# General Assembly Retirement System of Illinois

Experience Review

April 17, 2013

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# Background

- The June 30, 2012, actuarial valuation represents the first actuarial valuation of the GARS performed by GRS.
- Many of the assumptions and methods used by the prior actuary were retained for that valuation.
- GRS suggested a review of the assumptions and methods after the July 1, 2012, valuation.
- For the first year, the State hired its own actuary to review the valuation reports for the five State pension systems.
- We have considered the State actuary's recommendations as part of this review.
- Upon approval, assumptions recommendations would be implemented in the July 1, 2013, valuation which determines the FYE 2015 State contribution.



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# Overview

- Purposes of experience study:
  - Compare actual experience with expected experience based on actuarial assumptions
  - Validate current actuarial assumptions and recommend changes, as needed
  - Ensure all stakeholders have clear picture of funded status of plan under set of assumptions that reflect recent expectations of future anticipated experience

# Economic Assumptions

- Price Inflation
  - Measured by change in Consumer Price Index (CPI)
  - Main building block for other economic assumptions
    - Investment return
    - General pay/wage inflation
    - Provisions applicable to new hires (1/1/2011)
      - Cost of living increases
      - Growth in cap on pensionable pay



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# Economic Assumptions
# Price Inflation

- Expectations of future inflation
  - Range of 2.16% to 3.26% from sample of eight investment consulting firms
    - Average assumption is 2.60%
  - SSA's Office of the Chief Actuary assumed 2.8% under intermediate cost assumption in 2012 Trustees Report
  - Reasonable long-term inflation assumption likely falls in the range of 2.50% to 3.25%
- Recommendation
  - Maintain current assumption of 3.00%



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# Economic Assumptions
# Investment Return

- Investment return assumption
  - Inflation
  - Real rate of return (net of expenses)
- GRS
  - Reviewed capital market assumptions developed by eight investment consulting firms
  - ISBI target asset allocation
  - Developed ranges for expected average returns over a 30-year period



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# Economic Assumptions
# Investment Return

- The current and target asset allocation for the GARS as of December 31, 2012, as disclosed by the Illinois State Board of Investments is as follows:

| Asset Class | Current Allocation 12/31/2012 | Target Allocation |
|---|---|---|
| Domestic Equity | 29.74% | 30.00% |
| International Equity | 20.47% | 20.00% |
| Fixed Income + Cash | 21.26% | 20.00% |
| Private Equity | 5.50% | 5.00% |
| Real Estate | 9.58% | 10.00% |
| Infrastructure | 4.32% | 5.00% |
| Hedge Funds | 9.14% | 10.00% |
| **Total** | **100.0%** | **100.0%** |



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# Economic Assumptions
# Investment Return

- Based on the review of capital market assumptions developed by eight investment consulting firms and the GARS target asset allocation, the one year expected return is shown below:

| Investment Consultant | Investment Consultant Expected Nominal Return | Investment Consultant Inflation Assumption | Expected Real Return (2)–(3) | Actuary Inflation Assumption | Expected Nominal Return (4)+(5) | Plan Incurred Expense Assumption | Expected Nominal Return Net of Expenses (6)-(7) |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 1 | 7.41% | 2.50% | 4.91% | 3.00% | 7.91% | 0.50% | 7.41% |
| 2 | 7.94% | 3.00% | 4.94% | 3.00% | 7.94% | 0.50% | 7.44% |
| 3 | 7.56% | 2.50% | 5.06% | 3.00% | 8.06% | 0.50% | 7.56% |
| 4 | 7.55% | 2.40% | 5.15% | 3.00% | 8.15% | 0.50% | 7.65% |
| 5 | 8.42% | 3.26% | 5.16% | 3.00% | 8.16% | 0.50% | 7.66% |
| 6 | 8.12% | 2.50% | 5.62% | 3.00% | 8.62% | 0.50% | 8.12% |
| 7 | 8.20% | 2.50% | 5.70% | 3.00% | 8.70% | 0.50% | 8.20% |
| 8 | 8.28% | 2.16% | 6.11% | 3.00% | 9.11% | 0.50% | 8.61% |
| **Average** | **7.93%** | **2.60%** | **5.33%** | **3.00%** | **8.33%** | **0.50%** | **7.83%** |



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# Economic Assumptions
# Investment Return

- We then developed ranges for expected average returns over a 30-year period.

| Investment Consultant | Distribution of 30-Year Average Geometric Net Nominal Return | | | Probability of exceeding 7.00% |
|---|---|---|---|---|
| | 25th | 50th | 75th | |
| (1) | (2) | (3) | (4) | (5) |
| 1 | 4.80% | 6.66% | 8.56% | 44.1% |
| 2 | 4.86% | 6.71% | 8.59% | 44.9% |
| 3 | 5.19% | 6.92% | 8.67% | 48.4% |
| 4 | 5.69% | 7.18% | 8.69% | 53.9% |
| 5 | 4.66% | 6.73% | 8.85% | 45.8% |
| 6 | 5.05% | 7.16% | 9.31% | 52.5% |
| 7 | 5.54% | 7.43% | 9.36% | 57.4% |
| 8 | 6.07% | 7.90% | 9.76% | 65.8% |
| **Average** | **5.23%** | **7.09%** | **8.97%** | **51.6%** |

Plan's current investment return assumption net of investment expenses is 7.0%

Actuarial standards of practice (ASOPs) state that the investment return assumption should fall within the best estimate range (25th to 75th percentile). The average probability of exceeding the current 7.0% assumption (net of inv. expenses) is about 52%.



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# Economic Assumptions
# Investment Return

- Recommend maintaining assumption of 7.00 percent based on
  - Capital market assumptions
  - Maintaining current target asset allocation over long-term



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# Economic Assumptions
# Investment Return

- Impact of GASB 67 and 68 on investment return assumption used for financial reporting
  - GARS current funding policy (as set forth in Chapter 40, Act 5, Article 2 of the Illinois Compiled Statutes) never fully funds the System
    - 90% funded in 2045
  - GASB 67 and 68 require the use of a blended discount rate if the funding policy is projected to deplete assets
  - Blended discount rate based on a combination of the municipal bond rate (4% to 5%) and the long-term assumed rate (7.0% for GARS)
  - GASB 67 and 68 blended discount rate is expected to increase the unfunded actuarial liability

# Economic Assumptions
# Pay Increases

- Total pay increase assumption used to project members' pays at time of retirement is comprised of
  - Wage inflation (price inflation plus productivity increases), plus,
  - Merit/Promotion/Longevity component
- We reviewed the report issued by the Legislative Research Unit regarding the history of Illinois Legislators' compensation

**General Assembly Retirment System of Illinois - Salary History**

| Average Salary Increase From 1991-2012 | Average CPI Increase From 1991-2012 | Average Salary Increase in excess of Average CPI |
|---|---|---|
| 2.90% | 2.51% | 0.39% |



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# Economic Assumptions
# Pay Increases

- Recommendation
  - Lower salary increase assumption from 4.0% to 3.5%
  - Salary Increase Assumption comprised of the following:

| | |
|---|---|
| Price Inflation: | 3.00% |
| Productivity Increase: | 0.40% |
| Merit/Promotion Increase: | 0.10% |
| Total Increase | 3.50% |

  - Furthermore, assume no pay increases for the next two years



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# Economic Assumptions
# Pay Increases for Inactive Members

- Increases in actuarial liability for inactive members over the past six years have averaged 9.3%

**Impact of Reciprocal Salary Increases of Inactive Members**

| Valuation Date | Inactives Actuarial Liability | Increase in UAL Due to Inactive Member Salary Increases | Increase in UAL as a Percent of Inactives Actuarial Liability |
|---|---|---|---|
| 6/30/2006 | $ 23,772,867 | $ 2,008,594 | 8.4% |
| 6/30/2007 | 25,637,149 | 1,567,266 | 6.1% |
| 6/30/2008 | 20,963,068 | 1,025,565 | 4.9% |
| 6/30/2009 | 24,982,545 | 977,739 | 3.9% |
| 6/30/2010 | 22,566,036 | 2,139,529 | 9.5% |
| 6/30/2011 | 26,829,958 | 6,514,624 | 24.3% |
| Total | $ 144,751,623 | $ 14,233,317 | |
| Average | | | 9.3% |

- Recommendation
  - Apply 10% load on inactive vested liabilities to account for future pay increases for inactive members



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# Demographic Assumptions

- Types of Demographic Assumptions
  - Mortality
  - Retirement
  - Turnover
  - Disability
- Overview
  - Assumptions should reflect long-term expectation of plan's demographic mix
  - Each assumption should be:
    - Individually reasonable
    - Consistent with other demographic assumptions



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# Demographic Assumptions

- Mortality (Current Assumption)
  - For active and retired members:
    - UP-1994 Mortality Table for Males, setback 4 years
  - For spouses:
    - UP-1994 Mortality Table for Females, setback 1 years
- Recommendation
  - Update mortality assumption to reflect longer life expectancies
  - Sex distinct assumption
  - Separate rate for pre-retirement and post-retirement



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# Demographic Assumptions

- Recommendation (Cont'd)
  - RP-2000 Combined Healthy Mortality, sex distinct, projected to 2015 (static table) setback 3 years for males and 2 years for females
    - For pre-retirement mortality use multiplier of post-retirement rates of 0.85 for males and 0.70 for females
  - Similar mortality assumptions as SERS but with additional adjustments to reflect lower mortality
  - Same assumption adopted by the JRS Board
  - Includes approximately 15%-20% margin for future mortality improvements (small sample size)



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# Demographic Assumptions

- Retirement and Turnover
  - Rates were developed in an experience study, for the period from 2006 to 2010, performed by Goldstein and Associates prior to the June 30, 2011, valuation.
  - We reviewed the experience study and conclude the experience based rates are reasonable
  - Recommend maintaining the current retirement and termination rates

# Demographic Assumptions

- Disability
  - No disabilities over the past six years
  - Recommend eliminating the disability assumption
  - Recommendation consistent with the State Actuary's report



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# Demographic Assumptions

- Future Population Projection
  - The valuation at June 30, 2012, assumed a stable active population (176 active members)
  - Approximately 25 new members have declined participation in the GARS
  - We have performed a projection assuming an ultimate population of 150 active members



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# Demographic Assumptions

- Future Population Projection (Cont'd)
  - Implications of members declining to participate
    - Ultimate cost of the plan is lower because fewer members are projected to retire
    - In the short term, State contributions increase as a result of:
      - Fewer employee contributions made to the System
      - Lower payroll base over which to finance the unfunded accrued liability (contributions are less "back loaded")



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# Cost Impact

| *($ in Millions)* | Baseline Valuation | Experience Study | Change |
|---|---|---|---|
| Valuation Date: | June 30, 2012 | June 30, 2012 | |
| Fiscal Year Ending: | June 30, 2014 | June 30, 2014 | |
| Actuarial Information | | | |
| • Normal Cost Amount | $3,108,142 | $2,815,608 | ($292,534) |
| • Actuarial Accrued Liability (AAL) | $303,469,263 | $309,923,452 | $6,454,189 |
| • Unfunded Actuarial Accrued Liability (UAAL) | $247,379,182 | $253,833,371 | $6,454,189 |
| • Funded Ratio based on AVA | 18.5% | 18.1% | -0.4% |
| • Funded Ratio based on MVA | 17.4% | 17.0% | -0.4% |
| Estimated Statutory Contributions (Stable Population of 176): | | | |
| • Annual Amount | $13,856,000 | $14,855,057 | $999,057 |
| • Percentage of Covered Payroll | 95.46% | 106.19% | 10.73% |
| Estimated Statutory Contributions (Ultimate Population of 150): | | | |
| • Annual Amount | $13,856,000 | $16,255,000 | $2,399,000 |
| • Percentage of Covered Payroll | 95.46% | 123.92% | 28.46% |
| Annual Required Contribution (ARC): | | | |
| • Annual Amount | $17,110,135 | $17,182,917 | $72,782 |
| • Percentage of Covered Payroll | 117.88% | 131.00% | 13.12% |

# Projections – Stable Population

## Required State Contribution

### Determined at June 30, 2012 [a]

| | Contribution Percent | | | Contribution Dollar (in millions) | | |
|---|---|---|---|---|---|---|
| Year | Valuation Baseline | Experience Study | Change | Valuation Baseline | Experience Study | Change |
| 2013 | 95.0% | 95.0% | 0.0% | $ 14.2 | $ 14.2 | $ - |
| 2014 | 95.5% | 106.2% | 10.7% | $ 13.9 | $ 14.9 | $ 1.0 |
| 2015 | 96.7% | 107.5% | 10.8% | $ 14.6 | $ 15.1 | $ 0.5 |
| 2020 | 97.1% | 107.9% | 10.8% | $ 17.7 | $ 18.3 | $ 0.6 |
| 2025 | 95.9% | 106.4% | 10.5% | $ 21.2 | $ 21.7 | $ 0.5 |
| 2030 | 95.9% | 106.3% | 10.4% | $ 25.8 | $ 26.0 | $ 0.2 |
| 2035 | 97.9% | 108.3% | 10.4% | $ 32.0 | $ 31.7 | $ (0.3) |
| 2040 | 97.9% | 108.3% | 10.4% | $ 38.6 | $ 37.9 | $ (0.7) |
| 2045 | 97.9% | 108.3% | 10.4% | $ 46.3 | $ 45.1 | $ (1.2) |

[a] *Assumes deferred asset gains and losses are phased into the actuarial value of assets.*



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# Projections – Stable Population

## Accrued Liability and Funded Ratio

### Determined at June 30, 2012[a]

| | Accrued Liability (in millions) | | | Funded Ratio | | |
|---|---|---|---|---|---|---|
| Year | Valuation Baseline | Experience Study | Change | Valuation Baseline | Experience Study | Change |
| 2012 | $ 303.5 | $ 309.9 | $ 6.4 | 18.5% | 18.1% | -0.4% |
| 2013 | $ 308.2 | $ 314.8 | $ 6.6 | 16.6% | 16.3% | -0.3% |
| 2014 | $ 313.0 | $ 319.5 | $ 6.5 | 15.9% | 15.8% | -0.1% |
| 2015 | $ 317.4 | $ 324.0 | $ 6.6 | 15.1% | 15.2% | 0.1% |
| 2020 | $ 334.6 | $ 340.4 | $ 5.8 | 10.8% | 11.4% | 0.6% |
| 2025 | $ 340.9 | $ 344.8 | $ 3.9 | 7.2% | 8.3% | 1.1% |
| 2030 | $ 336.8 | $ 337.2 | $ 0.4 | 6.5% | 7.5% | 1.0% |
| 2035 | $ 328.3 | $ 324.0 | $ (4.3) | 14.4% | 14.7% | 0.3% |
| 2040 | $ 323.6 | $ 313.7 | $ (9.9) | 39.7% | 39.2% | -0.5% |
| 2045 | $ 330.0 | $ 314.2 | $ (15.8) | 90.0% | 90.0% | 0.0% |

[a] *Assumes deferred asset gains and losses are phased into the actuarial value of assets.*



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# Projections – Reduced Population

## Required State Contribution

### Determined at June 30, 2012 [a]

| | Contribution Percent | | | Contribution Dollar (in millions) | | |
|---|---|---|---|---|---|---|
| Year | Valuation Baseline | Experience Study | Change | Valuation Baseline | Experience Study | Change |
| 2013 | 95.0% | 95.0% | 0.0% | $ 14.2 | $ 14.2 | $ - |
| 2014 | 95.5% | 123.9% | 28.4% | $ 13.9 | $ 16.3 | $ 2.4 |
| 2015 | 96.7% | 125.3% | 28.6% | $ 14.6 | $ 15.4 | $ 0.8 |
| 2020 | 97.1% | 125.3% | 28.2% | $ 17.7 | $ 18.0 | $ 0.3 |
| 2025 | 95.9% | 123.6% | 27.7% | $ 21.2 | $ 21.4 | $ 0.2 |
| 2030 | 95.9% | 123.4% | 27.5% | $ 25.8 | $ 25.6 | $ (0.2) |
| 2035 | 97.9% | 126.1% | 28.2% | $ 32.0 | $ 31.4 | $ (0.6) |
| 2040 | 97.9% | 126.1% | 28.2% | $ 38.6 | $ 37.5 | $ (1.1) |
| 2045 | 97.9% | 126.1% | 28.2% | $ 46.3 | $ 44.8 | $ (1.5) |

[a] *Assumes deferred asset gains and losses are phased into the actuarial value of assets.*



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# Projections – Reduced Population

## Accrued Liability and Funded Ratio

### Determined at June 30, 2012[a]

| | Accrued Liability (in millions) | | | Funded Ratio | | |
|---|---|---|---|---|---|---|
| Year | Valuation Baseline | Experience Study | Change | Valuation Baseline | Experience Study | Change |
| 2012 | $ 303.5 | $ 309.9 | $ 6.4 | 18.5% | 18.1% | -0.4% |
| 2013 | $ 308.2 | $ 314.7 | $ 6.5 | 16.6% | 16.3% | -0.3% |
| 2014 | $ 313.0 | $ 319.3 | $ 6.3 | 15.9% | 16.3% | 0.4% |
| 2015 | $ 317.4 | $ 323.4 | $ 6.0 | 15.1% | 15.7% | 0.6% |
| 2020 | $ 334.6 | $ 337.8 | $ 3.2 | 10.8% | 11.3% | 0.5% |
| 2025 | $ 340.9 | $ 338.8 | $ (2.1) | 7.2% | 7.2% | 0.0% |
| 2030 | $ 336.8 | $ 326.4 | $ (10.4) | 6.5% | 5.0% | -1.5% |
| 2035 | $ 328.3 | $ 307.2 | $ (21.1) | 14.4% | 10.7% | -3.7% |
| 2040 | $ 323.6 | $ 289.7 | $ (33.9) | 39.7% | 35.1% | -4.6% |
| 2045 | $ 330.0 | $ 282.2 | $ (47.8) | 90.0% | 90.0% | 0.0% |

[a] *Assumes deferred asset gains and losses are phased into the actuarial value of assets.*



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# Conclusions

- Increase in AL mainly attributable to the change in mortality assumption (members are assumed to live longer)
- Decrease in Normal Cost is mainly attributable to the decrease in the salary increase assumption
- Funded ratio remains dangerously low (projected to decrease for the next 15 to 20 years before improving)



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# Questions?



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# Appendix – Proposed Actuarial Assumptions

**Mortality**

*Post-Retirement Mortality*

RP-2000 Combined Healthy Mortality, sex distinct, projected to 2015 (static table) setback 3 years for males and 2 years for females

The mortality table used is a static table with the provision for future mortality improvement in the projection to 2015 which is in sync with the next scheduled experience study.

*Pre-Retirement Mortality*

Based on a percentage of 85 percent for males and 70 percent for females of post-retirement mortality.

**Interest**

7.00 percent per annum, compounded annually.

**General Inflation**

3.00 percent per annum, compounded annually.



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# Appendix – Proposed Actuarial Assumptions

**Marriage Assumption**

75.0 percent of active participants are assumed to be married. Actual marital status at benefit commencement is used for retirees.

**Termination**

Illustrative rates of withdrawal from the plan are as follows:

| Age Based Withdrawal | |
|---|---|
| Age | Males and Females |
| 20 | 0.0400 |
| 25 | 0.0400 |
| 30 | 0.0400 |
| 35 | 0.0400 |
| 40 | 0.0400 |
| 45 | 0.0400 |
| 50 | 0.0400 |
| 55 | 0.0400 |
| 60 | 0.0400 |
| 65 | 0.0400 |

It is assumed that terminated employees will not be rehired. The rates apply only to employees who have not fulfilled the service requirement necessary for retirement at any given age.



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# Appendix – Proposed Actuarial Assumptions

**Salary Increases**

A salary increase assumption of 3.50% per year, compounded annually, was used. This 3.50% salary increase assumption includes an inflation component of 3.00% per year, a productivity component of 0.40% per year, and a merit/promotion component of 0.10% per year.

**Inactive Member Pay Increases**

10% load on inactive vested liabilities

**Disability**

No assumption for disability

**Population Projection**

The annual appropriation is based on a percent of total covered payroll for members electing to participate in the Plan. We have a assumed a stable population of 150 members who elect to participate and 26 members who decline coverage in the Plan.



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# Appendix – Proposed Actuarial Assumptions

**Retirement**

Employees are assumed to retire in accordance with the rates shown below. The rates apply only to employees who have fulfilled the service requirement necessary for retirement at any given age.

| Retirement Rates | |
|---|---|
| Age | Males |
| 55 | 10.00% |
| 56 - 79 | 8.50% |
| 80 | 100.00% |

**Expenses**

As estimated and advised by GARS staff, based on current expenses and are expected to increase in relation to the projected capped payroll.



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# Appendix – Proposed Actuarial Assumptions

**Spouse's Age**

The spouse is assumed to be four years younger than employee /retiree.

**Decrement Timing**

All decrements are assumed to occur beginning of year.

**Decrement Relativity**

Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.

**Decrement Operation**

Turnover decrement does not operate after member reaches retirement eligibility.

**Eligibility Testing**

Eligibility for benefits is determined based upon the age nearest birthday and service on the date the decrement is assumed to occur.



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# Appendix – Proposed Actuarial Assumptions

**Assumptions as a result of Public Act 96-0889**

Members hired after December 31, 2010, are assumed to make contributions on salary up to the final average compensation cap in a given year until this plan provision or administrative procedure is clarified. State contributions, expressed as a percentage of pay, are calculated based upon capped pay. Retirement rates for tier two members to account for the change in retirement age, as follows:

| Retirement Rates | |
|---|---|
| Age | Males |
| 62 | 40.00% |
| 63 | 15.00% |
| 64 | 20.00% |
| 65 | 25.00% |
| 66 | 30.00% |
| 67 | 40.00% |
| 68 - 79 | 5.00% |
| 80 | 100.00% |

# Disclosures

- Circular 230 Notice: Pursuant to regulations issued by the IRS, to the extent this presentation concerns tax matters, it is not intended or written to be used, and cannot be used, for the purpose of (i) avoiding tax-related penalties under the Internal Revenue Code or (ii) marketing or recommending to another party any tax-related matter addressed within. Each taxpayer should seek advice based on the individual's circumstances from an independent tax advisor.
- This presentation shall not be construed to provide tax advice, legal advice or investment advice.
- The actuary submitting this presentation (Alex Rivera) is a member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.
- The results summarized in this report involve actuarial calculations that require assumptions about future events. The major actuarial assumptions used in this analysis were provided by and are the responsibility of JRS. We are unable to judge the reasonableness of some of these assumptions without performing a substantial amount of additional work beyond the scope of the assignment.

# Disclosures

- Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law.
- Additional information regarding actuarial assumptions and methods, and important additional disclosures are provided in the full actuarial valuation report of GARS as of June 30, 2012.
- If you need additional information to make an informed decision about the contents of this presentation, or if anything appears to be missing or incomplete, please contact us before relying on this presentation.