years. The near term rates reflect the fact that currently employers are seeing sharp increases in the cost of health goods and services. If this trend is projected to continue for years to come, it implies that years from now virtually all our expenditures will be for health care. The seemingly more reasonable alternative is that in the not too distant future inflation in medical expenses will decrease to a level at or near wage inflation. It is on this basis that we project premium rates will continue to exceed wage inflation for the next 5 - 10 years, but by less each year until leveling off at an ultimate rate, assumed to be 4.0% in this valuation.

The trend assumption is established by reviewing the System's historical trends and evaluating their relationship with national trends. Comparative trends obtained from a variety of resources including trend surveys from major insurers and benefit consulting groups. This information is added to information we have collected from analysis done in conjunction with many retiree health valuations we have completed for other clients.

This analysis is done separately for the prescription drug program and the remainder of the medical benefits since the trends and forces driving the trends are quite different in these two segments. Review of the System's recent experience indicates trends typical of our comparative trends for both prescription drug and medical. The trends used in this valuation are found on page B-9.

# POST-RETIREMENT HEALTH PREMIUM AND MEDICARE REIMBURSEMENT SELECTION OF ASSUMPTIONS DECEMBER 31, 2011

In order to prepare actuarial studies of the coverages, it is necessary to make assumptions regarding future events such as:

1. When people will retire and how long people will live after retirement.
2. Whether or not people will quit employment prior to eligibility for a benefit.
3. Whether or not people will die in service or become disabled.
4. Rates of Investment Return and pay increases.
5. The proportion of retirees electing coverage for a spouse after retirement.
6. Rates of increase in health care premium.
7. Effect of managed care program on future claims.

Regarding items 1 through 4, the assumptions from the regular December 31, 2011 valuations were used. It was assumed that eligible retirees would elect coverage under this program. It was further assumed that 90% of males and 50% of females who retire would elect coverage for a spouse at retirement, and that coverage would be available to surviving spouses of deceased retirees and active members.

For purposes of the solvency projections, an investment return assumption of 8.0% was chosen by default to be the same rate used in the Pension Plan valuations. It is uncertain how much longer retiree health fund assets can be invested in the same manner as pension assets given the current solvency period of the retiree health fund. For purposes of GASB Statements No. 43 and No. 45 reporting, an investment return assumption of 5.0% was used. The rates of pay growth used in the Retirement System valuations are 4.00% per year. Stability can only be achieved if the rate of increase in Health Care premiums is brought in line with the rate of growth of employee pays. Consequently, it was assumed that average Health Care cost increases would eventually stabilize at 4.00% per year. Higher or lower rates of increase could, however be possible for an extended period before that happens.

# Post-Retirement Health Premium and Medicare Reimbursement Selection of Assumptions December 31, 2011

Three alternate assumptions for near term health care cost increases were considered and are shown below. A brief description of each of the alternate assumptions follows:

**Alternate A (Optimistic):** The Alternate A assumption assumes that the employer share of per capita costs would increase at 6% next year, 5.75% the second year, 5.5% the third year, 5.25% the fourth year, 5% the fifth year, 4.75% the sixth year, 4.5% the seventh year, 4.25% the eighth year and no faster than 4% per year thereafter.

**Alternate B (Intermediate):** In the middle of the range of probable conditions is the view that short-term Health Care trends will rise somewhat over the next few years before declining to the level of overall GDP growth. This is the assumption set upon which Governmental Accounting Standards Board (GASB) Statements No. 43 and No. 45 information is based.

**Alternate C (Pessimistic):** This scenario envisions poorer experience than the other two.

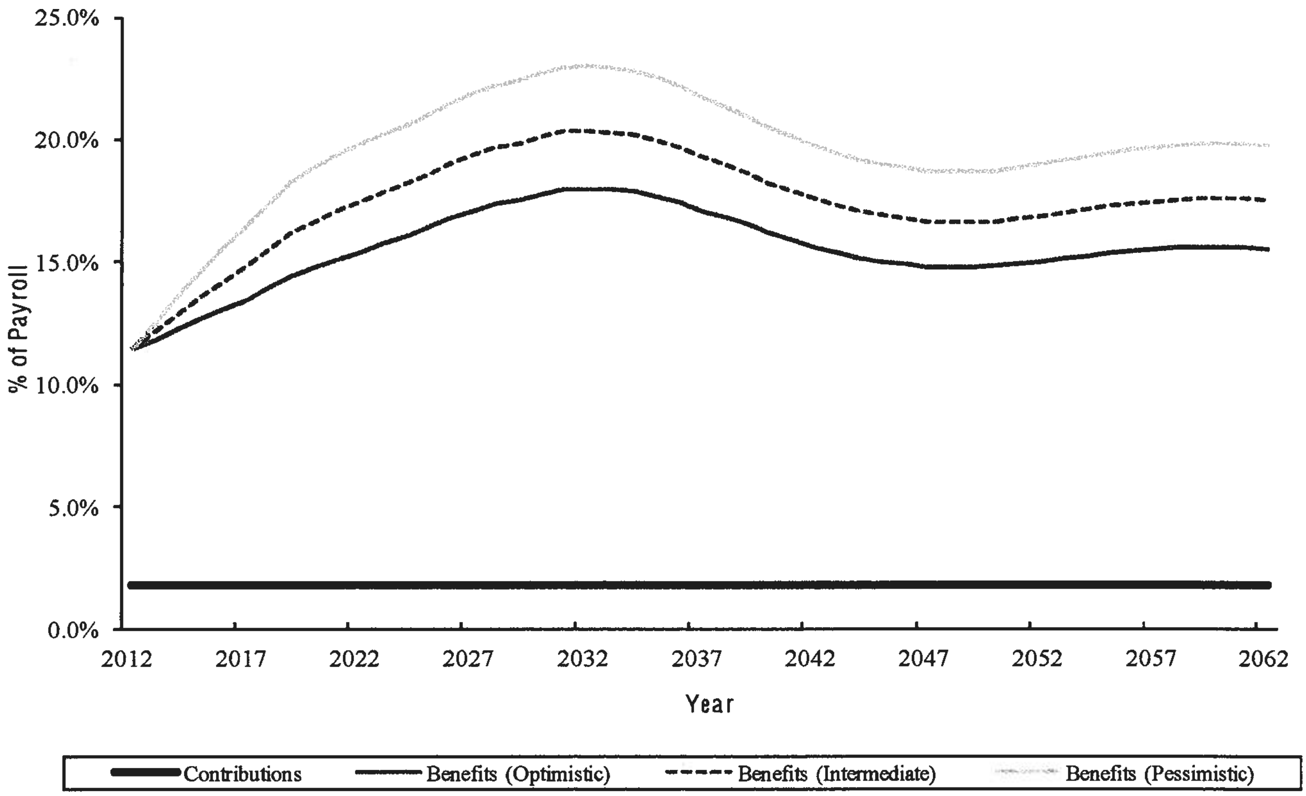
No trend was applied to the monthly member or spouse premium.

| | Health Trend Above Wage Inflation Assumption of 4.0% | | | |
|---|---|---|---|---|
| | Medical and Prescription Drug | | | Medicare |
| Year | Alt. A Optimistic | Alt. B Intermediate | Alt. C Pessimistic | Part B |
| 2012 | | | | |
| 2013 | 2.00% | 5.00% | 8.00% | 5.00% |
| 2014 | 1.75% | 4.25% | 7.00% | 4.25% |
| 2015 | 1.50% | 3.50% | 6.00% | 3.50% |
| 2016 | 1.25% | 3.00% | 5.00% | 3.00% |
| 2017 | 1.00% | 2.50% | 4.00% | 2.50% |
| 2018 | 0.75% | 2.00% | 3.00% | 2.00% |
| 2019 | 0.50% | 1.50% | 2.25% | 1.50% |
| 2020 | 0.25% | 1.00% | 1.50% | 1.00% |
| 2021 | 0.00% | 0.50% | 0.75% | 0.50% |
| 2022 | 0.00% | 0.00% | 0.00% | 0.00% |
| 2023 | 0.00% | 0.00% | 0.00% | 0.00% |
| 2024 | 0.00% | 0.00% | 0.00% | 0.00% |
| 2025 | 0.00% | 0.00% | 0.00% | 0.00% |
| 2026 & Later | 0.00% | 0.00% | 0.00% | 0.00% |

# POST-RETIREMENT HEALTH CARE AND MEDICARE REIMBURSEMENT
## PROJECTED BENEFITS
## DECEMBER 31, 2011

| Year Ended 12/31 | Projected Benefits as a % of Payroll | | |
|---|---|---|---|
| | Alt. A Optimistic | Alt. B Intermediate | Alt. C Pessimistic |
| 2012 | 11.4% | 11.4% | 11.4% |
| 2013 | 11.8% | 12.1% | 12.5% |
| 2014 | 12.2% | 12.9% | 13.5% |
| 2015 | 12.7% | 13.6% | 14.6% |
| 2016 | 13.0% | 14.2% | 15.6% |
| 2017 | 13.5% | 14.8% | 16.5% |
| 2018 | 13.9% | 15.5% | 17.4% |
| 2019 | 14.4% | 16.2% | 18.2% |
| 2020 | 14.7% | 16.7% | 18.8% |
| 2021 | 15.1% | 17.1% | 19.4% |
| 2026 | 16.7% | 19.0% | 21.4% |
| 2031 | 17.9% | 20.3% | 22.9% |
| 2036 | 17.4% | 19.7% | 22.2% |
| 2041 | 15.9% | 17.9% | 20.1% |
| 2046 | 14.9% | 16.7% | 18.8% |
| 2051 | 14.9% | 16.7% | 18.8% |
| 2056 | 15.4% | 17.4% | 19.6% |
| 2061 | 15.6% | 17.6% | 19.8% |

# CONTRIBUTIONS VS. BENEFIT PAYOUTS



# POST-RETIREMENT HEALTH CARE AND MEDICARE REIMBURSEMENT
# GASB 43/45 REPORTING
## ALTERNATIVE B: INTERMEDIATE HEALTH TREND

| Determination of the Annual Required Contribution for the Period July 1, 2012 to June 30, 2013 | Contributions Expressed as Percents of Payroll |
|---|---|
| Normal Cost | 12.87% |
| UAL Payment (30 year amortization) | 13.13% |
| Total (Annual Required Contribution) | 26.00% |
| Current Employer Contribution Rate Allocation | 1.75% |

Accrued Health and Medicare Reimbursement Liabilities, $424,143,941 were more than applicable assets of $99,001,756.

The calculations above show the employer's annual required contribution (ARC) for the year ended June 30, 2013. The System's ARC for the year ended December 31, 2012 will be ½ of 23.97% and ½ of the 26.00% shown above.

# GASB STATEMENTS 43/45
## NOTES TO TREND DATA

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

| | |
|---|---|
| Valuation Date | December 31, 2011 |
| Actuarial Cost Method | Entry Age |
| Amortization Method | Level Percent Open |
| Remaining Amortization Period | 30 years for retiree health benefits in determining the Annual Required Contribution |
| Asset Valuation Method | 4 year smoothed market<br>20 % Corridor |
| Actuarial Assumptions: | |
| Investment Rate of Return | 5.0% |
| Projected Salary Increases | 4.3% - 14.0% |
| Includes Wage Inflation at | 4.0% |
| Health Trend | Intermediate Trend (See Page B-9) |

# POST-RETIREMENT HEALTH AND MEDICARE REIMBURSEMENT RESULTS WITH ALTERNATE HEALTH INFLATION ASSUMPTIONS DECEMBER 31, 2011

Optimistic, Intermediate and Pessimistic assumption sets were described on page B-9. For each assumption set, two questions are asked.

**Question 1.** How long will the Health Care fund remain solvent if the present employer contribution rate allocation, "Funding Level 1", is not changed?

**Question 2.** What is the lowest employer contribution rate, "Funding Level 2", that would maintain the solvency of the fund indefinitely?

The answers to these questions are summarized below. In reviewing the answers, it is important to keep in mind that the alternates are intended to be helpful in understanding the range of potential outcomes. They are not predictions.

| | Funding Level 1 (Employer Rate Allocation) | | Funding Level 2 (Lowest Employer Rate to Maintain Solvency of Fund Indefinitely) | | |
|---|---|---|---|---|---|
| Assumption Set | % | Fund Solvent Until | % | Fund Solvent Until | Prior Valuation % |
| A (Optimistic) | 1.75% | 2023 | 11.00% | Indefinitely | 9.80% |
| B (Intermediate) | 1.75% | 2022 | 12.80% | Indefinitely | 11.40% |
| C (Pessimistic) | 1.75% | 2021 | 14.80% | Indefinitely | 13.20% |

The above results show that:

Under the optimistic assumptions, the employer rate will need to be raised prior to 2023 in order to maintain the solvency of the fund. The ultimate rate needed to support the plan would be 11.00% of payroll.

Under the intermediate assumptions, the employer rate will need to be raised prior to 2022 in order to maintain the solvency of the fund. The ultimate rate needed to support the plan would be 12.80% of payroll if the increase were made today.

Under the pessimistic assumptions, the employer rate will need to be raised prior to 2021 in order to maintain the solvency of the fund. The ultimate rate needed to support the plan would be 14.80% of payroll if the increase were made today.

The following pages show projected fund activity based upon Alternate Assumptions A, B and C, and Funding Levels 1 and 2.

# Post-Retirement Health Care & Medicare Reimbursement
## Cash Flow Projection
## Optimistic Assumptions: A
## Funding Level 1
## ($ In Thousands)

| Fiscal Year | Fund Balance BOY | Contributions | Benefits | Net | Investment Return % | Investment Return $ | Fund Balance EOY | | % of Payroll | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Nominal $ | Real $ | Contrib. | Benefits |
| 2012 | $99,002 | $1,690 | $ 11,029 | $ (9,339) | 8.00% | $7,551 | $97,214 | $97,214 | 1.75% | 11.42% |
| 2013 | 97,214 | 1,749 | 11,782 | (10,033) | 8.00% | 7,381 | 94,562 | 90,925 | 1.75% | 11.79% |
| 2014 | 94,562 | 1,812 | 12,643 | (10,831) | 8.00% | 7,137 | 90,868 | 84,013 | 1.75% | 12.21% |
| 2015 | 90,868 | 1,879 | 13,587 | (11,708) | 8.00% | 6,807 | 85,967 | 76,424 | 1.75% | 12.66% |
| 2016 | 85,967 | 1,948 | 14,522 | (12,574) | 8.00% | 6,381 | 79,774 | 68,191 | 1.75% | 13.05% |
| 2017 | 79,774 | 2,018 | 15,518 | (13,500) | 8.00% | 5,849 | 72,123 | 59,280 | 1.75% | 13.46% |
| 2018 | 72,123 | 2,089 | 16,618 | (14,529) | 8.00% | 5,196 | 62,790 | 49,624 | 1.75% | 13.92% |
| 2019 | 62,790 | 2,164 | 17,793 | (15,629) | 8.00% | 4,406 | 51,567 | 39,187 | 1.75% | 14.39% |
| 2020 | 51,567 | 2,242 | 18,871 | (16,629) | 8.00% | 3,469 | 38,407 | 28,064 | 1.75% | 14.73% |
| 2021 | 38,407 | 2,326 | 20,010 | (17,684) | 8.00% | 2,374 | 23,097 | 16,228 | 1.75% | 15.06% |
| 2022 | 23,097 | 2,412 | 21,210 | (18,798) | 8.00% | 1,105 | 5,404 | 3,651 | 1.75% | 15.39% |
| 2023 | 5,404 | 2,500 | 22,429 | (19,929) | 8.00% | (355) | (14,880) | (9,666) | 1.75% | 15.70% |

Funding Level 1 is the present contribution rate for post-retirement Health Care and Medicare reimbursement. The fund remains solvent until 2023 in this projection.

# POST-RETIREMENT HEALTH CARE & MEDICARE REIMBURSEMENT
## CASH FLOW PROJECTION
## OPTIMISTIC ASSUMPTIONS: A
## FUNDING LEVEL 2
## ($ In Thousands)

| Fiscal Year | Fund Balance BOY | Contributions | Benefits | Net | Investment Return % | Investment Return $ | Fund Balance EOY Nominal $ | Fund Balance EOY Real $ | % of Payroll Contrib. | % of Payroll Benefits |
|---|---|---|---|---|---|---|---|---|---|---|
| 2012 | $ 99,002 | $ 10,622 | $ 11,029 | $ (407) | 8.00% | $ 7,904 | $ 106,499 | $106,499 | 11.00% | 11.42% |
| 2013 | 106,499 | 10,991 | 11,782 | (791) | 8.00% | 8,489 | 114,197 | 109,805 | 11.00% | 11.79% |
| 2014 | 114,197 | 11,391 | 12,643 | (1,252) | 8.00% | 9,086 | 122,031 | 112,825 | 11.00% | 12.21% |
| 2015 | 122,031 | 11,809 | 13,587 | (1,778) | 8.00% | 9,692 | 129,945 | 115,521 | 11.00% | 12.66% |
| 2016 | 129,945 | 12,242 | 14,522 | (2,280) | 8.00% | 10,306 | 137,971 | 117,938 | 11.00% | 13.05% |
| 2017 | 137,971 | 12,683 | 15,518 | (2,835) | 8.00% | 10,926 | 146,062 | 120,052 | 11.00% | 13.46% |
| 2018 | 146,062 | 13,132 | 16,618 | (3,486) | 8.00% | 11,547 | 154,123 | 121,806 | 11.00% | 13.92% |
| 2019 | 154,123 | 13,601 | 17,793 | (4,192) | 8.00% | 12,164 | 162,095 | 123,179 | 11.00% | 14.39% |
| 2020 | 162,095 | 14,095 | 18,871 | (4,776) | 8.00% | 12,779 | 170,098 | 124,289 | 11.00% | 14.73% |
| 2021 | 170,098 | 14,619 | 20,010 | (5,391) | 8.00% | 13,395 | 178,102 | 125,132 | 11.00% | 15.06% |
| 2026 | 209,344 | 17,535 | 26,669 | (9,134) | 8.00% | 16,387 | 216,597 | 125,079 | 11.00% | 16.73% |
| 2031 | 242,067 | 21,416 | 34,908 | (13,492) | 8.00% | 18,833 | 247,408 | 117,430 | 11.00% | 17.93% |
| 2036 | 267,143 | 26,617 | 42,126 | (15,509) | 8.00% | 20,759 | 272,393 | 106,266 | 11.00% | 17.41% |
| 2041 | 299,355 | 32,935 | 47,521 | (14,586) | 8.00% | 23,372 | 308,141 | 98,806 | 11.00% | 15.87% |
| 2046 | 352,769 | 40,248 | 54,504 | (14,256) | 8.00% | 27,659 | 366,172 | 96,505 | 11.00% | 14.90% |
| 2051 | 426,818 | 48,782 | 65,972 | (17,190) | 8.00% | 33,467 | 443,095 | 95,984 | 11.00% | 14.88% |
| 2056 | 508,163 | 59,129 | 82,877 | (23,748) | 8.00% | 39,715 | 524,130 | 93,319 | 11.00% | 15.42% |
| 2061 | 586,901 | 71,901 | 101,775 | (29,874) | 8.00% | 45,772 | 602,799 | 88,214 | 11.00% | 15.57% |
| 2071 | 778,429 | 106,995 | 142,472 | (35,477) | 8.00% | 60,873 | 803,825 | 79,468 | 11.00% | 14.65% |
| 2081 | 1,073,555 | 158,104 | 211,738 | (53,634) | 8.00% | 83,767 | 1,103,688 | 73,713 | 11.00% | 14.73% |
| 2091 | 1,301,553 | 233,670 | 323,432 | (89,762) | 8.00% | 100,580 | 1,312,371 | 59,214 | 11.00% | 15.23% |
| 2101 | 1,274,423 | 346,642 | 468,203 | (121,561) | 8.00% | 97,154 | 1,250,016 | 38,102 | 11.00% | 14.86% |
| 2111 | 630,485 | 512,677 | 694,145 | (181,468) | 8.00% | 43,273 | 492,290 | 10,137 | 11.00% | 14.89% |

Funding Level 2 is the lowest funding level that will keep the fund solvent indefinitely, i.e., throughout the entire 100-year projection period assuming all assumptions are realized.

## Post-Retirement Health Care & Medicare Reimbursement
## Cash Flow Projection
## Intermediate Assumptions: B
## Funding Level 1
**($ In Thousands)**

| Fiscal Year | Fund Balance BOY | Contributions | Benefits | Net | Investment Return % | Investment Return $ | Fund Balance EOY | | % of Payroll | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Nominal $ | Real $ | Contrib. | Benefits |
| 2012 | $99,002 | $1,690 | $ 11,029 | $ (9,342) | 8.00% | $7,551 | $97,211 | $97,211 | 1.75% | 11.42% |
| 2013 | 97,211 | 1,749 | 12,121 | (10,372) | 8.00% | 7,367 | 94,206 | 90,583 | 1.75% | 12.13% |
| 2014 | 94,206 | 1,812 | 13,309 | (11,497) | 8.00% | 7,082 | 89,791 | 83,017 | 1.75% | 12.85% |
| 2015 | 89,791 | 1,879 | 14,561 | (12,682) | 8.00% | 6,683 | 83,792 | 74,491 | 1.75% | 13.56% |
| 2016 | 83,792 | 1,948 | 15,804 | (13,856) | 8.00% | 6,156 | 76,092 | 65,044 | 1.75% | 14.20% |
| 2017 | 76,092 | 2,018 | 17,107 | (15,089) | 8.00% | 5,492 | 66,495 | 54,654 | 1.75% | 14.84% |
| 2018 | 66,495 | 2,089 | 18,517 | (16,428) | 8.00% | 4,671 | 54,738 | 43,260 | 1.75% | 15.51% |
| 2019 | 54,738 | 2,164 | 19,998 | (17,834) | 8.00% | 3,675 | 40,579 | 30,837 | 1.75% | 16.17% |
| 2020 | 40,579 | 2,242 | 21,338 | (19,096) | 8.00% | 2,492 | 23,975 | 17,518 | 1.75% | 16.65% |
| 2021 | 23,975 | 2,326 | 22,712 | (20,386) | 8.00% | 1,113 | 4,702 | 3,304 | 1.75% | 17.09% |
| 2022 | 4,702 | 2,412 | 24,072 | (21,660) | 8.00% | (479) | (17,437) | (11,780) | 1.75% | 17.47% |

Funding Level 1 is the present contribution rate for post-retirement Health Care and Medicare reimbursement. The fund remains solvent until 2022 in this projection.

# Post-Retirement Health Care & Medicare Reimbursement
## Cash Flow Projection
## Intermediate Assumptions: B
## Funding Level 2
## ($ In Thousands)

| Fiscal Year | Fund Balance BOY | Contributions | Benefits | Net | Investment Return % | Investment Return $ | Fund Balance EOY Nominal $ | Fund Balance EOY Real $ | % of Payroll Contrib. | % of Payroll Benefits |
|---|---|---|---|---|---|---|---|---|---|---|
| 2012 | $ 99,002 | $ 12,360 | $ 11,029 | $ 1,328 | 8.00% | $ 7,973 | $ 108,303 | $108,303 | 12.80% | 11.42% |
| 2013 | 108,303 | 12,790 | 12,121 | 669 | 8.00% | 8,691 | 117,663 | 113,138 | 12.80% | 12.13% |
| 2014 | 117,663 | 13,255 | 13,309 | (54) | 8.00% | 9,411 | 127,020 | 117,437 | 12.80% | 12.85% |
| 2015 | 127,020 | 13,742 | 14,561 | (819) | 8.00% | 10,129 | 136,330 | 121,197 | 12.80% | 13.56% |
| 2016 | 136,330 | 14,246 | 15,804 | (1,558) | 8.00% | 10,845 | 145,617 | 124,474 | 12.80% | 14.20% |
| 2017 | 145,617 | 14,758 | 17,107 | (2,349) | 8.00% | 11,557 | 154,825 | 127,255 | 12.80% | 14.84% |
| 2018 | 154,825 | 15,281 | 18,517 | (3,236) | 8.00% | 12,258 | 163,847 | 129,491 | 12.80% | 15.51% |
| 2019 | 163,847 | 15,826 | 19,998 | (4,172) | 8.00% | 12,943 | 172,618 | 131,175 | 12.80% | 16.17% |
| 2020 | 172,618 | 16,402 | 21,338 | (4,936) | 8.00% | 13,615 | 181,297 | 132,472 | 12.80% | 16.65% |
| 2021 | 181,297 | 17,011 | 22,712 | (5,701) | 8.00% | 14,279 | 189,875 | 133,404 | 12.80% | 17.09% |
| 2026 | 223,152 | 20,404 | 30,216 | (9,812) | 8.00% | 17,465 | 230,805 | 133,284 | 12.80% | 18.96% |
| 2031 | 257,265 | 24,921 | 39,506 | (14,585) | 8.00% | 20,005 | 262,685 | 124,681 | 12.80% | 20.29% |
| 2036 | 282,518 | 30,972 | 47,565 | (16,593) | 8.00% | 21,946 | 287,871 | 112,305 | 12.80% | 19.66% |
| 2041 | 316,351 | 38,324 | 53,503 | (15,179) | 8.00% | 24,709 | 325,881 | 104,494 | 12.80% | 17.87% |
| 2046 | 375,237 | 46,834 | 61,269 | (14,435) | 8.00% | 29,449 | 390,251 | 102,851 | 12.80% | 16.75% |
| 2051 | 458,886 | 56,765 | 74,215 | (17,450) | 8.00% | 36,022 | 477,458 | 103,427 | 12.80% | 16.73% |
| 2056 | 552,456 | 68,804 | 93,386 | (24,582) | 8.00% | 43,226 | 571,100 | 101,682 | 12.80% | 17.37% |
| 2061 | 645,835 | 83,666 | 114,742 | (31,076) | 8.00% | 50,440 | 665,199 | 97,346 | 12.80% | 17.55% |
| 2071 | 890,129 | 124,503 | 160,431 | (35,928) | 8.00% | 69,792 | 923,993 | 91,349 | 12.80% | 16.49% |
| 2081 | 1,309,989 | 183,975 | 238,384 | (54,409) | 8.00% | 102,651 | 1,358,231 | 90,714 | 12.80% | 16.59% |
| 2091 | 1,787,826 | 271,907 | 364,367 | (92,460) | 8.00% | 139,375 | 1,834,741 | 82,783 | 12.80% | 17.15% |
| 2101 | 2,284,029 | 403,366 | 527,173 | (123,807) | 8.00% | 177,834 | 2,338,056 | 71,267 | 12.80% | 16.73% |
| 2111 | 2,774,086 | 596,569 | 781,599 | (185,030) | 8.00% | 214,621 | 2,803,677 | 57,733 | 12.80% | 16.77% |

Funding Level 2 is the lowest funding level that will keep the fund solvent indefinitely, i.e., throughout the entire 100-year projection period assuming all assumptions are realized.

# POST-RETIREMENT HEALTH CARE & MEDICARE REIMBURSEMENT
## CASH FLOW PROJECTION
## PESSIMISTIC ASSUMPTIONS: C
## FUNDING LEVEL 1
### ($ In Thousands)

| Fiscal Year | Fund Balance BOY | Contributions | Benefits | Net | Investment Return % | Investment Return $ | Fund Balance EOY | | % of Payroll | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Nominal $ | Real $ | Contrib. | Benefits |
| 2012 | $99,002 | $1,690 | $ 11,029 | $ (9,345) | 8.00% | $7,551 | $97,208 | $97,208 | 1.75% | 11.43% |
| 2013 | 97,208 | 1,749 | 12,462 | (10,713) | 8.00% | 7,354 | 93,849 | 90,239 | 1.75% | 12.47% |
| 2014 | 93,849 | 1,812 | 14,024 | (12,212) | 8.00% | 7,026 | 88,663 | 81,974 | 1.75% | 13.54% |
| 2015 | 88,663 | 1,879 | 15,686 | (13,807) | 8.00% | 6,548 | 81,404 | 72,368 | 1.75% | 14.61% |
| 2016 | 81,404 | 1,948 | 17,322 | (15,374) | 8.00% | 5,905 | 71,935 | 61,490 | 1.75% | 15.56% |
| 2017 | 71,935 | 2,018 | 18,992 | (16,974) | 8.00% | 5,085 | 60,046 | 49,353 | 1.75% | 16.47% |
| 2018 | 60,046 | 2,089 | 20,733 | (18,644) | 8.00% | 4,067 | 45,469 | 35,935 | 1.75% | 17.37% |
| 2019 | 45,469 | 2,164 | 22,534 | (20,370) | 8.00% | 2,833 | 27,932 | 21,226 | 1.75% | 18.23% |
| 2020 | 27,932 | 2,242 | 24,138 | (21,896) | 8.00% | 1,370 | 7,406 | 5,411 | 1.75% | 18.84% |
| 2021 | 7,406 | 2,326 | 25,738 | (23,412) | 8.00% | (332) | (16,338) | (11,479) | 1.75% | 19.37% |

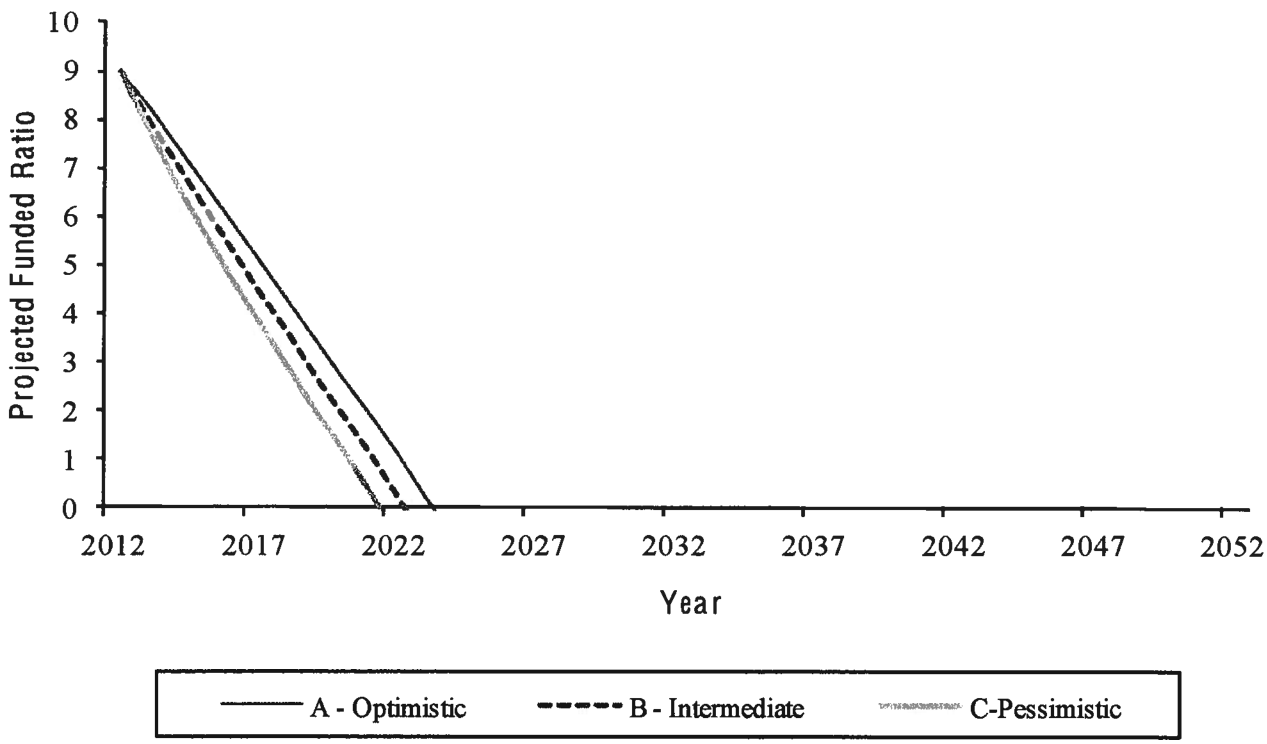
Funding Level 1 is the present contribution rate for post-retirement Health Care and Medicare reimbursement. The fund remains solvent until 2021 in this projection.

# Post-Retirement Health Care & Medicare Reimbursement
## Cash Flow Projection
## Pessimistic Assumptions: C
## Funding Level 2
## ($ In Thousands)

| Fiscal Year | Fund Balance BOY | Contributions | Benefits | Net | Investment Return % | Investment Return $ | Fund Balance EOY Nominal $ | Fund Balance EOY Real $ | % of Payroll Contrib. | % of Payroll Benefits |
|---|---|---|---|---|---|---|---|---|---|---|
| 2012 | $ 99,002 | $ 14,292 | $ 11,029 | $ 3,257 | 8.00% | $ 8,049 | $ 110,308 | $ 110,308 | 14.80% | 11.43% |
| 2013 | 110,308 | 14,788 | 12,462 | 2,326 | 8.00% | 8,916 | 121,550 | 116,875 | 14.80% | 12.47% |
| 2014 | 121,550 | 15,326 | 14,024 | 1,302 | 8.00% | 9,775 | 132,627 | 122,621 | 14.80% | 13.54% |
| 2015 | 132,627 | 15,889 | 15,686 | 203 | 8.00% | 10,618 | 143,448 | 127,525 | 14.80% | 14.61% |
| 2016 | 143,448 | 16,472 | 17,322 | (850) | 8.00% | 11,442 | 154,040 | 131,674 | 14.80% | 15.56% |
| 2017 | 154,040 | 17,064 | 18,992 | (1,928) | 8.00% | 12,247 | 164,359 | 135,091 | 14.80% | 16.47% |
| 2018 | 164,359 | 17,668 | 20,733 | (3,065) | 8.00% | 13,028 | 174,322 | 137,769 | 14.80% | 17.37% |
| 2019 | 174,322 | 18,299 | 22,534 | (4,235) | 8.00% | 13,779 | 183,866 | 139,723 | 14.80% | 18.23% |
| 2020 | 183,866 | 18,964 | 24,138 | (5,174) | 8.00% | 14,505 | 193,197 | 141,167 | 14.80% | 18.84% |
| 2021 | 193,197 | 19,669 | 25,738 | (6,069) | 8.00% | 15,216 | 202,344 | 142,164 | 14.80% | 19.37% |
| 2026 | 237,550 | 23,592 | 34,183 | (10,591) | 8.00% | 18,586 | 245,545 | 141,796 | 14.80% | 21.44% |
| 2031 | 272,582 | 28,815 | 44,650 | (15,835) | 8.00% | 21,181 | 277,928 | 131,916 | 14.80% | 22.93% |
| 2036 | 297,068 | 35,812 | 53,649 | (17,837) | 8.00% | 23,061 | 302,292 | 117,931 | 14.80% | 22.17% |
| 2041 | 331,258 | 44,312 | 60,193 | (15,881) | 8.00% | 25,874 | 341,251 | 109,423 | 14.80% | 20.10% |
| 2046 | 394,067 | 54,152 | 68,837 | (14,685) | 8.00% | 30,945 | 410,327 | 108,143 | 14.80% | 18.81% |
| 2051 | 485,170 | 65,635 | 83,436 | (17,801) | 8.00% | 38,111 | 505,480 | 109,497 | 14.80% | 18.81% |
| 2056 | 587,519 | 79,555 | 105,142 | (25,587) | 8.00% | 45,991 | 607,923 | 108,238 | 14.80% | 19.56% |
| 2061 | 689,999 | 96,739 | 129,249 | (32,510) | 8.00% | 53,916 | 711,405 | 104,108 | 14.80% | 19.77% |
| 2071 | 966,515 | 143,957 | 180,520 | (36,563) | 8.00% | 75,877 | 1,005,829 | 99,439 | 14.80% | 18.56% |
| 2081 | 1,467,299 | 212,721 | 268,190 | (55,469) | 8.00% | 115,194 | 1,527,024 | 101,987 | 14.80% | 18.66% |
| 2091 | 2,096,986 | 314,392 | 410,158 | (95,766) | 8.00% | 163,977 | 2,165,197 | 97,693 | 14.80% | 19.31% |
| 2101 | 2,901,403 | 466,392 | 593,141 | (126,749) | 8.00% | 227,107 | 3,001,761 | 91,497 | 14.80% | 18.82% |
| 2111 | 4,059,060 | 689,783 | 879,429 | (189,646) | 8.00% | 317,236 | 4,186,650 | 86,212 | 14.80% | 18.87% |

Funding Level 2 is the lowest funding level that will keep the fund solvent indefinitely, i.e., throughout the entire 100-year projection period assuming all assumptions are realized.

# POST-RETIREMENT HEALTH CARE & MEDICARE REIMBURSEMENT PROJECTED FUNDING RATIOS BASED ON 1.75% EMPLOYER CONTRIBUTION RATE DECEMBER 31, 2011




The *funding ratio* is the ratio of the fund balance at the beginning of the year to the projected benefit payout during the year. It is one measure of the Plan's ability to pay benefits. A funding ratio on the order of about 15 to 25 is expected in a plan that is funding health care payouts as a level percentage of payroll. Given the experience of the last several years, very few, if any plans, are likely to be able to report such a funded ratio.

# APPROXIMATE IRC SECTION 401(h) COMPUTATION
## ($ IN THOUSANDS)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| | Covered | Pension | | | Health | | Sum of | Sum of | IRC Ratio |
| Year | Pay | EANC % | PUCNC % | PUCNC $ | Contribution | (4) + (5) | (5) | (6) | (7) / (8) |
| 1990 | $45,640 | 22.75% | 23.66% | $ 10,798.4 | $1,835.5 | $12,633.9 | $ 8,761.7 | $ 63,353.5 | 13.8% |
| 1991 | 48,586 | 22.15% | 23.04% | 11,194.2 | 2,165.1 | 13,359.3 | 10,926.8 | 76,712.8 | 14.2% |
| 1992 | 50,255 | 22.15% | 23.04% | 11,578.8 | 2,542.7 | 14,121.5 | 13,469.5 | 90,834.3 | 14.8% |
| 1993 | 54,715 | 22.36% | 23.25% | 12,721.2 | 2,563.5 | 15,284.7 | 16,033.0 | 106,119.0 | 15.1% |
| 1994 | 58,341 | 22.36% | 23.25% | 13,564.3 | 3,053.4 | 16,617.7 | 19,086.4 | 122,736.7 | 15.6% |
| 1995 | 56,833 | 23.79% | 24.74% | 14,060.5 | 3,122.0 | 17,182.5 | 22,208.4 | 139,919.2 | 15.9% |
| 1996 | 60,909 | 23.79% | 24.74% | 15,068.9 | 2,860.8 | 17,929.7 | 25,069.2 | 157,848.9 | 15.9% |
| 1997 | 61,714 | 24.47% | 25.45% | 15,706.2 | 2,548.8 | 18,255.0 | 27,618.0 | 176,103.9 | 15.7% |
| 1998 | 65,848 | 24.45% | 25.55% | 16,824.2 | 2,719.5 | 19,543.7 | 30,337.5 | 195,647.6 | 15.5% |
| 1999 | 69,030 | 24.96% | 26.08% | 18,003.0 | 3,278.9 | 21,281.9 | 33,616.4 | 216,929.5 | 15.5% |
| 2000 | 68,505 | 24.96% | 26.08% | 17,866.1 | 3,254.0 | 21,120.1 | 36,870.4 | 238,049.6 | 15.5% |
| 2001 | 74,140 | 23.10% | 23.63% | 17,519.3 | 3,521.7 | 21,041.0 | 40,392.1 | 259,090.6 | 15.6% |
| 2002 | 79,594 | 23.14% | 23.71% | 18,871.7 | 3,780.7 | 22,652.4 | 44,172.8 | 281,743.0 | 15.7% |
| 2003 | 80,641 | 21.88% | 22.72% | 18,321.6 | 3,395.7 | 21,717.3 | 47,568.5 | 303,460.3 | 15.7% |
| 2004 | 81,931 | 21.91% | 22.83% | 18,704.8 | 2,867.6 | 21,572.4 | 50,436.1 | 325,032.7 | 15.5% |
| 2005 | 85,828 | 21.68% | 22.59% | 19,388.5 | 3,006.4 | 22,394.9 | 53,442.5 | 347,427.6 | 15.4% |
| 2006 | 87,563 | 20.99% | 21.83% | 19,115.0 | 3,384.8 | 22,499.8 | 56,827.3 | 369,927.4 | 15.4% |
| 2007 | 95,032 | 20.78% | 21.92% | 20,831.0 | 4,575.1 | 25,406.1 | 61,402.4 | 395,333.5 | 15.5% |
| 2008 | 93,029 | 20.81% | 21.89% | 20,364.0 | 4,668.0 | 25,032.0 | 66,070.4 | 420,365.5 | 15.7% |
| 2009 | 93,339 | 21.21% | 22.92% | 21,393.3 | 4,794.7 | 26,188.0 | 70,865.1 | 446,553.5 | 15.9% |
| 2010 | 92,226 | 21.23% | 23.25% | 21,445.7 | 3,699.8 | 25,145.5 | 74,564.9 | 471,699.0 | 15.8% |
| 2011 | 92,790 | 21.72% | 24.03% | 22,297.8 | 2,418.4 | 24,716.2 | 76,983.3 | 496,415.2 | 15.5% |

The approximate computations above indicate compliance with IRC Section 401(h) because the ratio in column 9 is below 25%.

The ratio in column 9 would appear lower if the computations were extended farther into the past.

# SECTION C
## GAIN/LOSS ANALYSIS

# GAIN/(LOSS) ANALYSIS

*Purpose of Gain/Loss Analysis.* Regular actuarial valuations provide information about the composite change in unfunded actuarial accrued liabilities -- whether or not the liabilities are increasing or decreasing, and by how much.

However, valuations do not show the portion of the change attributable to each risk area within the Retirement System: the rate of investment income on plan assets; the rates of withdrawal of active members who leave covered employment; the rates of mortality; the rates of disability; the rates of salary increases; the assumed ages at actual retirement. In an actuarial valuation, assumptions are made as to what these rates will be for the next year and for decades in the future.

*The objective of a gain and loss analysis is to determine the portion of the change in unfunded actuarial accrued liabilities attributable to each risk area.*

The fact that actual experience differs from assumed experience is to be expected. The future cannot be predicted with precision. Changes in the valuation assumption for a risk area should be made when the differences between assumed and actual experience have been observed to be sizable and persistent. One year's gain and loss analysis may or may not be indicative of *long-term trends, which are the basis of financial assumptions.*

# Development of Total Gain/(Loss)
## January 1, 2011 to December 31, 2011

| | |
|---|---|
| Unfunded Accrued Liabilities (UAL), January 1 | $386,798,949 |
| Normal Cost | 21,128,782 |
| Contributions | 31,055,251 |
| Interest | 30,546,857 |
| Expected UAL Before Any Changes | 407,419,337 |
| Effect of Changes in Assumptions | 0 |
| Expected UAL After All Changes | 407,419,337 |
| Actual UAL | 424,339,565 |
| Gain/(Loss) for Year from Financial Experience | $ (16,920,228) |

This page measures the actual gain or loss for the year after adjusting for the effect of benefit and assumption changes.

# Analysis of Financial Experience for the Year Ended December 31, 2011 and 2010

*Gains and Losses in Pension Accrued Liabilities Resulting from Differences Between Assumed Experience and Actual Experience*

| Type of Activity | Gain or (Loss) for Year Ended 12/31 2011 | 2010 |
|---|---|---|
| Age & Service Retirements. If members retire at older ages or with lower final average pay than assumed, there is a gain. If younger ages or higher average pays, a loss. | $ (209,554) | $ (147,669) |
| Disability Retirements. If disability claims are less than assumed, there is a gain. If more claims, a loss. | 806,119 | 810,248 |
| Death-in-Service Benefits. If survivor claims are less than assumed, there is a gain. If more claims, there is a loss. | 61,822 | (326,458) |
| Withdrawal From Employment. If more liabilities are released by withdrawals than assumed, there is a gain. If smaller releases, a loss. | 2,302,510 | 222,407 |
| Pay Increases. If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss. | 10,098,393 | 8,089,777 |
| Investment Income. If there is greater investment return on pension assets than assumed, there is a gain. If less return, a loss. | (30,337,072) | (18,851,548) |
| Other. Miscellaneous gains and losses resulting from data adjustments, timing of financial transactions, valuation methods, etc. | 357,554 | (4,235,950) |
| Gain (or Loss) During Year From Experience | $ (16,920,228) | $ (14,439,193) |
| Non-Recurring Items (Effect of Benefit/Assumption Changes) | 0 | (36,418,935) |
| Composite Gain (or Loss) During Year | $ (16,920,228) | $ (50,858,128) |

# INVESTMENT GAIN (LOSS)
# DEVELOPMENT OF PORTION ATTRIBUTABLE TO RETIREMENT, SURVIVOR AND DISABILITY ALLOWANCES
# JANUARY 1, 2011 TO DECEMBER 31, 2011

| | |
|---|---|
| Assets, Beginning of Year | $630,971,500 |
| Net Cash Flow | (26,684,641) |
| Assumed Investment Return | 49,410,334 |
| Expected Assets End of Year | $653,697,193 |
| Actual Assets End of Year | 623,360,121 |
| Gain/(Loss) for Year | $ (30,337,072) |

The total investment gain (loss) was ($35,431,652), including the gain (loss) on health assets.

# Active Member Population Reconciliation
## January 1, 2011 to December 31, 2011

| | Actual | Expected |
|---|---|---|
| Active Members Beginning of Year | 1,537 | |
| Plus New Hires | 72 | |
| Minus Retirements | 50 | 36.8 |
| Minus Deaths | 1 | 1.0 |
| Minus Disabilities | 5 | 7.2 |
| Minus Other Terminations* | 35 | 16.4 |
| Returned to Active Status | 2 | |
| Plus or Minus Data Correction | 0 | |
| Active Members End of Year | 1,520 | |

** Includes 0 members who took a leave of absence and 0 members who transferred out of the System.*

# SECTION D

## FINANCIAL INFORMATION

# Current Asset Information Furnished for the Valuation December 31, 2011

## Balance Sheet

| Current Assets (Market Value) | | Fund Balance | |
|---|---|---|---|
| Cash & Short-Term Investments | $ 10,640,944 | Employees' Savings Fund | $ 102,768,994 |
| Fixed Income | 172,444,371 | Employer Accumulation Fund | 31,888,741 |
| Stocks | 355,594,107 | Pension Reserve Fund | 400,757,214 |
| Real Estate | 32,317,937 | Survivors Benefit Fund | 28,386,557 |
| Alternatives | 128,432,768 | Health Care Fund | 96,623,521 |
| Other Short-Term | 66,607 | Income Fund | 18,979,459 |
| Accruals & Receivables | (20,092,248) | | |
| **Total Current Assets** | **$ 679,404,486** | **Total Fund Balance** | **$ 679,404,486** |

## Revenues and Expenditures

| | Year Ended December 31, 2011 | 2010 |
|---|---|---|
| Net Assets Held in Trust for Pension and Postemployment Health Care Benefits | $734,282,707 | $675,673,202 |
| DROP Liabilities | 20,226,941 | 15,911,587 |
| Total | 754,509,648 | 691,584,789 |
| Revenues* | | |
| Employee contributions | | |
| For non-DROP members | 8,348,577 | 8,295,882 |
| For DROP members | 929,956 | 926,038 |
| Employer contributions (net) | 23,399,608 | 24,202,569 |
| Investment income (net) | | |
| Non-DROP investment income | (19,137,754) | 89,895,586 |
| DROP investment income | 352,408 | (3,077) |
| Miscellaneous | 0 | 0 |
| Total | 13,892,795 | 123,316,998 |
| Expenditures | | |
| Benefit payments | | |
| Retirees and Beneficiaries | 49,899,253 | 46,628,195 |
| From DROP account | 7,328,957 | 2,422,970 |
| Health insurance | 10,296,993 | 10,064,645 |
| Refund of member contributions | 451,682 | 476,936 |
| Administrative expenses | 1,107,590 | 744,393 |
| Death benefit | 60,000 | 55,000 |
| Total | 69,144,475 | 60,392,139 |
| Net Addition to Assets | (55,251,680) | 62,924,859 |
| Net Assets Held in Trust for Pension and Postemployment Health Care Benefits | $679,404,486 | $734,282,707 |
| DROP Liabilities | 19,853,482 | 20,226,941 |
| **Total** | **699,257,968** | **754,509,648** |

** Revenues include transfers to and from systems.*

# CAFR Asset Information Furnished for the Valuation
## December 31, 2011

### Additions by Source

| | Pension Benefits | | | | | Other Postemployment Benefits | | |
|---|---|---|---|---|---|---|---|---|
| | Contributions | | Net Investment | Transfers from | | Employer | Net Investment | |
| Year | Member* | Employer | Income | Other Systems | Total | Contributions | Income | Total |
| 2002 | $7,563,173 | $14,923,893 | $(42,921,956) | $ 999,176 | $ (19,435,714) | $3,780,715 | $ (6,673,383) | $ (2,892,668) |
| 2003 | 8,136,974 | 16,361,339 | 105,112,725 | 763,419 | 130,374,457 | 3,395,749 | 18,885,722 | 22,281,471 |
| 2004 | 8,192,944 | 17,205,609 | 62,907,281 | 856,496 | 89,162,330 | 2,867,602 | 12,051,961 | 14,919,563 |
| 2005 | 8,582,130 | 18,467,789 | 35,511,228 | 1,180,951 | 63,742,098 | 3,006,385 | 8,603,479 | 11,609,864 |
| 2006 | 8,610,088 | 19,263,941 | 85,757,656 | 648,282 | 114,279,967 | 3,384,780 | 15,312,122 | 18,696,902 |
| 2007 | 8,901,454 | 19,956,700 | 51,176,733 | 717,017 | 80,751,904 | 4,575,072 | 10,475,428 | 15,050,500 |
| 2008 | 9,666,665 | 20,302,216 | (207,368,115) | 632,894 | (176,766,340) | 4,667,972 | (30,809,552) | (26,141,580) |
| 2009 | 9,503,526 | 20,453,914 | 109,523,583 | 1,009,422 | 140,490,445 | 4,794,710 | 21,030,418 | 25,825,128 |
| 2010 | 9,221,920 | 21,211,944 | 72,158,093 | 329,335 | 102,921,292 | 3,699,814 | 17,734,416 | 21,434,230 |
| 2011 | 9,278,533 | 22,966,338 | (16,039,272) | 608,366 | 16,813,965 | 2,418,411 | (2,746,073) | (327,662) |

** Does not include service purchases.*

### Deductions by Type

| | Pension Benefits | | | | | Other Postemployment Benefits | | |
|---|---|---|---|---|---|---|---|---|
| | | | Transfers to | | | | | |
| Year | Benefits# | Refunds | Other Systems | Administrative | Total | Benefits | Administrative | Total |
| 2002 | $31,325,089 | $ 266,137 | $ 1,054,264 | $462,200 | $33,107,690 | $7,025,043 | $ 78,635 | $7,103,678 |
| 2003 | 33,074,853 | 386,931 | 789,387 | 559,052 | 34,810,223 | 7,181,129 | 93,769 | 7,274,898 |
| 2004 | 35,187,531 | 155,989 | 602,345 | 518,834 | 36,464,699 | 6,948,650 | 86,031 | 7,034,681 |
| 2005 | 37,716,268 | 495,640 | 403,975 | 561,817 | 39,177,700 | 8,932,259 | 92,344 | 9,024,603 |
| 2006 | 40,408,244 | 299,128 | 914,949 | 572,616 | 42,194,937 | 7,980,823 | 92,761 | 8,073,584 |
| 2007 | 44,741,510 | 98,628 | 330,539 | 605,165 | 45,775,842 | 10,652,642 | 97,101 | 10,749,743 |
| 2008 | 43,455,149 | 570,827 | 282,987 | 613,447 | 44,922,410 | 8,864,161 | 98,082 | 8,962,243 |
| 2009 | 46,009,029 | 1,076,685 | 406,147 | 758,818 | 48,250,679 | 8,899,533 | 123,210 | 9,022,743 |
| 2010 | 49,106,165 | 476,936 | 566,615 | 637,943 | 50,787,659 | 10,536,554 | 106,450 | 10,643,004 |
| 2011 | 57,288,210 | 451,682 | 1,797,986 | 948,319 | 60,486,197 | 11,092,515 | 159,271 | 11,251,786 |

*# Includes death benefits.*

# DEVELOPMENT OF FUNDING VALUE OF RETIREMENT SYSTEM ASSETS
## DECEMBER 31, 2011

| | | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|
| A. | Funding Value From Prior Year | $ 699,051,166 | $ 721,104,290 | $ 735,709,837 | | | |
| B. | Market Value End of Year | 691,584,789 | 754,509,648 | 699,257,968 | | | |
| C. | Market Value Beginning of Year | 582,542,638 | 691,584,789 | 754,509,648 | | | |
| D. | Non-Investment Net Cash Flow | (20,629,822) | (26,223,257) | (35,358,745) | | | |
| E. | Investment Return: | | | | | | |
| | E1. Market Total: B - C - D | 129,671,973 | 89,148,116 | (19,892,935) | | | |
| | E2. For Immediate Recognition (8.0%) | 55,098,900 | 56,639,413 | 57,442,437 | | | |
| | E3. Amount for Phased-In Recognition E1-E2 | 74,573,073 | 32,508,703 | (77,335,372) | | | |
| F. | Phased-In Recognition of Investment Return: | | | | | | |
| | F1. Current Year: 25% x E3 | 18,643,268 | 8,127,176 | (19,333,843) | | | |
| | F2. First Prior Year | (42,868,253) | 18,643,268 | 8,127,176 | $ (19,333,843) | | |
| | F3. Second Prior Year | 287,199 | (42,868,253) | 18,643,268 | 8,127,176 | $ (19,333,843) | |
| | F4. Third Prior Year | 11,521,832 | 287,200 | (42,868,253) | 18,643,269 | 8,127,175 | $ (19,333,843) |
| | F5. Total Recognized Phase-ins | $ (12,415,954) | $ (15,810,609) | $ (35,431,652) | $ 7,436,602 | $ (11,206,668) | $ (19,333,843) |
| G. | Funding Value End of Year: | | | | | | |
| | G1. Preliminary Funding Value End of Year: A + D + E2 + F5 | $ 721,104,290 | $ 735,709,837 | $ 722,361,877 | | | |
| | G2. Corridor Percent | 20% | 20% | 20% | | | |
| | G3. Upper Corridor Limit: (100% + G2) x B | 829,901,747 | 905,411,578 | 839,109,562 | | | |
| | G4. Lower Corridor Limit: (100% - G2) x B | 553,267,831 | 603,607,718 | 559,406,374 | | | |
| | G5. Funding Value End of Year | $ 721,104,290 | $ 735,709,837 | $ 722,361,877 | | | |
| H. | Difference between Market Value and Funding Value | $ (29,519,501) | $ 18,799,811 | $ (23,103,909) | $ (30,540,511) | $ (19,333,843) | $ - |
| I. | Funding Value Rate of Return | 6.2 % | 5.8 % | 3.1 % | | | |
| J. | Market Value Rate of Return | 22.7 % | 13.1 % | (2.7)% | | | |
| K. | Ratio of Funding Value to Market Value | 104% | 98% | 103% | | | |

The asset valuation method recognizes assumed investment income (line E2) fully each year. Differences between actual and expected investment income (line E3) are phased in over a closed 4-year period. When investment markets are performing well, Funding Value will tend to lag market value. When investment markets are performing poorly, Funding Value will tend to exceed market value. From a Funding standpoint, the asset valuation method is *neutral*.

# Separation of Assets between Pension and Health
## December 31, 2011

| | Pension | Health | Total |
|---|---|---|---|
| A. Market Value Beginning of Year | $647,094,901 | $107,414,747 | $754,509,648 |
| B. Member Contributions | | | |
| B1. Pension Contributions | 8,348,577 | | 8,348,577 |
| B2. DROP Contributions | 929,956 | | 929,956 |
| B3. Retiree Health Contributions | | 1,268,402 | 1,268,402 |
| C. Employer Contributions | | | |
| C1. System Contributions | 22,966,338 | 1,622,889 | 24,589,227 |
| C2. Transfers | (1,189,620) | | (1,189,620) |
| C3. Medicare Part D Reimbursement | | 795,522 | 795,522 |
| D. Benefits Paid | | | |
| D1. Pension Benefits | 49,899,253 | | 49,899,253 |
| D2. Benefit Payments from DROP Account | 7,328,957 | | 7,328,957 |
| D3. HPRS Paid Retiree Health Benefits | | 10,322,332 | 10,322,332 |
| D4. HPRS Paid Medicare Part B Benefits | | 770,183 | 770,183 |
| D5. Member Paid Retiree Health Benefits | | 1,268,402 | 1,268,402 |
| E. Refunds of Member Contributions | 451,682 | 0 | 451,682 |
| F. Death Benefits | 60,000 | 0 | 60,000 |
| G. Net External Cash Flow (B + C - D - E - F) | (26,684,641) | (8,674,104) | (35,358,745) |
| H. Other Changes in Market Value | (16,987,591) | (2,905,344) | (19,892,935) |
| I. Market Value End of Year (A + G + H) | 603,422,669 | 95,835,299 | 699,257,968 |
| J. Funding Value Adjustment | 19,937,452 | 3,166,457 | 23,103,909 |
| K. Funding Value End of Year (I + J) | $ 623,360,121 | $ 99,001,756 | $ 722,361,877 |

Line J is allocated in proportion to Line I.

# SECTION E

## SUMMARY OF MEMBER DATA

# Active Members as of December 31, 2011 By Attained Age and Years of Service*

| Attained Age | Years of Service to Valuation Date | | | | | | | Totals | |
|---|---|---|---|---|---|---|---|---|---|
| | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 Up | No. | Payroll |
| 20-24 | 28 | | | | | | | 28 | $ 1,019,001 |
| 25-29 | 97 | 34 | | | | | | 131 | 5,925,696 |
| 30-34 | 49 | 153 | 84 | 1 | | | | 287 | 15,752,764 |
| 35-39 | 19 | 68 | 193 | 59 | 2 | | | 341 | 20,756,473 |
| 40 | | 9 | 29 | 28 | 5 | | | 71 | 4,537,786 |
| 41 | | 5 | 34 | 31 | 12 | | | 82 | 5,196,499 |
| 42 | | 15 | 15 | 36 | 17 | | | 83 | 5,391,561 |
| 43 | 1 | 3 | 15 | 32 | 17 | 1 | | 69 | 4,515,398 |
| 44 | | 1 | 10 | 24 | 25 | | | 60 | 4,178,082 |
| 45 | 1 | 1 | 9 | 14 | 26 | 4 | | 55 | 3,728,973 |
| 46 | | | 3 | 11 | 18 | 10 | | 42 | 3,014,769 |
| 47 | | | 7 | 10 | 30 | 7 | | 54 | 3,809,642 |
| 48 | | | 2 | 7 | 17 | 16 | | 42 | 2,972,919 |
| 49 | | | 1 | 3 | 14 | 13 | 1 | 32 | 2,184,544 |
| 50 | | | | 6 | 12 | 14 | 2 | 34 | 2,437,307 |
| 51 | | | | 2 | 3 | 13 | 3 | 21 | 1,455,999 |
| 52 | | | | 2 | 6 | 11 | 7 | 26 | 1,786,219 |
| 53 | | | | 1 | 4 | 6 | 7 | 18 | 1,330,161 |
| 54 | | | | | 1 | 6 | 9 | 16 | 1,103,160 |
| 55 | | | | | 1 | 3 | 7 | 11 | 736,764 |
| 56 | | | | | | 1 | 5 | 6 | 442,127 |
| 57 | | | | | | 1 | 5 | 6 | 460,936 |
| 58 | | | | | 1 | | 2 | 3 | 266,916 |
| 59 | | | | | | | 2 | 2 | 122,753 |
| Totals | 195 | 289 | 402 | 267 | 211 | 106 | 50 | 1,520 | $ 93,126,449 |

While not used in valuations, the following group averages are computed and shown for their general interest.

Age: 39.1 years.

Service: 14.1 years.

Annual Pay: $61,267

** Includes 122 DROP members.*

# ACTIVE MEMBERS
# BY AGES OF ENTRY INTO SERVICE
# DECEMBER 31, 2011

| Entry Age Nearest Birthday | Number | Cumulative Number | Percent | Cumulative Percent |
|---|---|---|---|---|
| Less than 18 | 0 | 0 | 0.00% | 0.00% |
| 18 | 6 | 6 | 0.39% | 0.39% |
| 19 | 38 | 44 | 2.50% | 2.89% |
| 20 | 51 | 95 | 3.36% | 6.25% |
| 21 | 135 | 230 | 8.88% | 15.13% |
| 22 | 193 | 423 | 12.70% | 27.83% |
| 23 | 184 | 607 | 12.10% | 39.93% |
| 24 | 211 | 818 | 13.89% | 53.82% |
| 25 | 155 | 973 | 10.19% | 64.01% |
| 26 | 116 | 1,089 | 7.63% | 71.64% |
| 27 | 96 | 1,185 | 6.32% | 77.96% |
| 28 | 86 | 1,271 | 5.66% | 83.62% |
| 29 | 46 | 1,317 | 3.02% | 86.64% |
| 30 | 52 | 1,369 | 3.43% | 90.07% |
| 31 | 35 | 1,404 | 2.30% | 92.37% |
| 32 | 38 | 1,442 | 2.50% | 94.87% |
| 33 | 37 | 1,479 | 2.43% | 97.30% |
| 34 | 22 | 1,501 | 1.45% | 98.75% |
| 35 | 13 | 1,514 | 0.86% | 99.61% |
| 36 | 0 | 1,514 | 0.00% | 99.61% |
| 37 | 0 | 1,514 | 0.00% | 99.61% |
| 38 | 5 | 1,519 | 0.32% | 99.93% |
| 39 | 0 | 1,519 | 0.00% | 99.93% |
| 40 & Up | 1 | 1,520 | 0.07% | 100.00% |
| Total | 1,520 | | | |

# ACTIVE DROP MEMBERS AS OF DECEMBER 31, 2011
## BY ATTAINED AGE AND YEARS OF SERVICE

| Attained Ages | DROP No. | Annual Benefit | Annual Pay | DROP Account Balance |
|---|---|---|---|---|
| 48 | 13 | $ 594,429 | $ 920,657 | $ 328,288 |
| 49 | 12 | 548,219 | 846,523 | 742,824 |
| 50 | 16 | 717,753 | 1,146,708 | 1,793,809 |
| 51 | 16 | 689,234 | 1,108,211 | 1,735,112 |
| 52 | 17 | 770,625 | 1,246,177 | 2,022,802 |
| 53 | 14 | 576,536 | 922,986 | 2,171,687 |
| 54 | 10 | 464,681 | 723,983 | 1,990,003 |
| 55 | 10 | 407,775 | 674,075 | 2,068,112 |
| 56 | 8 | 366,348 | 555,073 | 1,889,850 |
| 57 | 4 | 226,492 | 350,034 | 1,241,142 |
| 58 | 2 | 91,549 | 120,347 | 522,415 |
| Totals | 122 | $ 5,453,640 | $ 8,614,772 | $ 16,506,045 |

Average Age at DROP: 49.9 yrs.

Average Service: 28.9 yrs.
Average Service at DROP: 25.4 yrs.

Average Annual Pay: $70,613

# Age and Service Pensions Being Paid December 31, 2011
## By Attained Ages

| Attained Ages | Number | Monthly Pensions | Number Married | Average Age of Spouse |
|---|---|---|---|---|
| 47 | 2 | $ 4,199 | | N/A |
| 48 | 9 | 34,692 | 5 | N/A |
| 49 | 9 | 31,468 | 2 | 45 |
| 50 | 14 | 55,890 | 10 | 49 |
| 51 | 20 | 70,766 | 16 | 51 |
| 52 | 33 | 117,521 | 26 | 49 |
| 53 | 33 | 113,377 | 24 | 51 |
| 54 | 28 | 95,148 | 21 | 51 |
| 55 | 25 | 93,822 | 22 | 54 |
| 56 | 43 | 155,776 | 35 | 54 |
| 57 | 28 | 105,075 | 24 | 57 |
| 58 | 24 | 95,802 | 21 | 56 |
| 59 | 39 | 147,499 | 31 | 55 |
| 60 | 48 | 165,035 | 37 | 57 |
| 61 | 46 | 167,959 | 40 | 58 |
| 62 | 40 | 152,572 | 33 | 60 |
| 63 | 54 | 184,505 | 45 | 62 |
| 64 | 72 | 253,858 | 61 | 62 |
| 65 | 46 | 169,937 | 41 | 64 |
| 66 | 39 | 142,899 | 35 | 64 |
| 67 | 53 | 186,116 | 53 | 64 |
| 68 | 38 | 124,587 | 33 | 66 |
| 69 | 50 | 166,165 | 46 | 65 |
| 70 | 37 | 121,281 | 34 | 66 |
| 71 | 28 | 96,379 | 25 | 68 |
| 72 | 25 | 88,349 | 24 | 69 |
| 73 | 26 | 72,983 | 25 | 70 |
| 74 | 26 | 80,385 | 24 | 70 |
| 75 | 17 | 46,214 | 15 | 71 |
| 76 | 13 | 38,082 | 11 | 74 |
| 77 | 13 | 33,348 | 12 | 72 |
| 78 | 9 | 21,779 | 9 | 74 |
| 79 | 13 | 33,508 | 11 | 74 |
| 80 | 10 | 24,455 | 9 | 77 |
| 81 | 15 | 40,563 | 14 | 77 |
| 82 | 13 | 28,059 | 10 | 78 |
| 83 | 10 | 20,388 | 9 | 80 |
| 84 | 12 | 23,500 | 10 | 81 |
| 85 & Over | 27 | 51,012 | 13 | 84 |
| Totals | 1,087 | $ 3,654,953 | 916 | |

# DISABILITY PENSIONS BEING PAID DECEMBER 31, 2011
## BY ATTAINED AGE

| Attained Ages | Number | Monthly Pensions | Number Married | Average Age of Spouse |
|---|---|---|---|---|
| 33 | 2 | $ 5,584 | 2 | 65 |
| 34 | 1 | 2,303 | 1 | 39 |
| 36 | 1 | 2,346 | | N/A |
| 37 | 2 | 3,577 | 1 | 37 |
| 39 | 3 | 7,849 | 2 | 39 |
| 40 | 3 | 7,214 | 2 | 29 |
| 41 | 3 | 6,333 | 2 | 38 |
| 42 | 2 | 5,599 | 2 | 38 |
| 43 | 5 | 11,591 | 3 | 38 |
| 44 | 4 | 9,943 | 2 | 34 |
| 45 | 5 | 10,730 | 2 | 45 |
| 46 | 3 | 6,229 | 2 | 50 |
| 47 | 5 | 15,342 | 3 | 47 |
| 48 | 6 | 14,334 | 5 | 45 |
| 49 | 5 | 16,569 | 3 | 43 |
| 50 | 3 | 11,545 | 3 | 51 |
| 51 | 6 | 16,737 | 6 | 50 |
| 52 | 5 | 14,276 | 4 | 47 |
| 53 | 7 | 17,149 | 4 | 52 |
| 54 | 7 | 19,645 | 5 | 55 |
| 55 | 4 | 11,915 | 3 | 54 |
| 56 | 2 | 6,551 | 2 | 58 |
| 58 | 3 | 8,605 | 3 | 56 |
| 59 | 3 | 7,816 | 2 | 58 |
| 60 | 3 | 9,137 | 3 | 58 |
| 61 | 1 | 1,803 | 1 | 56 |
| 62 | 4 | 9,226 | 2 | 60 |
| 63 | 6 | 13,140 | 5 | 60 |
| 64 | 1 | 2,518 | 1 | 64 |
| 65 | 2 | 5,384 | 1 | 54 |
| 67 | 2 | 5,528 | 1 | 69 |
| 68 | 2 | 4,084 | 2 | 67 |
| 70 | 1 | 1,608 | 1 | 64 |
| 74 | 1 | 3,147 | 1 | 71 |
| 76 | 1 | 1,608 | 1 | 72 |
| 81 | 1 | 1,712 | 1 | 76 |
| 82 | 1 | 1,730 | 1 | 78 |
| 84 | 1 | 1,736 | 1 | 82 |
| 85 | 1 | 1,748 | | N/A |
| Totals | 118 | $303,891 | 86 | |

## DEPENDENTS BEING PAID AS OF DECEMBER 31, 2011
## TABULATED BY ATTAINED AGE

| Attained Ages | Number | Monthly Pensions |
|---|---|---|
| 12 & Under | 6 | $ 1,053 |
| 14 | 2 | 368 |
| 15 | 1 | 195 |
| 16 | 1 | 198 |
| 17 | 2 | 348 |
| 19 | 3 | 598 |
| 20 | 3 | 521 |
| 21 | 3 | 549 |
| 22 | 3 | 562 |
| 23 | 1 | 218 |
| 24 | 1 | 900 |
| 25 | 1 | 1,008 |
| 32 | 1 | 1,035 |
| 34 | 1 | 1,170 |
| 38 | 1 | 1,185 |
| 39 | 1 | 1,254 |
| 41 | 1 | 1,185 |
| 43 | 1 | 1,335 |
| 45 | 1 | 1,254 |
| 46 | 1 | 1,229 |
| 47 | 3 | 2,418 |
| 49 | 4 | 6,317 |
| 52 | 2 | 444 |
| 54 | 2 | 2,680 |
| 55 | 1 | 984 |
| 56 | 3 | 4,979 |
| 57 | 3 | 3,589 |
| 58 | 1 | 1,008 |
| 59 | 2 | 3,194 |
| 60 | 5 | 6,706 |
| 61 | 3 | 4,325 |
| 62 | 3 | 4,381 |
| 63 | 4 | 5,647 |
| 64 | 8 | 11,469 |
| 65 | 7 | 11,399 |
| 66 | 5 | 7,438 |
| 67 | 4 | 6,553 |
| 68 | 5 | 7,307 |
| 69 | 7 | 9,675 |
| 70-79 | 56 | 75,239 |
| 80-89 | 79 | 96,480 |
| 90 & Over | 18 | 23,566 |
| Totals | 260 | $311,963 |

## Active Member Valuation Data, 2002 to 2011

| Actuarial Valuation as of December 31 | Number of Active Members | Annual Payroll | Average Annual Salary | % Increase in Average Pay |
|---|---|---|---|---|
| 2002 | 1,548 | $78,997,065 | $51,032 | 1.6 % |
| 2003 | 1,542 | 81,737,962 | 53,008 | 3.9 |
| 2004 | 1,562 | 81,757,707 | 52,342 | (1.3) |
| 2005 | 1,573 | 83,408,155 | 53,025 | 1.3 |
| 2006 | 1,592 | 85,878,329 | 53,944 | 1.7 |
| 2007 | 1,597 | 93,752,908 | 58,706 | 8.8 |
| 2008 | 1,544 | 94,301,538 | 61,076 | 4.0 |
| 2009 | 1,547 | 94,824,789 | 61,296 | 0.4 |
| 2010 | 1,537 | 94,767,852 | 61,658 | 0.6 |
| 2011 | 1,520 | 93,126,449 | 61,267 | (0.6) |

## Retirants and Beneficiaries Valuation Data, 2002 to 2011

| Actuarial Valuation | Added to Rolls | | Removed from Rolls | | Number | Total | |
|---|---|---|---|---|---|---|---|
| as of December 31 | No. | Monthly Benefits | No. | Monthly Benefits | of People | Monthly Benefits | Average Benefit |
| 2002 | 55 | $ 184,301 | 31 | $41,501 | 1,231 | $ 2,603,108 | $2,115 |
| 2003 | 48 | 196,385 | 26 | 29,344 | 1,253 | 2,770,149 | 2,211 |
| 2004 | 58 | 287,345 | 29 | 34,153 | 1,282 | 3,023,341 | 2,358 |
| 2005 | 45 | 194,666 | 26 | 40,276 | 1,301 | 3,177,731 | 2,443 |
| 2006 | 70 | 215,820 | 34 | 51,746 | 1,337 | 3,341,805 | 2,499 |
| 2007 | 53 | 184,644 | 31 | 56,120 | 1,359 | 3,470,329 | 2,554 |
| 2008 | 45 | 211,061 | 33 | 53,298 | 1,371 | 3,628,092 | 2,646 |
| 2009 | 45 | 207,598 | 31 | 42,636 | 1,385 | 3,793,054 | 2,739 |
| 2010 | 64 | 259,964 | 25 | 41,464 | 1,424 | 4,011,554 | 2,817 |
| 2011 | 73 | 327,709 | 32 | 68,456 | 1,465 | 4,270,807 | 2,915 |

Of the 1,465 retirants and beneficiaries as of December 31, 2011, 1,087 are service retirees, 118 are disability retirees and 260 are survivor beneficiaries. The average monthly benefits are $3,362 for service retirees, $2,575 for disability retirees and $1,200 for survivor beneficiaries.

# NUMBER OF RETIRED LIVES COVERED BY AETNA & OTHER CARRIERS
## COMPARATIVE SCHEDULE

| | Census Date | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 12/11 | 12/10 | 12/09 | 12/08 | 12/07 | 12/06 | 12/05 | 12/04 | 12/03 | 12/02 | 12/01 | 12/00 |
| Recipients: | | | | | | | | | | | | |
| w/o Medicare A | NA | 732 | 692 | 762 | 751 | 779 | 806 | 808 | 791 | 773 | 771 | 761 |
| Medicare A | NA | 596 | 580 | 398 | 503 | 522 | 437 | 411 | 394 | 386 | 368 | 346 |
| Spouses: | | | | | | | | | | | | |
| w/o Medicare A | NA | 365 | 368 | 518 | 372 | 420 | 375 | 373 | 403 | 483 | 471 | 447 |
| w Medicare A | NA | 257 | 267 | 232 | 242 | 156 | 187 | 176 | 165 | 158 | 155 | 151 |
| Dependent Children | NA | 216 | 165 | 167 | 154 | 168 | 127 | 130 | 129 | 111 | 105 | 110 |
| Orphans | NA | 0 | 23 | 26 | 63 | 33 | 26 | 30 | 30 | 32 | 30 | 33 |
| Totals | 2,269 | 2,166 | 2,095 | 2,103 | 2,085 | 2,078 | 1,958 | 1,928 | 1,912 | 1,943 | 1,900 | 1,848 |

A summary of recipients and dependents covered by AETNA, Medicare Advantage and Medical Mutual of Ohio follows:

| | AETNA | | Medicare Advantage | | Medical Mutual | | |
|---|---|---|---|---|---|---|---|
| | Network | Non-Network | Network | Non-Network | Network | Non-Network | Totals |
| 2002 | 880 | 491 | | | 516 | 56 | 1,943 |
| 2003 | 815 | 486 | | | 546 | 65 | 1,912 |
| 2004 | 783 | 494 | | | 568 | 83 | 1,928 |
| 2005 | 767 | 505 | | | 588 | 98 | 1,958 |
| 2006 | 1,279 | 22 | | | 749 | 28 | 2,078 |
| 2007 | 1,264 | 25 | | | 723 | 73 | 2,085 |
| 2008 | 1,262 | 2 | | | 818 | 21 | 2,103 |
| 2009 | 1,260 | 0 | | | 835 | 0 | 2,095 |
| 2011 | 197 | 0 | 891 | 0 | 1,181 | 0 | 2,269 |

# DEFERRED PENSIONS AS OF DECEMBER 31, 2011
## TABULATED BY ATTAINED AGE

| Attained Ages | Number | Annual Pensions |
|---|---|---|
| 40 | 2 | $ 61,521 |
| 42 | 1 | 32,014 |
| 43 | 1 | 32,022 |
| 45 | 3 | 99,284 |
| 47 | 1 | 42,876 |
| 48 | 2 | 60,954 |
| 49 | 1 | 31,745 |
| 50 | 2 | 69,387 |
| 53 | 1 | 13,106 |
| Totals | 14 | $442,909 |

A *deferred retirant* is a member who has left active service with at least 15 (and in most cases 20) years of service credit, and has not withdrawn his accumulated contributions. Such members are entitled to a pension upon attaining eligibility age.

# SECTION F

## ASSUMPTIONS USED IN THE VALUATION

# APPENDIX

## SUMMARY OF VALUATION METHOD AND ASSUMPTIONS
## DECEMBER 31, 2011

*The actuarial assumptions used* in the valuation are shown in this Appendix of the report. The assumptions were established for the December 31, 2010 actuarial valuation, following a 5-year experience study covering the period January 1, 2005 through December 31, 2009. They were adopted by the Board after obtaining the advice of the Actuary and other professionals.

### Economic Assumptions

*The investment return rate used* in making the valuations was 8.0% per year, compounded annually (net after administrative expenses). The real rate of return is defined to be the portion of total investment return, which is more than the wage inflation rate. Considering other financial assumptions, the 8.0% investment return rate translates to an assumed real rate of return over wage growth of 4.0%. In order to assume a 4.0% real return over wage growth, it would be necessary to realize about a 5.0% real return over price inflation, after accounting for expenses and the difference between wage increases and price increases. Based on our experience with other public employee retirement systems, both nationally and statewide, and published results of national surveys, the assumed investment return rate remains reasonable, but many systems have recently lowered their assumption. The economic assumptions were last reviewed as part of the 5-year experience study for the period January 1, 2005 through December 31, 2009. It is scheduled to be reviewed again following the December 31, 2014 actuarial valuation.

*Pay increase assumptions* for individual active members are shown for sample ages on page F-4. Part of the assumed increase at each age is for merit and/or seniority, and the other 4.0% recognizes changes in wage levels due to broad economic effects, including inflation and real wage growth. No specific price inflation assumption is required to perform the actuarial valuation.

*The active member payroll* is assumed to increase 4.0% annually, which is the portion of the individual pay increase assumptions attributable to broad economic effects.

*The number of active members* is assumed to continue at the present number.

# Non-Economic Assumptions

*The mortality tables*, for post-retirement mortality, used in evaluating allowances to be paid were the RP-2000 Combined Healthy Male and Female Tables projected to 2020 using Projection Scale AA. This assumption was last reviewed and updated as part of the 5-year experience study for the period January 1, 2005 through December 31, 2009. As shown in that study, the current assumption allows for an approximate 2% margin for future mortality improvement. It is scheduled to be reviewed again following the December 31, 2014 actuarial valuation. Related values are shown on page F-3.

*The probabilities of age and service retirement* are shown on page F-4.

*The probabilities of withdrawal from service, disability and death-in-service* are shown for sample ages on page F-4. For disability retirement, impaired longevity was recognized by basing benefit values on the RP-2000 Combined Healthy Male and Female Tables projected to 2020 using Projection Scale AA set-forward 5 years. Fifty percent of disability retirements are assumed to be non-duty related and fifty percent are assumed to be duty related.

*The entry age normal actuarial cost method of valuation* was used in determining liabilities and normal cost.

> Differences in the past between assumed experience and actual experience ("actuarial gains and losses") become part of actuarial accrued liabilities.
>
> Unfunded actuarial accrued liabilities are amortized to produce payments (principal & interest), which are level percent of payroll contributions.

*Employer contributions* were assumed to be *paid in equal installments* throughout the employer fiscal year.

*Present assets (cash & investments)* were used with a market value adjustment that spreads differences between actual and assumed return over a closed four-year period. Funding value is not permitted to deviate from market value by more than 20%. Details of the method may be found in the body of the report on page D-3. Assets may be used in the valuation prior to the final audit.

*The data about persons now covered and about present assets* were furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the Actuary.

---

The actuarial valuation computations were made by or under the supervision of a Member of the American Academy of Actuaries (MAAA) who has experience performing public plan valuations.

# Single Life Retirement Values
## (8.00% Interest)

| Sample Attained Ages | Present Value of $1 Monthly for Life | | Future Life Expectancy (years) | |
|---|---|---|---|---|
| | Men | Women | Men | Women |
| 50 | $138.57 | $140.09 | 32.77 | 34.63 |
| 55 | 131.86 | 133.89 | 28.04 | 29.88 |
| 60 | 123.09 | 125.97 | 23.47 | 25.31 |
| 65 | 112.30 | 116.30 | 19.17 | 21.02 |
| 70 | 99.65 | 105.04 | 15.22 | 17.06 |
| 75 | 84.62 | 92.13 | 11.58 | 13.47 |
| 80 | 68.15 | 77.48 | 8.42 | 10.23 |

The present values shown above are for illustrative purposes only and do not include the value of future post-retirement increases.

| Sample Ages | Percent of Active Members Separating Within Next Year | | | | Salary Increase Assumptions for an Individual Member | | | |
|---|---|---|---|---|---|---|---|---|
| | Disability | Death: Men | Death: Women | Other | Service | Merit & Seniority | Base (Economic) | Increase Next Year |
| 20 | 0.08% | 0.02% | 0.01% | 2.57% | 1-2 | 10.00% | 4.00% | 14.00% |
| 25 | 0.08% | 0.02% | 0.01% | 2.24% | 3-5 | 3.00% | 4.00% | 7.00% |
| 30 | 0.23% | 0.02% | 0.01% | 1.91% | 6-10 | 1.00% | 4.00% | 5.00% |
| 35 | 0.42% | 0.04% | 0.02% | 1.56% | 11 & Up | 0.30% | 4.00% | 4.30% |
| 40 | 0.70% | 0.05% | 0.04% | 0.84% | | | | |
| 45 | 0.85% | 0.08% | 0.06% | 0.41% | | | | |
| 50 | 1.13% | 0.11% | 0.08% | 0.15% | | | | |
| 55 | 1.32% | 0.18% | 0.14% | 0.00% | | | | |

In the first year of employment, 6% of active members are assumed to terminate employment.

| Probabilities of Age & Service Retirement | | |
|---|---|---|
| Retirement Ages | Percents of Eligible Members Retiring Within Next Year with an Unreduced Benefit | Percents of Eligible Members Retiring Within Next Year with a Reduced Benefit |
| 48 | 35% | 3.5% |
| 49 | 15% | 3.5% |
| 50 | 10% | 3.5% |
| 51 | 10% | 3.5% |
| 52 | 15% | |
| 53 | 10% | |
| 54 | 10% | |
| 55 | 20% | |
| 56 | 30% | |
| 57 | 25% | |
| 58 | 20% | |
| 59 | 20% | |
| 60 & Over | 100% | |

In addition, it was assumed that 100% of eligible members age 55 and older would retire upon attaining 34 years of service. A member was assumed eligible for unreduced retirement at age 48 or greater with 25 or more years of service or age 52 or greater with 20 or more years of service. A member was assumed eligible for reduced retirement at age 48 or greater with 20 or more years of service.

It was assumed that members eligible to DROP would either retire or "DROP in" at first eligibility for unreduced retirement. 100% of members still working 8 years after first reaching retirement eligibility are assumed to retire.

# ADDITIONS TO AND REMOVALS FROM ACTIVE MEMBERSHIP
## ACTUAL AND EXPECTED NUMBERS

| Year Ended | Number Added During Year | | Retirement | | Disability Retirement | | Death-in-Service | | Other Terminations | | Active |
|---|---|---|---|---|---|---|---|---|---|---|---|
| December 31 | A | E | A | E | A | E | A | E | A | E | Members |
| 2002 | 92 | 53.8 | 35 | 26.7 | 3 | 6.2 | 0 | 0.9 | 26 | 20.0 | 1,548 |
| 2003 | 64 | 61.0 | 32 | 33.5 | 6 | 6.3 | 0 | 1.0 | 32 | 20.2 | 1,542 |
| 2004 | 90 | 63.6 | 39 | 36.5 | 4 | 6.5 | 1 | 1.0 | 26 | 19.6 | 1,562 |
| 2005 | 76 | 60.7 | 23 | 33.2 | 8 | 6.7 | 0 | 1.0 | 34 | 19.8 | 1,573 |
| 2006 | 80 | 70.4 | 26 | 41.9 | 9 | 6.7 | 2 | 0.8 | 24 | 21.0 | 1,592 |
| 2007 | 53 | 65.9 | 17 | 36.7 | 4 | 6.7 | 3 | 0.8 | 24 | 21.7 | 1,597 |
| 2008 | 9 | 71.8 | 27 | 44.8 | 4 | 6.9 | 0 | 0.8 | 31 | 19.3 | 1,544 |
| 2009 | 49 | 74.5 | 21 | 50.0 | 10 | 7.0 | 0 | 0.9 | 15 | 16.6 | 1,547 |
| 2010 | 51 | 79.7 | 39 | 54.5 | 4 | 7.1 | 1 | 0.9 | 17 | 17.2 | 1,537 |
| 2011 | 74 | 61.4 | 50 | 36.8 | 5 | 7.2 | 1 | 1.0 | 35 | 16.4 | 1,520 |
| Total | 638 | 662.8 | 309 | 394.6 | 57 | 67.3 | 8 | 9.1 | 264 | 191.8 | |

A: Actual

E: Expected

The following pages summarize the removals from active membership by age group and years of accrued service.

## AGE AND SERVICE RETIREMENTS DURING CALENDAR YEAR 2011

| Age Group | 15-19 | 20-24 | 25-29 | 30 Plus | Total |
|---|---|---|---|---|---|
| Under 20 | | | | | |
| 20-24 | | | | | |
| 25-29 | | | | | |
| 30-34 | | | | | |
| 35-39 | | | | | |
| 40-44 | | | | | |
| 45 | | | | | |
| 46 | | | | | |
| 47 | | | | | |
| 48 | | | 8 | | 8 |
| 49 | | | 3 | | 3 |
| 50 | | | 6 | | 6 |
| 51 | | | 4 | 1 | 5 |
| 52 | | | 8 | 1 | 9 |
| 53 | | | 6 | | 6 |
| 54 | | | 3 | | 3 |
| 55 | | | 3 | | 3 |
| 56 | | | | | |
| 57 | | | 1 | 1 | 2 |
| 58 | | | | 1 | 1 |
| 59 | | | 2 | 1 | 3 |
| 60 & Over | | | | 1 | 1 |
| Totals | | | 44 | 6 | 50 |

## DISABILITY RETIREMENTS DURING CALENDAR YEAR 2011

| Age Group | Years of Accrued Service | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 Plus | Total |
| Under 20 | | | | | | | | |
| 20-24 | | | | | | | | |
| 25-29 | | | | | | | | |
| 30-34 | | 1 | 1 | | | | | 2 |
| 35-39 | | | | 1 | | | | 1 |
| 40-44 | | | 1 | 1 | | | | 2 |
| 45-49 | | | | | | | | |
| 50 & Over | | | | | | | | |
| Totals | | 1 | 2 | 2 | | | | 5 |

## Death-in-Service Terminations During Calendar Year 2011

| Age Group | Years of Accrued Service 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 Plus | Total |
|---|---|---|---|---|---|---|---|---|
| Under 20 | | | | | | | | |
| 20-24 | | | | | | | | |
| 25-29 | | | | | | | | |
| 30-34 | | | | | | | | |
| 35-39 | | | | | | | | |
| 40-44 | | | | | | | | |
| 45-49 | | | | | 1 | | | 1 |
| 50 & Over | | | | | | | | |
| Totals | | | | | 1 | | | 1 |

## Withdrew and Eligible for Deferred Benefit Terminations During Calendar Year 2011

| Age Group | Years of Accrued Service 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 Plus | Total |
|---|---|---|---|---|---|---|---|---|
| Under 20 | | | | | | | | |
| 20-24 | | | | | | | | |
| 25-29 | | | | | | | | |
| 30-34 | | | | | | | | |
| 35-39 | | | | 1 | | | | 1 |
| 40-44 | | | | 4 | 2 | | | 6 |
| 45-49 | | | | | 2 | 1 | | 3 |
| 50 & Over | | | | | | | 1 | 1 |
| Totals | | | | 5 | 4 | 1 | 1 | 11 |

## Withdrew and Pending Contributions Termination During Calendar Year 2011

| Age Group | Years of Accrued Service 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 Plus | Total |
|---|---|---|---|---|---|---|---|---|
| Under 20 | | | | | | | | |
| 20-24 | | | | | | | | |
| 25-29 | | | | | | | | |
| 30-34 | | | | | | | | |
| 35-39 | | | | | | | | |
| 40-44 | | | | | | | | |
| 45-49 | | | | | | | | |
| 50 & Over | | | | | | | | |
| Totals | | | | | | | | 0 |

## Withdrew and Refunded Terminations During Calendar Year 2011

| Age Group | Years of Accrued Service 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 Plus | Total |
|---|---|---|---|---|---|---|---|---|
| Under 20 | | | | | | | | |
| 20-24 | 1 | | | | | | | 1 |
| 25-29 | 5 | | | | | | | 5 |
| 30-34 | 5 | | 3 | | | | | 8 |
| 35-39 | 1 | 2 | 3 | | | | | 6 |
| 40-44 | | 1 | 1 | 1 | | | | 3 |
| 45-49 | | | | | 1 | | | 1 |
| 50 & Over | | | | | | | | |
| Totals | 12 | 3 | 7 | 1 | 1 | | | 24 |

# MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

| | |
|---|---|
| **Administrative Expenses:** | Assumed investment return is net of administrative and investment expenses. |
| **Marriage Assumption:** | 100% of active participants are assumed to be married for purposes of death-in-service benefits and for purposes of retiring with the automatic joint and survivor benefit. |
| **Pay Increase Timing:** | Beginning of year.<br>This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date. |
| **Decrement Timing:** | Decrements of all types are assumed to occur mid-year. |
| **Eligibility Testing:** | Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur. |
| **Benefit Service:** | Exact fractional service is used to determine the amount of benefit payable. |
| **Decrement Relativity:** | Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects. |
| **Other:** | Disability and turnover decrements do not operate during retirement eligibility.<br>For death-in-service, two children are assumed to receive benefits for a 10-year period. |
| **Miscellaneous Loading Factors:** | A load of 0.75% of payroll is used to measure the effect of military service purchases.<br>Reported pays were increased by 2% due to furlough days to June 20, 2011 that are not expected to recur in future years. |

# SECTION G

## FINANCIAL PRINCIPLES AND OPERATIONAL TECHNIQUES

# FINANCIAL PRINCIPLES AND OPERATIONAL TECHNIQUES OF THE RETIREMENT SYSTEM

*Promises Made, and To Be Paid For.* As each year is completed, the Retirement System in effect hands an "IOU" to each member then acquiring a year of service credit -- the "IOU" says: "The Ohio State Highway Patrol Retirement System owes you one year's worth of retirement benefits, payments in cash commencing when you qualify for retirement."

The principal related financial question is: When shall the money required to cover the "IOU" be contributed? This year, when the benefit of the member's service is received? Or, some future year when the "IOU" becomes a cash demand?

*The objective of level percent-of-**payroll financing is that this year's taxpayers contribute the** money to cover the IOUs being handed out this year.* By following this objective, *the employer contribution rate will remain approximately level from year to year* --- and will not have to be increased for future generations of taxpayers.

(There are systems which have a design for deferring contributions to future taxpayers, lured by a lower contribution rate now and putting aside the consequence that the contribution rate must then relentlessly grow much greater over decades of time.)

An inevitable by-product of the level-cost design is the accumulation of reserve assets, for decades, and the income produced when the assets are invested. *Invested assets are a by-product and not the objective.* Investment income becomes the third contributor for benefits to employees, and is interlocked with the contribution amounts required from employees and employer.

(Concluded on Next Page)

Translated to actuarial terminology, this level-cost objective means that the contribution rates must total at least the following:

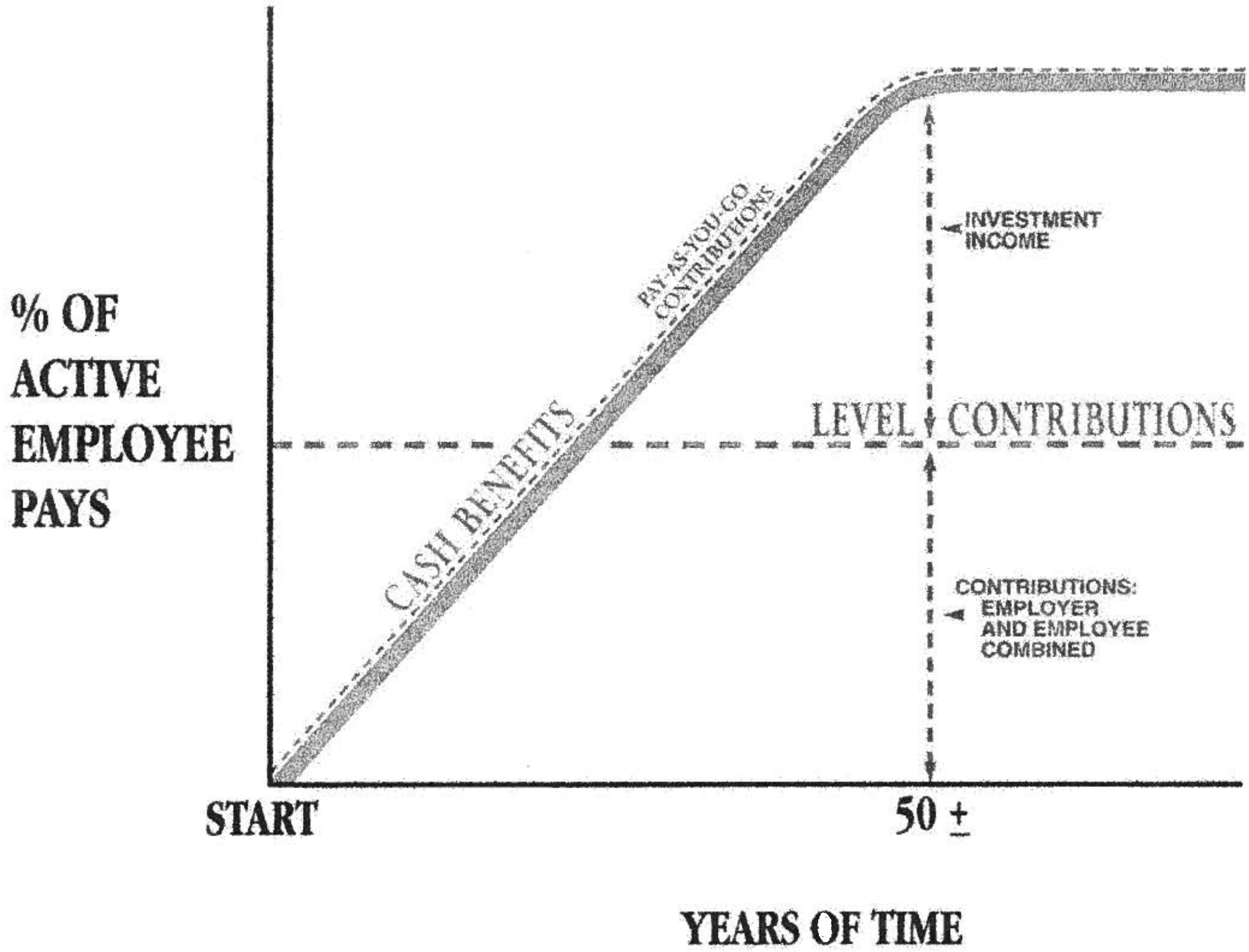
> *Normal Cost* (the value assigned to service being rendered this year)
>
> . . . plus . . .
>
> *Interest on Unfunded Actuarial Accrued Liabilities* (the difference between liabilities for service already rendered and the accrued assets of the Retirement System).

*Computing Contributions To Support System Benefits* From a given schedule of benefits and from the employee data and asset data furnished by the system, the actuary determines the contribution rates to support the benefits, by means of *an actuarial valuation*.

An actuarial valuation has a number of ingredients such as: the rate of investment return which plan assets will earn; the rates of withdrawal of active members who leave covered employment; the rates of mortality; the rates of disability; the rates of pay increases and the assumed age or ages at actual retirement.

In an actuarial valuation the actuary must assume what the above rates will be, for the next year and for decades in the future. Only the subsequent actual experience of the plan can indicate the degree of accuracy of the assumptions.

*Reconciling Differences Between Assumed Experience and Actual Experience* Once actual experience has occurred and has been observed, it will not coincide exactly with assumed experience, regardless of the skill of the actuary and the many calculations made. Most retirement systems cope with such differences by having annual actuarial valuations. Each actuarial valuation is a complete recalculation of assumed future experience, taking into account all past differences between assumed and actual experience. The result is *continuing adjustments to the financial position*.




CASH BENEFITS LINE. This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

LEVEL CONTRIBUTION LINE. Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

- Economic Risk Areas
  - Rates of investment return
  - Rates of pay increase
  - Changes in active member group size
- Non-Economic Risk Areas
  - Ages at actual retirement
  - Rates of mortality
  - Rates of withdrawal of active members (turnover)
  - Rates of disability

The *actuarial valuation* is the mathematical process by which the contribution rate is determined, and the flow of activity constituting the valuation may be summarized as follows:

A. *Covered people data* furnished by plan administrator, including:

Retired lives now receiving benefits

Former employees with vested benefits not yet payable

Active employees

B. + *Asset data* (cash & investments), furnished by the plan administrator

C. + *Benefit provisions* which specify eligibility and amounts of pensions

D. + *Assumptions concerning future experience in various risk areas*, which are established by the Retirement Board after consulting with the actuary

E. + *The funding method* for employer contributions (the long-term, planned pattern for employer contributions)

F. + *Mathematically combining the assumptions, the funding method, and the data*

G. = Determination of:

Plan Financial Position and/or

New Employer Contribution Rate

# MEANING OF "UNFUNDED ACTUARIAL ACCRUED LIABILITIES"

*"Actuarial accrued liabilities"* are *the portion of the present value of plan promises to pay benefits in the future that are not covered by future normal cost contributions.* A liability has been established ("accrued") because the service has been rendered but the resulting monthly cash benefit may not be payable until years in the future. Actuarial accrued liabilities are the result of complex mathematical calculations, which are made by the plan's actuary.

If "actuarial accrued liabilities" exceed the plan's accrued assets (cash & investments), the difference is *"unfunded actuarial accrued liabilities."* This is the usual condition. If the plan's assets equaled the plan's "actuarial accrued liabilities," then the plan would be termed "fully funded." This is an unusual condition.

---

Each time a plan adds a new benefit, which applies to service already rendered, an "actuarial accrued liability" is created, which is also an "unfunded actuarial accrued liability" because the plan can't print instant cash to cover the value of the new benefit promises. Payment for such unfunded actuarial accrued liabilities is spread over a period of years, commonly in the 15-30 year range.

Unfunded actuarial accrued liabilities can occur in another way: if actual plan experience is less favorable than assumed plan experience, the difference is added to unfunded actuarial accrued liabilities. In plans where benefits are directly related to an employee's pay near time of retirement, unfunded actuarial accrued liabilities rose dramatically during the 1970's. Unexpected rates of pay increase created additional actuarial accrued liabilities, which could not be matched by reasonable investment results. More recent experience has generally been more favorable with some reductions in unfunded actuarial accrued liabilities.

---

*The existence of unfunded actuarial accrued liabilities is not bad, but the changes from year to year in the amount of unfunded actuarial accrued liabilities are important,* --- "bad" or "good" or somewhere in between.

Even though unfunded actuarial accrued liabilities don't constitute a bill payable immediately, it is important that policy-makers prevent the amount from becoming unreasonably high and *it is vital for plans to have a sound method for making payments toward them* so that they are controlled.

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August 31, 2012

Mr. Mark Atkeson, Executive Director
Ohio State Highway Patrol Retirement System
6161 Busch Boulevard, Suite 119
Columbus, Ohio 43229

Dear Mark:

Enclosed are 2 bound copies of the December 31, 2011 actuarial valuation of the Ohio State Highway Patrol Retirement System.

Sincerely,

Mita Drazilov

Mita D. Drazilov, ASA, MAAA

MDD:dks:sac
Enclosures

cc: Kennedy, Cottrell & Associates LLC (+1 report copy)