



# Firefighters' and Rescue Squad Workers' Pension Fund Principal Results of Actuarial Valuation as of December 31, 2013

Advisory Panel Meeting

Larry Langer and Janie Shaw

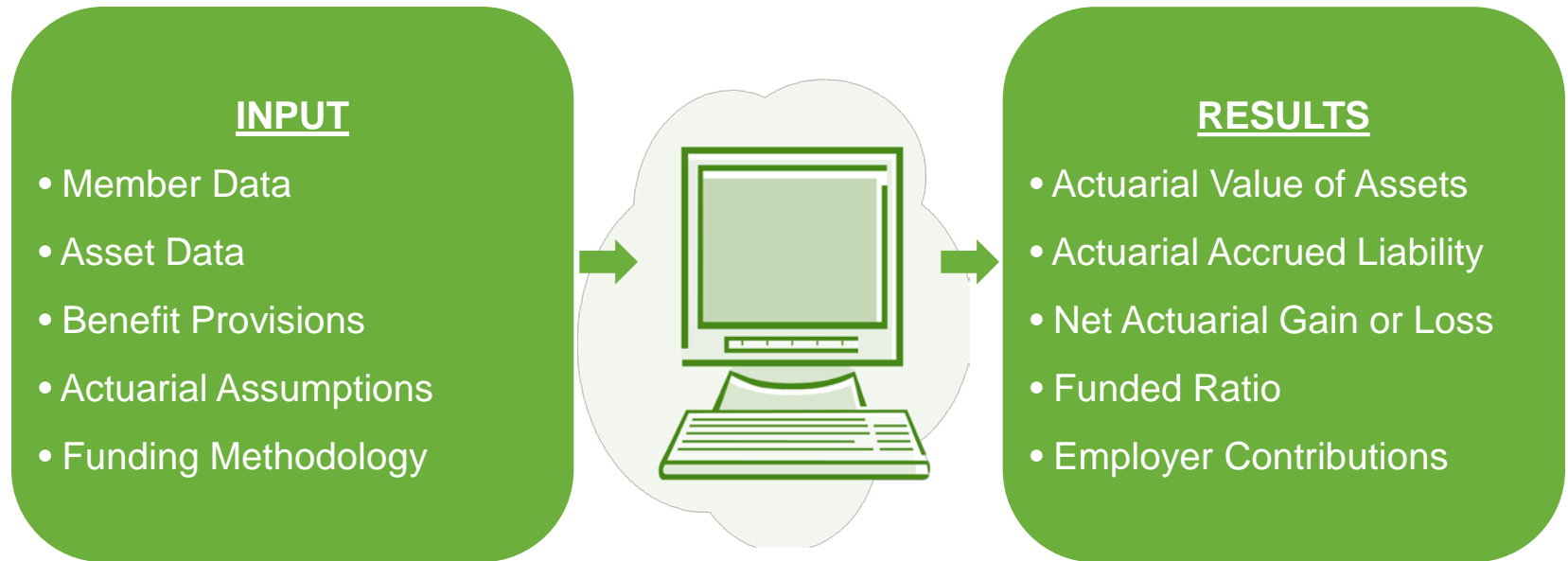
June 3, 2015 (Originally presented at October 2014 Board of Trustees meeting)

# Purpose of the Annual Actuarial Valuation

- As of the end of each calendar year (beginning with this December 31, 2013):
  - An annual actuarial valuation is performed on FRSWPF
  - The actuary determines the amount of employer contributions to be made to FRSWPF during each member's career that, when combined with investment return and member contributions, such contributions will be sufficient to pay for retirement benefits.
  - The prior actuarial valuation was performed as of June 30, 2012. The 18-month gap between valuations puts this valuation on the same timing as the actuarial valuations for all other North Carolina Retirement Systems.
- In addition, the annual actuarial valuation is performed to:
  - Determine the progress on funding FRSWPF,
  - Explore why the results of the current valuation differ from the results of the valuation of the previous year, and
  - Satisfy regulatory and accounting requirements.

# The Valuation Process

The following diagram summarizes the inputs and results of the actuarial valuation process.



A detailed summary of the valuation process and a glossary of actuarial terms are provided in Appendix A of the actuarial report.

# Key Takeaways

Key results of the December 31, 2013 valuation as compared to the June 30, 2012 valuation were:

- Annualized market value returns of 12.42% compared to 7.25% assumed
- Recent legislation signed into law including:
  - In-service distributions of pensions allowed for all members after attaining age 55 and 20 years of service as an eligible firefighter or eligible rescue squad worker.
- Adjustments to actuarial assumptions intended to estimate the impact of a full audit of the census data for lapsed members, including the development of a select and ultimate lapse assumption based on the full audit
- No significant changes in funding methodology from the prior year's valuations

When compared to the June 30, 2012 valuation, the above resulted in:

- Higher funded ratio (88.3% in the December 31, 2013 valuation compared to 83.9% in the June 30, 2012 valuation)
- Lower employer required contribution (\$13,240,552 for fiscal year ending June 30, 2016 compared to \$14,620,362 for fiscal year ending June 30, 2014)



# Valuation Input

# Valuation Input Membership Data



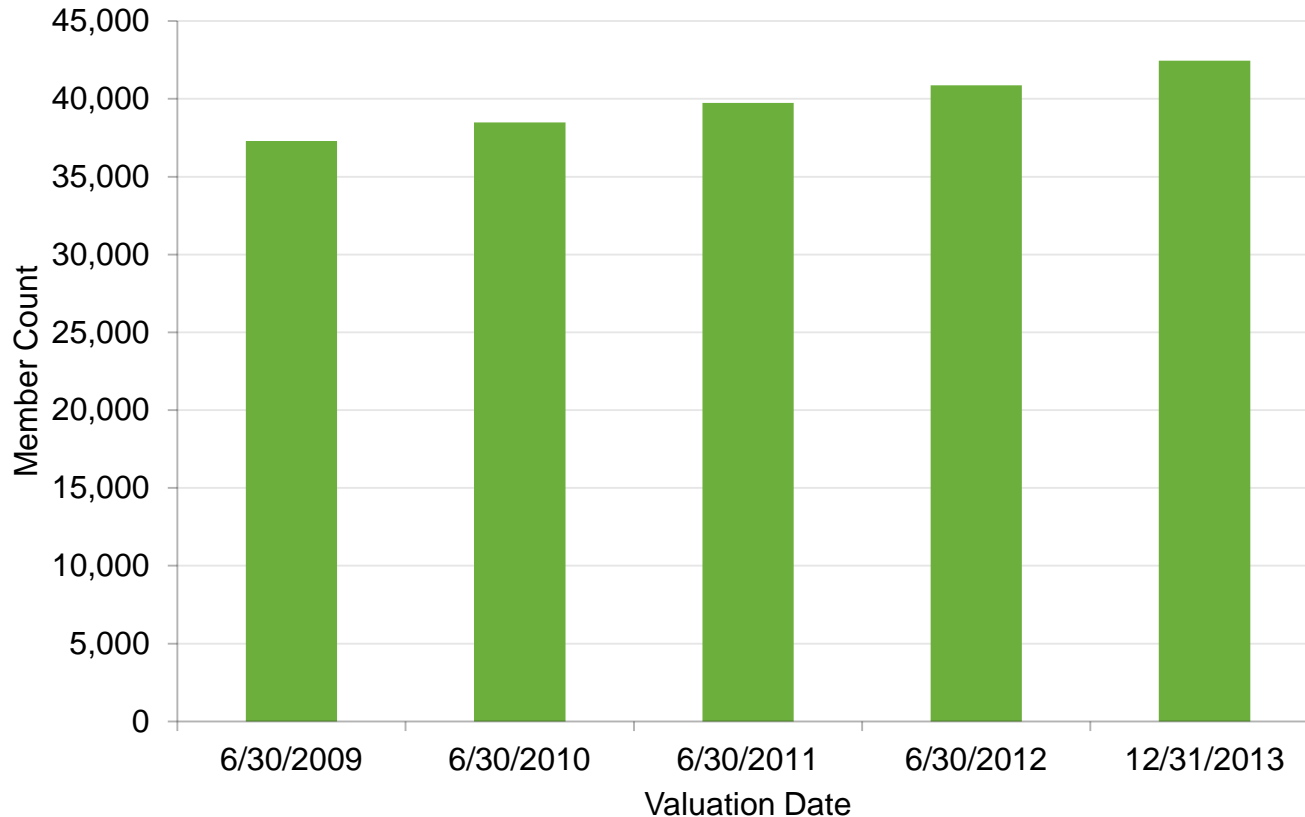
Number as of	December 31, 2013	June 30, 2012
Active members	42,464	40,870
Terminated members entitled to benefits but not yet receiving benefits	156	154
Retired members currently receiving benefits	<u>12,445</u>	<u>11,912</u>
Total	55,065	52,936

The number of active members increased by 3.9% from the previous valuation date. The increase in the active population could result in more benefits accruing, but also more contributions supporting the system.

The number of retired members currently receiving benefits increased by 4.5% from the previous valuation date. The increase in retiree population is consistent with expectations.

A detailed summary of the membership data used in this valuation is provided in Section 3 and Appendix B of the actuarial report.

# Membership Data: Active Members

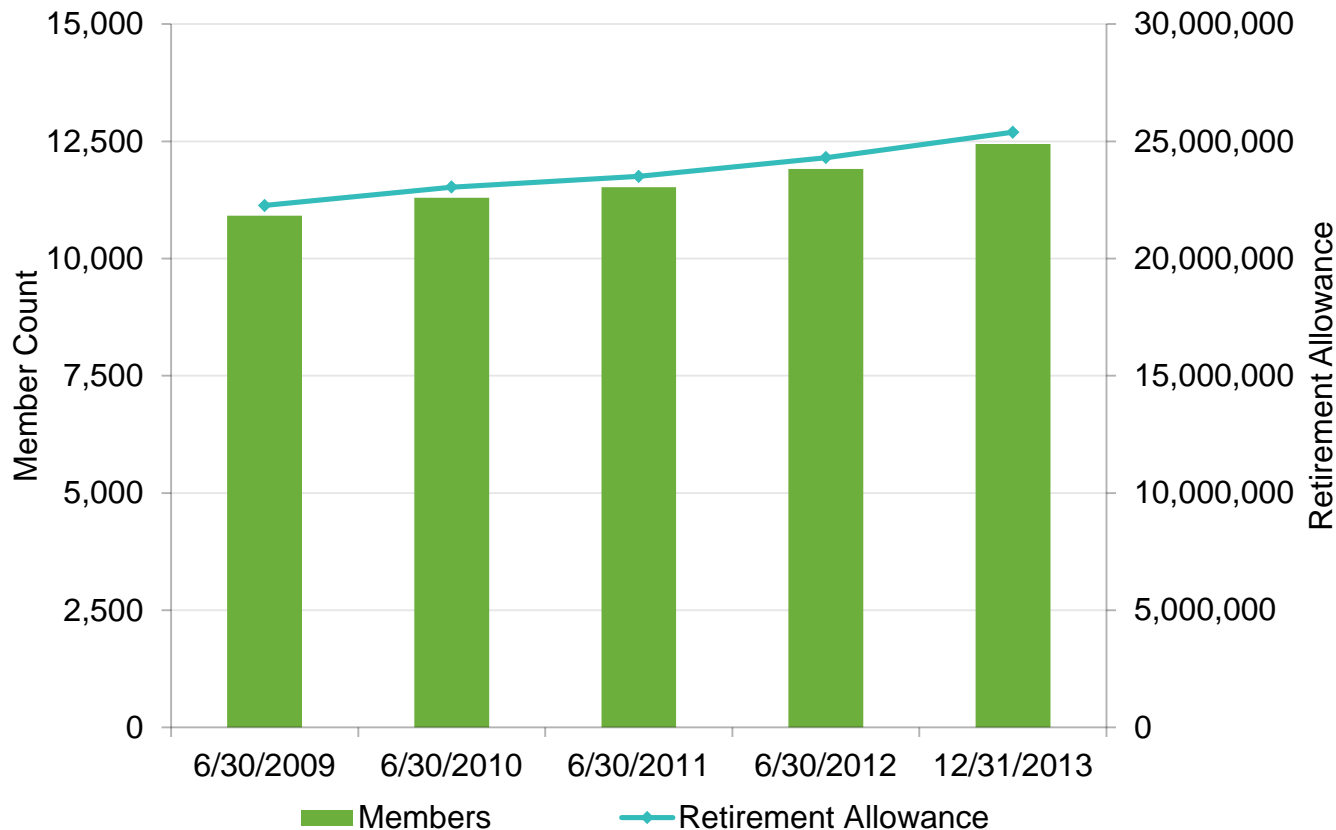


While we have seen a steady increase in the number of active members submitted for the annual valuation, more and more of these members are not accruing a benefit. As a result, an audit of the census data is being conducted in order to develop a lapse assumption to reflect that some members are reported as active but are not currently accruing benefits.

A detailed summary of the membership data used in this valuation is provided in Section 3 and Appendix B of the actuarial report.

# Valuation Input

## Membership Data: Retired Members



The number of retired members and the benefits paid to these members has been increasing steadily, as expected based on plan assumptions.

A detailed summary of the membership data used in this valuation is provided in Section 3 and Appendix B of the actuarial report.



# Valuation Input

## Asset Data: Market Value of Assets



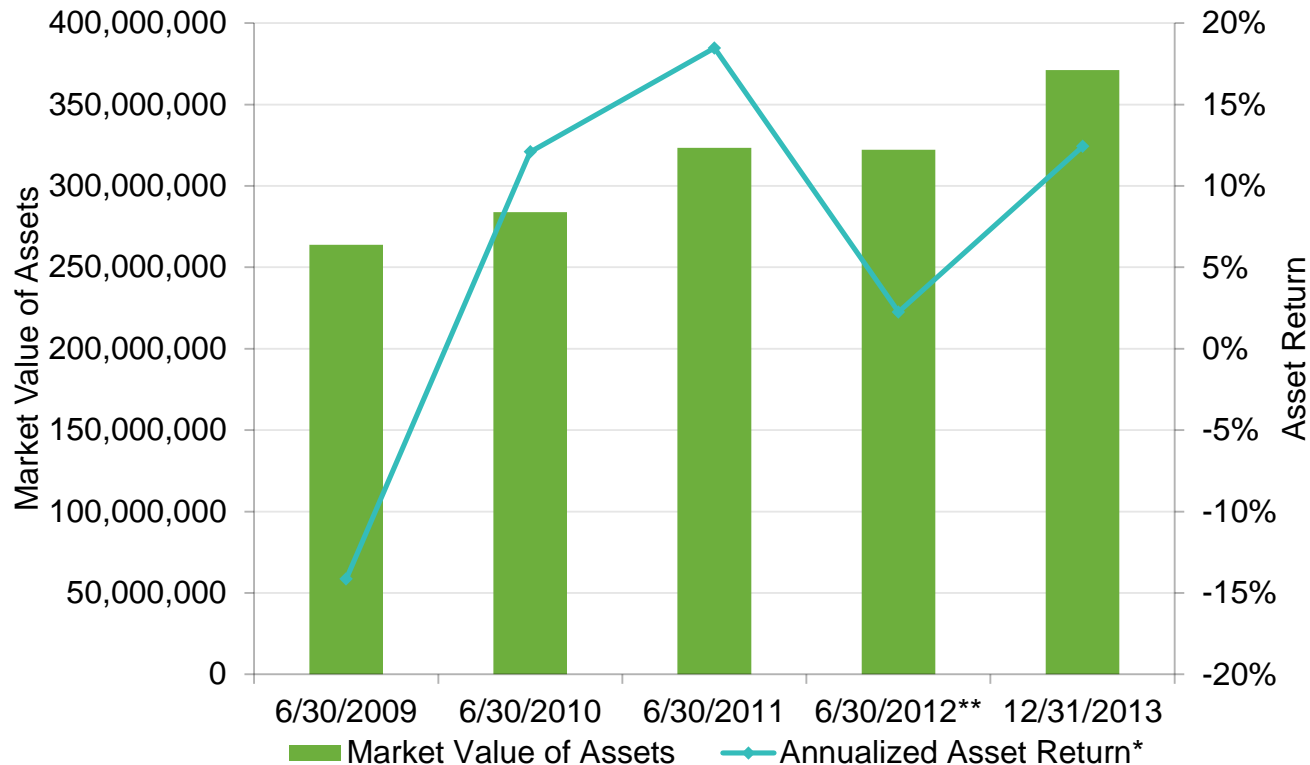
Asset Data as of	December 31, 2013	June 30, 2012
Beginning of Year Market Value of Assets	\$322,225,386	\$323,354,190
Contributions	27,469,616	17,171,291
Benefit Payments	(39,300,367)	(25,428,329)
Investment Income	<u>60,727,495</u>	<u>7,128,234</u>
Net Increase/(Decrease)	48,896,744	(1,128,804)
End of Year Market Value of Assets	\$371,122,130	\$322,225,386
Estimated Net Investment Return on Market Value (Annualized)	12.42%	2.25%

The Market Value of Assets is \$371 million as of December 31, 2013 and \$322 million as of June 30, 2012. The investment return for the market value of assets for the 18-month period between the two valuation dates was 19.20%.

The contributions, benefit payments, investment income, and estimated net investment return as of December 31, 2013 are for the 18-month period from June 30, 2012 to December 31, 2013. The contributions and market value of assets as of June 30, 2012 include employer contributions receivable of \$4,318,042 as appropriated for fiscal year ending June 30, 2012 but received after such date.

The market value of assets is provided in Section 4 of the actuarial report.

# Asset Data: Market Value of Assets and Annualized Asset Returns



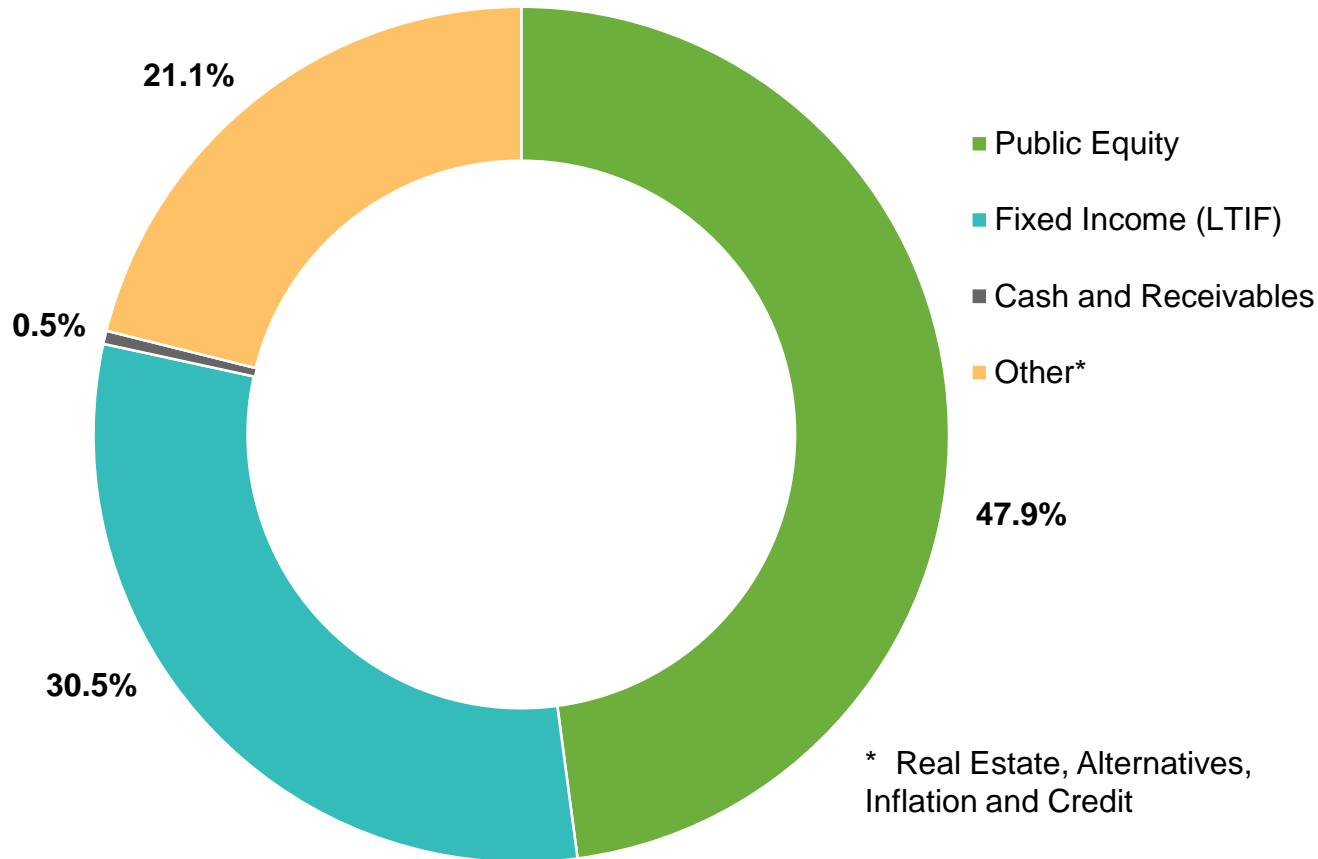
Returns were more than the 7.25% assumed rate of return, resulting in lower contributions and higher funded ratio than anticipated.

\* Equals the asset return for the year preceding the valuation date except for the asset return at 12/31/2013 which equals the annualized asset return between 6/30/2012 and 12/31/2013

\*\* The market value of assets as of June 30, 2012 includes employer contributions receivable of \$4,318,042 as appropriated for fiscal year ending June 30, 2012 but received after such date.

A detailed summary of the market value of assets is provided in Section 4 of the actuarial report.

# Asset Data: Allocation of Investments by Category



Based on historical market returns, the current asset allocation, the current investment policy, and the expectation of future asset returns, as reviewed in the last experience study, the 7.25% discount rate used in this valuation is reasonable and appropriate.

The discount rate will be reviewed at the next experience study to be presented to the Board in October 2015.

A detailed summary of the market value of assets is provided in Section 4 of the actuarial report.

# Valuation Input Benefit Provisions



Benefit provisions are described in North Carolina General Statutes, Chapter 58.

Highlights of the benefit provisions are described below:

- \$170 per month is payable to members who retire from service after attaining age 55 and 20 years of service as an eligible firefighter or eligible rescue squad worker.

Significant changes to the benefit provisions from the prior year's valuation were:

- In-service distributions of pensions allowed for all members after attaining age 55 and 20 years of service as an eligible firefighter or eligible rescue squad worker

Most Public Sector Retirement Systems in the United States have undergone pension reform where the benefits of members (current retirees and active or future members) have been reduced.

Because of the well-funded status of FRSWPF due to the legislature contributing the actuarially required contribution, benefit cuts have not been needed in North Carolina. Instead, we have seen a modest expansion of benefits this past year based on sound plan design.

A detailed summary of the benefit provisions is provided in Appendix C of the actuarial report.

# Valuation Input Actuarial Assumptions

- Demographic (future events that relate to people)
  - Retirement
  - Termination
  - Disability
  - Death
- Economic (future events that relate to money)
  - Interest rate – 7.25% per year
  - Real return – 4.25%
- The valuation was based on the same actuarial assumptions as used in the previous valuation, except that the valuation reflected adjustments intended to estimate the impact of a full audit of the census data for lapsed members, including the development of a select and ultimate lapse assumption based on the full audit.



Other than the adjustments previously described, the latest assumptions were adopted for use with the December 31, 2009 actuarial valuation, based on the experience study prepared as of December 31, 2009 and adopted by the Board of Trustees on October 21, 2010.

The next experience study will be prepared as of December 31, 2014 and presented to the Board in October 2015. This policy of reviewing assumptions every five years is a best practice.

A detailed summary of the actuarial assumptions and methods is provided in Appendix D of the actuarial report.

# Valuation Input Funding Methodology



The Funding Methodology is the payment plan for FRSWPF and is composed of the following three components:

- Actuarial Cost Methods allocate costs to the actuarial accrued liability (i.e. the amount of money that should be in the fund) for past service and normal cost (i.e. the cost of benefits accruing during the year) for current service.
  - The Board of Trustees has adopted Entry Age Normal as its actuarial cost method
  - Develops normal costs that stays level
- Asset Valuation Methods smooth or average the market value returns over time to alleviate contribution volatility that results from market returns.
  - 20% of market value plus 80% of the expected actuarial value
  - Assets corridor: not greater than 120% of market value and not less than 80% of market value

A detailed summary of the actuarial assumptions and methods is provided in Appendix D of the actuarial report.

# Funding Methodology (continued)



- Amortization Methods determine the payment schedule for unfunded actuarial accrued liability (i.e. the difference between the actuarial accrued liability and actuarial value of assets)
  - Payment level: the payment is determined as a level dollar amount, similar to a mortgage payment
  - Payment period: a 12-year closed amortization period was adopted for fiscal year ending 2012. A new amortization base is created each year based on the prior years' experience.
- There were no significant changes in funding methodology from the previous valuation.

When compared to other Public Sector Retirement Systems in the United States, the funding policy for FRWPF is quite aggressive in that the policy pays down the pension debt over a much shorter period of time (12 years) compared to the national average of around 24 years. As such it is a best practice in the industry.

A detailed summary of the actuarial assumptions and methods is provided in Appendix D of the actuarial report.



# Valuation Results



# Valuation Results

## Actuarial Value of Assets



Asset Data as of	December 31, 2013
(a) Actuarial Value of Assets at 6/30/2012	\$338,885,087
(b) Contributions*	27,469,616
(c) Benefit Payments	<u>(39,300,367)</u>
(d) Net Cash Flow: (b) + (c)	(11,830,751)
(e) Expected Investment Return: [(a) x 10.875%] + [(d) x 5.4375%]	36,210,456
(f) Expected End of Year Actuarial Value of Assets: (a) + (d) + (e)	363,264,792
(g) End of Year Market Value of Assets	371,122,130
(h) Excess of Market Value over Expected Actuarial Value of Assets: (g) – (f)	7,857,338
(i) 20% Adjustment toward Market Value of Assets: (h) x 20%	1,571,468
(j) Preliminary End of Year Actuarial Value of Assets: (f) + (i)	364,836,260
(k) Final End of Year Actuarial Value of Assets: (j) not less than 80% of (g) and not greater than 120% of (g)	364,836,260
(l) Estimated Net Investment Return (Annualized)	7.43%

\* Does not include employer contributions receivable of \$4,318,042 as appropriated for fiscal year ending June 30, 2012 but received after such date.

The actuarial value of assets smooths investment gains/losses, resulting in less volatility in the employer contribution. Higher than expected returns resulted in a \$1.6 million asset gain recognition this year (item (i)).

The contributions, benefit payments, expected investment return, and estimated net investment return are for the 18-month period from June 30, 2012 to December 31, 2013.

The Actuarial Value of Assets is provided in Section 4 of the actuarial report.

# Historical Annualized Asset Returns



Year*	Actuarial Value of Asset Return	Market Value of Asset Return
2006	8.63%	7.24%
2007	9.98%	14.85%
2008	7.43%	(1.92)%
2009	3.09%	(14.15)%
2010	4.47%	12.09%
2011	6.88%	18.47%
2012	5.96%	2.25%
2013	7.43%	12.42%
Average	6.71%	5.91%
Range	6.89%	32.62%

\* Asset returns are for the year ending on June 30 of the applicable year, except for the 2013 asset return, which is the annualized return for the 18-month period from June 30, 2012 to December 31, 2013.

The average investment return recognized for purposes of determining the annual change in contribution each year is the actuarial value of assets return.

Currently, the average actuarial return of 6.71% tracks average market return of 5.91% rather well. But the range of returns is markedly less – 6.89% versus 32.62%. This results in much lower employer contribution volatility using the actuarial value of assets versus market, while ensuring that the actuarial needs of FRSWPF are met.

The valuation assumes that the funds will earn a 7.25% asset return. This table provides a history of the Actuarial Value and Market Value of Asset annualized returns.

## Valuation Results

# Annualized Asset Returns: Actuarial Value and Market Value



The investment return for the market value of assets for the 18-month period between June 30, 2012 to December 31, 2013 was 19.20% (12.42% annualized).

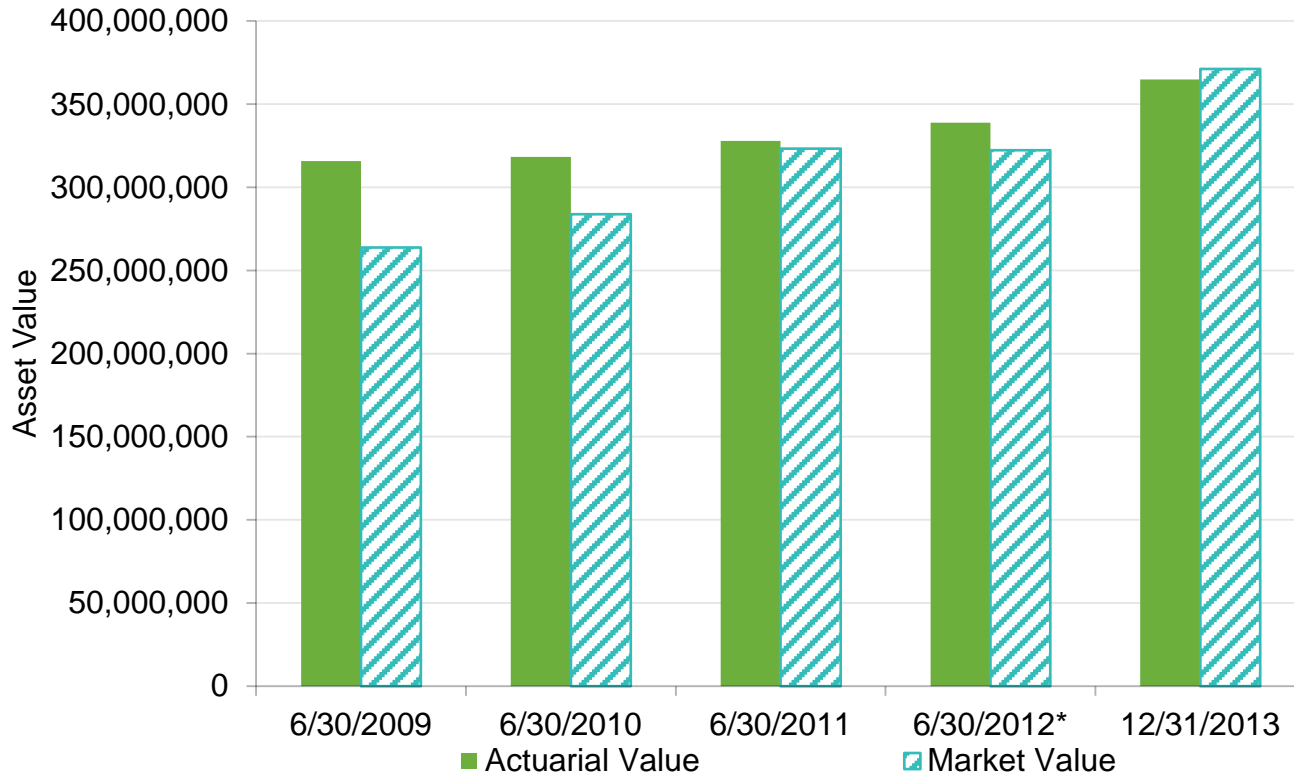
The actuarial value of assets smooths investment gains and losses.

The investment return for the actuarial value of assets for the 18-month period between June 30, 2012 to December 31, 2013 was 11.35% (7.43% annualized).

A detailed summary of the Actuarial Value of Assets is provided in Section 4 of the actuarial report.

## Valuation Results

# Actuarial Value of Assets: Compared to Market Value



For the first time in several years, the market value of assets is higher than the actuarial value of assets, which is used to determine employer contributions. This indicates that there are unrecognized asset returns to be recognized in future valuations, which will mitigate the impact of asset returns that are less than the assumed return of 7.25%.

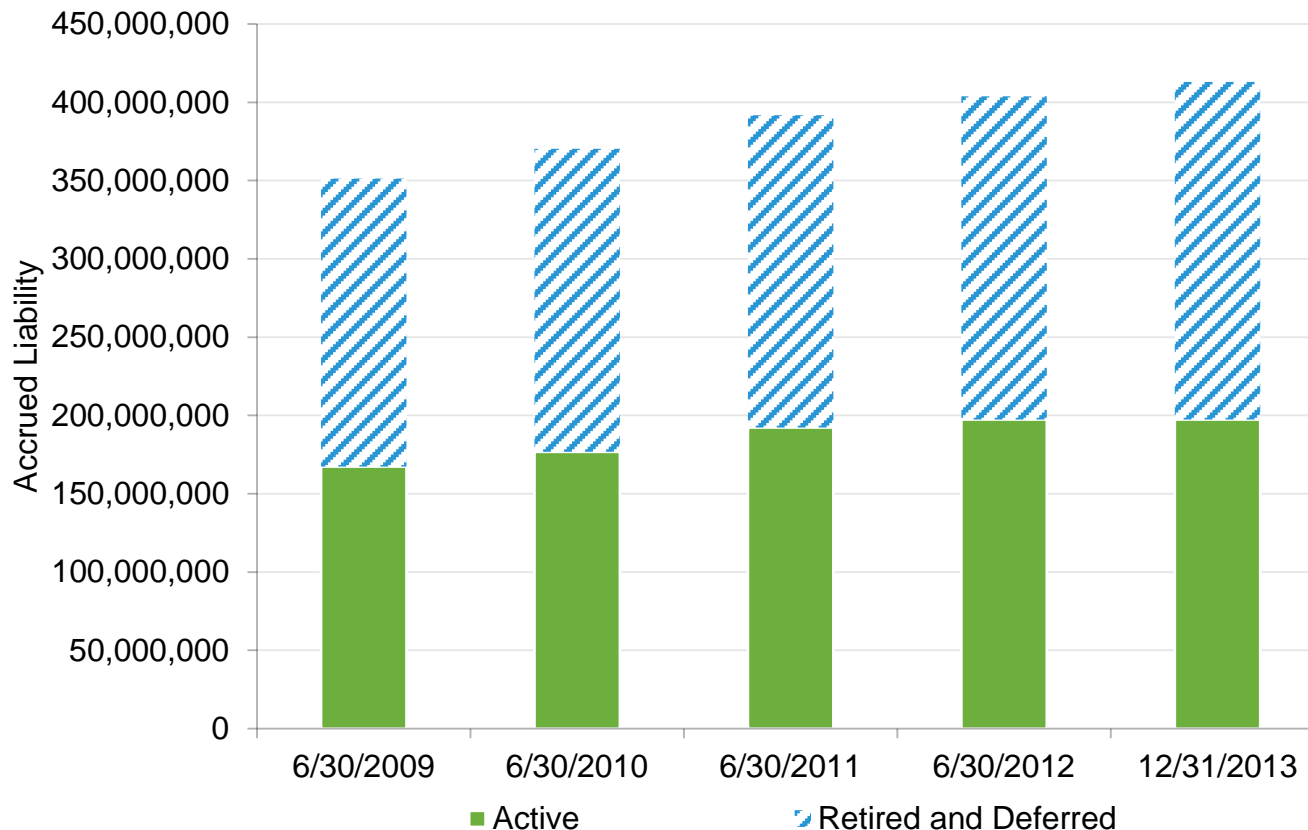
As a result, the upward pressure on contributions that we have seen since the Great Recession has been reversed, as seen in the projections of potentially higher funded ratios and lower employer contributions later in this report.

\* The Market Value and Actuarial Value of Assets as of June 30, 2012 include employer contributions receivable of \$4,318,042 as appropriated for fiscal year ending June 30, 2012 but received after such date.

A detailed summary of the Actuarial Value of Assets is provided in Section 4 of the actuarial report.

# Valuation Results

## Actuarial Accrued Liability (AAL)



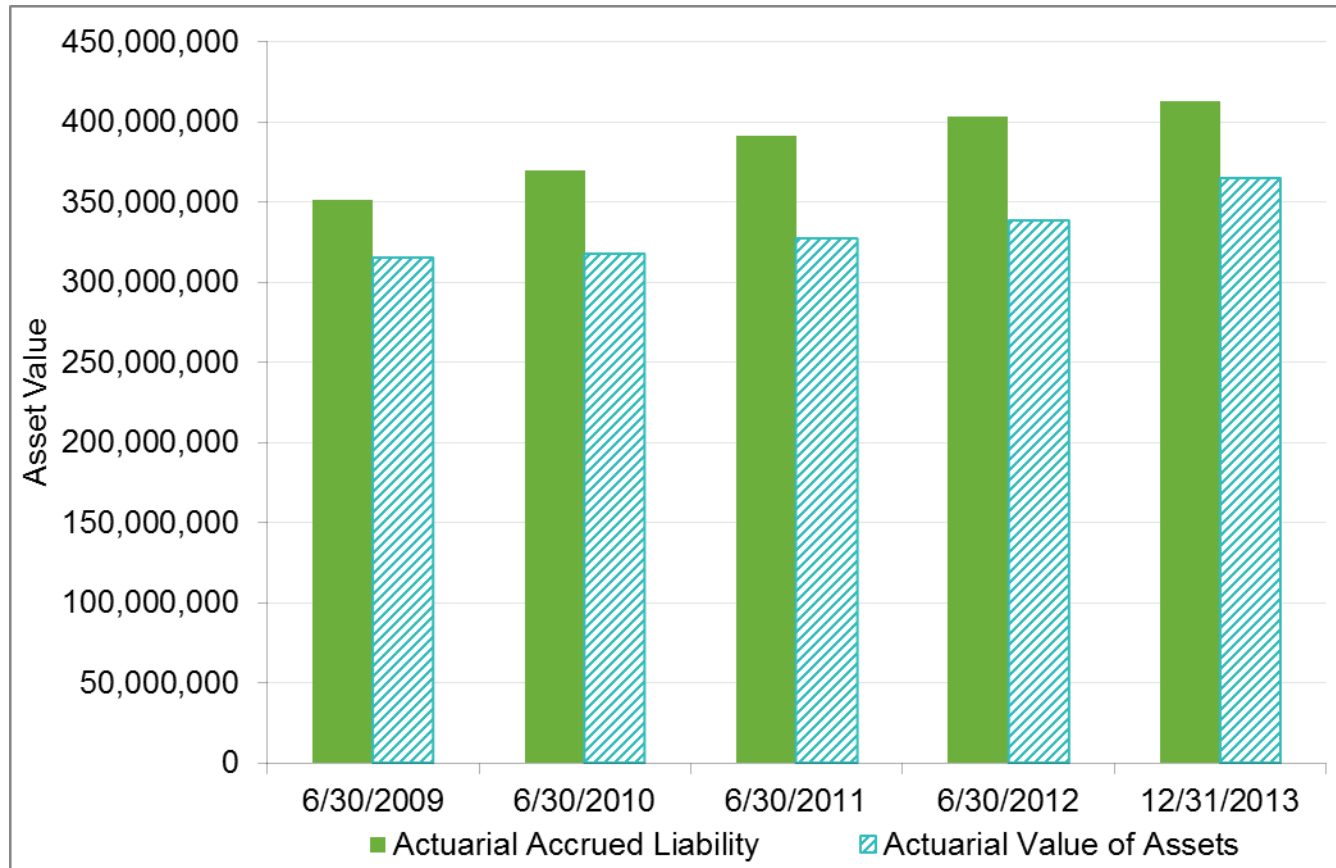
The AAL increased from \$404 million to \$413 million from June 30, 2012 to December 31, 2013. FRSWPF is an open plan, which means that new members enter the plan each year. In an open plan, liabilities are expected to grow from one year to next as more benefits accrue and the membership approaches retirement.

The AAL prior to legislative and assumption changes was \$3.6 million lower than expected, which resulted in a demographic gain of \$3.6 million during 2013. Legislation increased the AAL by \$8.7 million. Assumption changes intended to estimate the impact of a full audit of the census data for lapsed members decreased the AAL by \$16.0 million.

A detailed summary of the AAL is provided in Section 5 of the actuarial report.

## Valuation Results

# Actuarial Accrued Liability (AAL) and Actuarial Value of Assets (AVA)

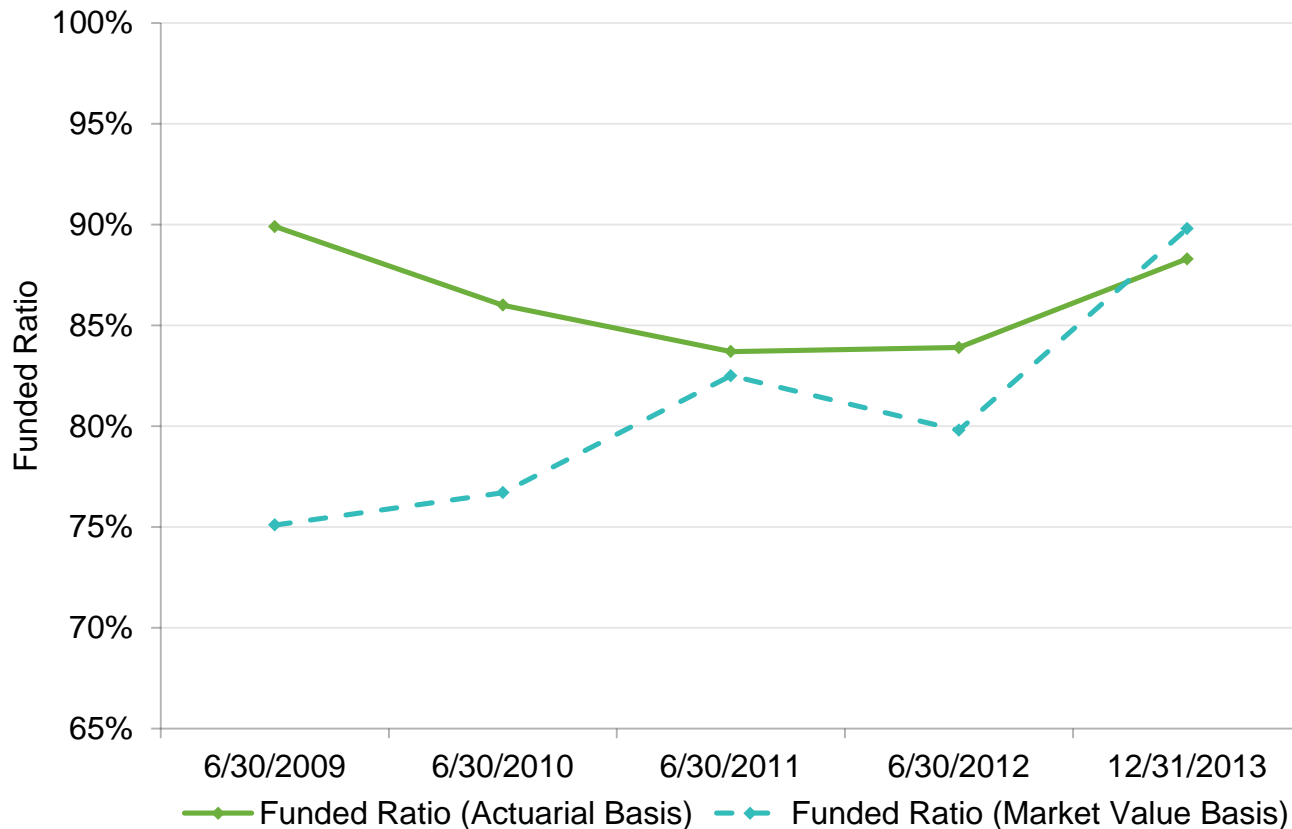


AVA is the basis used for computing contributions to alleviate contribution volatility.

The difference in the AAL and the AVA is the amount of pension debt (to be paid off in 12 years).

A detailed summary of the AVA is provided in Section 4 of the actuarial report, and a detailed summary of the AAL is provided in Section 5 of the actuarial report.

# Funded Ratio: AAL Divided by AVA



The ratio of assets to liabilities shows the health of the plan on an accrued basis.

The funded ratio on an actuarial basis increased from 83.9% at June 30, 2012 to 88.3% at December 31, 2013.

# Valuation Results

## Net Actuarial Gain or Loss



### Reconciliation of Unfunded Actuarial Accrued Liability Since the Prior Valuation (in Millions)

Unfunded Actuarial Accrued Liability (UAAL) as of 6/30/2012	\$ 64.9
Normal Cost from 6/30/2012 to 12/31/2013	16.0
Reduction due to Actual Contributions	(27.5)
Interest on UAAL, Normal Cost, and Contributions	7.3
Asset (Gain)/Loss	(1.6)
Actuarial Accrued Liability (Gain)/Loss	(3.6)
Impact of Assumption Changes*	(16.0)
Impact of Legislative Changes	<u>8.7</u>
Unfunded Actuarial Accrued Liability (UAAL) as of 12/31/2013	\$ 48.2

\* The December 31, 2013 valuation reflects adjustments to assumptions intended to estimate the impact of a full audit of the census data for lapsed members.

The accrued liability gain of \$3.6 million means that the unfunded actuarial accrued liability was \$3.6 million lower than we would have expected based on the assumptions.

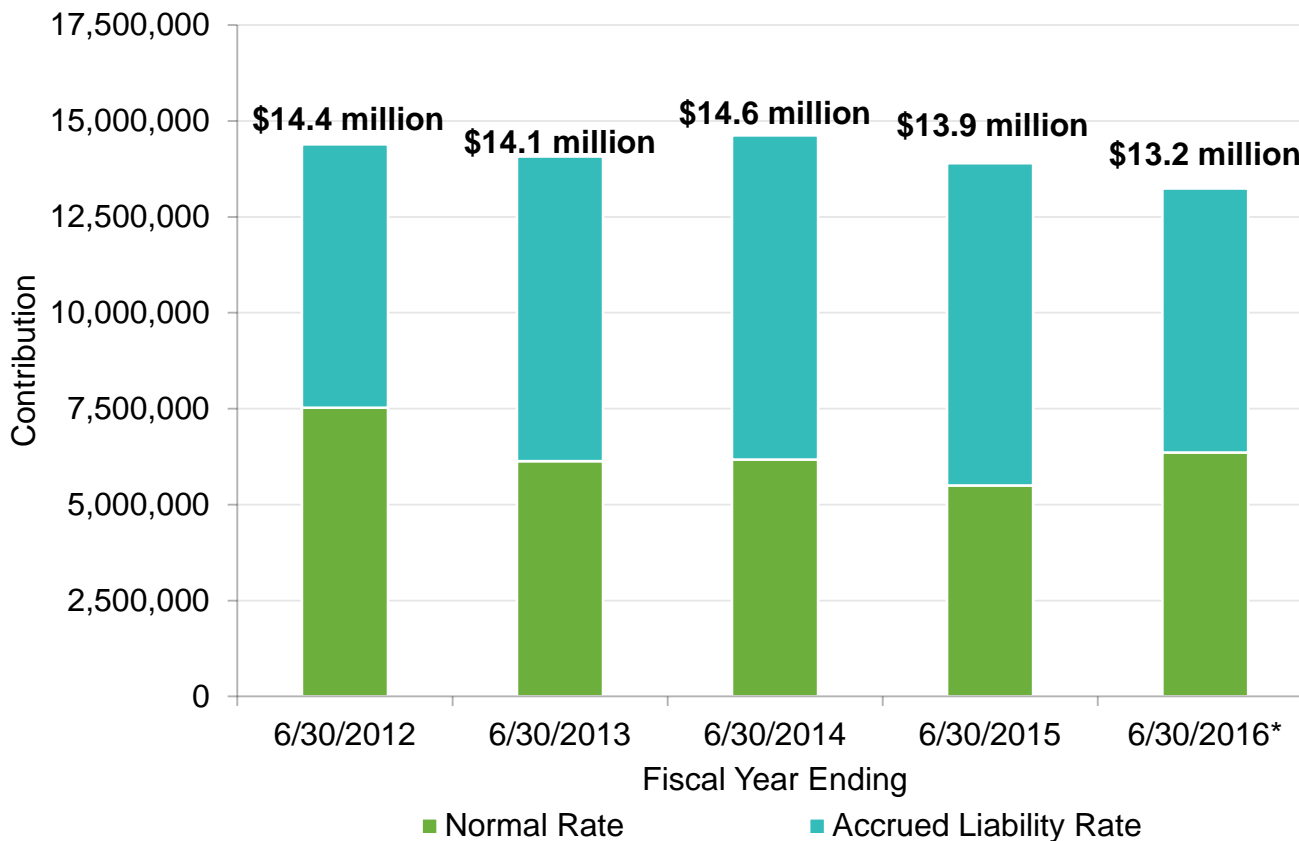
The asset gain of \$1.6 million means that the asset valuation method resulted in a recognition of \$1.6 million of deferred asset gains.

The net actuarial gain/(loss) is provided in Section 5 of the actuarial report.



# Valuation Results

## Employer Required Contributions



\* Subject to the impact of future legislative changes effective during that fiscal year.

The employer required contribution is the amount needed to pay for the cost of the benefits accruing and to pay off the pension debt over 12 years, offset for the \$10 monthly contribution the members make until the member attains 20 years of service.

The 12-year period is a short period for Public Sector Retirement Systems in the United States, with most Systems using a period of 30 years or more to pay off the pension debt. The shorter period results in higher contributions and more benefit security.

A detailed summary of the employer required contributions is provided in Section 6 of the actuarial report.

# Employer Required Contribution Rates



Valuation Date	Fiscal Year Ending	Preliminary ARC	Subsequent Changes to ARC	Final ARC	Appropriated Rate*
12/31/13	6/30/16	\$13,240,552	N/A	N/A	N/A
6/30/12*	6/30/15	15,100,000	\$(1,200,000)**	\$13,900,000	\$13,900,000
6/30/12	6/30/14	14,620,362	0	14,620,362	14,626,599
6/30/11	6/30/13	14,074,371	0	14,074,371	15,446,599
6/30/10	6/30/12	15,870,645	(1,481,939)	14,388,706	14,397,713

\* Because a valuation was not performed at June 30, 2013, the preliminary total employer contribution was estimated to be \$15,100,000 for fiscal year ending June 30, 2015 based on the June 30, 2012 valuation.

\*\* Based on the findings in Phase One of the audit of the census data for lapsed members, the total employer contribution was estimated to decrease by \$2,200,000. House Bill 1034 (Session Law 2014-64) increased the employer contribution by \$1,000,000. Subsequently, the 2014 Appropriations Act (Session Laws 2014-100) set contributions at \$13,900,000 effective for the fiscal year ending June 30, 2015.

The employer required contributions are provided in Section 6 of the actuarial report.

# Reconciliation of the Change in the Annual Required Contribution



Fiscal year ending June 30, 2014 Preliminary ARC (based on June 30, 2012 valuation)	\$14,620,362
Impact of Legislative Changes	<u>0</u>
Fiscal year ending June 30, 2014 Final ARC	\$14,620,362
Change due to One-Year Projection	<u>479,638</u>
Fiscal year ending June 30, 2015 Preliminary ARC (estimated based on June 30, 2012 valuation)	\$15,100,000
Estimated Change due to Phase One of Data Audit	(2,200,000)
Impact of Legislative Changes	<u>1,000,000</u>
Fiscal year ending June 30, 2015 Estimated Final ARC	\$13,900,000
Change due to Demographic (Gain)/Loss	(211,412)
Change due to Investment (Gain)/Loss	(215,028)
Change due to Contributions Greater than ARC	(233,008)
Fiscal year ending June 30, 2016 Preliminary ARC (based on December 31, 2013 valuation)	\$13,240,552

Investment gain is a recognition of deferred asset gains.

A detailed summary of the employer required contributions is provided in Section 6 of the actuarial report.

# Key Takeaways

Key results of the December 31, 2013 valuation as compared to the June 30, 2012 valuation were:

- Annualized market value returns of 12.42% compared to 7.25% assumed
- Recent legislation signed into law including:
  - In-service distributions of pensions allowed for all members after attaining age 55 and 20 years of service as an eligible firefighter or eligible rescue squad worker.
- Adjustments to actuarial assumptions intended to estimate the impact of a full audit of the census data for lapsed members, including the development of a select and ultimate lapse assumption based on the full audit
- No significant changes in funding methodology from the prior year's valuations

When compared to the June 30, 2012 valuation, the above resulted in:

- Higher funded ratio (88.3% in the December 31, 2013 valuation compared to 83.9% in the June 30, 2012 valuation)
- Lower employer required contribution (\$13,240,552 for fiscal year ending June 30, 2016 compared to \$14,620,362 for fiscal year ending June 30, 2014)

# Key Takeaways

FRSWPF is well funded compared to its peers. This is due to:

- Stakeholders working together to keep FRSWPF well-funded since inception
- A history of appropriating and contributing the recommended contribution requirements
- Assumptions that in aggregate are more conservative than peers
- A funding policy that aggressively pays down unfunded liability over a 12-year period
- Modest changes in benefits when compared to peers

Continued focus on these measures will be needed to maintain the solid status of FRSWPF well into the future.

# Certification

The results were prepared under the direction of Michael Ribble and Larry Langer who meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. These results have been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions about them.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law.

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Questions?

**THANK YOU**