

# Florida Retirement System Actuarial Assumption Estimating Conference Executive Summary

The Florida Retirement System Actuarial Assumption Conference met in October 2017 to consider updated economic assumptions to be used for the actuarial valuation of Florida's Retirement System (FRS). The preliminary results for July 1, 2017, show that the FRS continues to have an unfunded actuarial liability (UAL). Using the 2017 data and 2016 assumptions, the projected UAL was projected to increase from \$24.9 billion in 2016's final valuation to \$25.7 billion. Similarly, the system would remain 85.4% funded on an actuarial basis. However, the Conference agreed on a significant change to the 2016 assumptions which affect these results.

Asset performance has been fairly favorable over the past five fiscal years. Returns in Fiscal Years 2012-13, 2013-14, and 2016-17 far exceeded the investment rate assumption of 7.60% which was adopted at the last Conference. However, the investment return was much lower than expected in Fiscal Years 2014-15, and 2015-16. The tables below show actual investment returns for the past five fiscal years and actual returns for 5-year, 10-year and 15-year timeframes.

Fiscal Year	Investment Return
2012-13	13.12%
2013-14	17.40%
2014-15	3.67%
2015-16	0.54%
2016-17	13.77%

	Investment Return
3-year	5.85%
5-year	9.51%
10-year	5.46%
15-year	7.44%

The state's actuary, the State Board of Administration (SBA), and the SBA's financial consultant all recommended a reduction in the investment return assumption to approximately 6.6%. Representatives from the Division of Bond Finance and the SBA advocated for a lower assumption primarily due to the greater risk to long term fund viability that is associated with higher return expectations. After much discussion, the Conference ultimately decided to keep the inflation rate at 2.6% while lowering the investment return expectation to 7.50%. Several principals noted that if the data trends continue, it is likely that further reductions to the investment rate assumption will occur in the future. The table below displays the nominal returns, inflation rates, and real returns used in the four most recent valuations.

2014	2015	2016	2017
7.65% Investment Return	7.65% Investment Return	7.60% Investment Return	7.50% Investment Return
2.60% Inflation	2.60% Inflation	2.60% Inflation	2.60% Inflation
4.92% Real Return	4.92% Real Return	4.87% Real Return	4.52% Real Return

Note: The real return takes into account administrative expenses, so the numbers in this table are not additive.

The 2017 Legislature fully funded the UAL at the recommended contribution rate as provided in the 2016 valuation report. This action and continued full funding of the recommended UAL rate, as committed to by the Legislature, will result in the gradual increase of the funded ratio in future years. The UAL contribution rate is calculated assuming the liability will be funded over a period of 30 years. The contribution rates should remain stable as long as contributions are made as recommended and actual experience mirrors projections. However, there are many factors that affect these calculations and can cause the contribution rates to increase or decrease over time. For example, investment returns have been and will continue to be a

relatively volatile factor included in the calculations, and if actual investment results are lower than assumed, there could be a significant impact on the UAL and future contribution rates.

The preliminary report addresses information received prior to the Conference In October. The final report was based on these assumptions and released in December 2017. While unknown to the principals at the time of the Conference, those results showed:

<b>Valuation Results (numbers in \$ billions)</b>				
		<b>July 1, 2016</b>	<b>July 1, 2017</b>	<b>Difference</b>
1.	Actuarial Liability	\$170.4	\$178.6	\$8.2
2.	Actuarial Value of Assets	<u>\$145.5</u>	<u>\$150.6</u>	<u>\$5.1</u>
3.	Unfunded Actuarial Liability (1 - 2)	\$24.9	\$28.0	\$3.1
4.	Funded Percentage (2 / 1)	85.4%	84.3%	-1.1%

# Florida Retirement System

## 2017 FRS Actuarial Assumption Estimating Conference Including Preliminary July 1, 2017 Actuarial Valuation Results

Presented by:

Matt Larrabee, FSA, EA, MAAA

October 5, 2017

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# Agenda

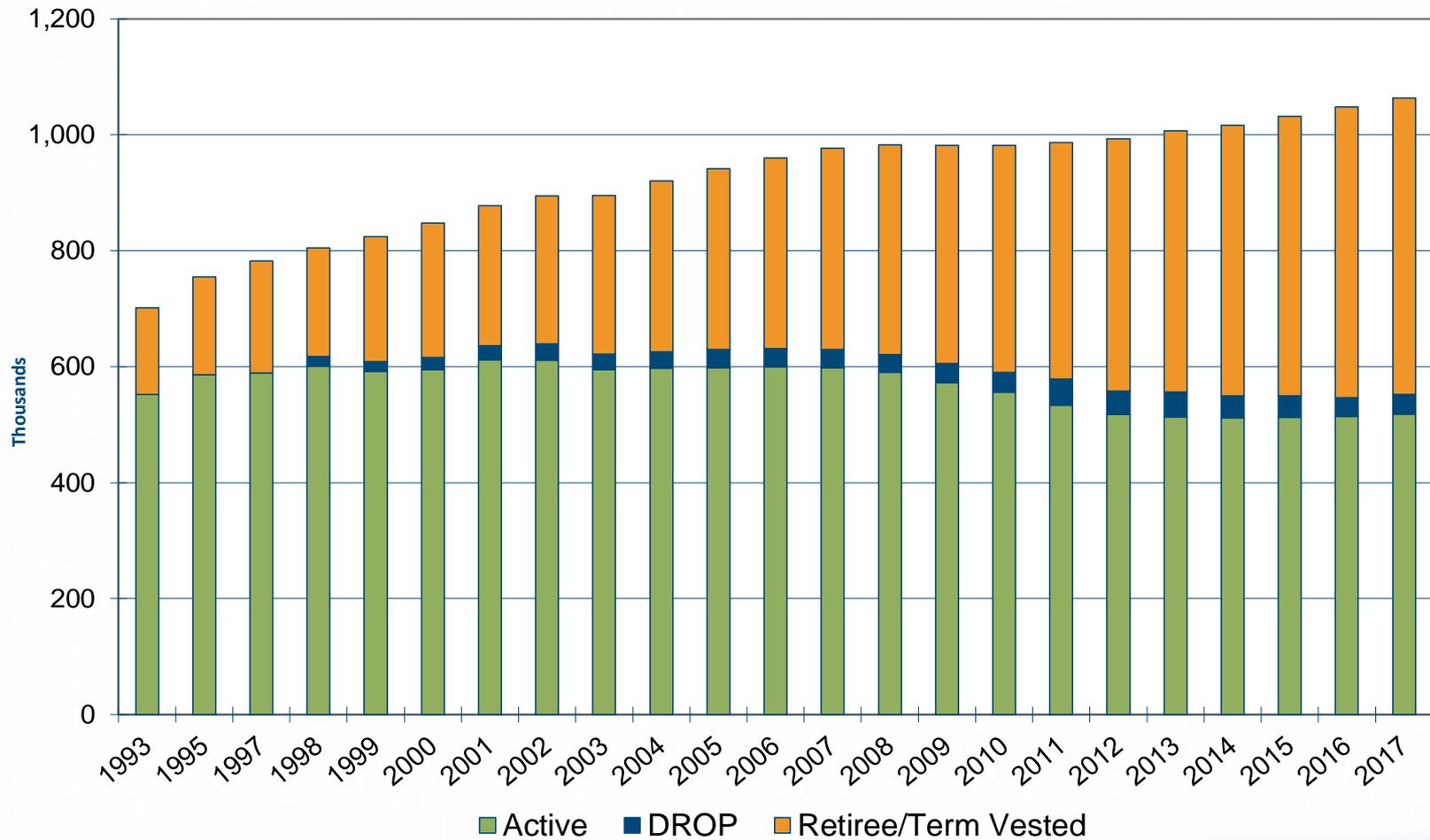
- Census demographics and assets
- Valuation process and projected benefit payments
- Actuarial methods and assumptions for system funding
- Preliminary baseline 2017 actuarial funding valuation results
- Return assumption
  - Outside professionals' guidance
  - For system funding
  - For GASB system and employer accounting
  - How system funding, GASB return assumptions interact
- Needed guidance

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# Census Demographics and Assets

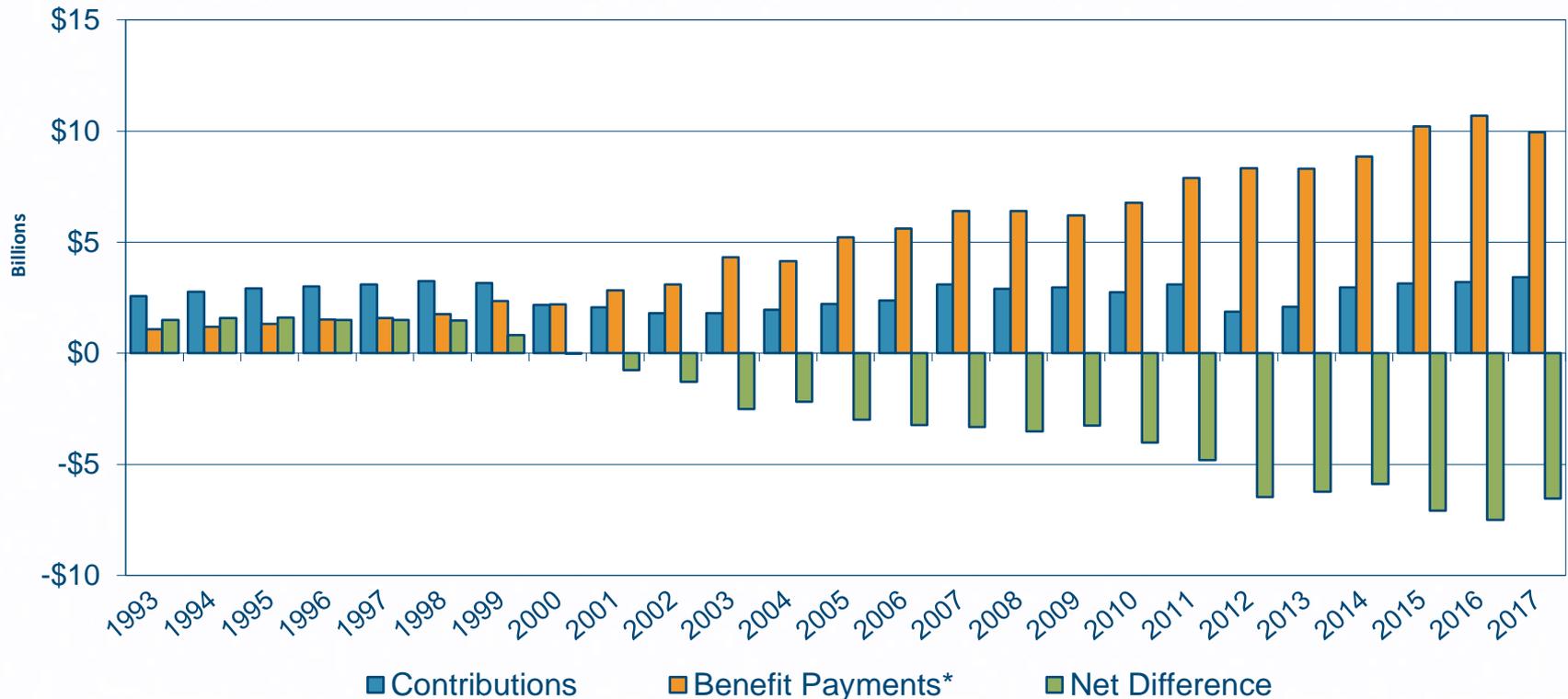
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# Pension Plan Membership



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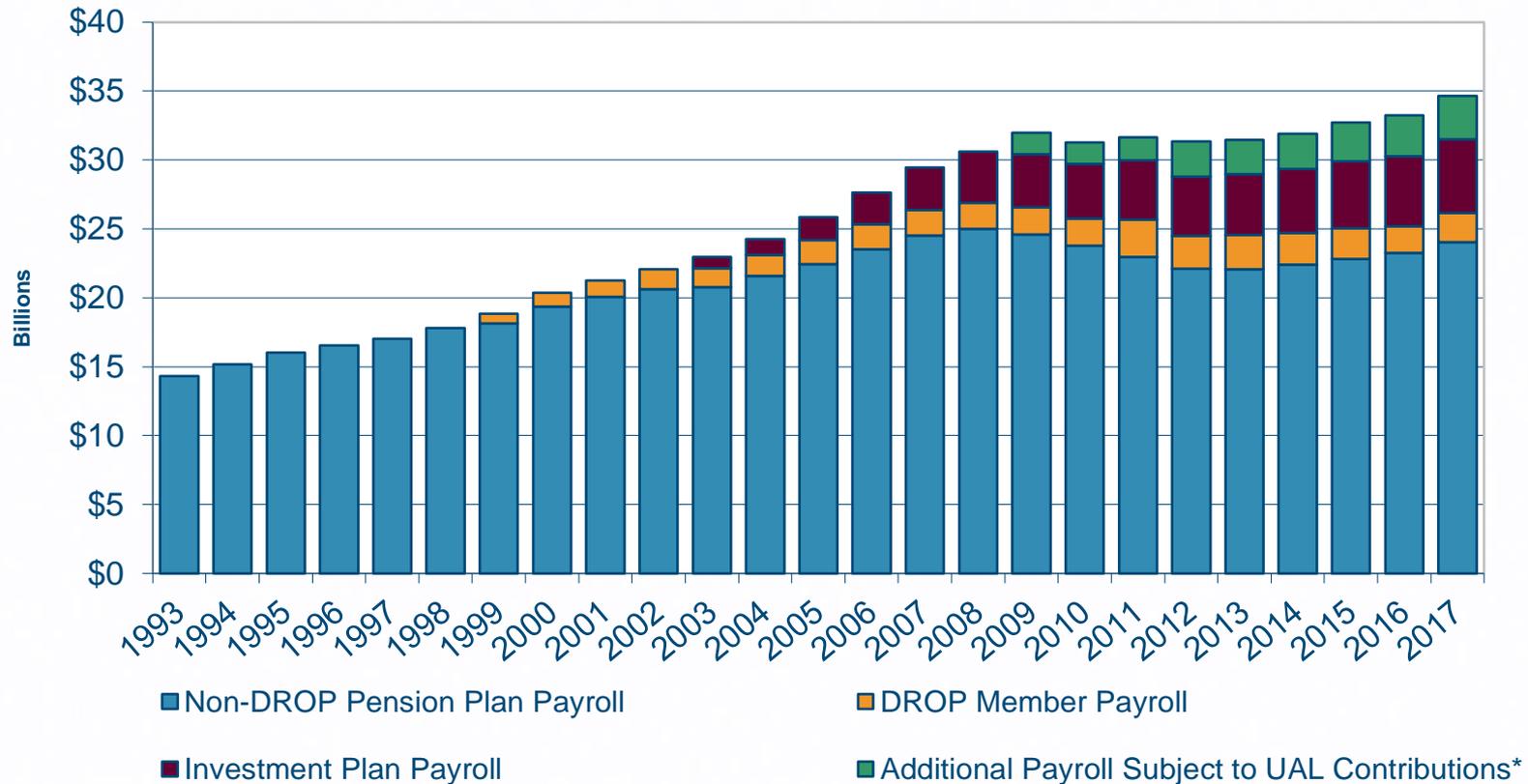
# Contributions and Benefit Payments



\* Includes transfers to Investment Plan in years 2013 and beyond.

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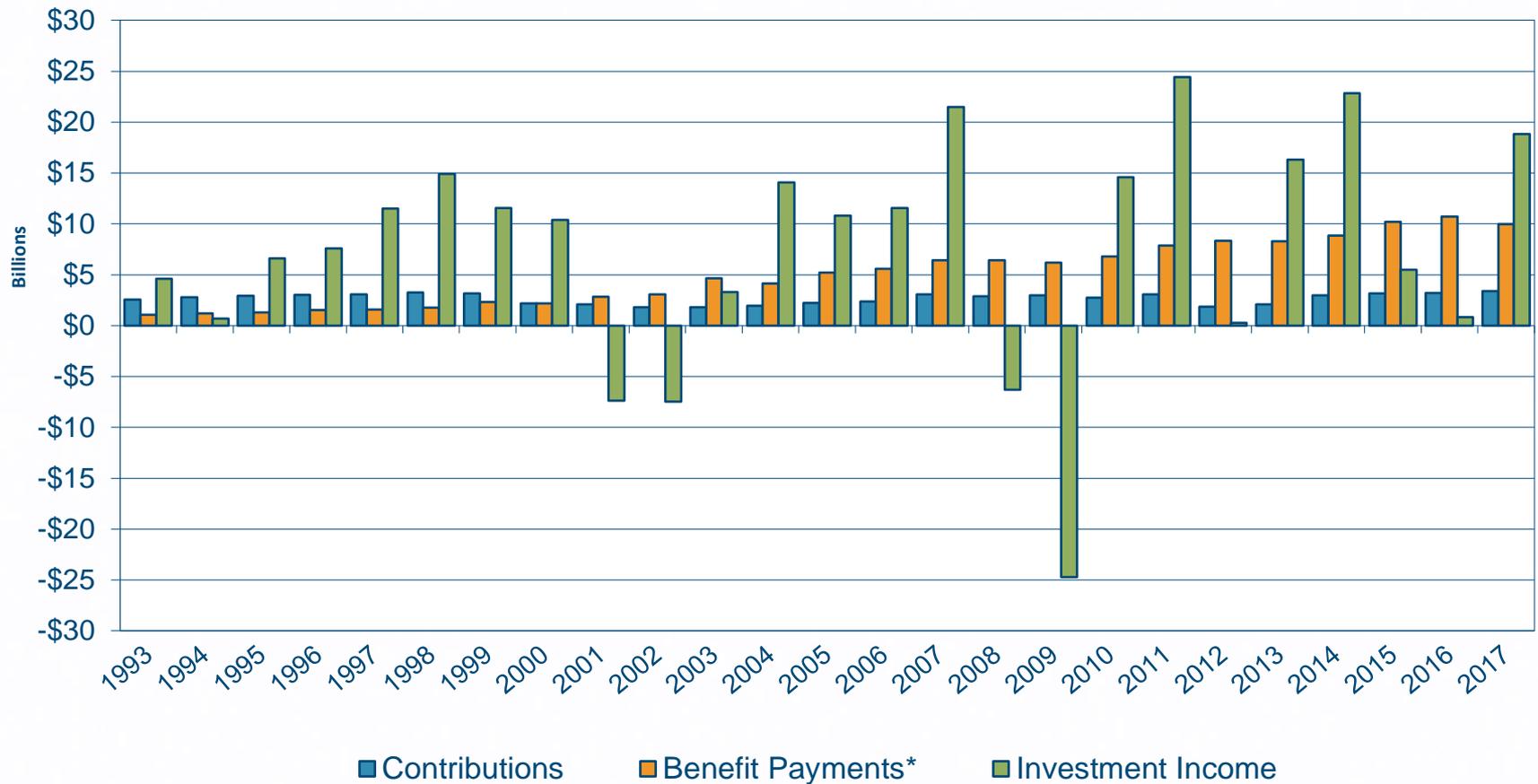
# Payroll: FRS + Non-FRS UAL Contributory



*\*Includes payroll for participants in certain non-FRS defined contribution plans upon which UAL Rate contributions to the FRS Pension Plan are made. This payroll component is projected to be \$3.2B in the 2017-2018 plan year.*

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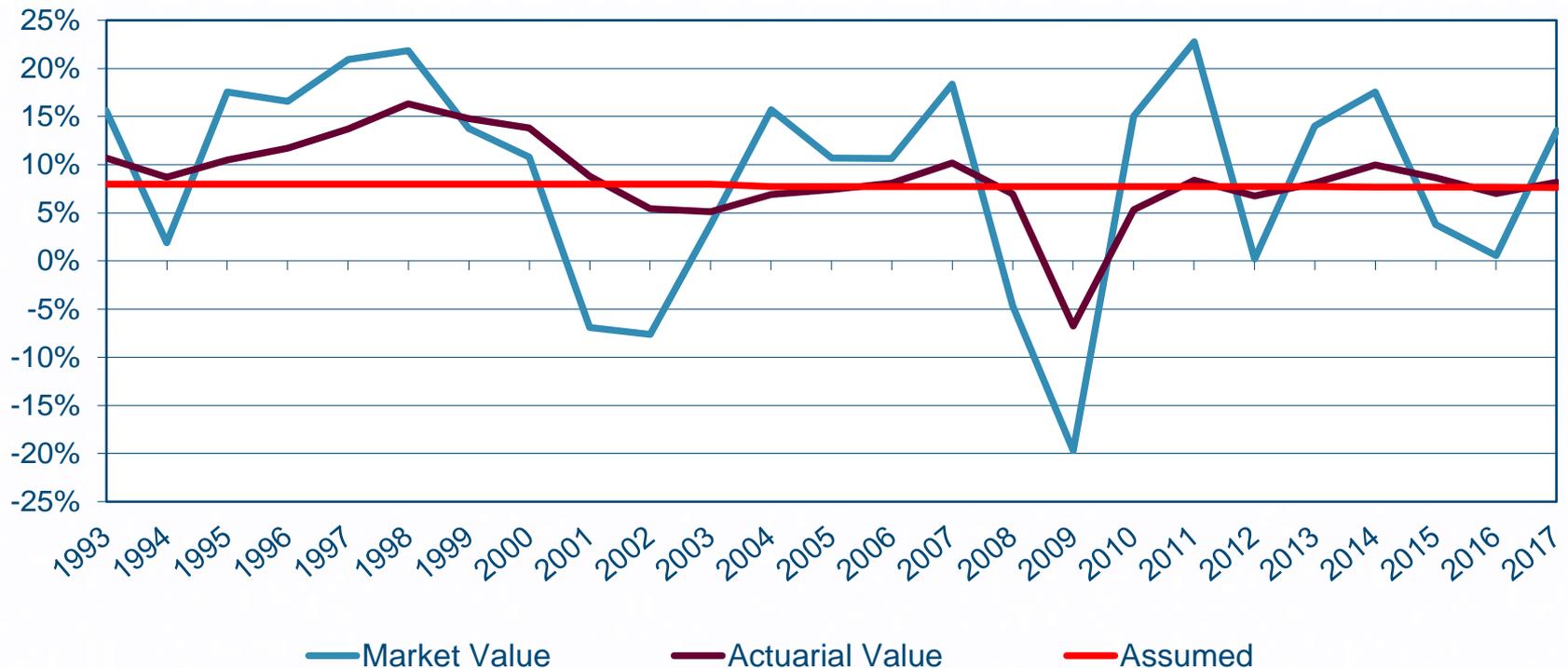
# Pension Plan Cash Flows



\* Includes transfers to Investment Plan

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# Historic Asset Returns

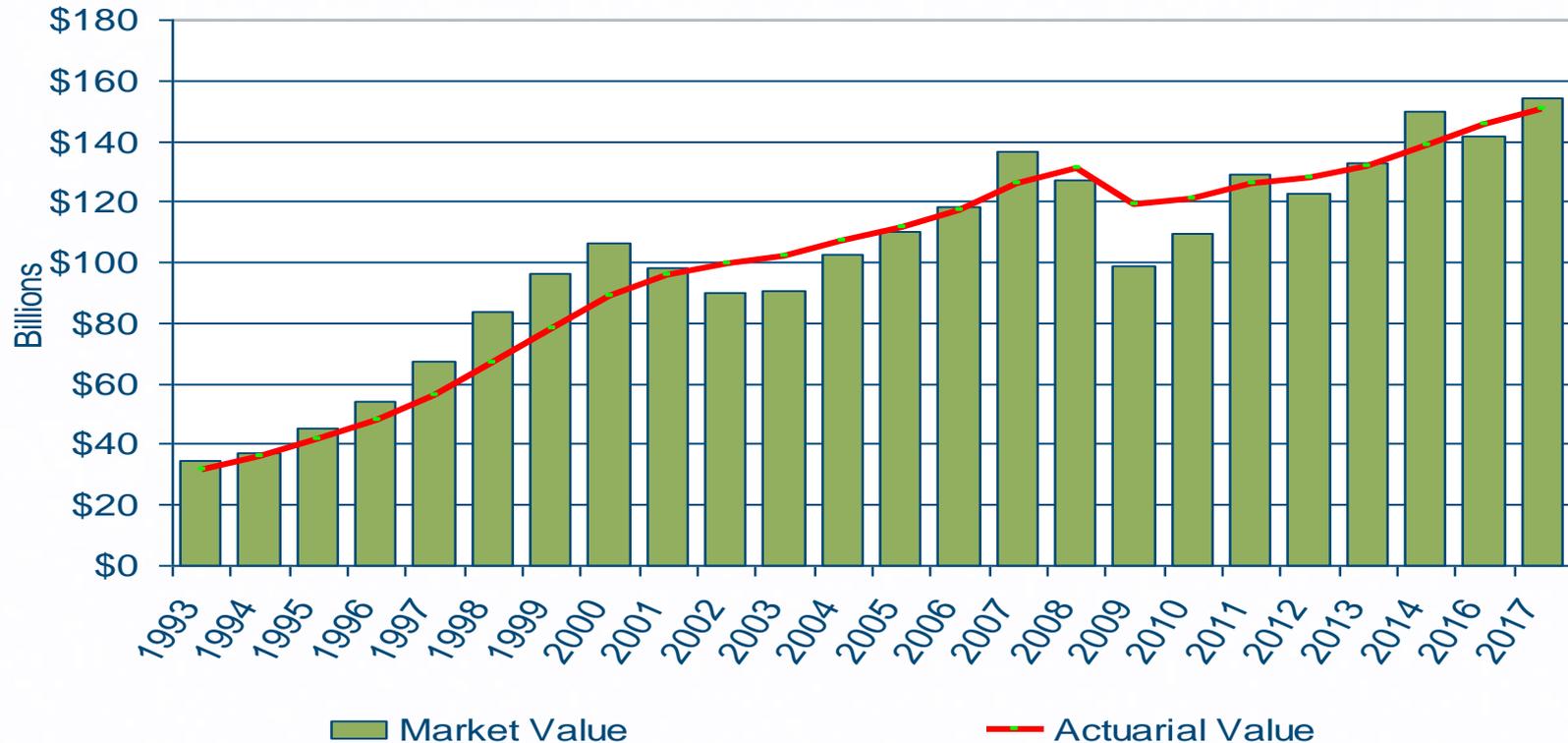


The 2016-17 return was +13.6% on a market value of assets (MVA) basis and +8.2% on a smoothed actuarial value of assets (AVA) basis

- AVA return is determined by market value returns over the prior five years

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# Market & Actuarial Value of Assets



Market Value of Assets (MVA) is \$3.5 billion above AVA at July 2017. That deferred investment gain will be recognized in AVA returns (and associated rate decreases) in subsequent valuations if future investment performance meets assumption.

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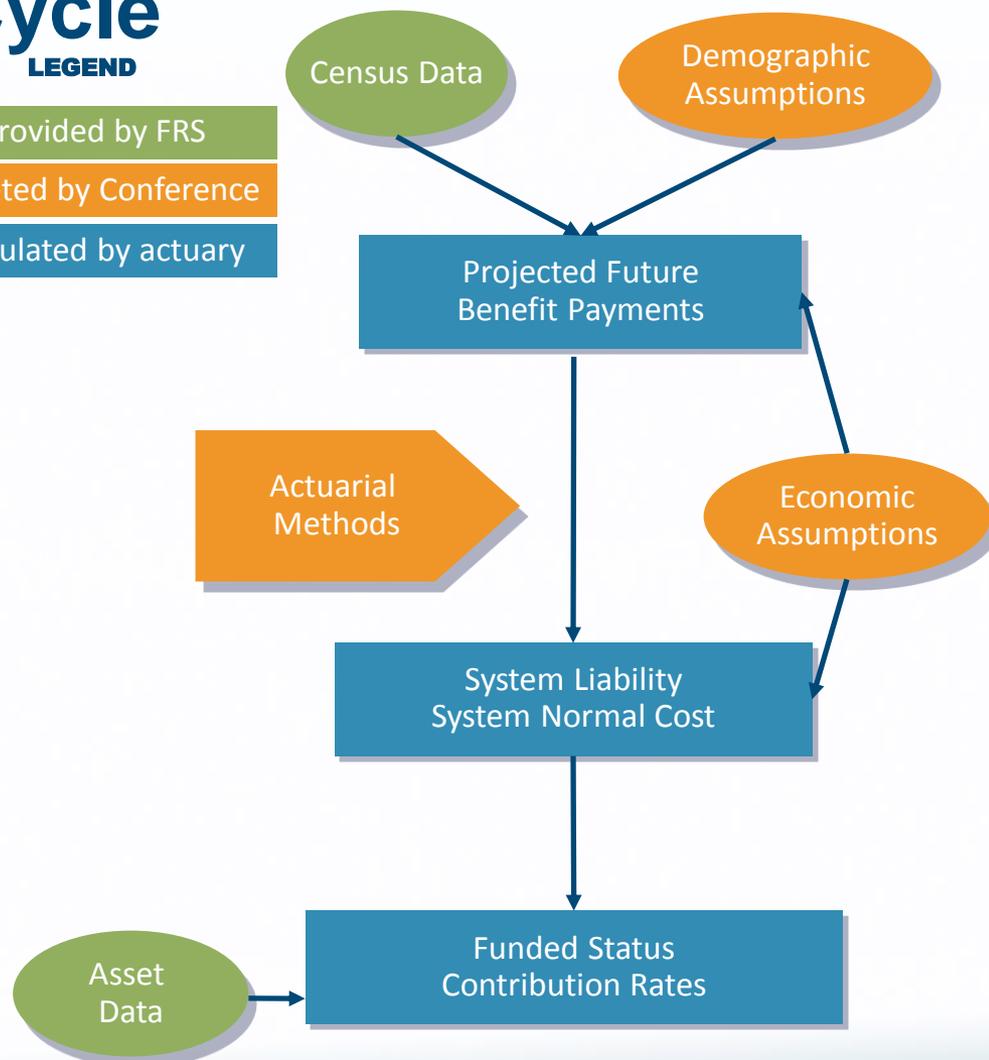
# Valuation Process and Projected Benefit Payments

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# Actuarial Valuation Cycle

## LEGEND

- Today: Discuss preliminary 2017 valuation results, select final assumptions and methods for 2017 system funding valuation
- By December 1: Complete 2017 actuarial valuation report, including actuarially calculated contribution rates
- Demographic and certain economic assumptions determine projected future benefit payments
- Methods and other economic assumptions affect calculations of funded status and contribution rates



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# Overview of an Actuarial Valuation

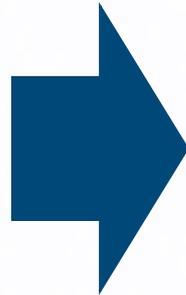
- Two Pension Plan valuations are conducted annually to:
  - Calculate funded status (funding valuation)
  - Develop actuarially calculated contribution rates (funding valuation)
  - Satisfy financial reporting requirements (separate GASB valuation)

**Data**

**Assumptions**

**Methods**

**Provisions**



**Projected  
Benefit  
Payments**



**Funded Status**

**Actuarially Calculated  
Contribution Rates**

**GASB Reporting**

**Status**

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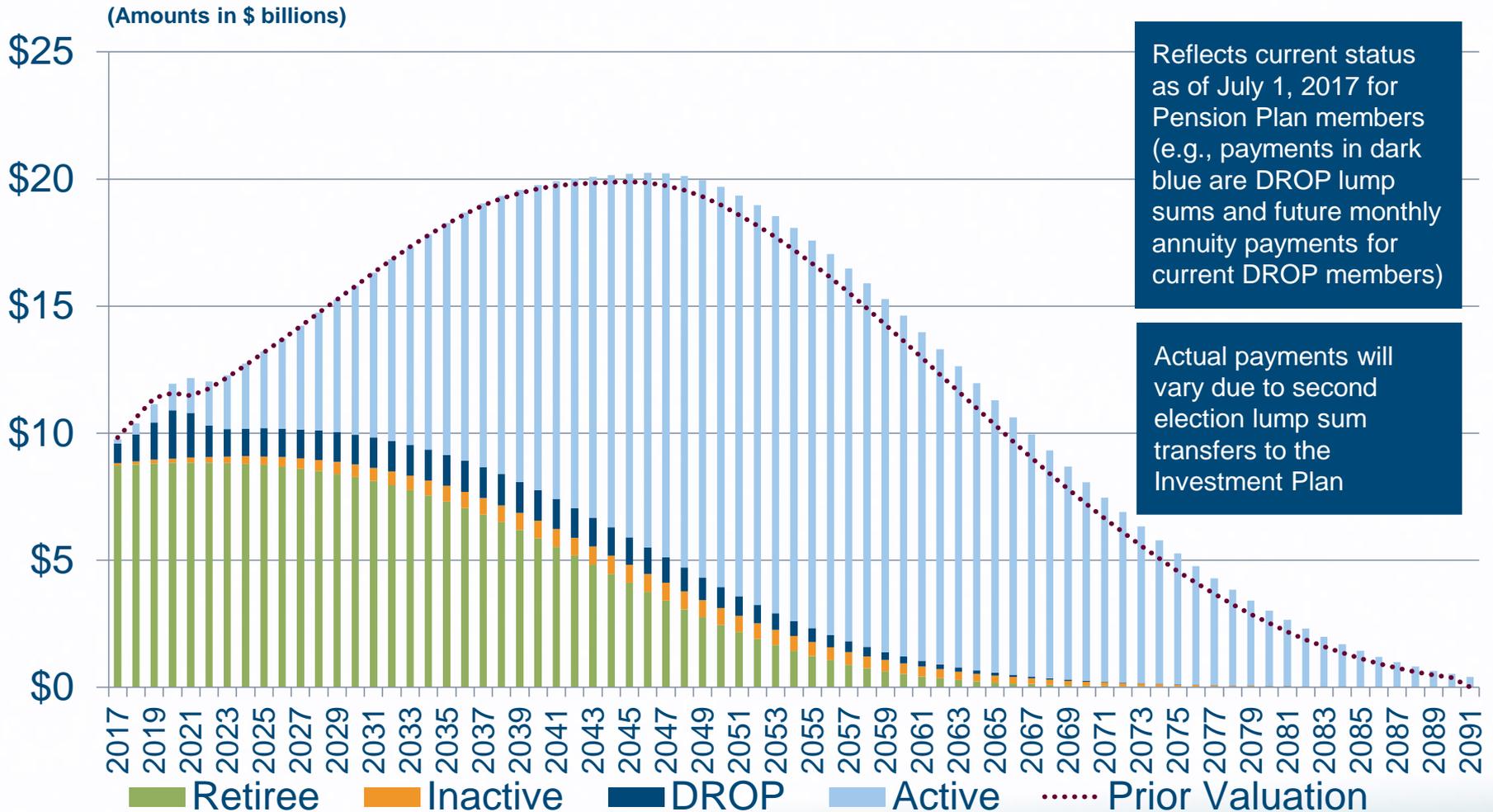
# Projected Benefit Payments

- Projected benefit payments are developed using:
  - Census data provided by the Division of Retirement
  - Demographic assumptions
    - Mortality
    - Timing of retirement / entry into DROP
    - Likelihood of termination of employment prior to unreduced benefit
    - Incidence of disability
  - Annual salary increase assumption for individual members

- Census data is provided annually
- Assumptions listed above are typically formally reviewed in detail every five years as part of an actuarial experience study

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# Projected Benefit Payments – 2017 Valuation

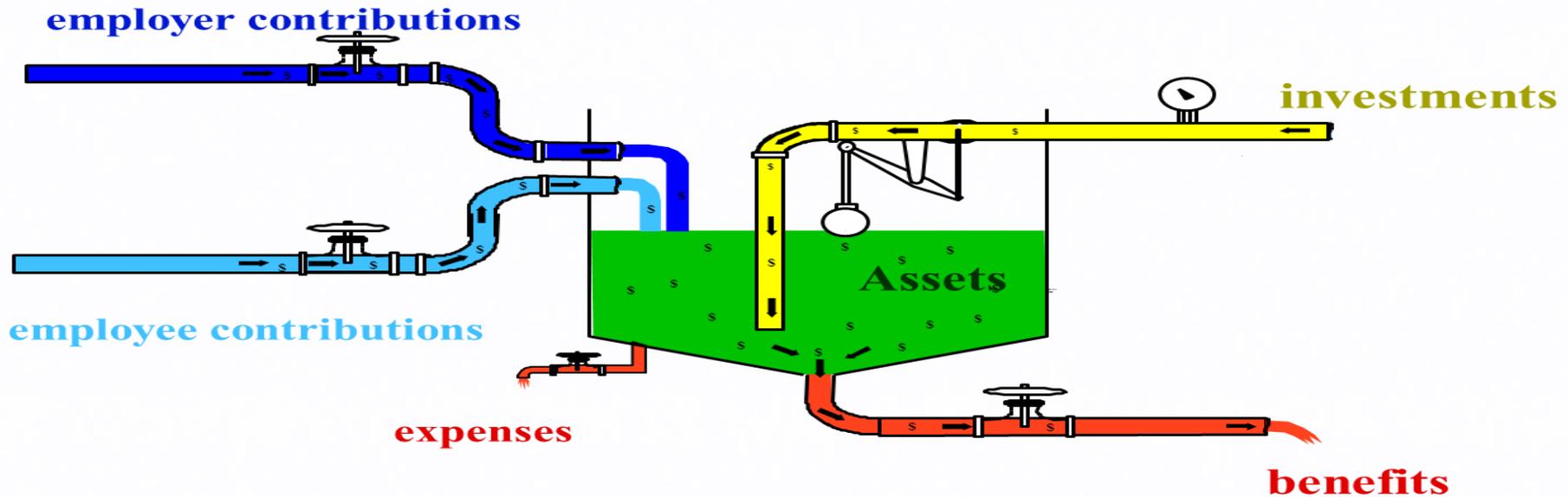


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# Actuarial Methods and Assumptions for System Funding

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# The Fundamental Cost Equation



- Methods & assumptions do not determine ultimate long-term System cost, only the budgetary timing of cost incurrence

Ultimately, the *Fundamental Cost Equation* always governs:

$$\text{Contributions} + \text{Investments} = \text{Benefits} + \text{Expenses}$$

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# Actuarial Methods for Funding Valuation

- Key methods currently adopted by the Conference:
  - Ultimate Entry Age Normal (Ultimate EAN) cost allocation method
    - This method sets the normal cost rate as if all members were in Tier 2, which means a lower normal cost rate when compared to the individual EAN method
    - Since the method doesn't affect projected benefits and the method decreases the normal cost rate, Ultimate EAN increases Actuarial Liability compared to the GASB-mandated method
  - 30-year amortization, as a level percent of projected pay, of actuarial gains and losses that arise during any given year
    - This approach has an extended period of net negative amortization:
      - The unamortized balance increases for the first 11 to 13 years
      - The balance decreases after that, with the original unamortized balance effectively being paid off in the last 10 years of the 30-year amortization period

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# **Preliminary Baseline 2017 Actuarial Funding Valuation Results**

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# Calculation of Valuation Results

- The projected year-by-year benefit payments are converted into a present value using the investment return assumption
  - The present value is allocated between past (Actuarial Liability) and projected future service (Normal Cost) via the cost allocation method
- This establishes Baseline 2017 valuation results using
  - Methods and assumptions as adopted by the 2016 FRS Actuarial Assumption Conference, based on the 2014 Experience Study
  - Demographic member census data as of July 2017
  - Actual 2016-17 investment returns

2017 Baseline shows funded status and contribution rates on current data, prior to any potential updates to assumptions and/or methods

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# Results Template - Actuarial Terms of Art

To summarize results, we use a template with a number of key actuarial terms

Acronym	Actuarial Term
AL	Actuarial Liability
AVA	Actuarial Value of Assets (smoothed, rather than market, value)
UAL (AVA)	Unfunded Actuarial Liability, on an AVA basis
FS	Funded Status
NCR	Normal Cost Rate (net employer-paid portion)
UALR	Unfunded Actuarial Liability (UAL) Rate
NCR + UALR	A proxy, albeit an imperfect one, for the employer composite Pension Plan-only contribution rate prior to blending with Investment Plan rates to create blended proposed statutory rates

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Composite Pension Plan-Specific	2016 Final (2016 data; 2016 assumptions)	Baseline 2017 (2017 data; 2016 assumptions)
AL	\$ 170.4	\$ 176.3
AVA	<u>145.5</u>	<u>150.6</u>
UAL (AVA)	\$ 24.9	\$ 25.7
FS	85.4%	85.4%
NCR	4.17%	4.23%
UALR	<u>5.63%</u>	<u>5.67%</u>
NCR + UALR	<u>9.80%</u>	<u>9.90%</u>

(Amounts in \$ billions)

Results shown are liabilities and rates calculated for funding purposes; results for GASB financial reporting differ

Results shown use the 7.60% investment return 3.25% system payroll growth, and 2.60% inflation assumptions used in the 2016 valuation

Composite Pension Plan-specific rates are shown, prior to blending with Investment Plan rates to create composite blended proposed statutory rates

Market Value of Assets (MVA) is \$3.5 billion above AVA at July 2017. That deferred investment gain will be recognized in AVA returns (and associated UALR decreases) in subsequent valuations if future investment performance meets or exceeds 7.60%.

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# Blended Proposed Statutory Rates at 7.60%

Pension Plan-only contribution rates are blended with Investment Plan contribution rates to create blended PP/IP proposed statutory rates

Weighted Average of Membership Classes Rates	Fiscal Year 2017-18 <u>Legislated Rates</u>			<u>Preliminary 2018-19 Rates (7.60% Return)</u>		
	NC	UAL	Total	NC	UAL	Total
PP composite employer rate	4.17%	5.63%	9.80%	4.23%	5.67%	9.90%
IP composite employer rate	<u>4.94%</u>	<u>0.00%</u>	<u>4.94%</u>	<u>4.94%</u>	<u>0.00%</u>	<u>4.94%</u>
Blended PP/IP employer rate	4.31%	4.79%	9.10%	4.35%	4.80%	9.15%
Employee contribution rate			<u>3.00%</u>			<u>3.00%</u>
Composite blended employer plus employee rate			12.10%			12.15%

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# Return Assumption

## Outside Professionals' Guidance

Note: Today's Milliman speaker is not a credentialed investment advisor

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# Last Year's Return Models and Assumption

- Median (50<sup>th</sup> percentile) average annual long-term future investment returns from three real return investment models presented at the 2016 Conference are summarized below:
  - “SBA Approach” model developed by Aon Hewitt Investment Consulting (AHIC) using average of global equity return premiums from four large investment consultancies: 7.0% median return
  - AHIC-only assumptions model: 6.3% median return
    - Both models above used AHIC’s 2.1% assumption for inflation at that time
  - Milliman model: 6.6% median return
    - Used 2015 Conference’s 2.6% adopted inflation assumption
- The Conference lowered the return assumption from 7.65% to 7.60% for the 2016 valuation

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# This Year's Return Models

- The three future investment return models discussed on the prior slide have been updated for this year's conference
- AHIC's "SBA Approach" model that blends the global equity return premiums of four large consultancies: 6.8% median return
- AHIC-only assumptions model: 6.6% median return
  - Both use AHIC's current 2.2% assumption for inflation
- Milliman model: 6.6% median return
  - Uses the Conference-adopted 2.6% inflation assumption
    - The current default inflation assumption in the Milliman model is 2.3%

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# Milliman Investment Return Model

- Based on the current target asset allocation, model results are geometric annual average net returns based on:

Percentile	30-Year Average
65 <sup>th</sup>	7.4%
60 <sup>th</sup>	7.1%
55 <sup>th</sup>	6.8%
<b>50<sup>th</sup></b>	<b>6.6%</b>
45 <sup>th</sup>	6.3%
40 <sup>th</sup>	6.0%
35 <sup>th</sup>	5.7%

- A series of average annual real returns by asset class, plus asset class correlations
- A 2.6% inflation assumption as adopted by the FRS Assumption Conference
- In this table, the 60<sup>th</sup> percentile means that in the Milliman model 60% of possible 30-year average returns are at or below 7.1%
- Details on the model inputs in the Appendix

In Milliman's model, long-term average annual future returns of 7.45% to 7.60% fall between the 65<sup>th</sup> and 70<sup>th</sup> percentiles

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# Return Assumption for System Funding

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# Setting the Assumed Return for Funding

- Per Florida Statutes, the Conference selects the assumption for system funding calculations
- To comply with Actuarial Standards of Practice (ASOPs), the actuary assesses the reasonableness of the assumption
  - Per the ASOPs, if, in the actuary’s professional judgment, the selected assumption “*significantly conflicts* with what...would be *reasonable* for the purpose of the measurement”, the actuary must disclose that conflict in his or her written report
- The Conference’s selected funding assumption is not subject to “pass/fail” review by any other parties; no entity can refuse to accept the system funding valuation report

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# What Makes an Assumption “Reasonable”?

- Per the relevant Actuarial Standard of Practice (ASOP), an assumption is *reasonable* for the purpose of the measurement if it:
  - Takes into account current economic data, and
  - Reflects the actuary’s estimate of future experience, and
  - It has no “*significant bias* (i.e., it is not significantly optimistic or pessimistic), except when provisions for adverse deviation...are included and disclosed”
- The actuary can incorporate experts’ views (such as those of investment professionals) in assessing reasonableness

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# What is “Significant Bias” in an Assumption?

- The governing Actuarial Standard of Practice acknowledges that the meaning of “significant” varies by situation
- For return assumption selection, the relevant meaning is that “a result may be *significant* because it is of consequence”

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# Funding Results at Various Assumptions

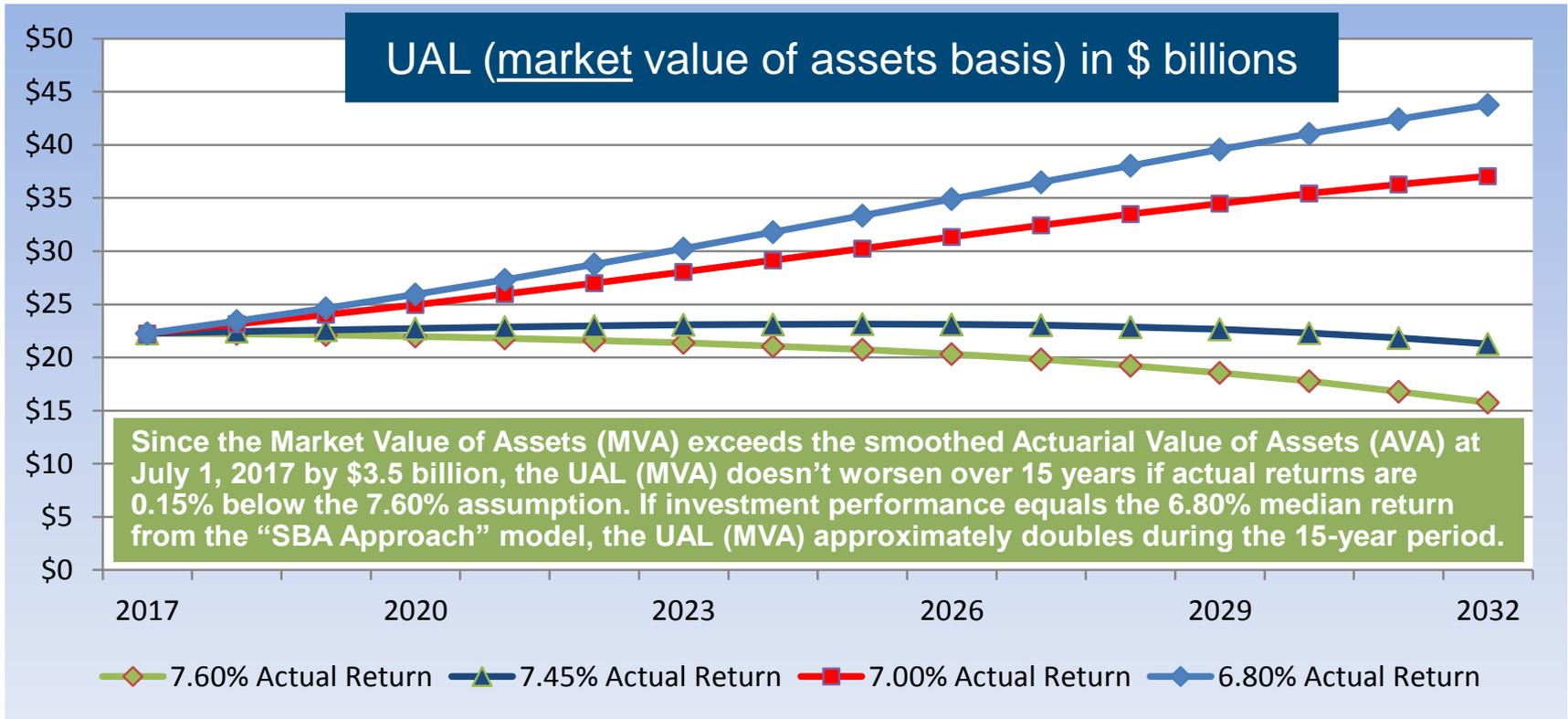
FRS Pension Plan Funding Results	Blended PP/IP Employer Rate	UAL (AVA)	Funded Status
Final 2017-18 (7.60% Assumption)	9.10%	\$24.9 B	85.4%
Preliminary 2018-19 (7.60% Assumption)*	9.15%	\$25.7 B	85.4%
Preliminary 2018-19 (7.55% Assumption)	9.49%	\$26.8 B	84.9%
Preliminary 2018-19 (7.50% Assumption)	9.83%	\$27.9 B	84.4%
Preliminary 2018-19 (7.45% Assumption)**	10.17%	\$28.9 B	83.9%
Preliminary 2018-19 (6.80% Assumption)	13.59%	\$43.9 B	77.4%

Based on projected 2018-19 PP/IP payroll of \$35.8 billion (including payroll subject to only UAL contributions), estimated combined 2018-19 PP/IP contribution of:

- \* \$3.13 billion at 7.60% return assumption
- \*\* \$3.49 billion at 7.45% return assumption

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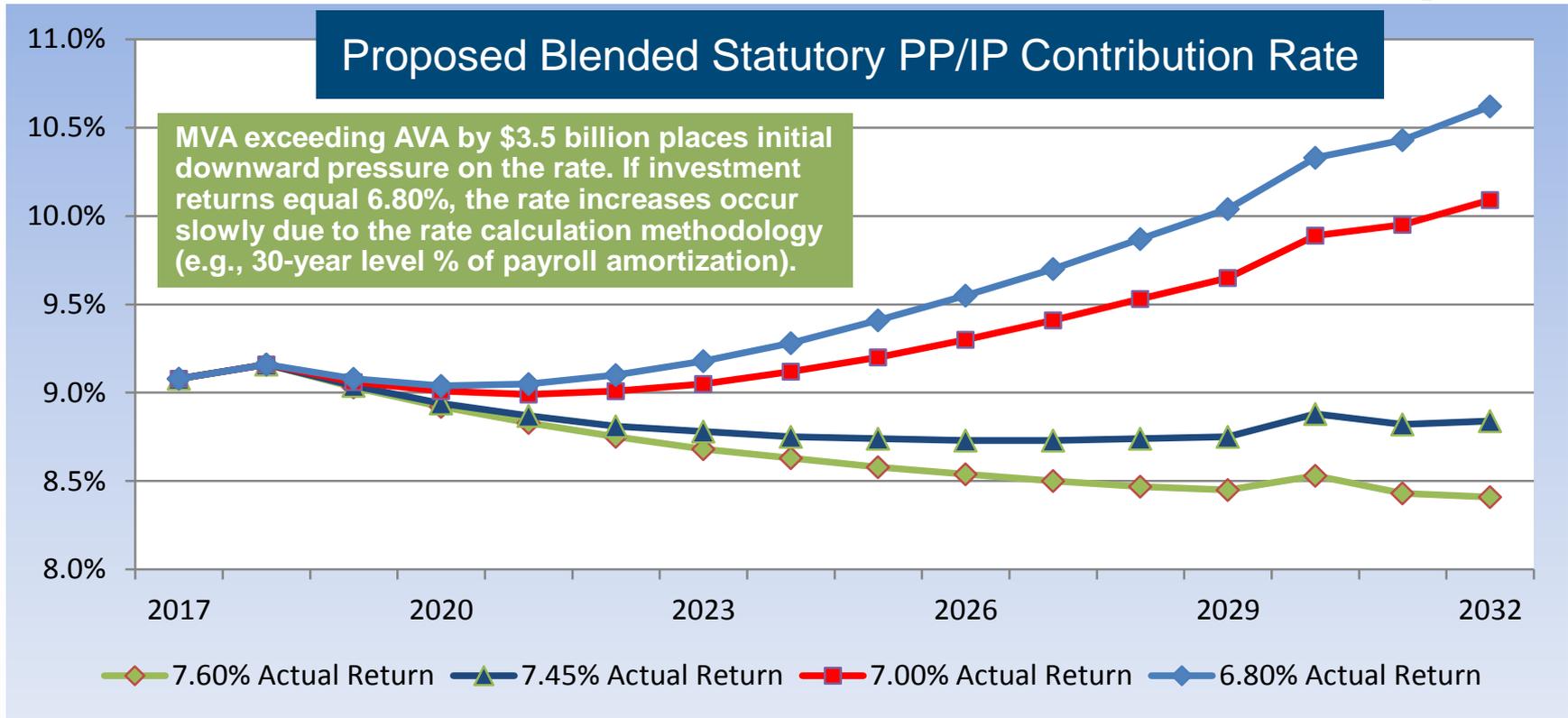
# Actual Return Scenarios at 7.60% Assumption



- With no change to assumed return, this chart illustrates UAL (MVA) changes for four possible scenarios for actual future investment return
- The assumption selected does not affect actual investment returns

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# Actual Return Scenarios at 7.60% Assumption

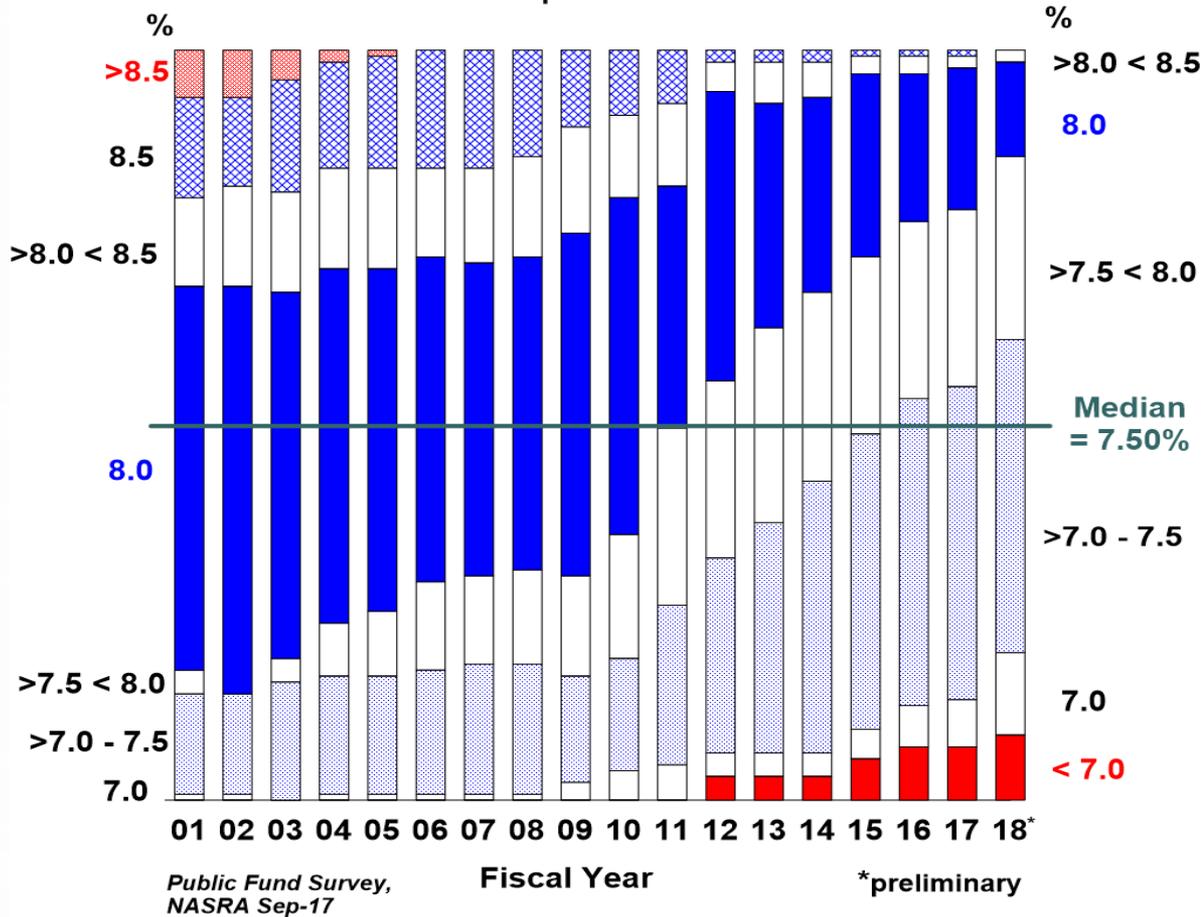


- With no change to assumed return, this chart illustrates the proposed blended statutory PP/IP contribution rate for four possible scenarios for actual future investment return

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# What are Other Systems Doing Nationally?

Distribution of Nominal Investment  
Return Assumptions Reported  
As of September 2017



- In response to changing market outlooks for future inflation and real return, large public plans continue lowering return assumptions
- The chart at left shows current assumptions for the largest 126 public plans, as tracked by NASRA
- The current median assumption is 7.50%

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# What Are FRS's Jumbo Peer Systems Doing?

- CalPERS
  - December 2016 – approved reduction from 7.50% to 7.00% over a three-year period [7.50% → 7.375% → 7.25% → 7.00%]
- CalSTRS
  - February 2017 – approved reduction from 7.50% to 7.00% over a two-year period [7.50% → 7.25% → 7.00%]
- New York State Common Fund (ERS, PFRS)
  - 2015 – lowered return from 7.50% to 7.00%
- New York City ERS & Teachers
  - 7.00%
- Texas TRS
  - Currently 8.00%, decrease anticipated in next several months

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# Return Assumption for GASB Employer Accounting

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# Changes to GASB Reporting Requirements

- An investment return assumption is used in system and participating employer GASB accounting calculations
  - The GASB assumption interacts with the system funding assumption, including the ability for the system's funding assumption to affect GASB results, as explained in this section of the presentation
- GASB 82 is newly effective, and guides assumptions selection
  - If the GASB assumption doesn't conform with Actuarial Standards of Practice, the associated financial reporting is not GASB compliant
- External auditors review participating employer pension schedules
  - If an employer's auditor does not accept the GASB assumption, he or she could issue a modified audit opinion of the financial statements, which would have significant consequences for the employer

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# GASB's Asset Projection “Crossover” Test

- GASB standards include a long-term asset projection test
  - Contributions are modeled using the system’s funding policy
  - The test also models projected benefit payments and investment earnings at the GASB assumed return level
- If the test shows sufficient assets in all years to pay benefits:
  - GASB liabilities are calculated using the GASB assumed return as the solitary discount rate
- If the test shows a “crossover” year where assets fully deplete:
  - Benefits subsequent to asset depletion are discounted using a long-duration tax-exempt municipal bond yield (3.58% as of June 30, 2017)
  - A bifurcated discount rate, when triggered by the test results, increases the Net Pension Liability (GASB unfunded liability measure)

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# Likelihood and Magnitude of Crossover

- If the system funding return assumption gets too far from the GASB return assumption, crossover will occur in the projection test
  - What constitutes “too far” will vary from year to year based on several factors (example: GASB uses fair market asset values)
  - The greater the disparity between the selected funding return assumption and the GASB return assumption, the greater the possibility of crossover
  - If crossover occurs, the greater the disparity between the selected funding return assumption and the GASB return assumption, the earlier that the crossover occurs and the more significant the impact on the GASB discount rate and the Net Pension Liability calculation

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# Needed Guidance

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# Needed Guidance

- From Conference Principals for system funding calculations:
  - Identification of methods and assumptions, including investment return assumption, to use in the 2017 Pension Plan valuation calculations for system funding (i.e., proposed statutory contribution rate) purposes

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# Appendix

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# Milliman Capital Market Outlook Assumptions

For assessing the expected portfolio return under Milliman's capital market assumptions, we considered FRS investments to be allocated among the model's asset classes as shown below. This allocation is based on our understanding of the current target allocation policy, as provided to us by AHIC on September 28, 2017.

	Policy Allocation	Annual Arithmetic Mean	Annualized Geometric Mean	Annual Standard Deviation	
Cash	0.4%	2.97%	2.96%	1.75%	*US Inflation assumption adopted by the 2014 FRS Actuarial Assumptions Conference and applied to the real return assumptions in Milliman's capital market outlook model. Real return assumptions in the Milliman model are set semi-annually by a committee of credentialed investment professionals.
Fixed Income	18.0%	4.43%	4.36%	4.00%	
US Bank/Leveraged Loans	1.2%	5.41%	5.16%	7.50%	
Global Equity	54.1%	7.82%	6.56%	16.95%	
US REITs	1.0%	7.65%	5.96%	19.70%	
Private Real Estate Property	10.2%	6.45%	5.81%	12.00%	
Timber	0.5%	6.66%	5.91%	13.00%	
Infrastructure	0.4%	7.65%	6.71%	14.65%	
Private Equity	8.7%	11.50%	7.82%	30.00%	
Commodities	0.2%	5.66%	4.05%	18.95%	
Hedge Funds - Multi-Strategy	2.1%	6.16%	5.81%	8.85%	
Hedge Funds - Event-Driven	0.6%	6.41%	6.06%	8.90%	
Hedge Funds - Equity Hedge	0.5%	6.92%	6.31%	11.70%	
Strategic Investments	2.1%	5.70%	5.31%	9.35%	
US Inflation (CPI-U)*			2.60%	1.85%	
<b>Total Fund</b>	<b>100%</b>	<b>7.2%</b>	<b><u>6.6%</u></b>	<b><u>12.1%</u></b>	

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# Setting the Investment Return Assumption

Actual future investment returns are not knowable in advance, so how should the assumption be set?

- Prudently select a best estimate
- Review return models from credentialed investment professionals
- Remain cognizant that hoping for a result does not make it happen; the assumption selected does not affect actual investment returns
- Avoid myopia --- the objective is to make a prudent long-term estimate, not to get a single individual year right
- Neither ignore historical results nor be 100% beholden to them
- Since actual results will vary from assumption, review a return model's probability range and consider a margin for variance

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# Contribution Rate Calculations

- Pension Plan-specific contribution rates have two components:
  - Normal cost rate
    - Cost assigned to current year benefits by the allocation method
  - UAL rate
    - Rate calculated to eliminate UAL in a systematic manner over a specified time period if future experience follows assumptions
- To calculate the UAL rate, an additional assumption and an additional method are needed
  - For amortizations as a level percentage of projected payroll, the system's **general wage increase** assumption affects the rate
  - In addition, the length of the **amortization period** affects the rate

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# Asset Measurement Method

- Contribution rates established annually based on the reported unfunded actuarial liability (UAL)
  - UAL compares Actuarial Liability against a system asset measure
- The Actuarial Value of Assets (AVA) measure used by FRS to calculate UAL is specified by statute, and employs an “asset smoothing” technique
  - The mandated method annually recognizes 20% of investment return deviations from assumption
- The statutory calculation approach includes a “corridor” to ensure smoothed assets vary no more than 20% from fair market value

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# Asset Smoothing

- Five-year smoothing method recognizes heavy losses gradually following times of unfavorable asset performance
- The smoothing is symmetrical, so that any large investment gains are also not “felt” all at once, but instead serve as a cushion against potential future unfavorable asset performance
- The objective of asset smoothing is to keep long-term contribution levels appropriately linked to actual investment performance, and to have year-to-year contribution rate changes be less volatile and more predictable

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# Disclaimer

At your request, we have provided these draft results prior to completion of the July 1, 2017 Actuarial Valuation Report. Because these are draft results, Milliman does not make any representation or warranty regarding the contents of the presentation. Milliman advises any reader not to take any action in reliance on anything contained in this presentation. All results from this presentation are subject to revision or correction prior to the release of the final July 1, 2017 Actuarial Valuation Report, and such changes or corrections may be material.

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# Certification

This presentation summarizes key preliminary results of an actuarial valuation of the Florida Retirement System (“FRS” or “the System”) as of July 1, 2017. The valuation, when finalized, will develop actuarially calculated contribution rates for the Plan Year ending June 30, 2019. The results in this presentation are preliminary in nature and may not be relied upon to, for example, prepare the System’s Consolidated Annual Financial Report (CAFR). The reliance document will be the formal July 1, 2017 Actuarial Valuation Report.

In preparing this presentation, we relied, without audit, on information (some oral and some in writing) supplied by Division of Retirement (“Division”) staff. This information includes, but is not limited to, statutory provisions, employee data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

Preliminary results have been determined on the basis of actuarial assumptions and methods as most recently adopted by the 2016 FRS Actuarial Assumption Conference. At the time of their review and adoption, those assumptions, with the exception of the investment return assumption as disclosed in the July 1, 2016 Actuarial Valuation Report, were individually reasonable (taking into account the experience of the System and reasonable expectations); and offered a reasonable estimate of anticipated future experience affecting the System.

Future actuarial measurements may differ significantly from the current measurements presented in this presentation 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; 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 our assignment, we did not perform an analysis of the potential range of future measurements. The FRS Actuarial Assumption Conference has the final decision regarding the selection of assumptions for System funding calculations.

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# Certification

Computations presented in this presentation are for purposes of preliminarily estimating the actuarially calculated contribution rates for funding the System. Computations prepared for other purposes may differ. The calculations in the presentation have been made on a basis consistent with our understanding of the System's funding requirements and goals. The calculations in this presentation have been made on a basis consistent with our understanding of the plan provisions described in the appendix of our formal actuarial valuation report as of July 1, 2016, as subsequently modified by Senate Bill 7022. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this presentation. Accordingly, additional determinations may be needed for other purposes.

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The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel. The presenting actuaries are independent of the plan sponsors. I am not aware of any relationship that would impair the objectivity of Milliman's work.

On the basis of the foregoing, I hereby certify that, to the best of my knowledge and belief, this presentation has been prepared in accordance with generally recognized and accepted actuarial principles and practices. I am a member of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

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# Actuarial Basis

## Data

We have based our calculations on demographic member census data as of July 1, 2017 as supplied by the Division of Retirement (“Division”). That data will be summarized in our formal actuarial valuation report for funding purposes as of July 1, 2017, which will be published in the 4<sup>th</sup> quarter of this year. Assets as of July 1, 2017, were based on values provided by the Division.

## Methods / Policies

*Actuarial Cost Method:* Ultimate Entry Age Normal, using the interpretation of that method as most recently endorsed by the 2016 FRS Actuarial Assumption Conference.

*UAL Amortization:* Newly arising UAL each plan year is amortized as a level percentage of projected payroll over a closed 30-year period.

*Actuarial Value of Assets:* A smoothed asset value specified by Florida Statutes that annually recognizes 20% of deviations in investment performance from the long-term assumption systematically over time. The statutory calculation approach includes a “corridor” to ensure smoothed assets vary no more than 20% from fair market value.

## Assumptions

Assumptions for 2017 Baseline valuation calculations use assumptions as most recently adopted by the 2016 FRS Actuarial Assumption Conference, and as detailed in the 2014 Experience Study and as used in the July 1, 2016 Actuarial Valuation Report for funding purposes.

## Provisions

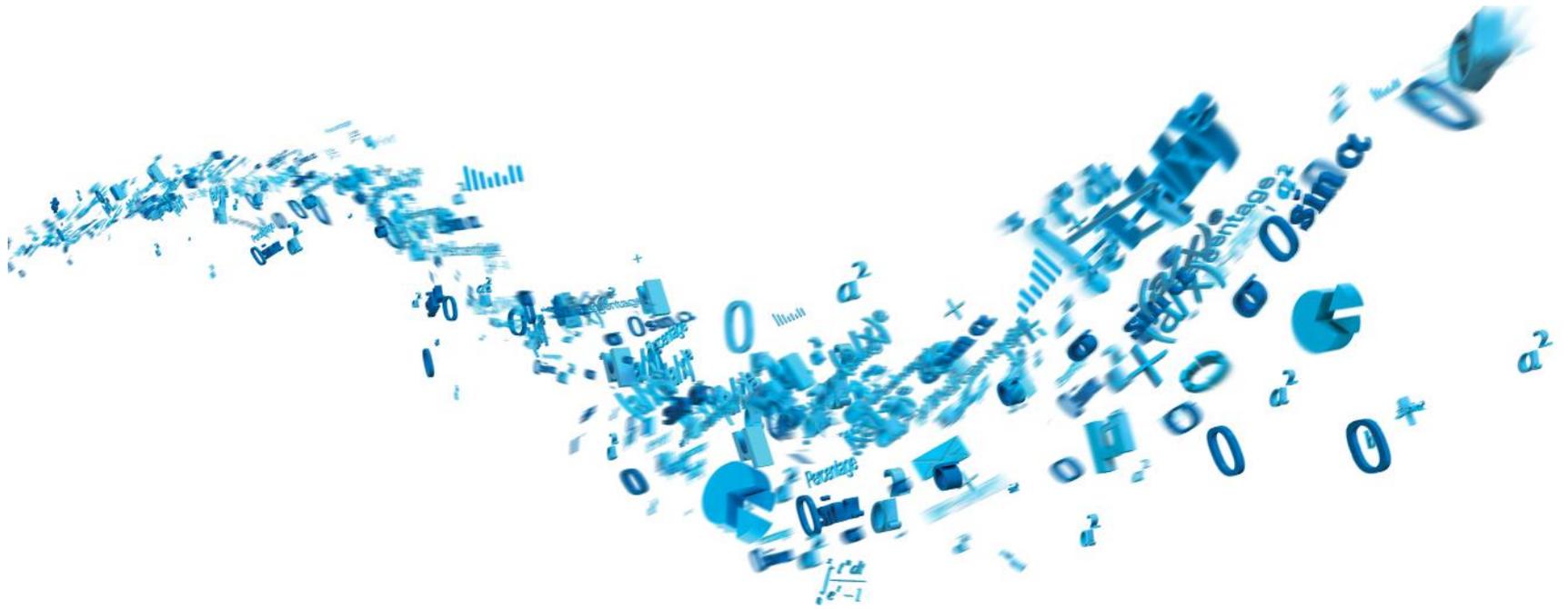
Provisions valued are as summarized in the July 1, 2016 Actuarial Valuation Report for system funding purposes, as subsequently modified by Senate Bill 7022.

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# Glossary – Results Template Actuarial Terms

Acronym	Actuarial Term
<b>AL</b>	Actuarial Liability
<b>AVA</b>	Actuarial Value of Assets (smoothed, rather than market, value)
<b>UAL (AVA)</b>	Unfunded Actuarial Liability, on an AVA basis
<b>FS</b>	Funded Status
<b>NCR</b>	Normal Cost Rate (net employer-paid portion)
<b>UALR</b>	Unfunded Actuarial Liability (UAL) Rate
<b>NCR + UALR</b>	A proxy, albeit an imperfect one, for the employer composite Pension Plan-only contribution rate prior to blending with Investment Plan rates to create blended proposed statutory rates

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# Historical Review of SBA Expected Return on Pension Assets

Florida State Board of Administration  
October 2017

**Aon Hewitt**  
Retirement and Investment

Investment advice and consulting services provided by Aon Hewitt Investment Consulting, Inc., an Aon Company.

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- Horizon Survey of Capital Market Assumptions
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# Executive Summary

# Executive Summary

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## ▪ Purpose of this Presentation

- Illustrate today's capital market expectations, historical capital market expectations, and implications to the expected return on SBA pension assets

## ▪ AHIC Capital Market Assumptions

- Based on the Q3 2017 30-year AHIC-only capital market assumptions (without reflecting the SBA approach), the SBA expected return on pension assets is 6.6%
- There has been a general trend of lower return expectations over the past several years with an uptick in the past year
  - Over a five year period, the decline has been approximately 110bps
  - Over the past year, AHIC's portfolio return expectations for SBA have increased approximately 30bps

## ▪ SBA Approach to Assumption Development

- SBA uses the equity risk premiums from four consulting firms (AHIC, Callan, Wilshire, and Mercer) to remove any biases from any one firm
- In 2016, SBA changed the methodology for determining the equity risk premium from using U.S. equities to global equities
- Using the SBA approach, the assumed equity risk premium decreased from 3.94% in 2016 to 3.72% in 2017 resulting in an expected return assumption of 6.81% from the 2017 asset-liability study

## ▪ Horizon Survey for Assumption Benchmarking

- The Horizon Survey reflects assumptions from dozens of investment advisors each year
- Capital market assumptions in aggregate were roughly flat year-over-year, according to the survey
- AHIC assumptions tend to be similar to somewhat conservative relative to other investment advisors in the Horizon Survey



# AHIC Capital Market Assumptions

# AHIC Capital Market Assumptions

## Background

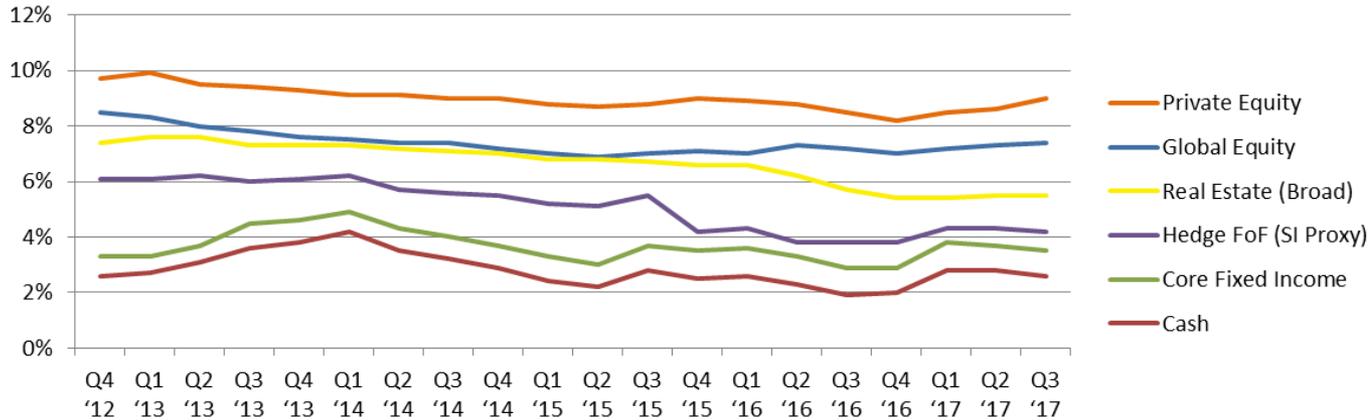
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- Long-term (10 and 30 year forecasts) forward-looking assumptions (asset class geometric return, volatility, and correlations)
- Building Block approach, primarily based on consensus expectations and market based inputs
- Best estimates of annualized returns (50/50 better or worse)
- Market returns: no active management value added (except for certain assets classes, such as hedge funds)
- Net of investment fees
- Updated quarterly
- We show AHIC's long-term (i.e., 30-year) capital market assumptions throughout this material

# AHIC Capital Market Assumptions

## Declining Return Expectations With Uptick Since Last Year

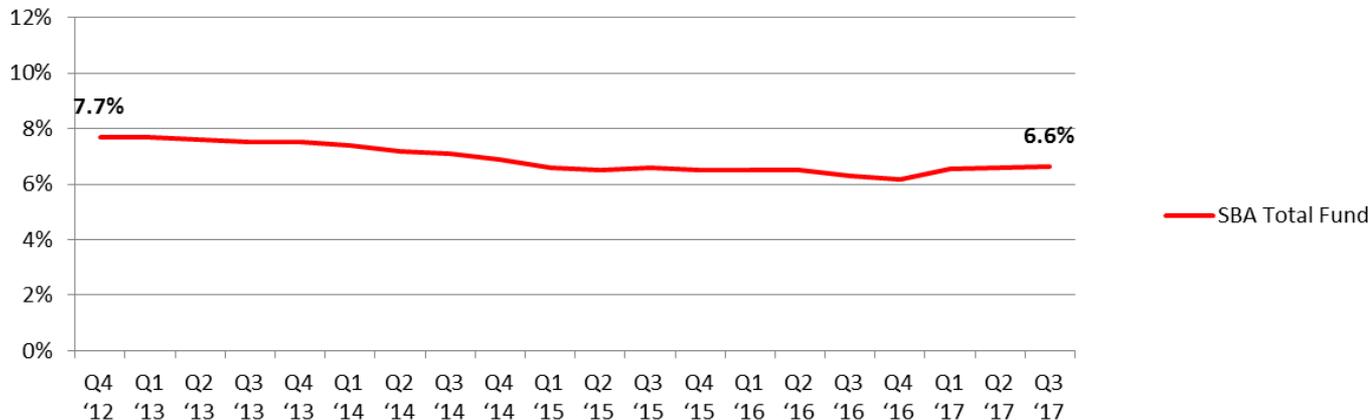
### Asset Classes



### Key Takeaways:

- There has been a general trend of lower return expectations over the past several years with an uptick in the past year
- As a result, SBA total fund expectations steadily declined over the period, based on AHIC assumptions, with an uptick in the past year

### SBA Total Fund

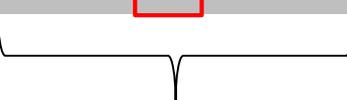


# AHIC Capital Market Assumptions

## Declining Return Expectations With Uptick Since Last Year

- The table below shows the expected portfolio returns using AHIC's capital market assumptions and SBA's long-term policy allocation
- Return expectations have fallen over the past five (5) years with an uptick in the past year
- Summary of expected return on pension plan assets:

Asset Classes	Q4 '12	Q1 '13	Q2 '13	Q3 '13	Q4 '13	Q1 '14	Q2 '14	Q3 '14	Q4 '14	Q1 '15	Q2 '15	Q3 '15	Q4 '15	Q1 '16	Q2 '16	Q3 '16	Q4 '16	Q1 '17	Q2 '17	Q3 '17
Global Equity	8.5%	8.3%	8.0%	7.8%	7.6%	7.5%	7.4%	7.4%	7.2%	7.0%	6.9%	7.0%	7.1%	7.0%	7.3%	7.2%	7.0%	7.2%	7.3%	7.4%
Cash	2.6%	2.7%	3.1%	3.6%	3.8%	4.2%	3.5%	3.2%	2.9%	2.4%	2.2%	2.8%	2.5%	2.6%	2.3%	1.9%	2.0%	2.8%	2.8%	2.6%
Core Fixed Income	3.3%	3.3%	3.7%	4.5%	4.6%	4.9%	4.3%	4.0%	3.7%	3.3%	3.0%	3.7%	3.5%	3.6%	3.3%	2.9%	2.9%	3.8%	3.7%	3.5%
Hedge FoF (SI Proxy)	6.1%	6.1%	6.2%	6.0%	6.1%	6.2%	5.7%	5.6%	5.5%	5.2%	5.1%	5.5%	4.2%	4.3%	3.8%	3.8%	3.8%	4.3%	4.3%	4.2%
Real Estate (Broad)	7.4%	7.6%	7.6%	7.3%	7.3%	7.3%	7.2%	7.1%	7.0%	6.8%	6.8%	6.7%	6.6%	6.6%	6.2%	5.7%	5.4%	5.4%	5.5%	5.5%
Private Equity	9.7%	9.9%	9.5%	9.4%	9.3%	9.1%	9.1%	9.0%	9.0%	8.8%	8.7%	8.8%	9.0%	8.9%	8.8%	8.5%	8.2%	8.5%	8.6%	9.0%
<b>SBA Total Fund</b>	<b>7.7%</b>	<b>7.7%</b>	<b>7.6%</b>	<b>7.5%</b>	<b>7.5%</b>	<b>7.4%</b>	<b>7.2%</b>	<b>7.1%</b>	<b>6.9%</b>	<b>6.6%</b>	<b>6.5%</b>	<b>6.6%</b>	<b>6.5%</b>	<b>6.5%</b>	<b>6.5%</b>	<b>6.3%</b>	<b>6.2%</b>	<b>6.5%</b>	<b>6.6%</b>	<b>6.6%</b>



AHIC CMAs have increased 30 bps over the past year

= Period used for 2017 Asset-Liability Study

# AHIC Capital Market Assumptions

## Declining Return Expectations With Uptick Since Last Year

- The table below illustrates the changes in AHIC's capital market assumptions over the past 5 years, using the long-term policy target allocations shown

Asset Class	Change Since Q4 '12
Global Equity	-1.1%
Cash	0.0%
Core Fixed Income	+0.2%
Hedge FoF (SI proxy)	-1.9%
Real Estate (Broad)	-1.9%
Private Equity	-0.7%
<b>SBA Total Fund</b>	<b>-1.1%</b>

Asset Class	LT Policy Weights
Global Equity	53%
Cash	1%
Core Fixed Income	18%
Hedge FoF (SI proxy)	12%
Real Estate (Broad)	10%
Private Equity	6%
<b>Total</b>	<b>100%</b>



# SBA Approach to Assumption Development

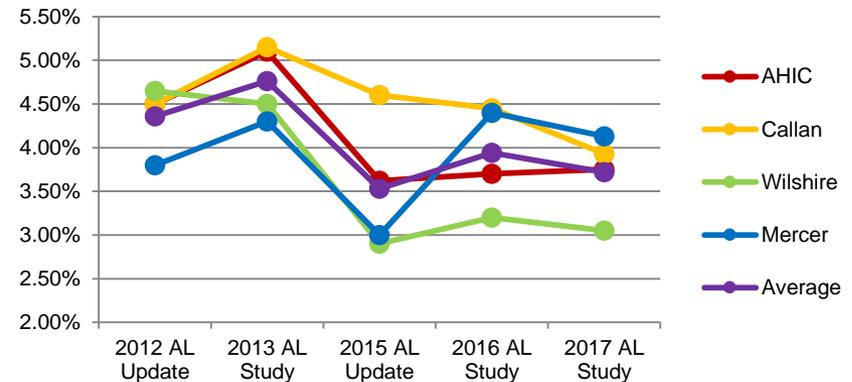
# SBA Approach to Assumption Development

## Development of Equity Risk Premium Assumption<sup>1</sup>

- SBA approach averages the equity risk premiums from four investment advisors (AHIC, Callan, Wilshire, Mercer)
  - Global equity risk premium used starting in 2016, deemed more applicable given global equity portfolio
  - Prior years were based on U.S. equity risk premiums
- Building block approach is used
  - Price inflation and fixed income returns reflect market conditions and yields
  - For all other asset classes (“risk assets”) a risk premium is added to fixed income returns
- Average risk premium is used to scale AHIC’s expected returns for the “Risk Assets”

**Average Global Equity Risk Premium = Average (Global Equity Return – U.S. Bond Return)**

Risk Premium for Equities <sup>2</sup>	U.S. Equities			Global Equities	
	2012 A-L Update	2013 A-L Study	2015 A-L Update	2016 A-L Study	2017 AL Study
AHIC	4.50%	5.10%	3.62%	3.70%	3.75%
Callan	4.50%	5.15%	4.60%	4.45%	3.93%
Wilshire	4.65%	4.50%	2.90%	3.20%	3.05%
Mercer	3.80%	4.30%	3.00%	4.40%	4.13%
<b>Average</b>	<b>4.36%</b>	<b>4.76%</b>	<b>3.53%</b>	<b>3.94%</b>	<b>3.72%</b>



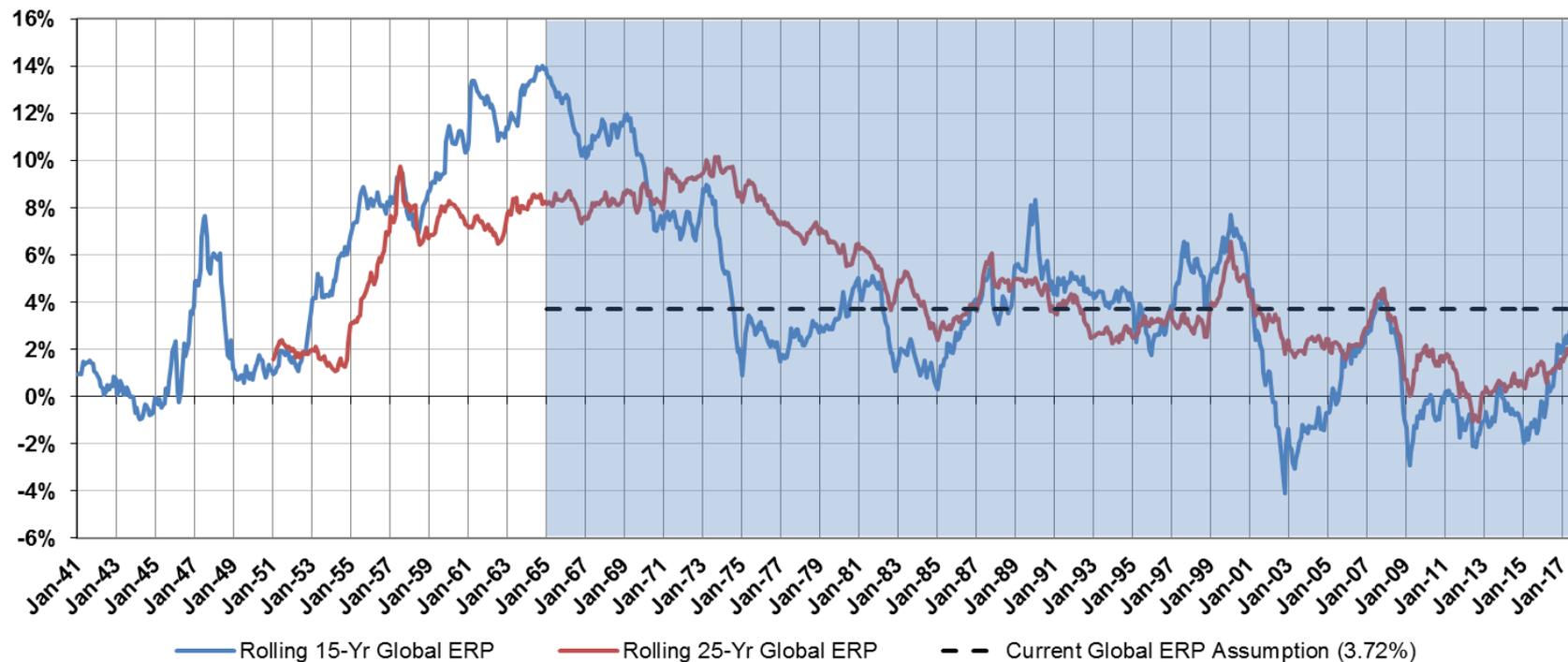
<sup>1</sup>Equity Risk Premium is defined as the excess return earned over bonds that compensates investors for taking on higher risk; all returns are 15-year geometric average (compounded) expected returns

<sup>2</sup>An asset-liability study was not completed in 2014

# SBA Approach to Assumption Development

## Historical and Expected Equity Risk Premium

- This graph shows the historical moving average of the global equity risk premium. The shaded section captures the experience since 1950. During this period, the average rolling 15-year global ERP has been 3.68%.

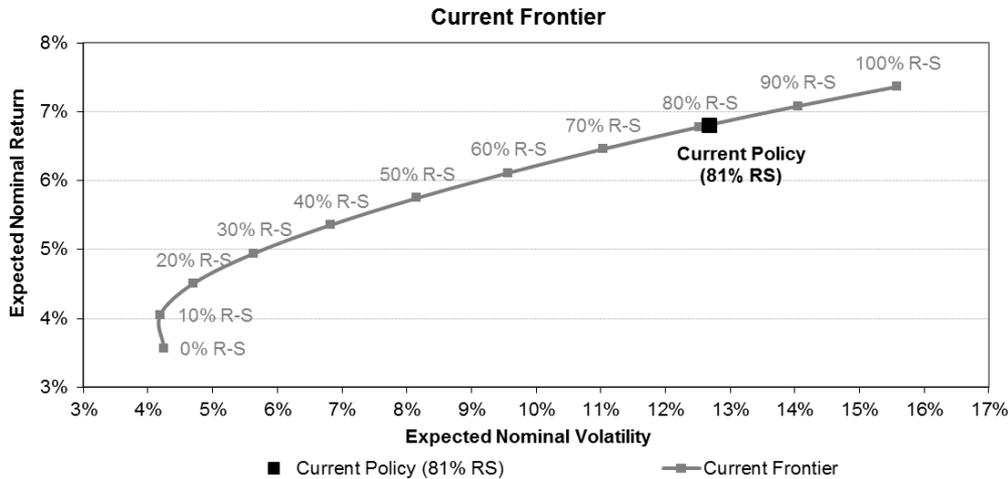


### Notes:

- Global equity risk premium measured as the difference between Global Stock returns and U.S. Bonds.
- Global Stocks: January 1926 to December 1969 – 50% U.S. [CRSP 1-10 Deciles Data (cap-based)] / 50% International stock data from Global Financial Database; January 1970 to present – MSCI All-Country Index
- U.S. Bonds: January 1926 to December 1975 – Long-Term Government Bond returns from Ibbotson; January 1976 to present – Barclays Capital Aggregate Bond Index

# SBA Approach to Assumption Development

## Investment Analysis | Current Frontier (From 2017 A-L Study)



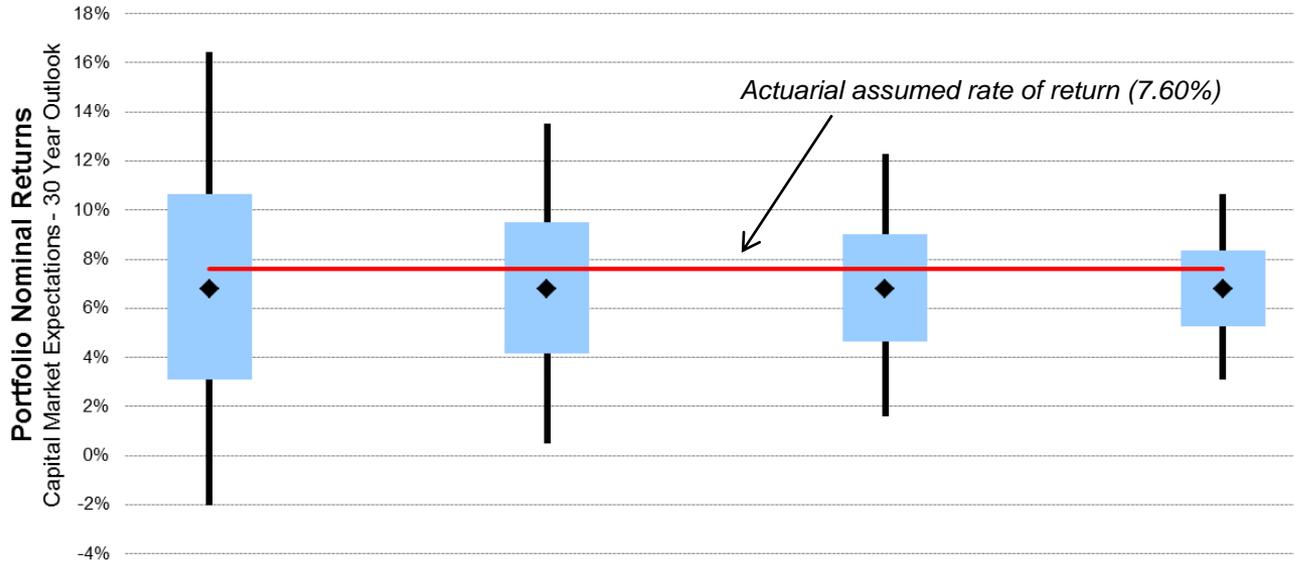
### Key Takeaways:

- The current portfolio is well-diversified
  - Return-seeking assets are broadly diversified
  - Safety assets should withstand stressed markets

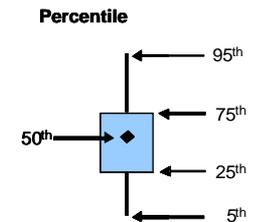
	Expected Nominal Return	Expected Nominal Volatility	Sharpe Ratio	Return Seeking				Risk-Reducing		
				Global Equity	Real Estate	Strategic	Private Equity	Cash & Short Duration Bonds	Interm. Duration Gov't Bonds	Interm. Duration Credit
Current Policy (81% RS)	6.81%	12.68%	0.3160	53%	10%	12%	6%	1%	9%	9%
<b>Current Frontier</b>										
0% Return-Seeking	3.56%	4.25%	0.1793	0%	0%	0%	0%	0%	50%	50%
10% Return-Seeking	4.05%	4.19%	0.2979	7%	1%	1%	1%	0%	45%	45%
20% Return-Seeking	4.51%	4.70%	0.3632	13%	2%	3%	1%	0%	40%	40%
30% Return-Seeking	4.94%	5.64%	0.3802	20%	4%	4%	2%	0%	35%	35%
40% Return-Seeking	5.36%	6.83%	0.3746	26%	5%	6%	3%	0%	30%	30%
50% Return-Seeking	5.75%	8.16%	0.3614	33%	6%	7%	4%	0%	25%	25%
60% Return-Seeking	6.11%	9.57%	0.3464	39%	7%	9%	4%	0%	20%	20%
70% Return-Seeking	6.46%	11.03%	0.3318	46%	9%	10%	5%	0%	15%	15%
80% Return-Seeking	6.78%	12.53%	0.3180	52%	10%	12%	6%	0%	10%	10%
90% Return-Seeking	7.09%	14.05%	0.3051	59%	11%	13%	7%	0%	5%	5%
100% Return-Seeking	7.37%	15.58%	0.2932	65%	12%	15%	7%	0%	0%	0%

# SBA Approach to Assumption Development

## Investment Analysis | Range of Nominal Returns (From 2017 A-L Study)



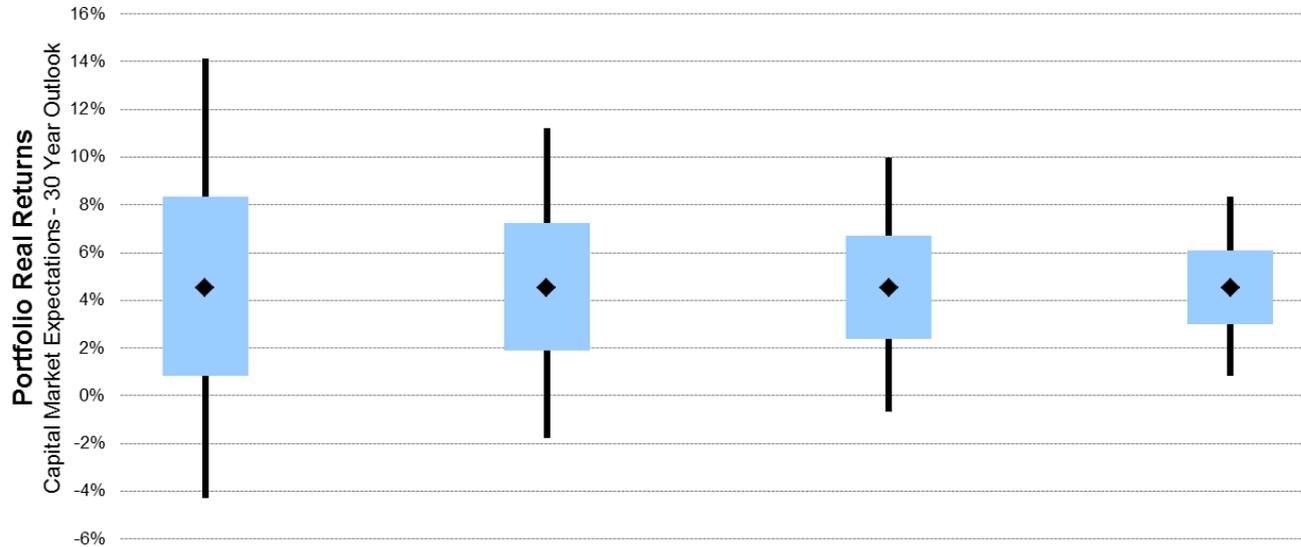
Percentile	Current Policy – 5 Year	Current Policy – 10 Year	Current Policy – 15 Year	Current Policy – 30 Year
5 <sup>th</sup>	-2.04%	0.48%	1.61%	3.10%
25 <sup>th</sup>	3.09%	4.16%	4.64%	5.27%
50 <sup>th</sup>	6.81%	6.81%	6.81%	6.81%
75 <sup>th</sup>	10.66%	9.52%	9.01%	8.36%
95 <sup>th</sup>	16.45%	13.54%	12.27%	10.64%



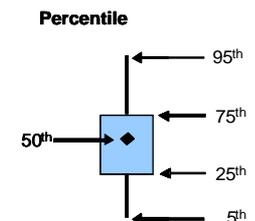
Note: Returns based on AHIC's 30 Year Capital Market Assumptions as of December 31, 2016

# SBA Approach to Assumption Development

## Investment Analysis | Range of Real Returns (From 2017 A-L Study)



Percentile	Current Policy – 5 Year	Current Policy – 10 Year	Current Policy – 15 Year	Current Policy – 30 Year
5 <sup>th</sup>	-4.27%	-1.78%	-0.65%	0.84%
25 <sup>th</sup>	0.82%	1.89%	2.37%	2.99%
50 <sup>th</sup>	4.52%	4.52%	4.52%	4.52%
75 <sup>th</sup>	8.36%	7.22%	6.72%	6.07%
95 <sup>th</sup>	14.12%	11.22%	9.96%	8.34%



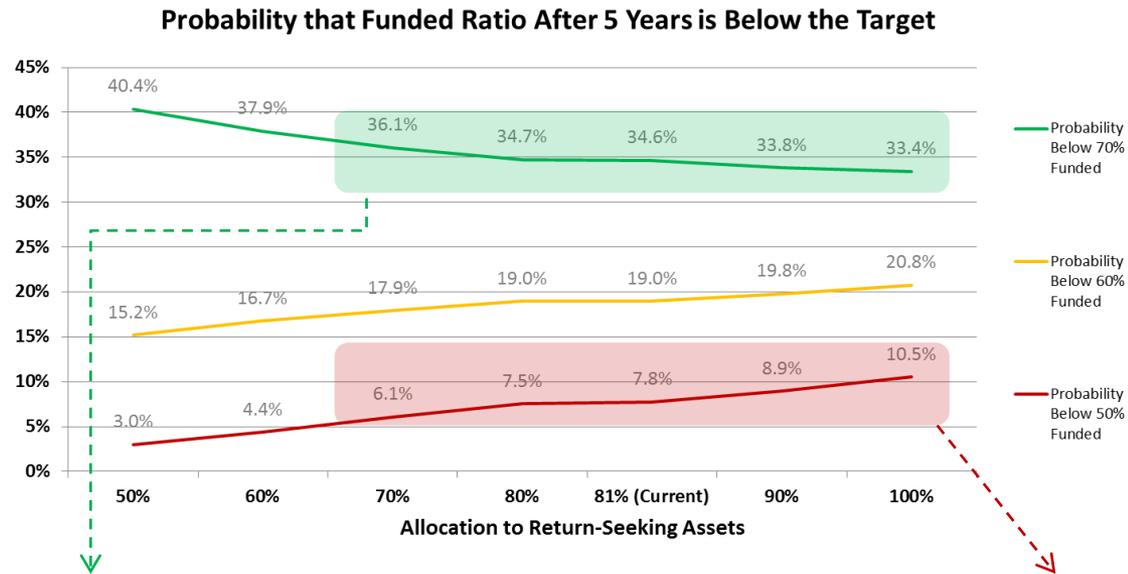
Note: Returns based on AHIC's 30 Year Capital Market Assumptions as of December 31, 2016

# Short-Term Funded Ratio Shortfall Analysis

## Based on Market Value of Assets (From 2017 A-L Study)

FRS' funded ratio based on the current allocation projects to the following outcomes after 5 years:

- 34.6% probability of being below **70%** funded
- 19.0% probability of being below **60%** funded
- 7.8% probability of being below **50%** funded

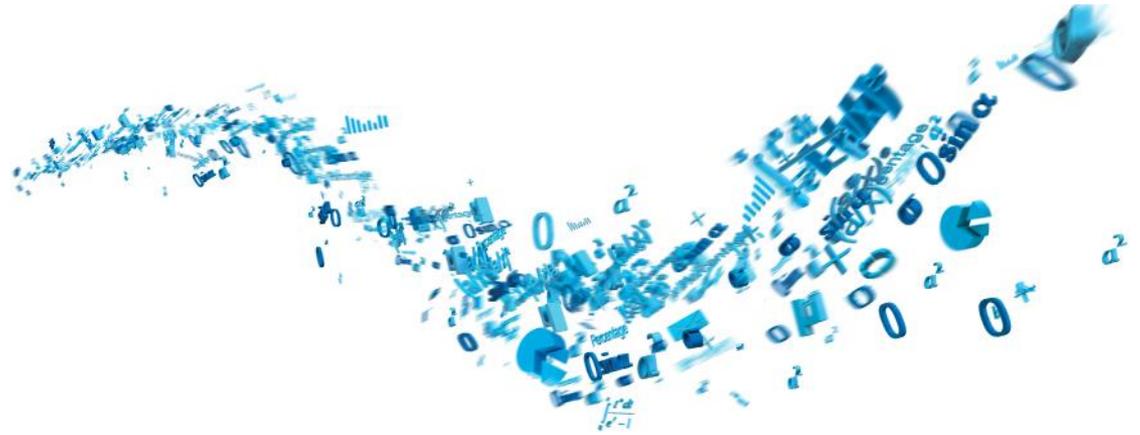


### **70% Funded Status**

- Dialing up the risk to 90% return-seeking assets will reduce the probability of falling below 70% funded to 33.8%
- Dialing down risk to 70% return-seeking assets will increase the probability to 36.1%

### **50% Funded Status**

- Dialing up the risk to 90% return-seeking assets will increase this probability of falling below 50% funded to 8.9%
- Dialing down risk to 70% return-seeking assets will decrease the probability to 6.1%



# Horizon Survey of Capital Market Assumptions

# 2017 Horizon Survey Results

## AHIC vs. Other Advisors

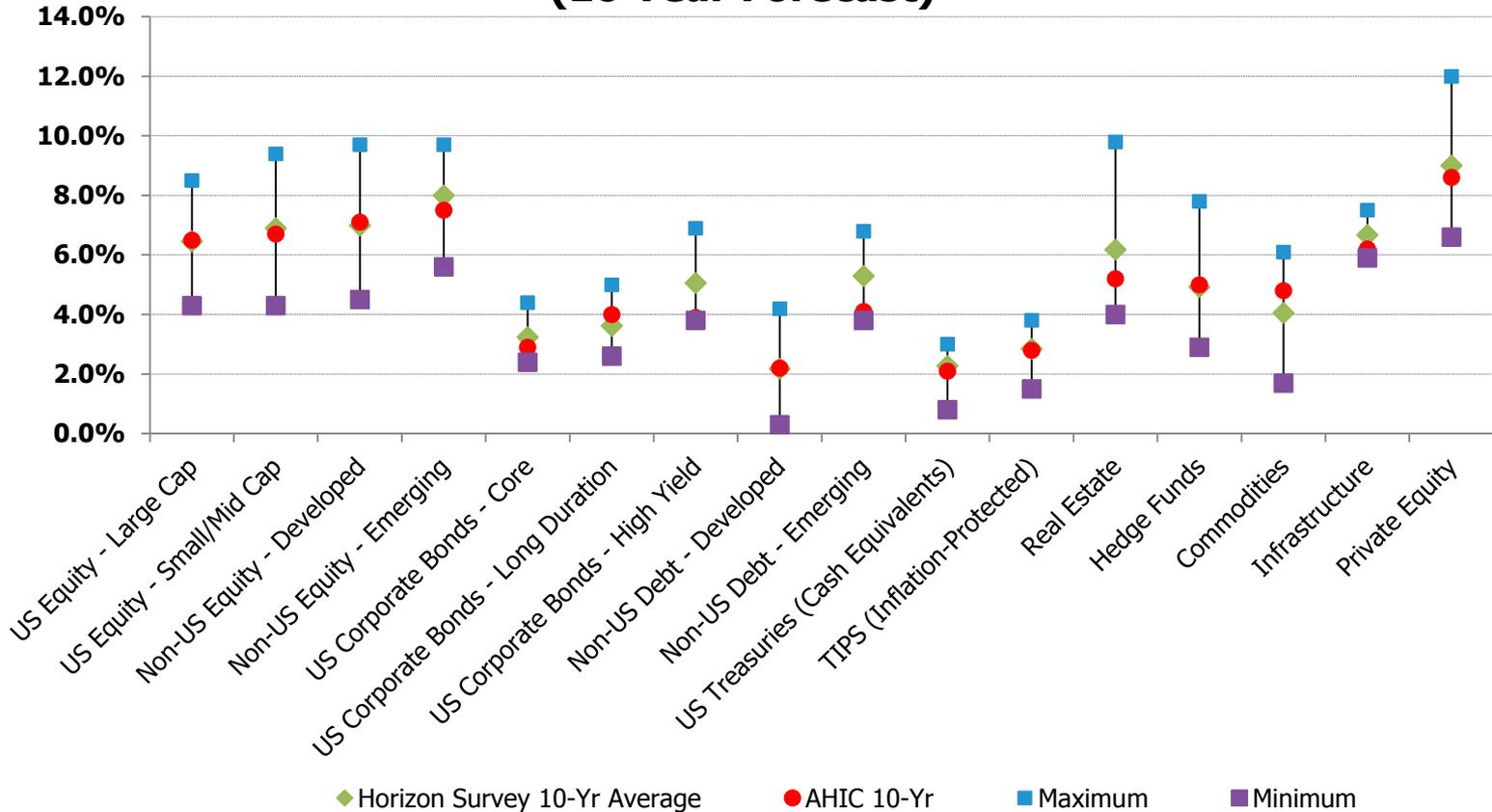
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- Since 2010, Horizon Actuarial Services, LLC has conducted a capital market assumption survey of investment firms to aid in determining reasonable assumptions for a pension plan's expected return on assets
  - While we do not seek to change our approach based on how we stack up to peers, it is a helpful double-check to make sure we are not too far off from others in the industry
- Compared to 2016, the 2017 survey results under the 10-year forecast indicate a slight decrease in return assumptions for both risky assets (equity-like) and fixed income asset classes
  - Equity return assumptions are lower by an average of 0.2%
  - Fixed income return assumptions are lower by an average of 0.3%
  - Alternative asset class return assumptions are lower by an average of 0.1%
- 2017 AHIC 10-year forecast assumptions tend to be lower than the survey average
  - AHIC equity assumptions are driven by market valuations, earnings growth expectations and assumed payouts to investors. Recent experience suggests strong equity market performance has been driven more by increasing valuations than increasing profits. As markets have become more expensive, our equity return assumptions have consequently fallen
  - AHIC fixed income assumptions reflect falling yields and flattening of yield curves during the first quarter of 2017
  - AHIC alternative asset class assumptions are generally lower due to methodological and inflation forecast differences compared to survey participant forecasts
- In conclusion, AHIC assumptions appear somewhat more conservative than peers included in the 2017 Horizon Survey of capital market assumptions

# 2017 Horizon Survey Results

## Distribution of Expected Returns from 35 Consultants

### Expected Geometric Returns by Asset Class (10 Year Forecast)

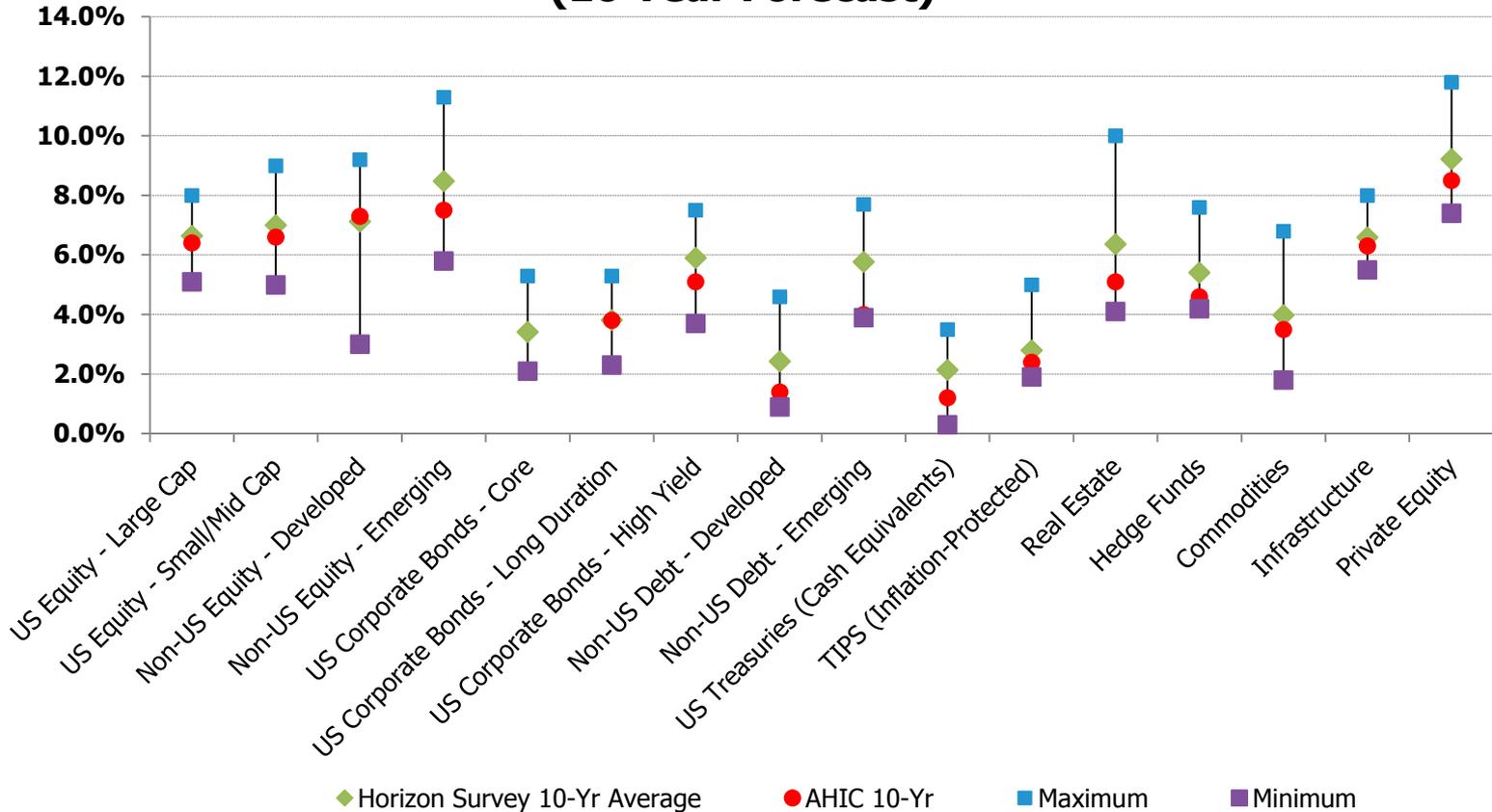


**SOURCE:** Horizon Actuarial survey of 2017 capital market assumptions from 35 independent investment advisors. Expected returns of the survey are annualized over 10-years (geometric). AHIC expected returns are annualized over 10-years as of 2Q 2017

# 2016 Horizon Survey Results

## Distribution of Expected Returns from 35 Consultants

### Expected Geometric Returns by Asset Class (10 Year Forecast)



**SOURCE:** Horizon Actuarial survey of 2016 capital market assumptions from 35 independent investment advisors. Expected returns of the survey are annualized over 10-years (geometric). AHIC expected returns are annualized over 10-years as of 3Q 2016



# Conclusions

# Conclusions

---

- **AHIC Capital Market Assumptions**

- Based on the Q3 2017 30-year AHIC-only capital market assumptions, the SBA expected return on pension assets is 6.6%

- **SBA Approach to Assumption Development**

- Using the SBA approach, averaging the equity risk premiums from four consulting firms, the expected return on pension assets from the 2017 asset-liability study was 6.81%

- **Horizon Survey for Assumption Benchmarking**

- AHIC assumptions tend to be similar to somewhat conservative relative to other investment advisors in the Horizon Survey



# Appendix

# 2017 Horizon Survey

## AHIC Versus Peers (10-Year)

Asset Class	Horizon Survey		AHIC		Difference
	10 Year Horizon		10 Year Forecasts		
	Expected Return	Expected Risk	Expected Return	Expected Risk	
US Equity - Large Cap	6.5%	16.6%	6.5%	17.0%	0.0%
US Equity - Small/Mid Cap	6.9%	20.2%	6.7%	23.0%	-0.2%
Non-US Equity - Developed	7.0%	18.9%	7.1%	20.0%	0.1%
Non-US Equity - Emerging	8.0%	25.4%	7.5%	30.0%	-0.5%
US Fixed Income - Core	3.2%	5.5%	2.9%	4.0%	-0.3%
US Fixed Income - Long Duration Corp	3.6%	10.4%	4.0%	11.0%	0.4%
US Fixed Income - High Yield	5.1%	10.6%	3.9%	12.0%	-1.2%
Non-US Fixed Income - Developed	2.2%	7.4%	2.2%	5.5%	0.0%
Non-US Fixed Income - Emerging	5.3%	11.8%	4.1%	13.0%	-1.2%
Treasuries (Cash Equivalents)	2.3%	3.0%	2.1%	1.0%	-0.2%
TIPS (Inflation-Protected)	2.9%	6.3%	2.8%	4.5%	-0.1%
Real Estate	6.2%	14.5%	5.2%	11.5%	-1.0%
Hedge Funds	4.9%	8.0%	5.0%	9.0%	0.1%
Commodities	4.1%	17.9%	4.8%	17.0%	0.8%
Infrastructure	6.7%	14.6%	6.2%	14.5%	-0.5%
Private Equity	9.0%	22.0%	8.6%	24.0%	-0.4%
Inflation	2.2%	1.7%	2.2%	1.0%	0.0%

### Notes (Horizon Survey):

Source: Horizon Actuarial survey of 2017 capital market assumptions from 35 independent investment advisors

Expected returns are annualized (geometric).

### Notes (AHIC Forecasts):

AHIC Forecasts are for Q2 2017

US Equity - Small/Mid Cap forecasts represents AHIC forecasts for US Small Cap

US Fixed Income - Long Duration forecasts represents AHIC forecasts for Long Duration Credit

Non-US Fixed Income - Developed forecasts represents AHIC forecasts for Non-US Fixed Income - Developed (50% Hedged)

Non-US Fixed Income- Emerging forecasts represents AHIC forecasts for Non-US Fixed Income- Emerging Sovereign USD

Real Estate forecasts represents AHIC forecasts for Core Private Real Estate

Hedge Funds forecasts represents AHIC forecasts for Hedge Fund-of-Funds (Buy List)

# 2016 Horizon Survey

## AHIC Versus Peers

Asset Class	Horizon Survey				AHIC			
	Expected Geometric Returns (10-Yr)			Expected Risk	10 Year Forecasts		30 Year Forecasts	
	Maximum	Minimum	Average	Average	Expected Return	Expected Risk	Expected Return	Expected Risk
US Equity - Large Cap	8.0%	5.1%	6.6%	16.9%	6.4%	17.0%	6.3%	17.0%
US Equity - Small/Mid Cap	9.0%	5.0%	7.0%	21.0%	6.6%	23.0%	6.8%	23.5%
Non-US Equity - Developed	9.2%	3.0%	7.1%	19.5%	7.3%	20.0%	7.2%	20.0%
Non-US Equity - Emerging	11.3%	5.8%	8.5%	26.4%	7.5%	30.0%	7.5%	30.5%
US Fixed Income - Core	5.3%	2.1%	3.4%	6.0%	2.1%	3.5%	2.9%	5.0%
US Fixed Income - Long Duration Corp	5.3%	2.3%	3.8%	10.5%	3.8%	11.5%	4.0%	15.0%
US Fixed Income - High Yield	7.5%	3.7%	5.9%	11.0%	5.1%	12.0%	5.4%	12.0%
Non-US Fixed Income - Developed	4.6%	0.9%	2.4%	7.6%	1.4%	5.5%	2.2%	6.5%
Non-US Fixed Income - Emerging	7.7%	3.9%	5.8%	11.6%	4.0%	13.0%	4.9%	13.5%
Treasuries (Cash Equivalents)	3.5%	0.3%	2.1%	2.8%	1.2%	1.0%	1.9%	2.0%
TIPS (Inflation-Protected)	5.0%	1.9%	2.8%	6.5%	2.4%	4.5%	3.1%	4.5%
Real Estate	10.0%	4.1%	6.4%	14.7%	5.1%	11.5%	5.1%	11.5%
Hedge Funds	7.6%	4.2%	5.4%	8.4%	4.6%	9.0%	5.0%	9.5%
Commodities	6.8%	1.8%	4.0%	18.5%	3.5%	17.0%	4.4%	17.0%
Infrastructure	8.0%	5.5%	6.6%	13.8%	6.3%	14.5%	6.6%	14.5%
Private Equity	11.8%	7.4%	9.2%	23.1%	8.5%	24.0%	8.5%	24.5%
Inflation			2.2%	1.8%	2.1%	1.0%	2.1%	1.5%

### Notes (Horizon Survey):

Source: Horizon Actuarial survey of 2016 capital market assumptions from 35 independent investment advisors  
Expected returns are annualized (geometric).

### Notes (AHIC Forecasts):

AHIC Forecasts are for Q3 2016

US Equity - Small/Mid Cap forecasts represents AHIC forecasts for US Small Cap

US Fixed Income - Long Duration forecasts represents AHIC forecasts for Long Duration Credit

Non-US Fixed Income - Developed forecasts represents AHIC forecasts for Non-US Fixed Income - Developed (50% Hedged)

Non-US Fixed Income- Emerging forecasts represents AHIC forecasts for Non-US Fixed Income- Emerging Sovereign USD

Real Estate forecasts represents AHIC forecasts for Core Private Real Estate

Hedge Funds forecasts represents AHIC forecasts for Hedge Fund-of-Funds (Buy List)

# Leading Methodologies & Reasons for Differences

---

## Leading Methodologies

- Building Block
- Global Capital Asset Pricing Model (Global CAPM)
- Surveys
- Historical data (as a guide to future)
- Black-Litterman (combination of building block and CAPM)

## Reasons for Differences

- Methodology
- Time Horizon
- Arithmetic vs. Geometric forecasts\*
- Alpha (active management)\*
- Inflation
- Investment Fees
- Asset class definition

\* While some firms in Horizon survey responded with Arithmetic forecasts, the results have been converted to Geometric forecasts for comparison purposes. Additionally, the return expectations included in the Horizon survey are based on indexed returns (no "alpha"). However, AHIC return assumptions for certain asset classes include "alpha" or active management premium (e.g., Hedge Funds)

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# State Board of Administration

## FRS Pension Plan Performance Review

Actuarial Assumptions Estimating Conference

October 5, 2017

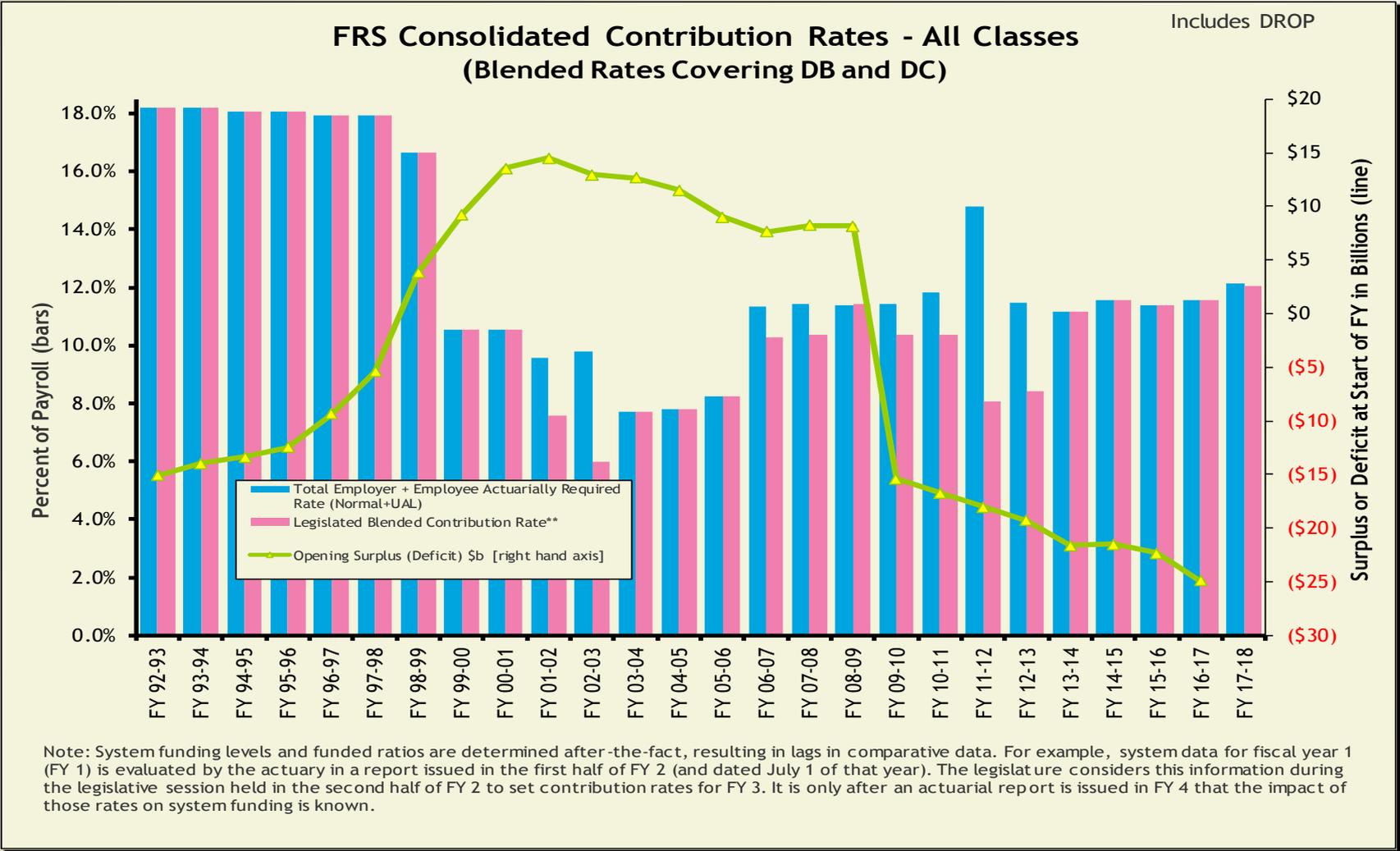


# Introduction

- The Legislature, SBA Trustees, Division of Retirement, and SBA staff, have a history of supporting three critical requirements for pension funding sustainability:
  - Reasonable benefits
  - Prudent investments
  - Responsible funding policy

Which resulted in 11-years of actuarial surpluses from 1998 thru 2008 and employers saving a cumulative \$6.6B through reduced contributions.

# Introduction

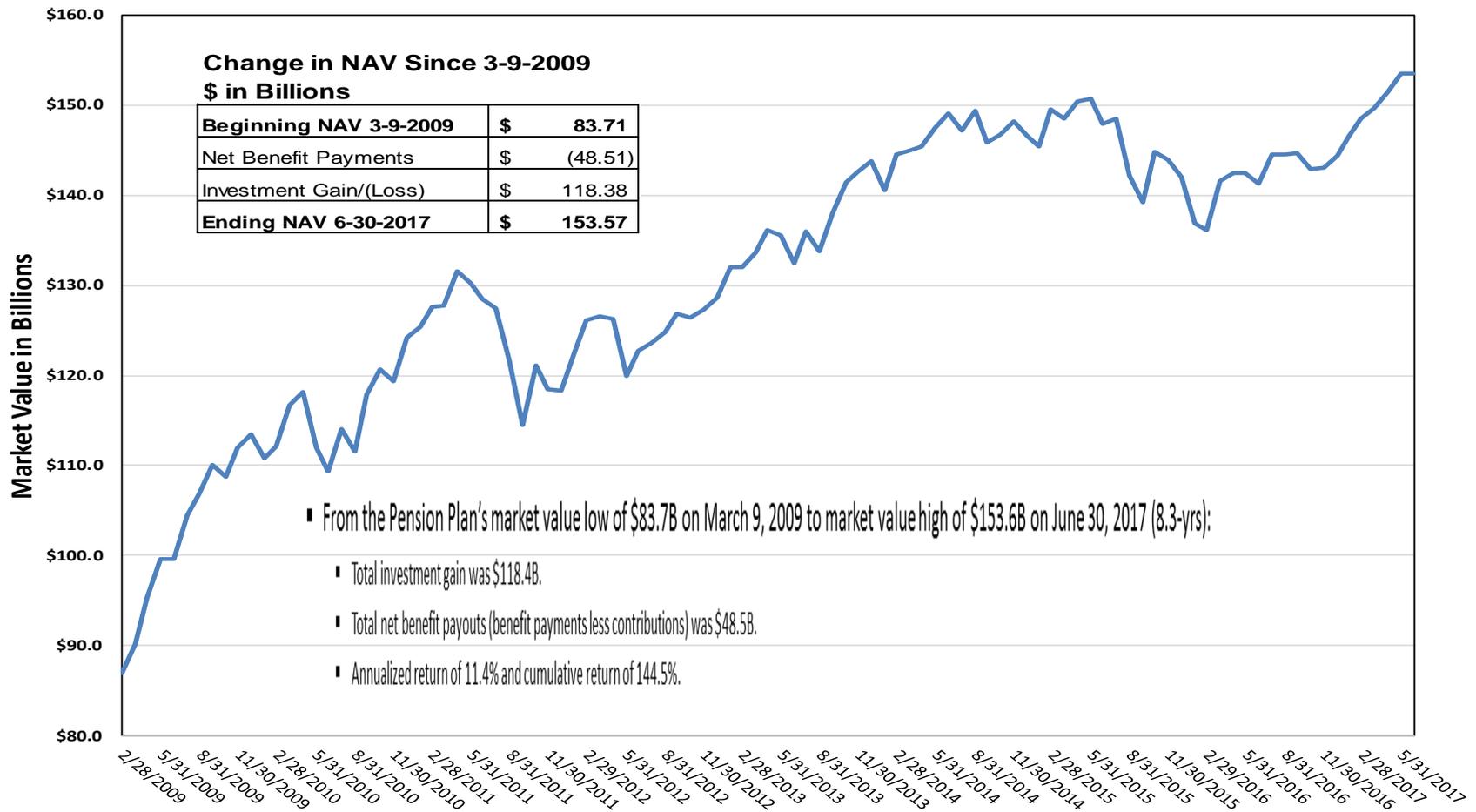


# Introduction

- The “Global Financial Crisis” that began in 2007 led to marked to market asset value declines, creating an unfunded liability.
  - Benefit reforms enacted in 2011 – Mandated employee contributions and elimination of COLA.
  - Despite the market decline, the SBA’s long-term investment discipline has since March 2009 to June 2017 (8.3 yrs.):
    - ✓ Produced an annualized return of 11.4% or cumulative return of 144.5%.
    - ✓ Had a total investment gain of \$118.4B.
    - ✓ While paying out \$48.5B in net benefit payments.
  - Budgetary constraints from 2010 to 2013.

# FRS Pension Plan Changes in Market Values From March 9, 2009 to June 30, 2017 (8.3 Years)

FRS Pension Plan Market Values from March 9, 2009 Market Low to June 30, 2017



# FRS Pension Plan Performance

## Fiscal Year 2016-17

- The Pension Plan's assets totaled \$153.6 billion (unaudited) as of June 30, 2017, which represents a \$12.3 billion increase since June 30, 2016, despite a net cash outflow of \$6.8 billion (in net benefit payouts).
- 13.8% net of fees return.
- Beating the benchmark by 0.81%.

# FRS Pension Plan Change in Market Value Fiscal Year Ending 6/30/2017

## Summary of Cash Flows

Fiscal Year 2016-17\*

\$ in Billions

<b>Beginning Market Value</b>	\$141.3
<b>+/- Net Contributions/(Withdrawals)</b>	(\$6.8)
<b>Investment Earnings</b>	\$19.0
<b>= Ending Market Value</b>	\$153.6
<b>Net Change</b>	\$12.3

\*Period July 2016 – June 2017, unaudited.



# FRS Pension Plan Short-Term Performance Periods Ending 6/30/2017

- The Pension Plan's returns over the trailing 3-yr, and 5-yr periods were 5.9% (3-yr), and 9.5% (5-yr), respectively.

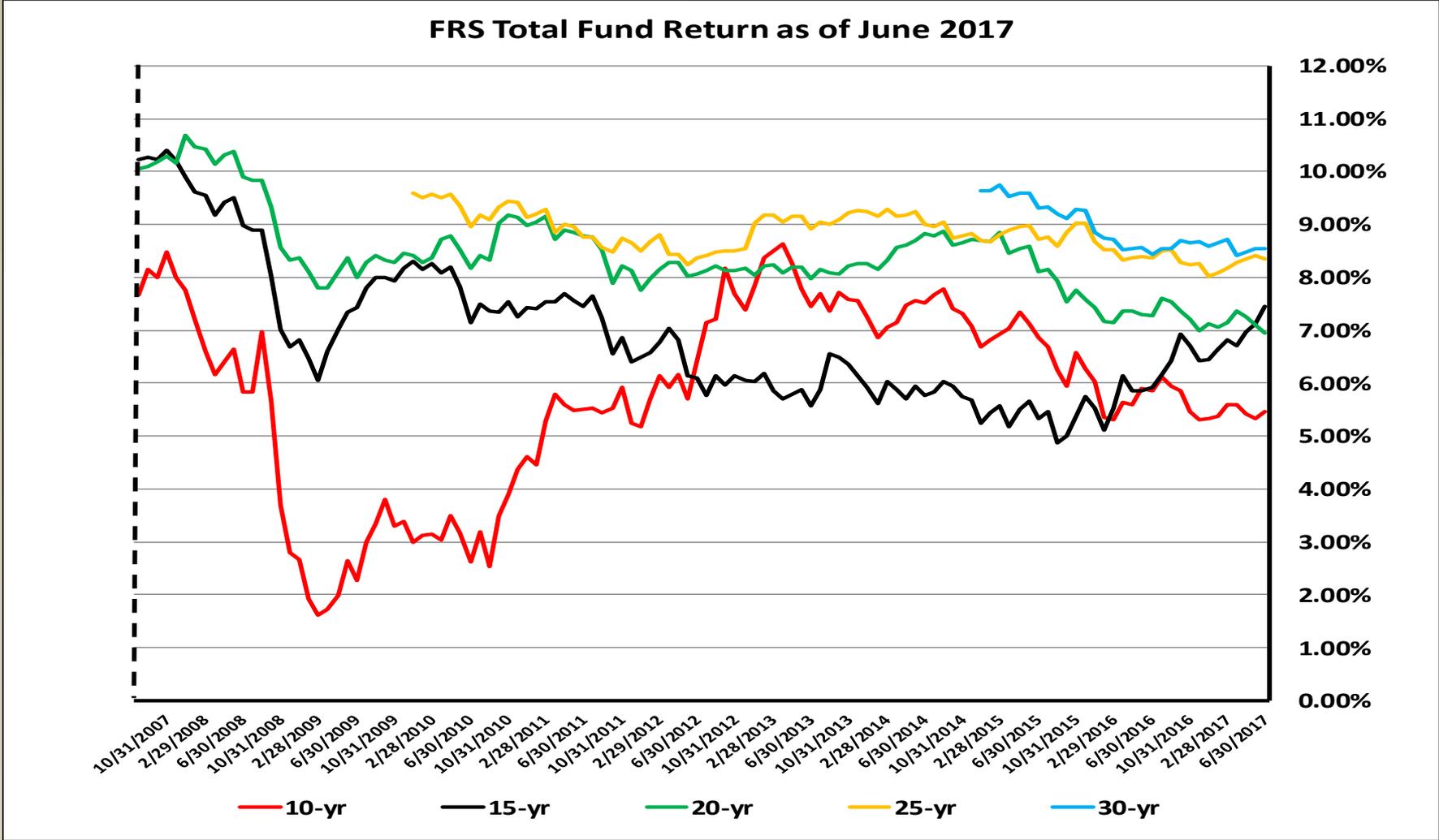


# FRS Pension Plan Long-Term Performance Periods Ending 6/30/2017

- Over longer time periods, the Pension Plan's returns over the trailing 10-yr, 15-yr, 20-yr, 25-yr, and 30-yr periods were 5.5% (10-yr), 7.4% (15-yr), 6.9% (20-yr), 8.4% (25-yr), and 8.6% (30-yr), respectively.

# FRS Pension Plan Long-Term Investment Results

## Periods Ending 6/30/2017



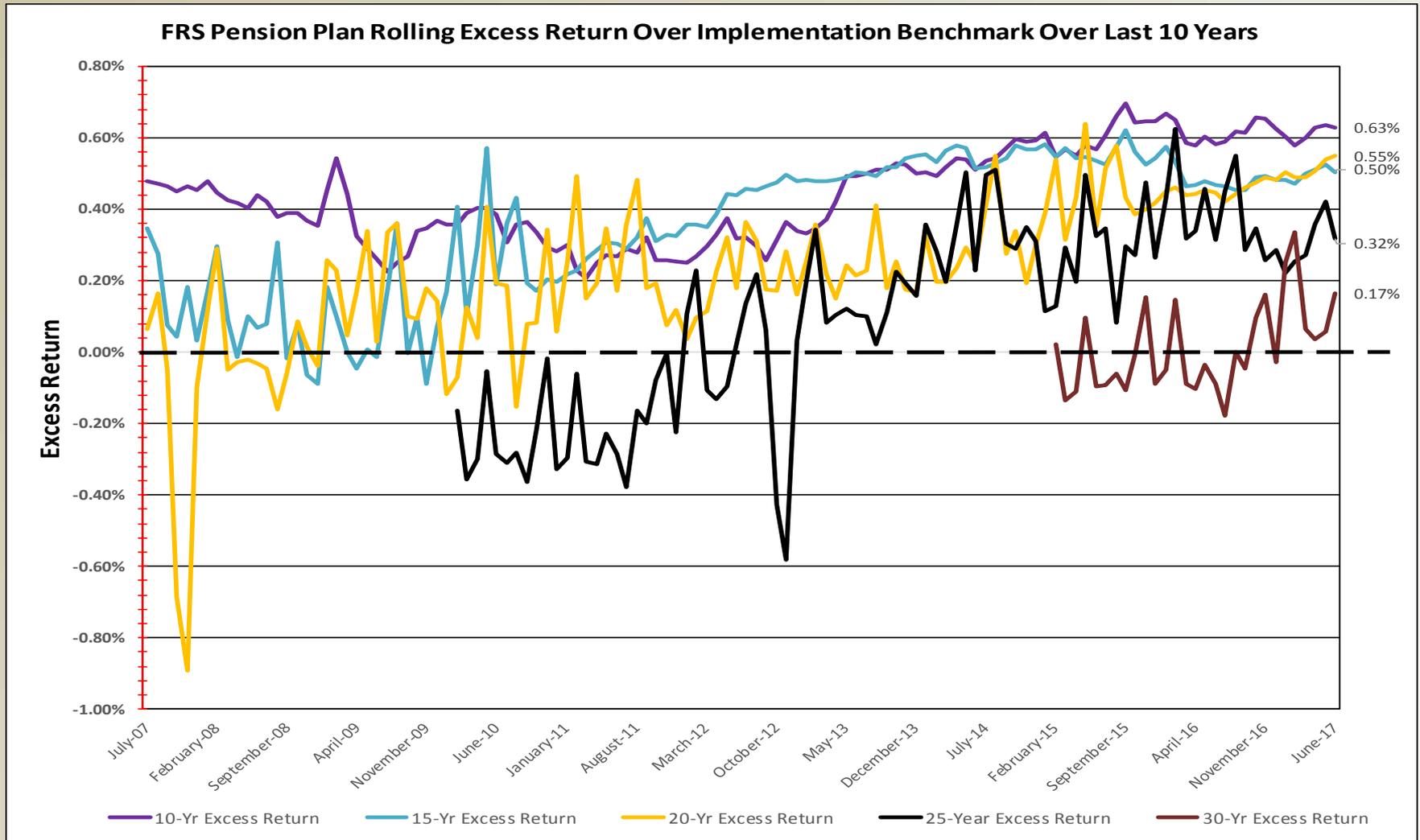
# FRS Pension Plan Long-Term Investment Results

## Periods Ending 6/30/2017

- As of June 30, 2017, the Pension Plan, when measured against its market based performance benchmark, outperformed over the trailing 10-yr, 15-yr, 20-yr, 25-yr, and 30-yr time periods.

# FRS Pension Plan Long-Term Investment Results

## Periods Ending 6/30/2017



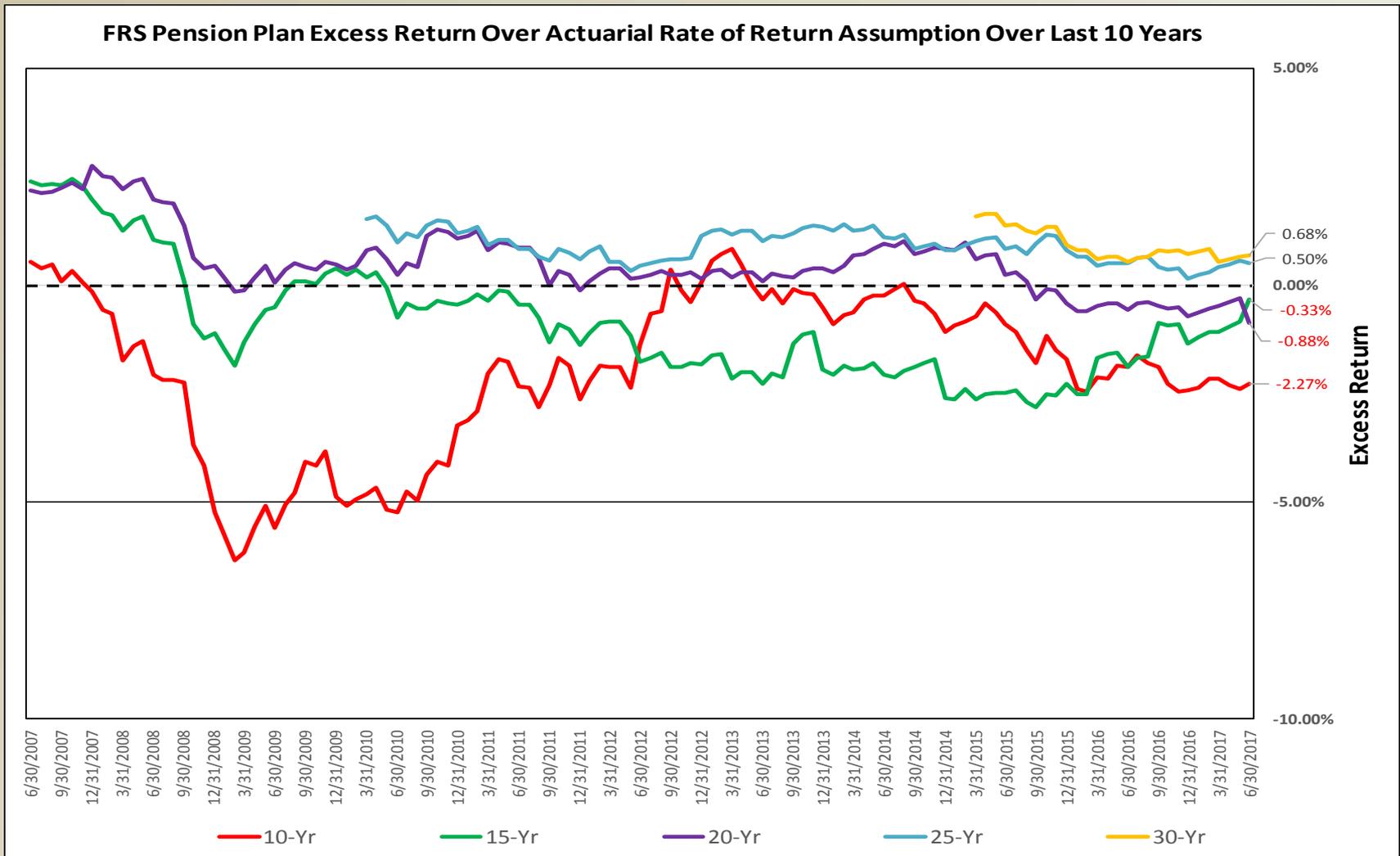
# FRS Pension Plan Long-Term Investment Results

## Periods Ending 6/30/2017

- Relative to historical actuarial return assumptions, the Pension Plan's performance is mixed. The Pension Plan outperformed over the trailing 25-yr, and 30-yr time periods; however, underperformed over the trailing 10-yr, 15-yr, and 20-yr time periods.

# FRS Pension Plan Long-Term Investment Results

## Periods Ending 6/30/2017



# Conclusions

- The SBA has experienced significant growth since the depth of the “Great Financial Crisis”.
- Expectations that future capital market returns are not robust.
- Heightened risk, illiquidity and implementation costs will increase volatility and therefore potential for contribution shock(s) that may challenge fiduciary prudence.
- Increasing fund volatility and risk is neither wise nor prudent as fiduciaries.

# Conclusions

- Responsibly recalibrate the actuarial return assumption to sustain the Pension Fund long term.
- Future Pension Fund sustainability must be in keeping with constitutional and statutory mandates and requires the continual support of the Legislature, Trustees, Division of Retirement, and SBA.

# Conclusions

- Future considerations:
  - Maintain the Pension Fund's position of strength, through low cost and responsible funding.
  - GASB reporting requirements and impact on state and local government financial statements.
  - Rating agencies (Moody's, S&P, and Fitch): Impact on state and local government bond ratings and debt costs.
  - Intergenerational transfer of pension costs to future taxpayers.



# Florida Retirement System Pension Plan

## Actuarial Valuation as of July 1, 2017

Prepared by:

**Matt Larrabee, FSA, EA, MAAA**  
Principal and Consulting Actuary

**Daniel Wade, FSA, EA, MAAA**  
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December 1, 2017

Ms. Elizabeth Stevens  
State Retirement Director  
Florida Department of Management Services, Division of Retirement

Re: **Actuarial Valuation as of July 1, 2017**

Dear Director Stevens:

We have conducted an annual actuarial valuation of the Florida Retirement System (FRS) Pension Plan as of July 1, 2017, for assessing plan funded status and determining actuarially calculated contribution rates for the July 2018 - June 2019 plan year. The major findings of the valuation are contained in the following report.

Section 1 contains an Executive Summary of the results of our valuation followed by four sections containing detailed information on Assets (Section 2), Liabilities (Section 3), Contributions (Section 4), and Accounting Statements (Section 5). In the Appendices, we provide information regarding actuarial methods and assumptions, a summary of plan provisions, membership statistics, cost projections, comparisons/reconciliation, and a glossary of terms.

All costs and liabilities shown in this report have been determined on the basis of actuarial assumptions and methods set forth in Appendix A. Preliminary 2017 valuation results using the actuarial assumptions and methods used in the previous valuation as of July 1, 2016 were presented by the actuary to the 2017 FRS Actuarial Assumption Conference held on October 5, 2017. The assumptions are based on Milliman's most recent review of the System's experience, which was for the observation period from July 1, 2008 through June 30, 2013. Additional details on that review of System experience can be located in our August 11, 2014 presentation materials to the 2014 FRS Actuarial Assumption Conference and our formal 2014 Experience Study report, which was issued on September 8, 2014. The assumptions used in this valuation are unchanged from those used in the prior valuation as of July 1, 2016 except for the investment return assumption for purposes of developing actuarially calculated contribution rates, which was decreased from 7.60% to 7.50%.

With one exception, in our professional opinion we believe the assumptions and methods used in this report for purposes of developing actuarially calculated contribution rates are reasonable. The investment return assumption, which was set by the 2017 FRS Actuarial Assumption Conference, is a *prescribed assumption* as defined by Actuarial Standard of Practice No. 27 (ASOP 27). The prescribed assumption conflicts with our professional judgment regarding what would constitute a reasonable assumption for the purpose of the measurement as discussed in ASOP 27. Details and discussion regarding the return assumption are shown in our 2017 FRS Actuarial Assumption Conference presentation materials and discussed in the Executive Summary of this report.

This work product was prepared solely for Florida Department of Management Services for the purposes described herein and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

The accounting calculations for the FRS Pension Plan's financial reporting and its June 30, 2017 CAFR in compliance with the GASB Statement No. 67 use some methods and assumptions that differ from those used in this report. The GASB financial reporting information, which is issued under separate cover, uses assumptions and methods which in our professional opinion are reasonable without any exceptions.

The results of this report are dependent upon future experience conforming to the assumptions disclosed in this report. Future actuarial measurements may differ significantly from the current measurements presented in this report due to many factors, including: plan experience differing from that anticipated by the economic or 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); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements.

Actuarial computations presented in this report are for purposes of assessing funded status and determining the actuarially calculated contribution rates for the FRS Pension Plan. The calculations in the enclosed report have been made on a basis consistent with our understanding of the FRS Pension Plan's funding requirements and goals. Determinations for purposes other than meeting those requirements referenced in this paragraph may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

In preparing our report we relied, without audit, on information (some oral and some written) supplied by the Florida Department of Management Services, Division of Retirement. This information includes, but is not limited to, statutory provisions, employee census, and financial information. In our examination of these data, we have found them to be reasonably consistent and comparable with data used for other purposes. Since the valuation results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised.

This actuarial valuation was prepared and completed by us and those under our direct supervision, and we acknowledge responsibility for the results. To the best of our knowledge, the results are complete and accurate. With the exception of the one assumption noted above, the techniques and assumptions used are reasonable. In our opinion this valuation meets the requirements and intent of Part VII, Chapter 112, Florida Statutes. Regarding the one noted exception, Section 216.136(10) of Florida Statutes indicates that the 2017 FRS Actuarial Assumption Conference holds the statutory authority to determine the investment return assumption for purposes of developing actuarially calculated contribution rates. There is no benefit provision or related expense to be provided by the plan and/or paid from the plan's assets for which liabilities or current costs have not been established or otherwise taken into account in the valuation. To the best of our knowledge, there were no known events that were not taken into account in the valuation.

Milliman's work product was prepared exclusively for the internal business use of Florida Department of Management Services, Division of Retirement, for a specific and limited purpose. It is a complex technical analysis that assumes a high level of knowledge concerning the Florida Retirement System's operations, and uses Division data, which Milliman has not audited. To the extent that Milliman's work is not subject to disclosure under applicable public record laws, Milliman's work may not be provided to third parties without Milliman's prior

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- (a) The Division of Retirement may provide a copy of Milliman's work, in its entirety, to the System's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit the System.
- (b) The Division of Retirement may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

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

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with Actuarial Standards of Practice, the Code of Professional Conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA  
Principal and Consulting Actuary

A handwritten signature in blue ink, appearing to read "Daniel Wade".

Daniel Wade, FSA, EA, MAAA  
Principal and Consulting Actuary

A handwritten signature in blue ink, appearing to read "Kathryn Hunter".

Kathryn Hunter, FSA, EA, MAAA  
Consulting Actuary

ML/DW/KH/nlo

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## 1. Executive Summary

This report presents the results of our July 1, 2017 actuarial valuation of the defined benefit Florida Retirement System (FRS) Pension Plan. This valuation is used to determine actuarially calculated Pension Plan-specific employer contribution rates for the July 1, 2018 – June 30, 2019 plan year. The Pension Plan-specific rates developed in this valuation report are then combined with contribution rates from the defined contribution FRS Investment Plan to create blended proposed statutory employer contribution rates. The actual contribution rates paid by employers during the 2018-2019 plan year will be determined by Florida Statutes. The statutory contribution rates in effect for the current 2017-2018 plan year are identical to the blended proposed statutory rates developed in conjunction with the July 1, 2016 actuarial valuation as subsequently modified to reflect the effects of Senate Bill 7022, which was enacted during the 2017 legislative session.

On the smoothed Actuarial Value of Assets (AVA) basis used to determine actuarially calculated contribution rates and the Unfunded Actuarial Liability (UAL), Pension Plan funded status decreased from 85.4% to 84.3%. On a Market Value of Assets (MVA) basis, Pension Plan funded status calculated on the assumptions and methods in this report for system funding purposes increased from 83.2% to 86.3% due to actual plan year investment return of approximately +13.6% compared to an assumed prior year return of 7.60%.<sup>1</sup>

Pension Plan actuarially calculated employer contribution rates, prior to blending with Investment Plan rates to create blended proposed statutory contribution rates, increased from 9.80% of pay to 10.50% of pay on a composite basis. The most significant rate increase source was the 0.10% decrease in the assumed future average annual long-term investment return. Actual retirement and DROP entry behavior of eligible members during 2016-2017 plan year compared to the long-term assumption played the next largest role in the rate increase. Other actual member demographic experience during the year, which includes the effects of actual salary increase and mortality experience compared to long-term assumption, and an increase to in-line-of-duty death benefits for beneficiaries of Special Risk members played lesser roles in the year-over-year increase. The increase factors noted above were partially offset by a plan year investment return on a smoothed Actuarial Value of Assets basis of +8.2%, which is above the long-term assumption used in the prior valuation, and a 4.1% increase in the payroll on which UAL rates are calculated prior to blending with Investment Plan rates, compared to the long-term average payroll growth assumption of 3.25%.

Due to strong market value investment performance over the past plan year, the Market Value of Assets exceeds the smoothed Actuarial Value of Assets used for funded status and contribution rate calculations by \$3.46 billion as of July 1, 2017. That \$3.46 billion not yet recognized market investment gain will be systematically recognized as a sequence of actuarial investment gains in the UAL over the next several years if market value investment experience during that period meets or exceeds the 7.50% investment return assumption. If actual market value investment experience during that period fails to meet or exceed the 7.50% assumption used in this valuation, the not yet recognized market investment gain will serve as buffer, either mitigating or eliminating increases in actuarially calculated employer contribution rates.

For this valuation, a long-term average annual future investment return assumption of 7.50% was used, a decrease of 0.10% from the assumption used in the previous valuation. The 7.50% assumed return is a *prescribed assumption* as defined by Actuarial Standard of Practice No. 27 (ASOP 27), as it was set by the 2017 FRS Actuarial Assumption Conference. The prescribed assumption conflicts with our judgment regarding what

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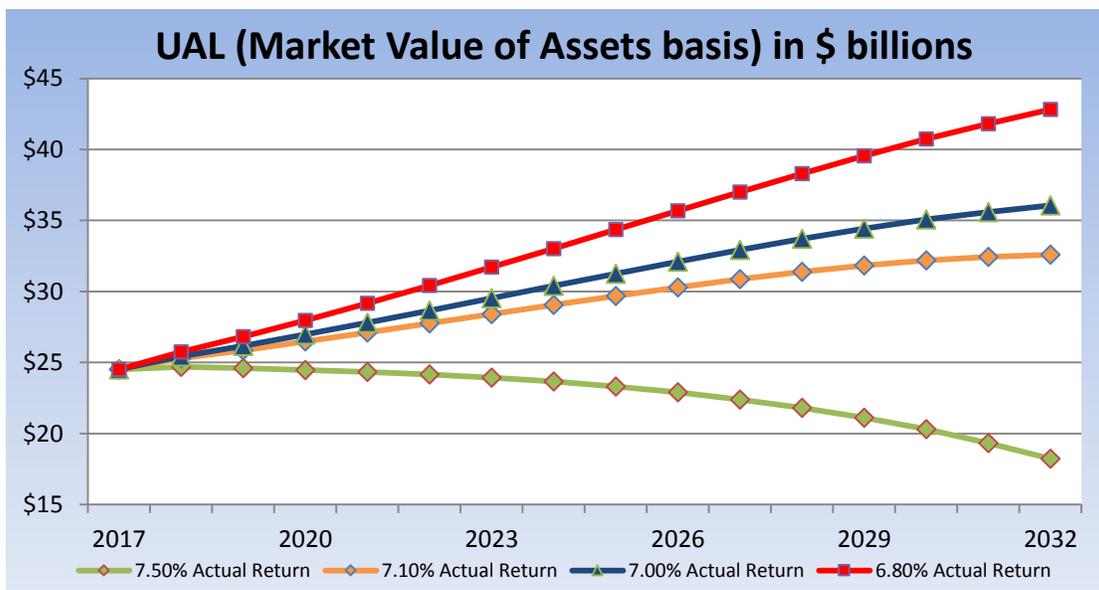
<sup>1</sup> The required financial reporting information under GASB 67 also uses market value of assets, but has a cost allocation method and an investment return assumption different from those used in this valuation for funding purposes. GASB 67 information was issued under separate cover, and indicated a funded ratio of 83.9% as of June 30, 2017 using a 7.10% investment return assumption.

would constitute a reasonable assumption for the purpose of the measurement as discussed in ASOP 27. It is materially above the 50<sup>th</sup> percentile average returns in the proprietary capital market outlook models developed by both Milliman and the Florida State Board of Administration’s outside investment consultant (Aon Hewitt Investment Consulting). All models developed in 2017 by Milliman and Aon Hewitt had 50<sup>th</sup> percentile geometric average annual long-term future returns in the 6.6%-6.8% range, and all models developed in 2017 indicated a likelihood of less than 40% of actual long-term future returns meeting or exceeding 7.50%. More details are shown in our 2017 FRS Actuarial Assumption Conference presentation materials.

All else being equal, the lower the selected investment return assumption, the higher the likelihood the FRS Pension Plan will meet or exceed its assumed investment return in future years. A lower assumption would result in higher short-term actuarially calculated contribution rates for employers, but would also serve to lessen the magnitude of actuarially calculated contribution rate increases in the event that actual future investment performance fails to meet the assumption.

Actual future investment return experience for the FRS Pension Plan is not affected by the assumption used in the actuarial valuation. Applying the 7.50% assumption used in this valuation, the following graph illustrates the UAL (Unfunded Actuarial Liability) on a Market Value of Assets basis under four scenarios for steady actual future investment returns:

- 7.50%, which is the assumption selected for this valuation by the 2017 FRS Actuarial Assumption Conference
- 7.10%, which is the assumption used for GASB 67 calculations as of a June 30, 2017 Measurement Date
- 7.00%, which is moderate recurring annual underperformance compared to the valuation assumption
- 6.80%, which is near the 50<sup>th</sup> percentile assumption for a model developed by Aon Hewitt Investment Consulting in consultation with the Florida State Board of Administration for the 2017 asset-liability study



As illustrated in the graph, if actual future investment returns match the 7.50% assumption the UAL would decrease by approximately one-quarter by the end of the illustrated 15-year period. Currently, there are market investment gains that are not yet recognized in the smoothed Actuarial Value of Assets as of the valuation date. When that is the case, the pattern shown over the first 15 years in the 7.50% actual return scenario is typical of the method of closed 30-year amortization periods used to calculate contribution rates in the valuation. (The UAL still remaining after 15 years is amortized over the latter 15 years of the amortization schedule if actual investment performance continues to match the assumption.) If actual returns underperform the 7.50% assumption by 0.40%

to 0.50%, the UAL would increase by between \$8 and \$12 billion over the illustrated 15-year projection period. If actual investment returns equal the 50<sup>th</sup> percentile return from Aon Hewitt Investment Consulting’s “SBA Approach” model of 6.8%, the UAL would increase by 75% over the modeled 15-year period even if actuarially calculated contributions are made and all other experience follows the assumptions used in this valuation.

We also want to point out other key items regarding this valuation:

- Consistent with the previous valuation, the contribution rate calculation methodology uses the Ultimate Entry Age Normal (Ultimate EAN) actuarial cost allocation method as selected by the FRS Actuarial Assumption Conference. Under the Ultimate EAN method, the Normal Cost Rate is calculated as the rate that would be applicable if the plan provisions of Senate Bill 2100 for members hired on or after July 1, 2011 applied to all FRS Pension Plan members for the entirety of their projected working careers. The present value of total projected benefits calculated for each member reflects the actual tier in which the member participates. As such, the methodology used for calculating contribution rates understates Normal Cost Rate but overstates Actuarial Liability and UAL Rate when compared to some alternative calculation methodologies, such as the Individual Entry Age Normal (Individual EAN) methodology that is mandated by GASB for financial reporting calculations under GASB Statements Nos. 67 & 68.
- The Ultimate EAN actuarial cost allocation method being used for liability and rate calculations, like any actuarial cost allocation method, divides the present value of total projected benefits for each active member between past service (Actuarial Liability, or AL) and future service (present value of future normal costs). The cost allocation method does not impact the calculation of the present value of total projected benefits.

The tables immediately following compare July 1, 2016 actuarial valuation results with July 1, 2017 actuarial valuation results. The difference column shows the change between the July 1, 2016 valuation results and the July 1, 2017 valuation results.

**A. Assets, Liabilities, and Funded Status**

A comparison of the Actuarial Liability and Actuarial Value of Assets (AVA) follows. These figures are based upon the actuarial assumptions used to determine the actuarial costs of the FRS Pension Plan (see Appendix A). Under current methodology, and as required by Florida law, the AVA cannot be less than 80% or greater than 120% of the Market Value of Assets (MVA). This corridor restriction does not come into play unless there are dramatic asset gains or losses in the prior plan year. The purpose of the corridor is to ensure that the “smoothed” value of assets does not vary from the market value by more than 20%. As of July 1, 2017, the AVA is 97.8% of the MVA.

		Valuation Results (numbers in \$ billions)		
		July 1, 2016	July 1, 2017	Difference
1.	Actuarial Liability	\$170.4	\$178.6	\$8.2
2.	Actuarial Value of Assets	<u>\$145.5</u>	<u>\$150.6</u>	<u>\$5.1</u>
3.	Unfunded Actuarial Liability (1 - 2)	\$24.9	\$28.0	\$3.1
4.	Funded Percentage (2 / 1)	85.4%	84.3%	-1.1%

In Section 5 of this report we present an additional measure of funded status based on a different liability measure, the "Accumulated Benefit Obligation" (ABO), based on both the AVA and the MVA.

**B. Contributions**

Actuarially calculated contribution rates by class are determined annually in the actuarial valuation. Actual contribution rates paid by employers for each class are set by statute and consist of Normal Cost and UAL Cost

components. For the 2017-2018 plan year, the actuarially calculated rates determined by the July 1, 2016 valuation, as subsequently modified to reflect the effects of Senate Bill 7022, and the legislated rates are equivalent. The 2018-2019 actual contribution rates will be set by the 2018 session of the Florida Legislature, with advice from this valuation and the associated 2018-2019 Blended Rate Study that will be issued subsequent to the publication of this valuation. The Unfunded Actuarial Liability (UAL) amortization payment will consist primarily of costs or savings associated with plan changes, assumption changes, differences in actual and expected experience, or changes in actuarial methodology. As of July 1, 2017 the FRS Pension Plan has a UAL of \$28.0 billion on a smoothed Actuarial Value of Assets basis. The UAL Cost is calculated to eliminate the UAL over a pre-determined amortization period if future experience follows assumptions.

The comparative FRS Regular and Special Risk contribution rates resulting from this valuation and the prior valuation are as follows. See Section 4 for more details on rate development and valuation results for all classes.

	July 1, 2016 Valuation (2017-2018 Rates)		July 1, 2017 Valuation (2018-2019 Rates)		Difference	
	Regular	Special Risk	Regular	Special Risk	Regular	Special Risk
Normal Cost	2.75%	11.57%	2.91%	11.95%	0.16%	0.38%
UAL Cost <sup>1</sup>	<u>3.93%</u>	<u>11.28%</u>	<u>4.19%</u>	<u>12.44%</u>	<u>0.26%</u>	<u>1.16%</u>
Total Cost for FRS Employers	6.68%	22.85%	7.10%	24.39%	0.42%	1.54%

1) The 0.26% increase in UAL Cost for the Regular class represents an 0.34% increase in rates due to assumption changes, and a 0.08% decrease in rates due to other experience. The 1.16% increase in UAL Cost for the Special Risk class represents a 0.14% increase in rates due to plan change, a 0.61% increase in rates due to assumption changes, and a 0.41% increase in rates due to other experience, including the effect of year-over-year salary increases.

### C. Membership

The total membership (active, terminated vested, retired, and DROP) of the FRS Pension Plan increased by 15,995 members from 1,047,482 as of July 1, 2016 to 1,063,477 as of July 1, 2017, an increase of 1.5%. The total annualized projected payroll of non-DROP active Pension Plan members increased by 3.0%, from \$23.3 billion for the 2016-2017 plan year to \$24.0 billion for the 2017-2018 plan year, a \$0.7 billion increase in payroll. Note that the payroll on which UAL Cost rates are determined is higher, and includes the payroll of DROP and members in Optional Retirement Plans subject to the UAL contribution.

A summary of Pension Plan membership change by status follows:

	Valuation Results: Counts		
	July 1, 2016	July 1, 2017	% Change
Active Members	514,629	518,622	0.8%
Terminated Vested Members	108,692	108,612	-0.1%
Retired Members	392,789	402,791	2.5%
DROP Members	<u>31,609</u>	<u>33,452</u>	5.8%
Total Members	1,047,719	1,063,477	1.5%

## D. Experience

Changes to assets and liabilities between July 1, 2016 and July 1, 2017 are described in this section.

### 1. Assets:

Changes in the smoothed Actuarial Value of Assets (AVA) during the plan year were due to:

▪ Contributions received	\$3.419	
▪ Payment of benefits and administrative expenses	(9.949)	
▪ Assumed plan year investment returns	10.807	
▪ Investment plan year gain/(loss) experience	<u>0.865</u>	
Total plan year Actuarial Value of Assets increase	\$5.142	Billion

The actual plan investment return on the AVA was 8.21% compared to the prior valuation's assumed return of 7.60%. On a market-value basis, the assets earned 13.57%. On a year-by-year basis, asset returns were as follows:

	Rates of Return*		
	2014/2015	2015/2016	2016/2017
Market Value	3.76%	0.54%	13.57%
Actuarial Value	8.62%	6.99%	8.21%

\* Assumes net cash flow occurs mid-year.

### 2. Actuarial Liability (AL):

Changes in the Actuarial Liability during the plan year were due to:

▪ Expected increase, due to combined effects of Normal Cost plus interest-related growth in Actuarial Liability less benefit payments during plan year	\$4.417
▪ Change in plan provisions	0.085
▪ Changes in assumptions	2.124

#### Liability Plan Year (Gain) / Loss Experience

▪ Active member salary increases different than assumption	0.181
▪ New active members	0.522
▪ Retirement and DROP entry behavior	0.787
▪ Inactive mortality	0.046
▪ Other demographic sources not noted above <sup>1</sup>	<u>0.043</u>
▪ Liability plan year (gain) / loss experience	1.579

Total plan year Actuarial Liability increase \$8.205 Billion

<sup>1</sup> Reflects the combined effects of all other liability (gain)/loss sources for actuarial experience compared to assumptions used in the July 1, 2016 actuarial valuation. These include actual experience for pre-retirement turnover, second election transfers to the Investment Plan, active member death and disability, and all other actual experience not otherwise noted in the table above compared to assumed on the demographic assumptions used to calculate July 1, 2016 actuarial valuation results.

**3. Unfunded Actuarial Liability (UAL):**

The net change in the UAL of the FRS Pension Plan was an increase of \$3.048 billion, from \$24.923 billion to \$27.971 billion. The net increase is attributable to the following:

Change due to:

▪ Expected increase, based on the net combined effect of plan contributions received, interest, and assumed investment and demographic experience	\$0.140
▪ Change in plan provisions	0.085
▪ Changes in assumptions	2.124
▪ Investment plan year (gain)/loss experience	(0.865)
▪ Liability plan year (gain)/loss experience	<u>1.579</u>

Total plan year increase/(decrease) in UAL	\$3.063	Billion
--------------------------------------------	---------	---------

See table on the following page for total gains/losses by class.

**2016-2017 Plan Year (Gain)/Loss Experience<sup>1</sup>**  
(All Amounts in Thousands)

	Regular	Special Risk	Special Risk Administrative	-- Elected Officers' Class --			Senior Management	Grand Total
			Judicial	Leg-Atty-Cab	Local			
<b>Investment plan year (gain)/loss experience</b>	<b>(\$666,231)</b>	<b>(\$174,166)</b>	<b>(\$454)</b>	<b>(\$5,353)</b>	<b>(\$360)</b>	<b>(\$1,890)</b>	<b>(\$16,551)</b>	<b>(\$865,005)</b>
<u>Liability plan year (gain) / loss experience by source</u>								
Assumption changes	1,531,457	507,500	909	15,208	1,269	6,881	60,355	2,123,579
Plan Changes	0	84,998	0	0	0	0	0	84,998
Active member salary increases different than assumption	(19,413)	202,953	(231)	(12,730)	(539)	1,972	9,285	181,297
New active Pension Plan members <sup>2</sup>	388,688	106,897	2,474	3,286	492	3,341	16,402	521,580
Retirement and Drop Entry Behavior	523,891	240,797	132	4,887	1,179	1,923	14,778	787,587
Inactive Mortality	22,543	17,472	(1,376)	(2,308)	434	2,106	7,054	45,925
Other demographic sources not noted above <sup>3</sup>	(41,221)	26,995	1,031	(16,475)	678	7,696	64,027	42,731
<b>Liability plan year (gain) / loss experience</b>	<b>\$2,405,945</b>	<b>\$1,187,612</b>	<b>\$2,939</b>	<b>(\$8,132)</b>	<b>\$3,513</b>	<b>\$23,919</b>	<b>\$171,901</b>	<b>\$3,787,697</b>

For purposes of this exhibit, liabilities and assets associated with members in DROP are allocated to their respective membership classes. This differs from their representation in Section 4, where UAL bases are tracked separately for the DROP.

Includes transfers and re-hires.

Reflects the combined effects of all other liability (gain)/loss sources for actuarial demographic experience compared to assumptions used in the July 1, 2016 valuation. This includes the effects of second election transfers to the Investment Plan and changes to census data reporting.

**4. Actuarially Calculated Contribution Rates:**

On a level-rate-of-pay basis, the FRS Pension Plan employer contribution rates for each membership class changed as follows:

	Regular	Special Risk	Special Risk Administrative	-- Elected Officers' Class --			Senior Management
				Judicial	Leg-Atty-Cab	Local	
A. 1. July 1, 2016 Employer Normal Cost	2.75%	11.57%	3.09%	11.73%	6.27%	8.37%	4.05%
2. UAL Cost	<u>3.93%</u>	<u>11.42%</u>	<u>42.81%</u>	<u>28.75%</u>	<u>55.87%</u>	<u>49.25%</u>	<u>22.16%</u>
3. Total July 1, 2016 Actuarially Calculated Employer Contribution Rate (1.+2.)	6.68%	22.99%	45.90%	40.48%	62.14%	57.62%	26.21%
B. 1. July 1, 2017 Employer Normal Cost	2.91%	11.95%	3.05%	12.10%	6.58%	8.32%	4.27%
2. UAL Cost (See Table 4-11)	<u>4.19%</u>	<u>12.44%</u>	<u>39.25%</u>	<u>29.83%</u>	<u>58.61%</u>	<u>52.90%</u>	<u>23.76%</u>
3. Total July 1, 2017 Actuarially Calculated Employer Contribution Rate (1.+2.)	7.10%	24.39%	42.30%	41.93%	65.19%	61.22%	28.03%
C. Change in Total Actuarially Calculated Employer Contribution Rate (B.3.-A.3.)	0.42%	1.40%	-3.60%	1.45%	3.05%	3.60%	1.82%

E. Graphs

Chart A: Assets / Liabilities

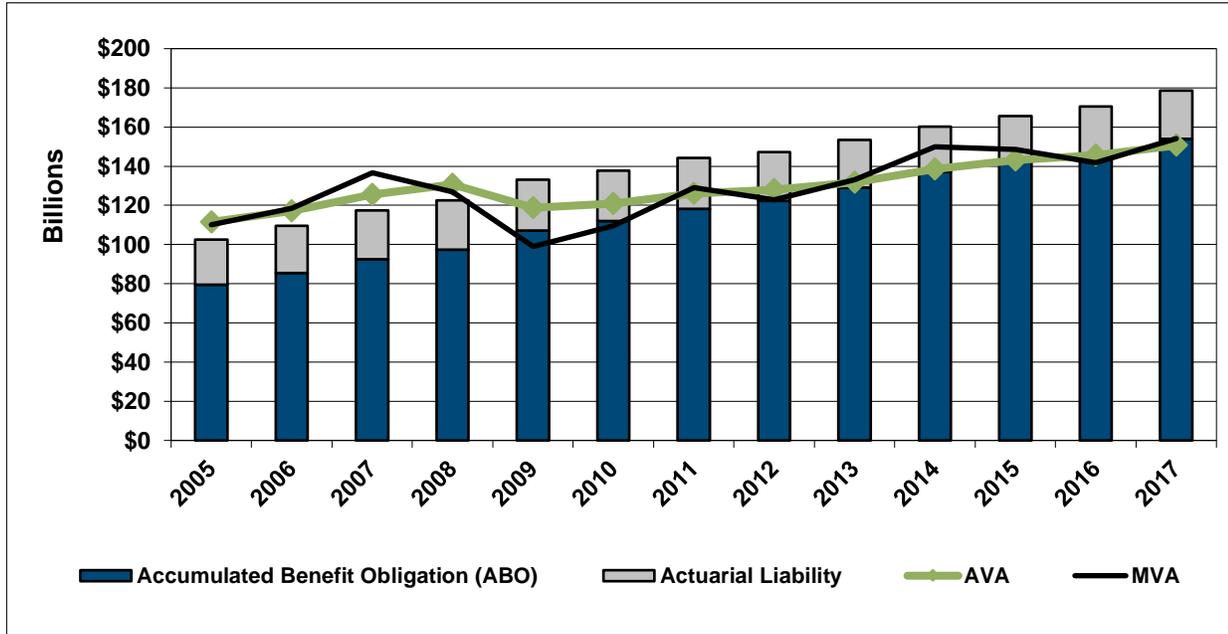


Chart B: Cash Flows

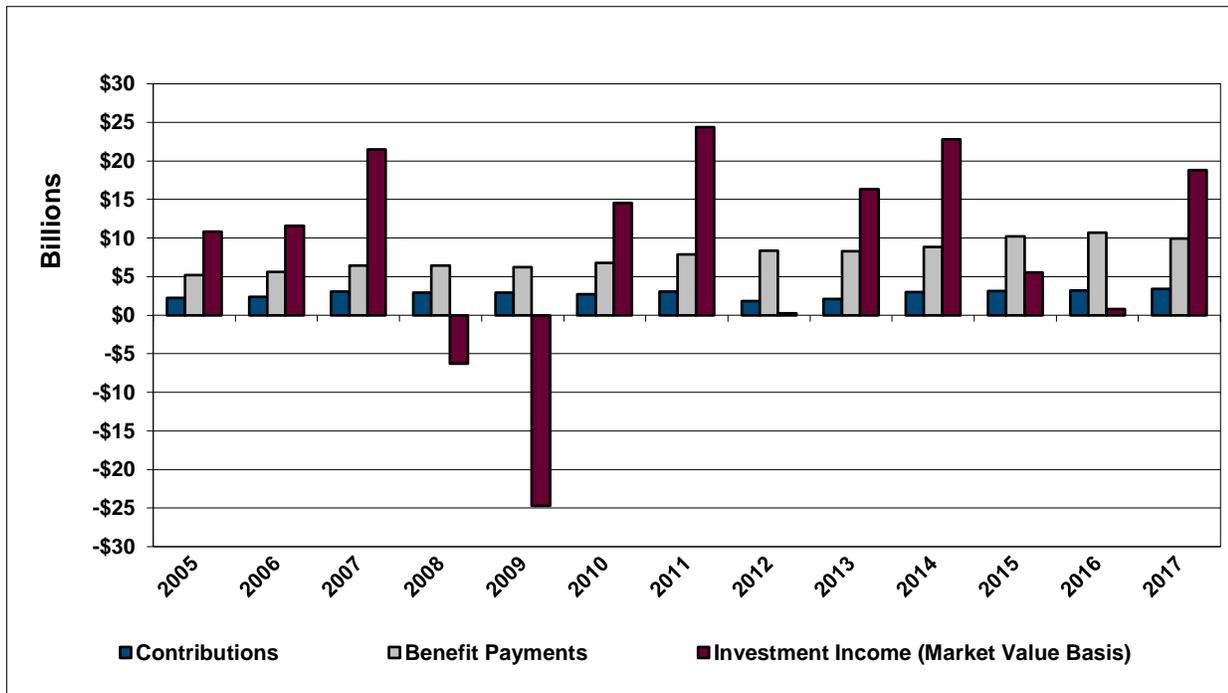


Chart C: Actuarially Calculated Pension Plan Contribution Rates<sup>1</sup> (as % of Payroll)

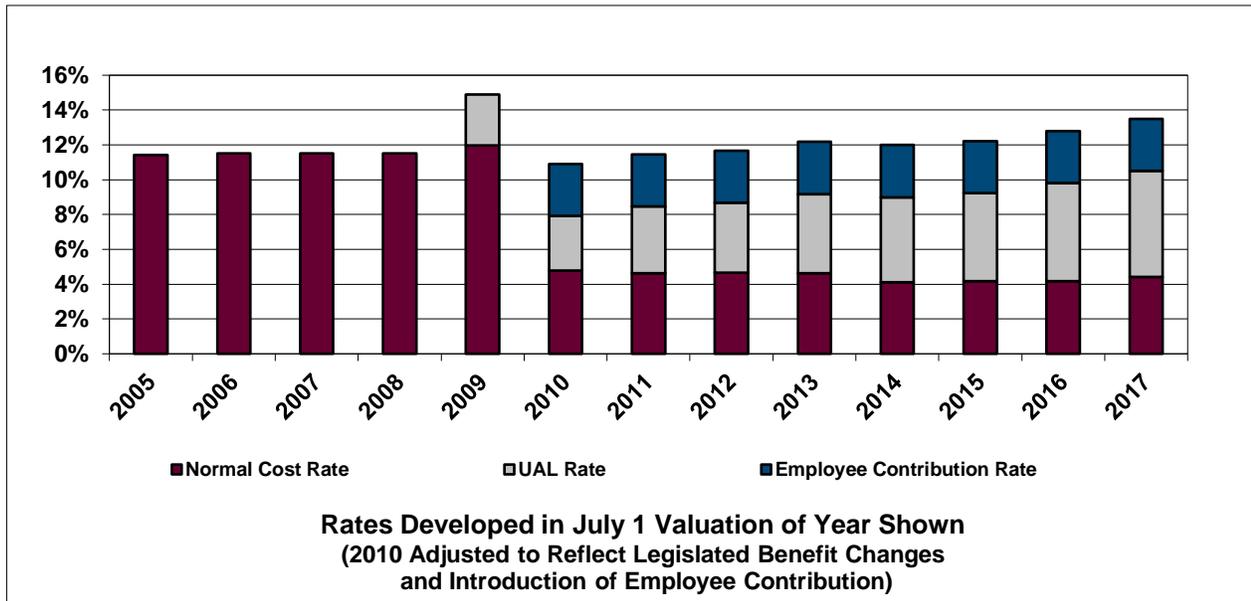
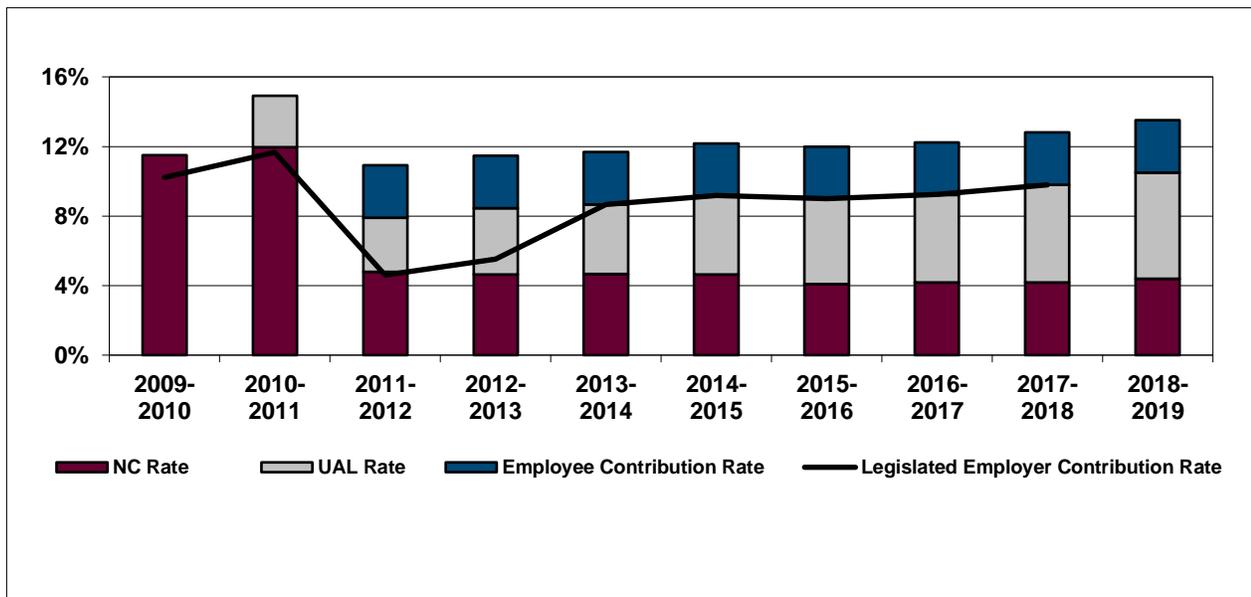


Chart D: Actuarially Calculated vs. Legislated Employer Contribution Rates<sup>1</sup> (as % of Payroll)



<sup>1</sup> Charts C and D show the Pension Plan components of proposed contribution rates prior to blending with Investment Plan contribution rates to create proposed statutory contribution rates. Historically, the Florida Legislature has enacted contribution rates which are charged uniformly on combined Investment Plan and Pension Plan payroll. Charts C and D reflect the Pension Plan component of proposed blended statutory rates, consistent with Table 4-12.

## F. Summary Comments

We caution that the results herein are applicable only for the next plan year. More than anything, actual future investment results will impact long-term future contribution rates. The investment return assumption selected affects the timing and pattern of contributions but does not affect the long-term cost of the plan, which is governed by the Fundamental Cost Equation [Benefit Payments + Expenses = Contributions + Actual Investment Returns].

- The most recent experience study covered the period from July 1, 2008 to June 30, 2013. Experience studies are performed every five years and compare actual plan experience to the assumptions used in the annual valuations. With the exceptions noted below, this valuation reflects the method and assumptions changes proposed by the 2014 Experience Study and first adopted by the 2014 FRS Actuarial Assumption Conference for use in the July 1, 2014 valuation.
- Subsequent FRS Assumption Conferences may, at the discretion of the Conference Principals, consider changes to items such as the investment return assumption, the cost allocation method, or modifications to other assumptions and methods. For this valuation, the 2017 FRS Assumption Conference decreased the investment return assumption to better anticipate expected future experience.

Future proposed blended statutory rates for the System will be impacted by choice elections for the defined contribution FRS Investment Plan (IP), which is available as an alternative to the defined benefit FRS Pension Plan for members. The existence of the IP affects the FRS Pension Plan contribution rates inasmuch as active members can elect to participate in either the FRS Pension Plan or the IP. Thus, member plan election decisions can affect the demographic composition of the FRS Pension Plan. Current IP membership is between 18% and 19% of total active membership on a headcount basis.

We mention these caveats because the actuarial valuation process merely measures the impact of these factors on FRS Pension Plan costs and liabilities after they have occurred. Unanticipated benefit or salary changes, changes in member behavior (e.g., withdrawal rates, rates of retirement, etc.), or variations in actual investment return could necessitate changes in the actuarially calculated contribution rates.

Finally, we caution the readers of this report not to overemphasize the results of any single valuation as long-term trends are more important.

## G. DROP Contribution Rate

The DROP (Deferred Retirement Option Program) started in 1998, with a study completed prior to the DROP's implementation showing an anticipated material cost increase due to its introduction. Since its introduction and consistent with legislative directive, employers have been charged a uniform DROP contribution rate on all DROP payroll without regard to a participant's membership class. In addition, the asset allocation developed in Table 2-5 is performed so that the DROP's funded percentage is set equal to the composite funded percentage of the FRS Pension Plan.

The DROP contribution rate has two components: Normal Cost and UAL Cost. The Normal Cost is set to the composite FRS Pension Plan average employer-paid Normal Cost Rate of 4.41%. The calculation of the UAL Cost for the DROP is consistent with the calculation of the UAL Cost component of the other membership classes. Essentially, the DROP is allocated a share of plan assets such that the DROP's funded percentage is equal to the composite FRS Pension Plan's funded percentage. This asset allocation to DROP results in a UAL Cost for DROP payroll of 7.96%. The total DROP contribution rate (Normal Cost plus UAL Cost) in this valuation is 12.37%, compared to a DROP contribution rate of 11.60% in the prior valuation.

## 2. Assets

In many respects, an actuarial valuation can be considered similar to an inventory process. The inventory is taken annually as of the actuarial valuation date, which for this valuation is July 1, 2017. On that date the assets available for the payment of current and future benefits are appraised. These assets are compared with the inventory of Actuarial Liability. This inventory process leads to a method of calculating what contributions by members and/or their employers are needed to systematically eliminate any shortfall if future experience follows assumptions. Prior to publication of this report, preliminary results based on assumptions and methods used in the previous valuation were discussed with the 2017 FRS Actuarial Assumption Conference.

This section of the report deals with the asset determination. In the next section, the Actuarial Liability will be discussed. Section 4 will deal with the process for determining actuarially calculated contribution rates in order to systematically eliminate any shortfall between the assets and Actuarial Liability.

Two measures of FRS Pension Plan assets are presented in the valuation:

1. The Market Value of Assets (MVA) provides the most accurate fair market “snapshot date” assessment of plan resources at a given date, and will be used on the balance sheet statements of position for the FRS Pension Plan and its participating employers for GASB financial reporting purposes.<sup>1</sup> It tends to be the more volatile of the two asset measures and is not used for determining the actuarially calculated contribution rates.
2. The Actuarial Value of Assets (AVA) is a second measure of FRS Pension Plan asset holdings. It is related to the Market Value of Assets, but uses a smoothing technique applied to mitigate year-to-year market fluctuations by recognizing actual single year investment returns different from the long-term assumption systematically over a multi-year period. The AVA is the basis for determining actuarially calculated contribution rates, and the smoothing technique is used to stabilize year-to-year contribution rate changes.

The actuarial smoothed asset valuation measure, implemented in 1989, reflects a five-year averaging methodology, as required by Section 121.031(3)(a) of Florida Statutes. Under this method, the expected actuarial value of assets is determined by crediting the rate of investment return assumed in the prior valuation (7.60%) to the prior year's AVA. Then, 20% of the difference between the actual market value and the expected actuarial value of assets is immediately recognized in the AVA. The AVA is also restricted by a 20% corridor around the MVA, so that the AVA cannot be greater than 120% or less than 80% of the MVA. Table 2-3 presents the details of this calculation. As of July 1, 2017 the AVA is 97.8% of the MVA.

Six tables are presented in this section, summarizing the financial resources of the FRS Pension Plan on July 1, 2017. Table 2-1 shows the reconciliation of valuation assets from June 30, 2016 to June 30, 2017. The assets are presented by category in Table 2-2. Table 2-3 provides a detailed development of the July 1, 2017 Actuarial Value of Assets. In Table 2-4, the AVA is initially allocated to each membership class, based on estimated cash flows. The table also shows the allocation of assets to/from the various classes from/to the DROP. Table 2-5 shows the derivation of the allocation of assets to/from the DROP in order that the DROP's funded percentage is equal to the funded percentage of the FRS Pension Plan as a whole. Finally, Table 2-6 presents rates of return for the 2016-2017 plan year and the two prior plan years.

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<sup>1</sup> The financial reporting information under GASB 67 requirements is issued under separate cover and uses an investment return assumption and a cost allocation method different from that used in this valuation report, which is for the purpose of developing actuarially determined contribution rates.

The Market Value of Assets as of July 1, 2017 was based on information furnished to us by the Division of Retirement, Florida Department of Management Services. The values have been accepted for use in this report without audit but have been reviewed for consistency and reasonableness, when compared to prior reports.

**Table 2-1**  
**Florida Retirement System**  
**Reconciliation of Market Value of Assets Used for Valuation**  
**DB Plan Trust**

<b>Market Value of Assets for Actuarial Valuation as of June 30, 2016</b>	<b>\$141,780,920,515</b>
Adjustment for Contribution Clearing Trust	-
Contributions by Source:	
Pension Contributions - Employer	2,603,246,196
Pension Contributions - Employees	737,776,492
Transfers from IP - Second Elections	71,109,940
Purchase of Time by Employees	7,062,918
Investment Income	
Interest Income	683,643,798
Dividend Income	1,790,068,722
Real Estate Income	469,305,831
Securities Lending income	63,625,418
Other	2,186,430,639
Less Investment Activity Expense	(571,859,418)
Less Securities Lending Expense	(14,200,232)
Other Income	2,484,714
Net Realized and Unrealized Appreciation	14,192,417,076
Pension Payments <sup>1</sup>	(9,348,035,738)
Contribution Refunds	(13,481,914)
Disbursements to IP - Second Elections	(568,911,732)
Administrative Expenses	(18,340,257)
 <b>Market Value of Assets for Actuarial Valuation as of June 30, 2017</b>	 <b>\$154,053,262,968</b>

<sup>1</sup> Includes Accrued DROP Liability of \$216,703,029 representing single sum DROP benefits of members who retired from DROP on or before June 30, 2017.

**Table 2-2**  
**Florida Retirement System Pension Plan**  
**Summary of Market Value of Assets for Actuarial Valuation**  
 (by Asset Category; \$ in Thousands)

<b>ASSETS</b>	<b>Market Value as of July 1,</b>	
	<b>2016</b>	<b>2017</b>
Cash and cash equivalents	\$137,044	\$130,731
State Treasury Investment Pool	1,994	60,429
Total cash and cash equivalents	\$139,038	\$191,161
 <u>Investments:</u>		
Certificates of Deposit	\$775,062	\$800,169
U.S. Government and Federally Guaranteed Obligations	11,074,341	10,910,710
Federal Agencies	7,725,369	8,418,178
Commercial Paper	3,516,125	4,050,193
Other Investments	38,673	17,211
Repurchase Agreements	850,000	750,000
International Bonds and Notes	1,717,406	1,952,266
Bonds and Notes	6,593,710	6,859,418
Real Estate Contracts	10,581,549	10,984,655
International Equity Commingled	5,452,110	7,911,256
Short Term Investment Funds	1,097	16,867
Domestic Equity / Domestic Equity Commingled	41,029,902	45,250,543
Alternative Investment	22,440,286	24,004,242
International Equity	31,814,912	34,509,635
Total Investments	\$143,610,542	\$156,435,345
 <u>Receivables:</u>		
Contributions receivable	155,931	189,586
Pending Investment Sales	1,499,740	1,221,252
Forward Contracts receivable	4,040,803	4,510,179
Other Receivables	1,031,730	855,430
Total receivables	\$6,728,204	\$6,776,447
Security Lending Collateral	\$1,915,672	\$1,289,852
Prepaid items; Furniture & Equipment net Accumulated Depreciation	8,139	8,145
Total Assets	\$152,401,595	\$164,700,949
 <b>LIABILITIES</b>		
Accrued DROP liability <sup>2</sup>	411,260	216,703
Obligations under Security Lending Agreements	1,960,173	1,328,234
Pending Investment Purchases	3,168,482	3,701,087
Forward Contracts payable	4,008,032	4,494,948
Other Liabilities and Payables	1,072,727	906,714
Total Liabilities	\$10,620,674	\$10,647,686
 <b>FIDUCIARY NET POSITION</b>		
<b>Held in trust for pension benefits</b>	<b>\$141,780,921</b>	<b>\$154,053,263</b>

<sup>1</sup> Amounts shown in exhibit are rounded to the nearest thousand. As such, sums may differ from amounts displayed due to rounding.

<sup>2</sup> Per our understanding, the accrued DROP liability represents lump sum DROP exit payments made early in the subsequent plan year for members exiting the DROP on or shortly before the asset measurement date.

**Table 2-3**  
**Florida Retirement System Pension Plan**  
**Development of 2017 Actuarial Value of Assets**

1. FRS Market Value of Assets on June 30, 2016 for Actuarial Valuation	\$141,780,920,515
2. Actuarial Value of Assets on July 1, 2016	\$145,451,612,486
3. 2016/2017 Net Cash Flow (Contributions less Benefits and Expenses)	(\$6,529,574,095)
4. Preliminary Actuarial Value of Assets, July 1, 2017, if Items 2 and 3 earned an assumed rate of 7.60%	\$149,728,237,124
5. Market Value of Assets, June 30, 2017 for Actuarial Valuation	\$154,053,262,968
6. Net Assets (Actuarial Value Basis) Available for Benefits Prior to Application of 80%/20% Corridor $4 + ((5 - 4) \times 20\%)$	\$150,593,242,293
7. 120% of Market Value [120% (5)]	\$184,863,915,562
8. 80% of Market Value [80% (5)]	\$123,242,610,375
9. Actuarial Value of Assets on July 1, 2017 Lesser of (6) and (7), but not less than (8)	<b>\$150,593,242,293</b>
10. Ratio of July 1, 2017 Actuarial Value of Assets to Market Value on June 30, 2017 for Actuarial Valuation	<b><u><u>97.75%</u></u></b>

**Table 2-4**  
**Florida Retirement System Pension Plan**  
**Development of Actuarial Value of Assets**  
**by Membership Class**  
 (\$ in Thousands)

	Regular	Special Risk	Special Risk	-- Elected Officers' Class --			Senior	DROP	Total System
			Administrative	Judicial	Leg-Atty-Cab	Local	Management		
1. Allocated Actuarial Value of Assets by Class, July 1, 2016	\$102,895,674	\$26,333,344	\$72,623	\$824,375	\$57,569	\$306,180	\$2,523,558	\$12,438,289	\$145,451,612
2. Total Contribution for the Plan Year	1,914,521	981,384	1,005	43,139	3,135	21,035	135,768	319,209	3,419,196
3. Benefit Payments and other Disbursements	(7,083,078)	(1,724,094)	(7,311)	(79,710)	(7,913)	(50,208)	(224,802)	(771,655)	(9,948,771)
4. Allocated Investment Earnings on AVA Basis	8,233,919	2,131,054	5,702	66,166	4,529	23,936	203,489	1,002,410	11,671,205
5. Unadjusted Actuarial Value of Assets (1) + (2) + (3) + (4)	105,961,036	27,721,688	72,019	853,970	57,320	300,943	2,638,013	12,988,253	150,593,242
6. Net Reallocation (see Table 2-5)	(202,680)	(74,287)	(26)	(4,225)	(216)	(903)	(10,606)	292,943	0
7. Allocated Actuarial Value of Assets by Class, July 1, 2017: (5) + (6)	\$105,758,356	\$27,647,401	\$71,993	\$849,745	\$57,104	\$300,040	\$2,627,407	\$13,281,196	\$150,593,242

**Table 2-5**  
**Florida Retirement System Pension Plan**  
**Reallocation of Actuarial Value of Assets**  
**by Membership Class**  
 (\$ in Thousands)

	<u>Regular</u>	<u>Special Risk</u>	<u>Special Risk Administrative</u>	<u>Judicial</u>	<u>-- Elected Officers' Class --</u>		<u>Senior Management</u>	<u>DROP</u>	<u>Total System</u>
					<u>Leg-Atty-Cab</u>	<u>Local</u>			
1. Actuarial Accrued Liability, July 1, 2017								\$15,749,075	\$178,579,116
2. Unadjusted Actuarial Value of Assets, July 1, 2017 prior to reallocation								12,988,253	150,593,242
3. Unfunded Actuarial Liability (UAL): (1) - (2)								\$2,760,822	\$27,985,874
4. Aggregate Funded Percentage: (2) / (1)								82.47%	84.33%
5. DROP Assets Required to Meet Aggregate Funded Percentage: (1) x (4) [Total System] - (2)								\$292,943	
6. Proportion of DROP Liability by Class	0.6919	0.2536	0.0001	0.0144	0.0007	0.0031	0.0362	N/A	1.0000
7. Assets to be Reallocated	(\$202,680)	(\$74,287)	(\$26)	(\$4,225)	(\$216)	(\$903)	(\$10,606)	\$292,943	\$0

**Table 2-6**  
**Florida Retirement System Pension Plan**  
**Rates of Return on Investments**  
(Assumes net cash flow occurs mid-year)

Asset Bases	Rates of Return		
	2014/2015	2015/2016	2016/2017
Market Value	3.76%	0.54%	13.57%
Actuarial Value	8.62%	6.99%	8.21%

### 3. Liabilities

In the previous section, an actuarial valuation was compared to an inventory process, and an analysis was given of the inventory of assets of the FRS Pension Plan as of the valuation date, July 1, 2017. In this section, the discussion will focus on the future benefit commitments of the FRS Pension Plan, which will be referred to as its Actuarial Liability. In Section 5 other liability measures are presented based on accounting principles of the Financial Accounting Standards Board (FASB). Calculations required by the Governmental Accounting Standards Board (GASB) are developed and issued as part of a separate report. It is important to note that the accounting liabilities shown in Section 5 of this report and in the separate GASB report are for informational disclosure and comparison purposes, while the Actuarial Liability calculated in this section is used for determining the FRS Pension Plan actuarially calculated contribution rates prior to blending with FRS Investment Plan contribution rates to create blended proposed statutory rates.

A fundamental principle in financing a retirement program is that the projected cost of retirement benefits should be accrued during the period in which service is performed, rather than during the post-retirement period of benefit distribution. There are several methods that can be used in making such an allocation.

Consistent with the previous valuation's methodology and with preliminary 2017 valuation results discussed in October with the 2017 FRS Actuarial Assumption Conference, the Pension Plan's Normal Cost and Actuarial Liability are calculated using the Ultimate Entry Age Normal (Ultimate EAN) actuarial cost allocation method. The actuarial cost method used does not affect the calculation of overall projected Pension Plan benefits (Present Value of Benefits), but it does affect the allocation of those benefits over a member's projected working career between past (Actuarial Liability), current year (Normal Cost) and all future year projected (Present Value of Future Normal Costs) service. The Present Value of Benefits is equal to the sum of the Actuarial Liability and the Present Value of Future Normal Costs.

For a system such as the FRS Pension Plan with two membership tiers, Ultimate EAN calculates the Normal Cost allocation for individual members as if each member participates in the tier available to new hires for his or her full working career. For members in Tier I, this means the Normal Cost under the Ultimate EAN method will be based on the benefit and retirement eligibility provisions of Tier II. Because Tier II results in lower expected benefit payments than under Tier I, the calculated Normal Cost Rate is lower than it would be if the plan provisions specific to the member's actual tier were used by the actuarial cost allocation method.

The actuarial cost allocation method does not affect the calculation of the Present Value of Benefits, which is based on the plan provisions specific to each member's enrollment date. The Actuarial Liability is the Present Value of Benefits minus the Present Value of Future Normal Costs. Thus, the Ultimate EAN method used in this valuation leads to a lower Normal Cost Rate and a higher Actuarial Liability for Tier I members than would be calculated under a method that based the Normal Costs of Tier I members on the Tier I benefit plan provisions.

The difference between the Actuarial Liability and the Actuarial Value of Assets accumulated as of the actuarial valuation date is referred to as the Unfunded Actuarial Liability (UAL). (If the difference is negative, the excess of the funds accumulated over the liabilities may be referred to as the surplus.) The UAL Contribution Rate is calculated in a manner such that the UAL will fully amortize in accordance with the schedules in Section 4 of this report if actual future experience follows the assumptions used in the valuation and contributions are made each year at levels equal to actuarially calculated contribution rates.

Please note that GASB Statements Nos. 67 & 68 do not permit the use of the Ultimate EAN cost allocation method for accounting calculations. The Ultimate EAN method and the GASB 67 & 68 mandated variation of Entry Age Normal (Individual EAN) will produce different Actuarial Liability and Normal Cost Rate results. Determining which EAN methodology (Ultimate or Individual) generates higher current contribution rates depends

on the period used to amortize the UAL. For the FRS Pension Plan, the amortization periods used in this report's contribution rate calculation methodology will lead to the Ultimate EAN methodology having lower current calculated contribution rates than the Individual EAN methodology. As the number of Tier I active participants decreases, the Individual EAN Normal Cost Rate would trend downward toward the Tier II Normal Cost Rate. When all Tier I active participants have left the workforce, the Normal Cost Rates of the two variations will converge.

The UAL will grow with interest and Normal Cost while contributions will reduce it.

Benefit improvements, actuarial gains and losses (variations in investment results and demographic changes from assumption), and changes in actuarial assumptions and methods will also have an effect on the Actuarial Liability and on the UAL.

After the amount of the UAL has been determined, as part of the rate calculation methodology used in the previous valuation and in preliminary 2017 valuation results discussed with the 2017 FRS Actuarial Assumption Conference, the actuarially calculated contribution rates include a component for the amortization of the UAL. A schedule of contributions is established to amortize the UAL. In Section 4 of the report, we discuss the contribution schedules in detail.

Table 3-1 contains a breakdown of the Actuarial Liabilities and Unfunded Actuarial Liabilities in the FRS Pension Plan for the 2016 valuation and the 2017 valuation. In Table 3-2, the 2017 liabilities are shown for each membership class.

Legislation enacted in 2001 "walls off," for 25 years, the actuarial gains arising from former FRS Pension Plan participants electing to participate in the FRS Investment Plan. The "walled off" amount is called the contingent liability. The Actuarial Liabilities generally do not include the contingent liability. However, surplus, if any, used for contribution rate reductions is net of the contingent liability. Table 3-3 shows the contingent liability and the number of current active participants, by class, who elected to transfer from the FRS Pension Plan to the FRS Investment Plan during the original 2002-2003 election periods available to FRS Pension Plan members who were active when the Investment Plan first became available for participation.

**Table 3-1**  
**Florida Retirement System Pension Plan**  
**Actuarial Liabilities**  
 (\$ in Thousands)

	July 1, 2016 Valuation	July 1, 2017 Valuation
1. Actuarial Liabilities for:		
(a) Active Members	\$54,444,492	\$56,093,533
(b) Retired, Disabled and Beneficiary Members	96,445,460	101,665,423
(c) Terminated Vested Members	4,914,799	5,071,085
(d) DROP	<u>14,569,858</u>	<u>15,749,075</u>
2. Total Actuarial Liability	\$170,374,609	\$178,579,116
3. Actuarial Value of Assets	<u>\$145,451,612</u>	<u>\$150,593,242</u>
4. Unfunded Actuarial Liability / (Surplus)	\$24,922,997	\$27,985,874
5. Investment Plan Contingent Liability <sup>1</sup>	<u>\$231,815</u>	<u>\$229,415</u>
6. Surplus Available for Rate Reduction	\$0	\$0

<sup>1</sup> See Table 3-3.

**Table 3-2**  
**Florida Retirement System Pension Plan**  
**Actuarial Liabilities by Membership Class**  
**July 1, 2017**  
(\$ in Thousands)

	Regular	Special Risk	Special Risk Administrative	-- Elected Officers' Class --			Senior Management	DROP	Total System
			Judicial	Leg-Atty-Cab	Local				
1. Present Value of Benefits for:									
a. Active Members	\$49,848,668	\$20,019,074	\$14,398	\$532,407	\$26,375	\$180,955	\$1,952,869	\$0	\$72,574,746
b. Retired, Disabled and Beneficiary Members	76,841,026	20,508,389	74,711	881,630	87,734	499,000	2,772,933	15,749,075	117,414,498
c. Terminated Vested Members	4,208,360	656,240	1,402	19,053	8,312	18,121	159,597	0	5,071,085
d. Total Present Value of Benefits (a)+(b)+(c)	130,898,054	41,183,703	90,511	1,433,090	122,421	698,076	4,885,399	15,749,075	195,060,329
2. Present Value of Future Normal Cost (Actives):	\$9,782,228	\$6,252,796	\$1,599	\$114,161	\$3,585	\$29,335	\$297,509	\$0	\$16,481,213
3. Actuarial Liabilities for:									
a. Active Members (1a) - (2)	\$40,066,440	\$13,766,278	\$12,799	\$418,246	\$22,790	\$151,620	\$1,655,360	\$0	\$56,093,533
b. Retired, Disabled and Beneficiary Members (1b)	76,841,026	20,508,389	74,711	881,630	87,734	499,000	2,772,933	15,749,075	117,414,498
c. Terminated Vested Members (1c)	4,208,360	656,240	1,402	19,053	8,312	18,121	159,597	0	5,071,085
d. Total Actuarial Liability (a)+(b)+(c)	\$121,115,826	\$34,930,907	\$88,912	\$1,318,929	\$118,836	\$668,741	\$4,587,890	\$15,749,075	\$178,579,116
4. Actuarial Value of Assets	\$105,758,356	\$27,647,401	\$71,993	\$849,745	\$57,104	\$300,040	\$2,627,407	\$13,281,196	\$150,593,242
5. Unfunded Actuarial Liability / (Surplus)	\$15,357,470	\$7,283,506	\$16,919	\$469,184	\$61,732	\$368,701	\$1,960,483	\$2,467,879 <sup>1</sup>	\$27,985,874
6. Present Value of Future Pay	\$170,754,668	\$42,499,913	\$24,651	\$767,098	\$39,012	\$266,455	\$4,154,265	\$0	\$218,506,062

<sup>1</sup> This is a bookkeeping item. DROP liabilities include the total present value of benefits to all members currently in DROP. When a member leaves DROP, their liability is transferred to the class of membership from which they retired.

**Table 3-3**  
**Florida Retirement System Investment Plan**  
**Contingent Actuarial Liabilities**  
**July 1, 2017**  
 (\$ in Thousands)

	<u>Regular</u>	<u>Special Risk</u>	<u>Special Risk Administrative</u>	<u>-- Elected Officers' Class --</u>		<u>Senior Management</u>	<u>DROP</u>	<u>Total System</u>	
			<u>Judicial</u>	<u>Leg-Atty-Cab</u>	<u>Local</u>				
<u>As of July 1, 2016</u>									
Contingent Liability	\$213,212	\$9,007	(\$32)	(\$704)	\$162	\$109	\$10,061	NA	\$231,815
Participant Counts	5,665	159	1	4	3	8	144	NA	5,984
<u>As of July 1, 2017</u>									
Contingent Liability <sup>1&amp;</sup>	\$211,435	\$8,960	(\$34)	(\$758)	\$116	\$73	\$9,623	NA	\$229,415
Participant Counts	5,221	147	1	4	2	5	128	NA	5,508

<sup>1</sup> The contingent liability is not included in the actuarial liabilities of FRS and is removed from the surplus.

<sup>2</sup> The contingent liability as of July 1, 2017 is calculated as the July 1, 2003 contingent liability increased by 14 years of interest, adjusted for the proportion of original transfers remaining in the Investment Plan.

## 4. Contributions

Differences between the Actuarial Liabilities and the assets can be made up through (1) future contributions in excess of the Normal Costs to amortize the shortfall and/or (2) actual future investment returns in excess of assumed returns. An actuarial valuation sets out a schedule of future contributions that will fully amortize the Unfunded Actuarial Liability (UAL) in a systematic manner if future experience follows the assumptions. By contrast, in prior years when the FRS Pension Plan had an actuarial surplus, legislated contribution rates were generally below the Normal Cost Rate. In this section we develop and present the FRS Pension Plan contribution rates proposed to be effective for the Plan Year beginning July 1, 2018 based on the July 1, 2017 membership data. Under separate cover, the FRS Pension Plan contribution rates calculated in this valuation are blended with contribution rates for the FRS Investment Plan to develop proposed blended statutory contribution rates for the Plan Year beginning July 1, 2018.

First, we present a description of the actuarial method used to determine the actuarially calculated FRS Pension Plan contribution rates for the 2018-2019 plan year. This is followed by a series of tables presenting the details of our calculations.

### A. Funding Methods

The actuarial cost method used to determine the pattern of future contributions is called the Ultimate Entry Age Normal (Ultimate EAN) actuarial cost allocation method. Under this method (as is the case for most actuarial cost allocation methods), the contribution rates calculated have two components:

- Normal Cost Rate
- UAL Contribution Rate, which amortizes the UAL if future experience follows assumptions.

These components are described in more detail below.

#### 1. Normal Cost Rate

Under the Ultimate EAN method, the Normal Cost Rate is that level percentage of pay which would fully fund a member's benefit at retirement, if paid from the year of entry (i.e., "entry age") to the year of retirement if future experience were to exactly match the actuarial assumptions. For a system such as the FRS Pension Plan with two membership tiers, Ultimate EAN determines the Normal Cost allocation for individual members as if each member participates in the tier available to new hires for his or her full working career. For members in Tier I, this means the Normal Cost Rate under the Ultimate EAN method will be based on the benefit and retirement eligibility provisions of Tier II. Because Tier II results in lower expected benefits than under Tier I, the calculated Normal Cost Rate is lower than it would be if the plan provisions specific to the member's actual tier were used. This lower Normal Cost Rate leads to a higher Actuarial Liability, all else equal, as is discussed below.

We have determined the Normal Cost Rates for the FRS Pension Plan separately by membership class and type of benefit (e.g., retirement, disability). These are summarized in Table 4-1.

#### 2. UAL (Unfunded Actuarial Liability) Contribution Rate

The Actuarial Liability is the difference between the Present Value of Projected Benefits (PVB) and the Present Value of Future Normal Costs (PVFNC). Because the Ultimate EAN cost allocation method produces lower Normal Costs than would be determined if each individual's tier-specific benefit and retirement eligibility provisions were used, the Actuarial Liability is higher under Ultimate EAN than it would be if the cost allocation method used tier-specific plan provisions applicable to each member.

The term "fully funded" is often applied to a system where contributions at the Normal Cost Rate are projected to be completely adequate to fully fund the projected future benefits of all existing members if future experience follows assumptions. Currently, most systems are not fully funded. This can be because contributions for the estimated value of benefits earned in a year have not been fully made, benefit improvements for past service are granted but then are funded gradually over future years, or actual experience has not been as favorable as assumed. Under these circumstances, a UAL exists. For the FRS Pension Plan, there has been a UAL for every valuation since the July 1, 2009 valuation. Prior to that time, the Actuarial Value of Assets exceeded the Actuarial Liability for the valuations from 1998 through 2008 and no UAL existed in those valuations.

Tables 4-2 through 4-10 show how the UAL contribution rates were derived for the FRS Pension Plan. Table 4-2 shows the calculations on a composite basis, while Tables 4-3 through 4-10 show the calculations for each individual membership class and sub-class and for the DROP.

As part of the funding policy selected by the Florida Legislature, the actuarially calculated contribution rate is based on a "layered" approach that includes closed 30-year charge and credit bases for the amortization of the UAL. Starting in the 1998 actuarial valuation, the Legislature required all UAL bases in existence at that time to be considered fully amortized, since the Plan was in a surplus position. Since then, new amortization bases were created whenever there were changes in plan provisions or changes in assumptions pursuant to an experience study or other action by the FRS Assumptions Conference to modify actuarial assumptions or methods. Since a UAL currently exists, all experience gains and losses are also subject to amortization. In this valuation, we show the amortization base of each plan/assumption change since 1998 and amortization bases for experience gains/losses starting in 2009. The plan changes include those attributable to House Bill 479 in 2009 (enacted, effective July 1, 2010), Senate Bill 2100 in 2011, and Senate Bill 7012 in 2016.

For a given base of UAL amortization, annual amortization payments in non-inflation-adjusted dollars are calculated as increasing by 3.25% per year ("level percent of projected payroll amortization"), consistent with the valuation's long-term annual payroll growth assumption as adopted by the FRS Actuarial Assumptions Conference. If future experience follows the actuarial assumptions, this should result in amortization payments that align with the assumed growth in overall compensation. Please note that with the current closed amortization periods of 30 years, amortization payments will not be large enough to cover interest on the UAL for several years, which means that as a dollar amount the UAL for each amortization base is expected to grow for a period of time subsequent to its establishment. Under current assumptions, the expected UAL for a newly established amortization base will grow until the amortization period is down to 18 years remaining. After that time, the amortization payments will be large enough that the amortization payments will cover both interest and principal, and the UAL as a dollar amount will be projected to decrease in each subsequent year. After approximately 20 years, the unamortized balance for the base will be approximately at the same level (in non-inflation-adjusted dollars) as the initial amount of the base.

The benefit changes effective in 2011 legislated by Senate Bill 2100 reduced the Normal Cost, PVFNC, and the PVB for current and future active members. All members initially enrolled before July 1, 2011 (Tier I) will continue to earn benefits at levels greater than those annually earned by members initially enrolled on or after July 1, 2011 (Tier II). While the base benefits are higher for Tier I members than Tier II members, the projected benefit levels for Tier I members are decreased from what they would have been absent Senate Bill 2100, due to the determination of the annual COLA percentage being based on the ratio of pre-July 2011 service to total service.

As noted on the prior page, the Actuarial Liability is defined as PVB less PVFNC. For some membership classes the decrease in the PVFNC from Senate Bill 2100 was larger than the decrease in the PVB, resulting in an increase in an Actuarial Liability. For the remaining membership classes, the decrease in the PVFNC from Senate Bill 2100 was smaller than the decrease in the PVB, resulting in a decrease in the Actuarial Liability. The variation is due to the different demographics, benefit multipliers and unique interrelation of the modified benefit provisions

of each membership class. The PVB will be lower in future valuations than it would have been had Senate Bill 2100 not been adopted.

## B. Employer Contribution Rates

Table 4-11 presents the actuarially calculated 2018-2019 employer contribution rates for the FRS Pension Plan prior to blending with FRS Investment Plan contribution rates to create 2018-2019 blended proposed statutory rates.

The reader should note that the payroll base for UAL Cost contributions is larger than the payroll base for Normal Cost contributions. Florida Statute requires the employers of certain defined contribution program participants to make UAL Cost contributions based on their payroll. The payroll base for UAL Cost contributions includes approximately \$3.2 billion of payroll for employees who are not currently participating in the FRS Pension Plan or the FRS Investment Plan. Thus, the total contribution shown is an arithmetic sum, but the actual contribution percentages will be determined on a blended rate basis so that employers pay the same contribution rate for FRS Pension Plan members and FRS Investment Plan members.

Table 4-12 compares the legislated employer contribution rates to those calculated in the actuarial valuations for the prior plan years. The legislated rates for the 2014-2015 through 2017-2018 plan years were the same as the actuarially calculated rates in the 2013 through 2016 actuarial valuations, respectively.

**Table 4-1**  
**Florida Retirement System Pension Plan**  
**Normal Cost Rates by Decrement**  
**July 1, 2017**

	----- Elected Officers' Class -----						Senior Management	DROP	Total
	Regular	Special Risk	Special Risk Administrative	Judicial	Leg-Atty-Cab	Local			
1. Vested Benefits and Early Retirement	1.25%	1.86%	1.56%	1.54%	3.58%	2.76%	1.27%	NA	1.35%
2. Regular Retirement	3.76%	11.63%	3.59%	12.42%	4.99%	7.57%	4.99%	NA	5.08%
3. Non-Duty Death	0.20%	0.34%	0.15%	0.73%	0.34%	0.45%	0.25%	NA	0.23%
4. Line of Duty Death	0.02%	0.41%	0.01%	0.03%	0.02%	0.03%	0.02%	NA	0.08%
5. Non-Duty Disability	0.12%	0.15%	0.09%	0.30%	0.15%	0.17%	0.14%	NA	0.12%
6. Line of Duty Disability	0.01%	0.29%	0.01%	0.02%	0.01%	0.02%	0.01%	NA	0.05%
7. Refund of Employee Contributions	<u>0.55%</u>	<u>0.27%</u>	<u>0.64%</u>	<u>0.06%</u>	<u>0.49%</u>	<u>0.32%</u>	<u>0.59%</u>	<u>NA</u>	<u>0.50%</u>
8. Total Normal Cost	5.91%	14.95%	6.05%	15.10%	9.58%	11.32%	7.27%	NA	7.41%
9. Expected Employee Contributions	<u>-3.00%</u>	<u>-3.00%</u>	<u>-3.00%</u>	<u>-3.00%</u>	<u>-3.00%</u>	<u>-3.00%</u>	<u>-3.00%</u>	<u>NA</u>	<u>-3.00%</u>
10. Employer Normal Cost	2.91%	11.95%	3.05%	12.10%	6.58%	8.32%	4.27%	4.41% <sup>1</sup>	4.41%

<sup>1</sup> DROP Normal Cost is set equivalent to the Pension Plan composite Normal Cost rate.

**Table 4-2**  
**Florida Retirement System Pension Plan**  
**Unfunded Actuarial Liability (UAL) Bases**  
**July 1, 2017**  
**Composite Plan**  
(\$ in Thousands)

(a)	(b)	(c)	(d)	(e)	(f) = (d) / (e)	(g)	(h)	(i)	(j) = (h) / (i)
Date Established	Description	Remaining Payments as of Valuation Date	Balance as of Valuation Date	Amortization Factor <sup>1</sup>	Amortization Payment for FY 2017-2018	Remaining Payments one year after Valuation Date	Balance One Year After Valuation Date	Amortization Factor <sup>1</sup>	Amortization Payment for FY 2018-2019
June 30, 1999	Assumption Change from 1998 Experience Study	13	(\$371,267)	9.9008	(\$37,499)	12	(\$360,232)	9.3611	(\$38,482)
June 30, 2000	Special Risk 65% In-Line-Of-Duty Disability (2000)	14	(2,438)	10.4645	(233)	13	(2,379)	9.9555	(239)
June 30, 2000	Special Risk-Regular 12% Pre-2000 Retired Benefit Increase (2000)	14	310,581	10.4645	29,679	13	303,102	9.9555	30,446
June 30, 2004	Assumption Change from 2003 Experience Study	18	(3,495,467)	12.5007	(279,621)	17	(3,467,710)	12.1072	(286,417)
June 30, 2009	Assumption Change from 2008 Experience Study	23	6,942,035	14.6160	474,962	22	6,970,237	14.3517	485,672
June 30, 2009	2008-2009 Experience (Gains) / Losses	23	21,785,051	14.6160	1,490,495	22	21,873,552	14.3517	1,524,106
June 30, 2009	Unrecognized (Gains)/Losses while in Surplus	23	(6,372,320)	14.6160	(435,983)	22	(6,398,207)	14.3517	(445,814)
June 30, 2009	2009-2010 Plan Changes (HB 479)	23	(1,317,367)	14.6160	(90,132)	22	(1,322,719)	14.3517	(92,164)
June 30, 2010	2009-2010 Experience (Gains) / Losses	24	1,179,971	14.9891	78,722	23	1,186,849	14.7488	80,471
June 30, 2010	2010-2011 Plan Changes (SB 2100)	24	(1,292,491)	14.9891	(86,229)	23	(1,300,024)	14.7488	(88,144)
June 30, 2011	2010-2011 Experience (Gains) / Losses	25	2,869,205	15.3472	186,953	24	2,890,558	15.1302	191,045
June 30, 2012	2011-2012 Experience (Gains) / Losses	26	(115,121)	15.6908	(7,337)	25	(116,148)	15.4965	(7,495)
June 30, 2013	2012-2013 Experience (Gains) / Losses	27	2,892,418	16.0205	180,545	26	2,922,156	15.8484	184,382
June 30, 2014	Assumption/Method Change from 2013 Experience Study	28	2,069,670	16.3369	126,687	27	2,093,543	16.1863	129,341
June 30, 2014	2013-2014 Experience (Gains) / Losses	28	(2,806,971)	16.3369	(171,818)	27	(2,839,349)	16.1863	(175,417)
June 30, 2015	2014-2015 Experience (Gains) / Losses	29	572,168	16.6404	34,384	28	579,431	16.5108	35,094
June 30, 2016	Special Risk 100% In-Line-Of-Duty Death (2016)	30	43,420	16.9317	2,564	29	44,017	16.8226	2,617
June 30, 2016	2016 Assumption Changes	30	1,150,555	16.9317	67,953	29	1,166,392	16.8226	69,335
June 30, 2016	2015-2016 Experience (Gains) / Losses	30	1,267,063	16.9317	74,834	29	1,284,503	16.8226	76,356
June 30, 2017	Special Risk 100% In-Line-Of-Duty Death (2017)		84,998			30	91,373	17.1220	5,337
June 30, 2017	2017 Assumption Changes		2,123,579			30	2,282,847	17.1220	133,328
June 30, 2017	2016-2017 Experience (Gains) / Losses		468,601 <sup>2</sup>			30	503,746	17.1220	29,421
<b>UAL as of Valuation Date</b>			<b>\$27,985,874</b>		<b>\$1,638,927</b>		<b>\$28,385,539</b>	Total:	<b>\$1,842,777</b>
							Projected FY 2018-2019 UAL Payroll:		<b>\$30,278,632</b>
								<b>NC Rate:</b>	<b>4.41%</b>
							<b>UAL Contribution Rate:</b>	<b>6.09%</b>	
							<b>NCR + UALR:</b>	<b>10.50%</b>	

<sup>1</sup> The 2017-2018 amortization factors are based on the assumptions used in the July 1, 2016 actuarial valuation, which determined actuarially calculated contribution rates for 2017-2018.

The 2018-2019 amortization factors are based on the assumptions used in this July 1, 2017 actuarial valuation, which determines actuarially calculated contribution rates for 2018-2019.

<sup>2</sup> The experience (gains)/losses developed on this table and the subsequent tables in this section are derived using a methodology which assumes 2016-2017 UAL contributions precisely equal the scheduled UAL amortization payments.

Actual System contributions differ somewhat from the amortization schedules in this section, and there is no clear delineation in actual contributions received between Normal Cost and UAL contributions.

The UAL (gain)/loss shown in the Executive Summary is derived using a methodology which incorporates actual 2016-2017 contributions.

**Table 4-3**  
**Florida Retirement System Pension Plan**  
**Unfunded Actuarial Liability (UAL) Bases**  
**July 1, 2017**  
**Regular Class**  
(\$ in Thousands)

(a)	(b)	(c)	(d)	(e)	(f) = (d) / (e)	(g)	(h)	(i)	(j) = (h) / (i)
Date Established	Description	Remaining Payments as of Valuation Date	Balance as of Valuation Date	Amortization Factor	Amortization Payment for FY 2017-2018	Remaining Payments one year after Valuation Date	Balance One Year After Valuation Date	Amortization Factor	Amortization Payment for FY 2018-2019
June 30, 1999	Assumption Change from 1998 Experience Study	13	(\$282,829)	9.9008	(\$28,566)	12	(\$274,423)	9.3611	(\$29,315)
June 30, 2004	Assumption Change from 2003 Experience Study	18	(3,088,064)	12.5007	(247,030)	17	(3,063,543)	12.1072	(253,035)
June 30, 2009	Assumption Change from 2008 Experience Study	23	5,646,950	14.6160	386,355	22	5,669,891	14.3517	395,067
June 30, 2009	2008-2009 Experience (Gains) / Losses	23	34,690,087	14.6160	2,373,435	22	34,831,013	14.3517	2,426,956
June 30, 2009	Unrecognized (Gains)/Losses while in Surplus	23	(27,211,227)	14.6160	(1,861,745)	22	(27,321,771)	14.3517	(1,903,727)
June 30, 2009	2009-2010 Plan Changes (HB 479)	23	(1,035,666)	14.6160	(70,858)	22	(1,039,873)	14.3517	(72,456)
June 30, 2010	2009-2010 Experience (Gains) / Losses	24	1,315,374	14.9891	87,755	23	1,323,040	14.7488	89,705
June 30, 2010	2010-2011 Plan Changes (SB 2100)	24	(1,669,822)	14.9891	(111,402)	23	(1,679,554)	14.7488	(113,877)
June 30, 2011	2010-2011 Experience (Gains) / Losses	25	1,419,291	15.3472	92,479	24	1,429,854	15.1302	94,503
June 30, 2012	2011-2012 Experience (Gains) / Losses	26	510,772	15.6908	32,552	25	515,328	15.4965	33,254
June 30, 2013	2012-2013 Experience (Gains) / Losses	27	1,757,014	16.0205	109,673	26	1,775,079	15.8484	112,004
June 30, 2014	Assumption/Method Change from 2013 Experience Study	28	605,979	16.3369	37,093	27	612,969	16.1863	37,870
June 30, 2014	2013-2014 Experience (Gains) / Losses	28	(1,271,655)	16.3369	(77,840)	27	(1,286,323)	16.1863	(79,470)
June 30, 2015	2014-2015 Experience (Gains) / Losses	29	756,417	16.6404	45,457	28	766,018	16.5108	46,395
June 30, 2016	2016 Assumption Changes	30	779,769	16.9317	46,054	29	790,502	16.8226	46,991
June 30, 2016	2015-2016 Experience (Gains) / Losses	30	1,303,515	16.9317	76,987	29	1,321,458	16.8226	78,553
June 30, 2017	2017 Assumption Changes		1,424,753			30	1,531,609	17.1220	89,453
June 30, 2017	2016-2017 Experience (Gains) / Losses		<u>(293,188)</u>			30	<u>(315,177)</u>	17.1220	<u>(18,408)</u>
		<b>UAL as of Valuation Date</b>	<b>\$15,357,470</b>		<b>\$890,397</b>		<b>\$15,586,097</b>	<b>Total:</b>	<b>\$980,462</b>
							<b>Projected FY 2018-2019 UAL Payroll:</b>		<b>\$23,412,818</b>
								<b>NC Rate:</b>	<b>2.91%</b>
								<b>UAL Contribution Rate:</b>	<b>4.19%</b>
								<b>NCR + UALR:</b>	<b>7.10%</b>

**Table 4-4**  
**Florida Retirement System Pension Plan**  
**Unfunded Actuarial Liability (UAL) Bases**  
**July 1, 2017**  
**Special Risk Class**  
(\$ in Thousands)

(a)	(b)	(c)	(d)	(e)	(f) = (d) / (e)	(g)	(h)	(i)	(j) = (h) / (i)
Date	Description	Remaining Payments as of Valuation Date	Balance as of Valuation Date	Amortization Factor	Amortization Payment for FY 2017-2018	Remaining Payments one year after Valuation Date	Balance One Year After Valuation Date	Amortization Factor	Amortization Payment for FY 2018-2019
June 30, 1999	Assumption Change from 1998 Experience Study	13	(\$85,628)	9.9008	(\$8,649)	12	(\$83,083)	9.3611	(\$8,875)
June 30, 2000	Special Risk 65% In-Line-Of-Duty Disability (2000)	14	(2,487)	10.4645	(238)	13	(2,427)	9.9555	(244)
June 30, 2000	Special Risk-Regular 12% Pre-2000 Retired Benefit Increase (2000)	14	310,581	10.4645	29,679	13	303,102	9.9555	30,446
June 30, 2004	Assumption Change from 2003 Experience Study	18	(630,864)	12.5007	(50,466)	17	(625,854)	12.1072	(51,693)
June 30, 2009	Assumption Change from 2008 Experience Study	23	554,651	14.6160	37,948	22	556,904	14.3517	38,804
June 30, 2009	2008-2009 Experience (Gains) / Losses	23	7,642,950	14.6160	522,917	22	7,673,999	14.3517	534,709
June 30, 2009	Unrecognized (Gains)/Losses while in Surplus	23	(2,536,137)	14.6160	(173,518)	22	(2,546,440)	14.3517	(177,431)
June 30, 2009	2009-2010 Plan Changes (HB 479)	23	(193,436)	14.6160	(13,235)	22	(194,222)	14.3517	(13,533)
June 30, 2010	2009-2010 Experience (Gains) / Losses	24	(417,906)	14.9891	(27,881)	23	(420,342)	14.7488	(28,500)
June 30, 2010	2010-2011 Plan Changes (SB 2100)	24	466,978	14.9891	31,154	23	469,700	14.7488	31,847
June 30, 2011	2010-2011 Experience (Gains) / Losses	25	264,501	15.3472	17,235	24	266,470	15.1302	17,612
June 30, 2012	2011-2012 Experience (Gains) / Losses	26	(569,574)	15.6908	(36,300)	25	(574,656)	15.4965	(37,083)
June 30, 2013	2012-2013 Experience (Gains) / Losses	27	502,887	16.0205	31,390	26	508,058	15.8484	32,057
June 30, 2014	Assumption/Method Change from 2013 Experience Study	28	1,365,977	16.3369	83,613	27	1,381,733	16.1863	85,364
June 30, 2014	2013-2014 Experience (Gains) / Losses	28	(890,671)	16.3369	(54,519)	27	(900,944)	16.1863	(55,661)
June 30, 2015	2014-2015 Experience (Gains) / Losses	29	(17,454)	16.6404	(1,049)	28	(17,676)	16.5108	(1,071)
June 30, 2016	Special Risk 100% In-Line-Of-Duty Death (2016)	30	43,420	16.9317	2,564	29	44,017	16.8226	2,617
June 30, 2016	2016 Assumption Changes	30	248,186	16.9317	14,658	29	251,602	16.8226	14,956
June 30, 2016	2015-2016 Experience (Gains) / Losses	30	217,197	16.9317	12,828	29	220,187	16.8226	13,089
June 30, 2017	Special Risk 100% In-Line-Of-Duty Death (2017)		84,998			30	91,373	17.1220	5,337
June 30, 2017	2017 Assumption Changes		463,191			30	497,930	17.1220	29,081
June 30, 2017	2016-2017 Experience (Gains) / Losses		462,146			30	496,807	17.1220	29,016
<b>UAL as of Valuation Date</b>			<b>\$7,283,506</b>			<b>\$418,134</b>	<b>\$7,396,238</b>	<b>Total:</b>	<b>\$490,844</b>
									Projected FY 2018-2019 UAL Payroll: \$3,945,979
									<b>NC Rate: 11.95%</b>
									<b>UAL Contribution Rate: 12.44%</b>
									<b>NCR + UALR: 24.39%</b>

**Table 4-5**  
**Florida Retirement System Pension Plan**  
**Unfunded Actuarial Liability (UAL) Bases**  
**July 1, 2017**  
**Special Risk Administrative Support Class**  
(\$ in Thousands)

(a)	(b)	(c)	(d)	(e)	(f) = (d) / (e)	(g)	(h)	(i)	(j) = (h) / (i)
Date Established	Description	Remaining Payments as of Valuation Date	Balance as of Valuation Date	Amortization Factor	Amortization Payment for FY 2017-2018	Remaining Payments one year after Valuation Date	Balance One Year After Valuation Date	Amortization Factor	Amortization Payment for FY 2018-2019
June 30, 1999	Assumption Change from 1998 Experience Study	13	(\$308)	9.9008	(\$31)	12	(\$298)	9.3611	(\$32)
June 30, 2000	Special Risk 65% In-Line-Of-Duty Disability (2000)	14	49	10.4645	5	13	48	9.9555	5
June 30, 2004	Assumption Change from 2003 Experience Study	18	10,532	12.5007	842	17	10,448	12.1072	863
June 30, 2009	Assumption Change from 2008 Experience Study	23	1,334	14.6160	91	22	1,340	14.3517	93
June 30, 2009	2008-2009 Experience (Gains) / Losses	23	20,056	14.6160	1,372	22	20,138	14.3517	1,403
June 30, 2009	Unrecognized (Gains)/Losses while in Surplus	23	(22,258)	14.6160	(1,523)	22	(22,349)	14.3517	(1,557)
June 30, 2009	2009-2010 Plan Changes (HB 479)	23	0	14.6160	0	22	0	14.3517	0
June 30, 2010	2009-2010 Experience (Gains) / Losses	24	1,203	14.9891	80	23	1,210	14.7488	82
June 30, 2010	2010-2011 Plan Changes (SB 2100)	24	(548)	14.9891	(37)	23	(552)	14.7488	(37)
June 30, 2011	2010-2011 Experience (Gains) / Losses	25	2,892	15.3472	188	24	2,913	15.1302	193
June 30, 2012	2011-2012 Experience (Gains) / Losses	26	599	15.6908	38	25	605	15.4965	39
June 30, 2013	2012-2013 Experience (Gains) / Losses	27	2,863	16.0205	179	26	2,892	15.8484	182
June 30, 2014	Assumption/Method Change from 2013 Experience Study	28	(5,900)	16.3369	(361)	27	(5,968)	16.1863	(369)
June 30, 2014	2013-2014 Experience (Gains) / Losses	28	6,684	16.3369	409	27	6,761	16.1863	418
June 30, 2015	2014-2015 Experience (Gains) / Losses	29	(5,857)	16.6404	(352)	28	(5,931)	16.5108	(359)
June 30, 2016	2016 Assumption Changes	30	490	16.9317	29	29	496	16.8226	30
June 30, 2016	2015-2016 Experience (Gains) / Losses	30	1,950	16.9317	115	29	1,977	16.8226	118
June 30, 2017	2017 Assumption Changes		892			30	959	17.1220	56
June 30, 2017	2016-2017 Experience (Gains) / Losses		<u>2,246</u>			30	<u>2,415</u>	17.1220	<u>141</u>
<b>UAL as of Valuation Date</b>			<b>\$16,919</b>		<b>\$1,046</b>		<b>\$17,104</b>	<b>Total:</b>	<b>\$1,268</b>
							<b>Projected FY 2018-2019 UAL Payroll:</b>		<b>\$3,230</b>
								<b>NC Rate:</b>	<b>3.05%</b>
							<b>UAL Contribution Rate:</b>		<b>39.25%</b>
							<b>NCR + UALR:</b>		<b>42.30%</b>

**Table 4-6**  
**Florida Retirement System Pension Plan**  
**Unfunded Actuarial Liability (UAL) Bases**  
**July 1, 2017**  
**Elected Officers' Class: Judicial Subclass**  
(\$ in Thousands)

(a)	(b)	(c)	(d)	(e)	(f) = (d) / (e)	(g)	(h)	(i)	(j) = (h) / (i)
Date Established	Description	Remaining Payments as of Valuation Date	Balance as of Valuation Date	Amortization Factor	Amortization Payment for FY 2017-2018	Remaining Payments one year after Valuation Date	Balance One Year After Valuation Date	Amortization Factor	Amortization Payment for FY 2018-2019
June 30, 1999	Assumption Change from 1998 Experience Study	13	\$40	9.9008	\$4	12	\$39	9.3611	\$4
June 30, 2004	Assumption Change from 2003 Experience Study	18	27,829	12.5007	2,226	17	27,608	12.1072	2,280
June 30, 2009	Assumption Change from 2008 Experience Study	23	20,386	14.6160	1,395	22	20,469	14.3517	1,426
June 30, 2009	2008-2009 Experience (Gains) / Losses	23	515,713	14.6160	35,284	22	517,808	14.3517	36,080
June 30, 2009	Unrecognized (Gains)/Losses while in Surplus	23	(279,755)	14.6160	(19,140)	22	(280,892)	14.3517	(19,572)
June 30, 2009	2009-2010 Plan Changes (HB 479)	23	(25,764)	14.6160	(1,763)	22	(25,869)	14.3517	(1,802)
June 30, 2010	2009-2010 Experience (Gains) / Losses	24	(22,442)	14.9891	(1,497)	23	(22,573)	14.7488	(1,530)
June 30, 2010	2010-2011 Plan Changes (SB 2100)	24	3,226	14.9891	215	23	3,245	14.7488	220
June 30, 2011	2010-2011 Experience (Gains) / Losses	25	85,490	15.3472	5,570	24	86,126	15.1302	5,692
June 30, 2012	2011-2012 Experience (Gains) / Losses	26	6,699	15.6908	427	25	6,759	15.4965	436
June 30, 2013	2012-2013 Experience (Gains) / Losses	27	108,783	16.0205	6,790	26	109,901	15.8484	6,935
June 30, 2014	Assumption/Method Change from 2013 Experience Study	28	24,807	16.3369	1,518	27	25,094	16.1863	1,550
June 30, 2014	2013-2014 Experience (Gains) / Losses	28	(54,856)	16.3369	(3,358)	27	(55,489)	16.1863	(3,428)
June 30, 2015	2014-2015 Experience (Gains) / Losses	29	5,470	16.6404	329	28	5,539	16.5108	335
June 30, 2016	2016 Assumption Changes	30	7,259	16.9317	429	29	7,359	16.8226	437
June 30, 2016	2015-2016 Experience (Gains) / Losses	30	35,520	16.9317	2,098	29	36,009	16.8226	2,140
June 30, 2017	2017 Assumption Changes		13,203			30	14,193	17.1220	829
June 30, 2017	2016-2017 Experience (Gains) / Losses		(2,423)			30	(2,605)	17.1220	(152)
		<b>UAL as of Valuation Date</b>	<b>\$469,184</b>			<b>\$30,528</b>	<b>\$472,721</b>	<b>Total:</b>	<b>\$31,881</b>
							<b>Projected FY 2018-2019 UAL Payroll:</b>		<b>\$106,884</b>
								<b>NC Rate:</b>	<b>12.10%</b>
								<b>UAL Contribution Rate:</b>	<b>29.83%</b>
								<b>NCR + UALR:</b>	<b>41.93%</b>

**Table 4-7**  
**Florida Retirement System Pension Plan**  
**Unfunded Actuarial Liability (UAL) Bases**  
**July 1, 2017**  
**Elected Officers' Class: Legislature/Attorney/Cabinet Subclass**  
**(\$ in Thousands)**

(a)	(b)	(c)	(d)	(e)	(f) = (d) / (e)	(g)	(h)	(i)	(j) = (h) / (i)	
Date	Description	Remaining Payments as of Valuation Date	Balance as of Valuation Date	Amortization Factor	Amortization Payment for FY 2017-2018	Remaining Payments one year after Valuation Date	Balance One Year After Valuation Date	Amortization Factor	Amortization Payment for FY 2018-2019	
June 30, 1999	Assumption Change from 1998 Experience Study	13	\$2	9.9008	\$0	12	\$2	9.3611	\$0	
June 30, 2004	Assumption Change from 2003 Experience Study	18	2,095	12.5007	168	17	2,079	12.1072	172	
June 30, 2009	Assumption Change from 2008 Experience Study	23	2,046	14.6160	140	22	2,054	14.3517	143	
June 30, 2009	2008-2009 Experience (Gains) / Losses	23	62,664	14.6160	4,287	22	62,919	14.3517	4,384	
June 30, 2009	Unrecognized (Gains)/Losses while in Surplus	23	(35,837)	14.6160	(2,452)	22	(35,983)	14.3517	(2,507)	
June 30, 2009	2009-2010 Plan Changes (HB 479)	23	(814)	14.6160	(56)	22	(817)	14.3517	(57)	
June 30, 2010	2009-2010 Experience (Gains) / Losses	24	2,922	14.9891	195	23	2,939	14.7488	199	
June 30, 2010	2010-2011 Plan Changes (SB 2100)	24	133	14.9891	9	23	133	14.7488	9	
June 30, 2011	2010-2011 Experience (Gains) / Losses	25	8,617	15.3472	561	24	8,681	15.1302	574	
June 30, 2012	2011-2012 Experience (Gains) / Losses	26	(4,040)	15.6908	(257)	25	(4,076)	15.4965	(263)	
June 30, 2013	2012-2013 Experience (Gains) / Losses	27	19,310	16.0205	1,205	26	19,508	15.8484	1,231	
June 30, 2014	Assumption/Method Change from 2013 Experience Study	28	(2,977)	16.3369	(182)	27	(3,011)	16.1863	(186)	
June 30, 2014	2013-2014 Experience (Gains) / Losses	28	(917)	16.3369	(56)	27	(928)	16.1863	(57)	
June 30, 2015	2014-2015 Experience (Gains) / Losses	29	(7,266)	16.6404	(437)	28	(7,358)	16.5108	(446)	
June 30, 2016	2016 Assumption Changes	30	611	16.9317	36	29	620	16.8226	37	
June 30, 2016	2015-2016 Experience (Gains) / Losses	30	10,296	16.9317	608	29	10,438	16.8226	620	
June 30, 2017	2017 Assumption Changes		1,162			30	1,249	17.1220	73	
June 30, 2017	2016-2017 Experience (Gains) / Losses		<u>3,724</u>			30	<u>4,003</u>	17.1220	<u>234</u>	
<b>UAL as of Valuation Date</b>			<b>\$61,732</b>		<b>\$3,770</b>		<b>\$62,453</b>	<b>Total:</b>	<b>\$4,160</b>	
									<b>Projected FY 2018-2019 UAL Payroll:</b>	<b>\$7,098</b>
									<b>NC Rate:</b>	<b>6.58%</b>
									<b>UAL Contribution Rate:</b>	<b>58.61%</b>
									<b>NCR + UALR:</b>	<b>65.19%</b>

**Table 4-8**  
**Florida Retirement System Pension Plan**  
**Unfunded Actuarial Liability (UAL) Bases**  
**July 1, 2017**  
**Elected Officers' Class: Local Subclass**  
(\$ in Thousands)

(a)	(b)	(c)	(d)	(e)	(f) = (d) / (e)	(g)	(h)	(i)	(j) = (h) / (i)
Date Established	Description	Remaining Payments as of Valuation Date	Balance as of Valuation Date	Amortization Factor	Amortization Payment for FY 2017-2018	Remaining Payments one year after Valuation Date	Balance One Year After Valuation Date	Amortization Factor	Amortization Payment for FY 2018-2019
June 30, 1999	Assumption Change from 1998 Experience Study	13	\$5	9.9008	\$0	12	\$5	9.3611	\$0
June 30, 2004	Assumption Change from 2003 Experience Study	18	35,225	12.5007	2,818	17	34,945	12.1072	2,886
June 30, 2009	Assumption Change from 2008 Experience Study	23	11,895	14.6160	814	22	11,943	14.3517	832
June 30, 2009	2008-2009 Experience (Gains) / Losses	23	244,157	14.6160	16,705	22	245,149	14.3517	17,081
June 30, 2009	Unrecognized (Gains)/Losses while in Surplus	23	(60,452)	14.6160	(4,136)	22	(60,698)	14.3517	(4,229)
June 30, 2009	2009-2010 Plan Changes (HB 479)	23	(7,380)	14.6160	(505)	22	(7,410)	14.3517	(516)
June 30, 2010	2009-2010 Experience (Gains) / Losses	24	2,139	14.9891	143	23	2,151	14.7488	146
June 30, 2010	2010-2011 Plan Changes (SB 2100)	24	305	14.9891	20	23	307	14.7488	21
June 30, 2011	2010-2011 Experience (Gains) / Losses	25	14,238	15.3472	928	24	14,344	15.1302	948
June 30, 2012	2011-2012 Experience (Gains) / Losses	26	(5,807)	15.6908	(370)	25	(5,858)	15.4965	(378)
June 30, 2013	2012-2013 Experience (Gains) / Losses	27	111,513	16.0205	6,961	26	112,660	15.8484	7,109
June 30, 2014	Assumption/Method Change from 2013 Experience Study	28	(23,666)	16.3369	(1,449)	27	(23,939)	16.1863	(1,479)
June 30, 2014	2013-2014 Experience (Gains) / Losses	28	(10,515)	16.3369	(644)	27	(10,636)	16.1863	(657)
June 30, 2015	2014-2015 Experience (Gains) / Losses	29	(10,446)	16.6404	(628)	28	(10,579)	16.5108	(641)
June 30, 2016	2016 Assumption Changes	30	3,261	16.9317	193	29	3,306	16.8226	197
June 30, 2016	2015-2016 Experience (Gains) / Losses	30	21,508	16.9317	1,270	29	21,804	16.8226	1,296
June 30, 2017	2017 Assumption Changes		6,416			30	6,897	17.1220	403
June 30, 2017	2016-2017 Experience (Gains) / Losses		<u>36,305</u>			30	<u>39,028</u>	17.1220	<u>2,279</u>
		<b>UAL as of Valuation Date</b>	<b>\$368,701</b>		<b>\$22,120</b>		<b>\$373,419</b>	<b>Total:</b>	<b>\$25,298</b>
							<b>Projected FY 2018-2019 UAL Payroll:</b>		<b>\$47,827</b>
								<b>NC Rate:</b>	<b>8.32%</b>
								<b>UAL Contribution Rate:</b>	<b>52.90%</b>
								<b>NCR + UALR:</b>	<b>61.22%</b>

**Table 4-9**  
**Florida Retirement System Pension Plan**  
**Unfunded Actuarial Liability (UAL) Bases**  
**July 1, 2017**  
**Senior Management Service Class**  
(\$ in Thousands)

(a)	(b)	(c)	(d)	(e)	(f) = (d) / (e)	(g)	(h)	(i)	(j) = (h) / (i)
Date Established	Description	Remaining Payments as of Valuation Date	Balance as of Valuation Date	Amortization Factor	Amortization Payment for FY 2017-2018	Remaining Payments one year after Valuation Date	Balance One Year After Valuation Date	Amortization Factor	Amortization Payment for FY 2018-2019
June 30, 1999	Assumption Change from 1998 Experience Study	13	(\$2,548)	9.9008	(\$257)	12	(\$2,473)	9.3611	(\$264)
June 30, 2004	Assumption Change from 2003 Experience Study	18	216,367	12.5007	17,308	17	214,649	12.1072	17,729
June 30, 2009	Assumption Change from 2008 Experience Study	23	65,579	14.6160	4,487	22	65,846	14.3517	4,588
June 30, 2009	2008-2009 Experience (Gains) / Losses	23	1,277,248	14.6160	87,387	22	1,282,437	14.3517	89,358
June 30, 2009	Unrecognized (Gains)/Losses while in Surplus	23	(289,909)	14.6160	(19,835)	22	(291,087)	14.3517	(20,282)
June 30, 2009	2009-2010 Plan Changes (HB 479)	23	(54,307)	14.6160	(3,716)	22	(54,528)	14.3517	(3,799)
June 30, 2010	2009-2010 Experience (Gains) / Losses	24	35,407	14.9891	2,362	23	35,614	14.7488	2,415
June 30, 2010	2010-2011 Plan Changes (SB 2100)	24	(92,763)	14.9891	(6,189)	23	(93,304)	14.7488	(6,326)
June 30, 2011	2010-2011 Experience (Gains) / Losses	25	133,716	15.3472	8,713	24	134,711	15.1302	8,903
June 30, 2012	2011-2012 Experience (Gains) / Losses	26	68,603	15.6908	4,372	25	69,216	15.4965	4,467
June 30, 2013	2012-2013 Experience (Gains) / Losses	27	384,908	16.0205	24,026	26	388,866	15.8484	24,537
June 30, 2014	Assumption/Method Change from 2013 Experience Study	28	(150,938)	16.3369	(9,239)	27	(152,679)	16.1863	(9,433)
June 30, 2014	2013-2014 Experience (Gains) / Losses	28	60,902	16.3369	3,728	27	61,605	16.1863	3,806
June 30, 2015	2014-2015 Experience (Gains) / Losses	29	51,992	16.6404	3,124	28	52,652	16.5108	3,189
June 30, 2016	2016 Assumption Changes	30	30,823	16.9317	1,820	29	31,247	16.8226	1,857
June 30, 2016	2015-2016 Experience (Gains) / Losses	30	96,769	16.9317	5,715	29	98,101	16.8226	5,831
June 30, 2017	2017 Assumption Changes		54,592			30	58,686	17.1220	3,428
June 30, 2017	2016-2017 Experience (Gains) / Losses		<u>74,041</u>			30	<u>79,594</u>	17.1220	<u>4,649</u>
		<b>UAL as of Valuation Date</b>	<b>\$1,960,483</b>						
					<b>\$123,808</b>		<b>\$1,979,153</b>	<b>Total:</b>	<b>\$134,651</b>
							<b>Projected FY 2018-2019 UAL Payroll:</b>		<b>\$566,672</b>
								<b>NC Rate:</b>	<b>4.27%</b>
								<b>UAL Contribution Rate:</b>	<b>23.76%</b>
								<b>NCR + UALR:</b>	<b>28.03%</b>

**Table 4-10**  
**Florida Retirement System Pension Plan**  
**Unfunded Actuarial Liability (UAL) Bases**  
**July 1, 2017**  
**DROP**  
(\$ in Thousands)

(a)	(b)	(c)	(d)	(e)	(f) = (d) / (e)	(g)	(h)	(i)	(j) = (h) / (i)
Date Established	Description	Remaining Payments as of Valuation Date	Balance as of Valuation Date	Amortization Factor	Amortization Payment for FY 2017-2018	Remaining Payments one year after Valuation Date	Balance One Year After Valuation Date	Amortization Factor	Amortization Payment for FY 2018-2019
June 30, 2004	Assumption Change from 2003 Experience Study	18	(\$68,586)	12.5007	(\$5,487)	17	(\$68,042)	12.1072	(\$5,620)
June 30, 2009	Assumption Change from 2008 Experience Study	23	639,194	14.6160	43,733	22	641,791	14.3517	44,719
June 30, 2009	2008-2009 Experience (Gains) / Losses	23	(22,667,825)	14.6160	(1,550,893)	22	(22,759,911)	14.3517	(1,585,866)
June 30, 2009	Unrecognized (Gains)/Losses while in Surplus	23	24,063,257	14.6160	1,646,366	22	24,161,012	14.3517	1,683,492
June 30, 2010	2009-2010 Experience (Gains) / Losses	24	263,276	14.9891	17,564	23	264,810	14.7488	17,955
June 30, 2011	2010-2011 Experience (Gains) / Losses	25	940,459	15.3472	61,279	24	947,458	15.1302	62,620
June 30, 2012	2011-2012 Experience (Gains) / Losses	26	(122,373)	15.6908	(7,799)	25	(123,465)	15.4965	(7,967)
June 30, 2013	2012-2013 Experience (Gains) / Losses	27	5,140	16.0205	321	26	5,192	15.8484	328
June 30, 2014	Assumption/Method Change from 2013 Experience Study	28	256,387	16.3369	15,694	27	259,344	16.1863	16,022
June 30, 2014	2013-2014 Experience (Gains) / Losses	28	(645,944)	16.3369	(39,539)	27	(653,395)	16.1863	(40,367)
June 30, 2015	2014-2015 Experience (Gains) / Losses	29	(200,688)	16.6404	(12,060)	28	(203,235)	16.5108	(12,309)
June 30, 2016	2016 Assumption Changes	30	80,157	16.9317	4,734	29	81,260	16.8226	4,830
June 30, 2016	2015-2016 Experience (Gains) / Losses	30	(419,693)	16.9317	(24,787)	29	(425,470)	16.8226	(25,292)
June 30, 2017	2017 Assumption Changes		159,370			30	171,323	17.1220	10,006
June 30, 2017	2016-2017 Experience (Gains) / Losses		<u>185,750</u>			30	<u>199,681</u>	17.1220	<u>11,602</u>
		<b>UAL as of Valuation Date</b>	<b>\$2,467,879</b>				<b>\$2,498,354</b>	Total:	<b>\$174,213</b>
							Projected FY 2018-2019 UAL Payroll:		<b>\$2,188,124</b>
								<b>NC Rate:</b>	<b>4.41%</b>
								<b>UAL Contribution Rate:</b>	<b>7.96%</b>
								<b>NCR + UALR:</b>	<b>12.37%</b>

**Table 4-11**  
**Florida Retirement System Pension Plan**  
**Actuarially Calculated Employer Contribution Rates**  
**July 1, 2017 Valuation for Fiscal Year Beginning July 1, 2018**

	Regular	Special Risk	Special Risk Administrative	-- Elected Officers' Class --			Senior Management	Composite (excluding DROP)	DROP <sup>1</sup>	Composite (including DROP)
			Judicial	Leg-Atty-Cab	Local					
1. Employer Normal Cost	2.91%	11.95%	3.05%	12.10%	6.58%	8.32%	4.27%	4.41%	4.41%	4.41%
2. UAL Cost	4.19%	12.44%	39.25%	29.83%	58.61%	52.90%	23.76%	5.94%	7.96%	6.09%
3. Total Employer Cost [(1) + (2)]	7.10%	24.39%	42.30%	41.93%	65.19%	61.22%	28.03%	10.35%	12.37%	10.50%
4. UAL Cost Paid from Surplus	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
5. Rate Reduction from Surplus	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
6. Total Adjusted Employer Contribution for FRS Trust Fund [(3) + (4) + (5)]	7.10%	24.39%	42.30%	41.93%	65.19%	61.22%	28.03%	10.35%	12.37%	10.50%

<sup>1</sup> DROP rates are special charges to cover the assumed cost of DROP participants; they are not Normal Cost or UAL Cost in the traditional sense. See Section G of Executive Summary for discussion of the DROP contribution rate.

**Table 4-12**  
**Florida Retirement System Pension Plan**  
**Actuarially Calculated vs. Legislated Defined Benefit Plan Contribution Rates (Before Blending) <sup>1 & 2 & 3 & 4</sup>**

Membership Class	Plan Year 2016-2017		Plan Year 2017-2018		Plan Year 2018-2019	
	Actuarially Calculated	Legislated	Actuarially Calculated	Legislated	Actuarially Calculated	Legislated
1. Regular	6.21%	6.21%	6.68%	6.68%	7.10%	TBD
2. Special Risk	22.24%	22.24%	22.99%	22.99%	24.39%	TBD
3. Special Risk Administrative	35.49%	35.49%	45.90%	45.90%	42.30%	TBD
4. Elected Officers' Class - Judicial	37.17%	37.17%	40.48%	40.48%	41.93%	TBD
5. Elected Officers' Class - Leg-Atty-Cab	51.19%	51.19%	62.14%	62.14%	65.19%	TBD
6. Elected Officers' Class - Local	52.99%	52.99%	57.62%	57.62%	61.22%	TBD
7. Senior Management Service	25.18%	25.18%	26.21%	26.21%	28.03%	TBD
8. Composite without DROP	9.14%	9.14%	9.69%	9.69%	10.35%	TBD
9. DROP	11.33%	11.33%	11.60%	11.60%	12.37%	TBD
10. Composite with DROP	9.32%	9.32%	9.82%	9.82%	10.50%	TBD

<sup>1</sup> The above rates (applied to DB plan payroll) are combined with the Investment Plan contribution rates (applied to IP payroll) to derive the uniform blended rates employers contribute.

<sup>2</sup> Contribution rates shown above do not include the 3% required employee contribution rate.

<sup>3</sup> The Plan Year 2016-2017 rates shown in this table differ from those developed in the July 1, 2015 actuarial valuation due to the modification of Special Risk in-line-of-duty death benefit provisions by the Florida Legislature subsequent to the publication of the valuation report.

<sup>4</sup> The Plan Year 2017-2018 rates shown in this table differ from those developed in the July 1, 2016 actuarial valuation due to the modification of Special Risk in-line-of-duty death benefit provisions by the Florida Legislature subsequent to the publication of the valuation report.

## 5. Accounting Statement

The liabilities presented in this report differ by section regarding whether future anticipated salary increases or service credits are included in the calculation. Actuarial Liabilities in Sections 3 and 4 are determined for plan funding purposes and include a provision for the projected effects of future salary increases and future service performed by current FRS Pension Plan members.

Statement No. 67 of the Governmental Accounting Standards Board (GASB) is the current standard for pension plan accounting disclosure by governmental pension systems. GASB 67 information for the FRS Pension Plan as of July 1, 2017 was provided under separate cover in November 2017.<sup>1</sup> GASB 67 liability calculations also include a provision for the projected effects of future salary increases and future service performed by current FRS Pension Plan members, but use a different actuarial cost allocation method to be in compliance with GASB standards.

Accounting Standards Codification (ASC) 960 – Plan Accounting – Defined Benefit Pension Plans, formerly titled Statement No. 35 of the Financial Accounting Standards Board (FASB), specifies a different methodology for disclosure of certain information regarding pension plan funded status. Accounting liabilities calculated under ASC 960 do not include the effects of either projected future salary increases or projected future service performed.

The ASC 960 disclosures are intended to provide a “snap shot” view of how the Plan’s assets compare to its liabilities if contributions stopped and accrued benefit claims had to be satisfied. The Accumulated Benefit Obligation (ABO) is determined based on each member’s accrued benefit, that is, the benefit based on employee service performed and compensation earned up to the valuation date. We assume that the plan is ongoing and that members continue to terminate employment, retire, and otherwise act in accordance with the actuarial assumptions. Liabilities are discounted at the assumed valuation interest rate of 7.50% per annum.

Table 5-1 presents the ABO for the FRS Pension Plan determined as of July 1, 2017. All of the calculations presented in that table are based on the actuarial assumptions used in the valuation, as described in Appendix A, except salaries are not projected to increase and no future benefit service is credited for service performed after the valuation date. Values of the ABO are shown by type of member and by class. The active members' values are also divided between the employee-financed (accumulated member contributions) and employer-financed portions, with the employer-financed portions shown separately for vested benefits and non-vested benefits. For purposes of calculating the ABO post-Senate Bill 2100, we estimated the COLA percentage for each member as 3% multiplied by service through June 30, 2011, divided by projected total service at the time of retirement.

Table 5-2 presents the total ABO for the FRS Pension Plan for the current and two prior valuations. The trend of the Pension Plan’s ASC 960 funded status, as measured by the ABO over a period of time, is one indication of the progress being made in accumulating sufficient assets to pay benefits when due. Past and future results are affected by changes in actuarial assumptions, benefit provisions, and accounting policies.

Table 5-3 reconciles the ABO determined as of the prior valuation, July 1, 2016, to the ABO as of July 1, 2017. This reconciliation indicates the impact of the assumption changes and plan changes, if any.

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<sup>1</sup> The valuation report in prior years included Table 5-4 which showed the Net Pension Obligation under GASB Statement No. 27. That exhibit has been discontinued since GASB Statement No. 27 is not applicable after plan year 2013-2014. Please refer to the separate GASB 67 report for financial reporting information.

**Table 5-1**  
**Florida Retirement System Pension Plan**  
**Accumulated Benefit Obligation - ASC 960**  
**July 1, 2017**  
(All Amounts in Thousands)

	Regular	Special Risk	Special Risk Administrative	-- Elected Officers' Class --			Senior Management	DROP	Total
			Judicial	Leg-Atty-Cab	Local				
<b>A. Accumulated Benefit Obligation</b>									
1. Active Members									
a. Accumulated Member Contributions	\$2,637,035	\$503,195	\$509	\$15,224	\$977	\$6,038	\$74,923	\$0	\$3,237,901
b. Employer-Financed Vested Benefits	19,363,337	6,407,491	6,847	252,799	12,828	93,040	903,731	0	27,040,073
c. Employer-Financed Non-Vested Benefits	831,813	224,426	269	7,231	907	3,637	21,991	0	1,090,274
d. Total	\$22,832,185	\$7,135,112	\$7,625	\$275,254	\$14,712	\$102,715	\$1,000,645	\$0	\$31,368,248
2. Annuitants	\$76,841,026	\$20,508,389	\$74,711	\$881,630	\$87,734	\$499,000	\$2,772,933	\$15,749,075	\$117,414,498
3. Other Inactive Members	\$4,208,360	\$656,240	\$1,402	\$19,053	\$8,312	\$18,121	\$159,597	\$0	\$5,071,085
4. Total Accumulated Benefit Obligation	\$103,881,571	\$28,299,741	\$83,738	\$1,175,937	\$110,758	\$619,836	\$3,933,175	\$15,749,075	\$153,853,831
<b>B. Assets Available for Benefits</b>									
1. Market	\$108,188,253	\$28,282,626	\$73,647	\$869,269	\$58,416	\$306,934	\$2,687,774	\$13,586,344	\$154,053,263
2. Actuarial Basis	\$105,758,356	\$27,647,401	\$71,993	\$849,745	\$57,104	\$300,040	\$2,627,407	\$13,281,196	\$150,593,242
<b>C. Unfunded / (Surplus) Total Accumulated Benefit Obligation,</b>									
Assets at:									
1. Market	(\$4,306,682)	\$17,115	\$10,091	\$306,668	\$52,342	\$312,902	\$1,245,401	\$2,162,731	(\$199,432)
2. Actuarial Basis	(\$1,876,785)	\$652,340	\$11,745	\$326,192	\$53,654	\$319,796	\$1,305,768	\$2,467,879	\$3,260,589
<b>D. Percent of Accumulated Obligation Funded,</b>									
Assets at:									
1. Market	104.15%	99.94%	87.95%	73.92%	52.74%	49.52%	68.34%	86.27%	100.13%
2. Actuarial Basis	101.81%	97.69%	85.97%	72.26%	51.56%	48.41%	66.80%	84.33%	97.88%

**Table 5-2**  
**Florida Retirement System Pension Plan**  
**Analysis of Funding Progress - ASC 960**  
(All Amounts in Thousands)

	<u>July 1, 2015</u> <u>Valuation Basis</u>	<u>July 1, 2016</u> <u>Valuation Basis</u>	<u>July 1, 2017</u> <u>Valuation Basis</u>
<b>A. Accumulated Benefit Obligation</b>			
<b>1. Active Members</b>			
a. Accumulated Member Contributions	\$2,304,079	\$2,775,994	\$3,237,901
b. Employer-Financed Vested Benefits	27,805,980	26,754,501	27,040,073
c. Employer-Financed Non-Vested Benefits	<u>1,086,499</u>	<u>1,064,426</u>	<u>1,090,274</u>
d. Total	\$31,196,558	\$30,594,921	\$31,368,248
2. Annuitants	\$88,519,139	\$96,445,460	\$101,665,423
3. Other Inactive Members	\$4,647,199	\$4,914,799	\$5,071,085
4. DROP	<u>\$18,058,528</u>	<u>\$14,569,858</u>	<u>\$15,749,075</u>
5. Total Accumulated Benefit Obligation	\$142,421,424	\$146,525,038	\$153,853,831
 <b>B. Assets Available for Benefits</b>			
1. Market	\$148,454,394	\$141,780,921	\$154,053,263
2. Actuarial Basis	\$143,195,531	\$145,451,612	\$150,593,242
 <b>C. Unfunded/(Surplus) Total Accumulated Benefit Obligation,</b> Assets at:			
1. Market	(\$6,032,970)	\$4,744,117	(\$199,432)
2. Actuarial Basis	(\$774,107)	\$1,073,426	\$3,260,589
 <b>D. Percent of Accumulated Benefit Obligation Funded,</b> Assets at:			
1. Market	104.24%	96.76%	100.13%
2. Actuarial Basis	100.54%	99.27%	97.88%
E. Annual Salaries <sup>1</sup>	\$25,063,048	\$25,204,393	\$26,171,584
 <b>F. Unfunded/(Surplus) Accumulated Benefit Obligation as a</b> Percent of Salary, Assets at:			
1. Market	-24.07%	18.82%	-0.76%
2. Actuarial Basis	-3.09%	4.26%	12.46%

<sup>1</sup> Includes Drop Salaries

**Table 5-3**  
**Florida Retirement System Pension Plan**  
**Statement of Changes in Accumulated**  
**Benefit Obligation**  
 (All Amounts in Thousands)

	<u>ASC 960 Basis</u>
Accumulated Benefit Obligation at July 1, 2016	\$146,525,038
Increase (Decrease) During Year Attributable to:	
Increase for Interest Due to Decrease in Discount Period	\$10,767,425
Benefits Paid - PY 2017	(\$9,877,660)
Benefits Accrued, & Other Gains/Losses	\$4,679,651
Plan Provision / Assumption Changes	\$1,759,377
Net Increase (Decrease)	\$7,328,793
Accumulated Benefit Obligation at July 1, 2017	\$153,853,831

## Appendix A: Actuarial Methods, Procedures and Assumptions

The actuarial assumptions are intended to estimate the future experience of FRS Pension Plan members, employers and investments. Any variations in future actual experience from these assumptions will result in corresponding changes in actuarially calculated contribution rates.

### Assumption Tables

A complete listing of all the assumptions, methods, and procedures that are used in the 2017 actuarial valuation of the FRS Pension Plan are summarized on the following pages. These assumptions, methods, and procedures were approved by the 2017 FRS Actuarial Assumption Conference and are based on the 2014 Experience Study. For this valuation, the one assumption update approved by the 2017 FRS Actuarial Assumption Conference was a decrease in the investment return assumption from 7.60% to 7.50%.

### Data

Except where noted, the analysis in this valuation was based on data as of June 30, 2017, as provided by the Division of Retirement, Florida Department of Management Services. The data used in this valuation consists of financial information and records of age, service and income of active members, annuitants, and other inactive members entitled to future benefits. The Division of Retirement, Florida Department of Management Services is solely responsible for the validity, accuracy and comprehensiveness of this information; the results of our analysis can be expected to differ and may need to be revised if the underlying data supplied is incomplete or inaccurate.

### Methods and Procedures

**Actuarial cost method:** The total cost of the FRS Pension Plan, over time, will be equal to the benefits paid and expenses less actual investment earnings and is not affected directly by the actuarial cost method. The actuarial cost method is simply a tool to allocate costs to past, current, or future years and thus primarily affects the timing of cost recognition.

The FRS Pension Plan uses Entry Age Normal (EAN), which is the most commonly used general cost method approach for state pension systems. Conceptually, EAN sets the normal cost rate level as a percent of payroll over a member's full projected working career. There are different categories of EAN, including Individual EAN, which is by far the most commonly used EAN category, and Ultimate EAN, which is the category of EAN used by the FRS Pension Plan. Even each category of EAN contains different interpretations of how to calculate the key metrics. GASB Statements Nos. 67 & 68 mandate the use of a particular interpretation of Individual EAN for financial reporting purposes. GASB 67 & 68 information is provided under separate cover.

Sponsors have autonomy to choose any cost method and identify any variation of that cost method for purposes of setting system funding policy. Ultimate EAN, which is used by the FRS, sets normal cost as if each member was initially enrolled on or after July 1, 2011 (Tier II). As such, normal cost is lower for Ultimate EAN than for Individual EAN, which sets normal cost in a manner that is representative of the tier in which the member actually participates. Cost methods do allocate benefits between past and projected future service, but do not affect the level of projected benefits; benefits are based on the actual tier of membership under either Ultimate EAN or Individual EAN. Compared to the Individual EAN method, the Ultimate EAN method allocates fewer projected benefits to future service (via lower normal cost) and hence produces a higher actuarial accrued liability for past service as a counterbalance.

The interpretation of Ultimate EAN used in this 2017 valuation sets normal cost rates as if each member in the Pension Plan was in Tier II as noted above. The projected future service period used for calculating the present value of future normal costs is based on Tier I retirement timing assumptions for members in Tier I. This is the same method used in the prior valuation.

**UAL amortization method:** The Unfunded Actuarial Liability (UAL) is amortized as a level percentage of projected payroll on which UAL Rates are charged in an effort to maintain level contribution rates as a percentage of payroll during the specified amortization period if future experience follows assumptions.

New UAL arises each year and is calculated in each new actuarial valuation. The newly arising UAL can be either positive or negative, and can be due either to experience varying from assumptions or to changes in actuarial liability from modifications to assumptions, plan provisions, or actuarial methods. Each year's newly arising UAL is currently amortized over a closed 30-year period as a level percent of the projected payroll on which UAL rates are charged.

Amortization periods longer than 20 years can incur significant negative amortization, wherein the calculated UAL increases for an extended period of time prior to final payoff even if all contributions are made and all assumptions are met. This was discussed and illustrated in Milliman's August 11, 2014 presentation materials to the FRS Actuarial Assumptions Conference.

**Asset valuation method:** This method recognizes actual investment performance different from the long-term assumption systematically. The expected Actuarial Value of Assets (AVA) is determined by crediting the rate of investment return assumed in the prior valuation to the prior year's AVA. Then, 20% of the difference between the actual Market Value of Assets (MVA) and the expected AVA is immediately recognized in the AVA. To ensure that the AVA remains reasonably close to the MVA, the asset method includes a corridor whereby the AVA must remain within 80% to 120% of MVA.

### Economic Assumptions

Assumption	
Inflation	2.60%
Real wage growth	0.65%
Payroll growth	3.25% (sum of two items above)
Investment Return	7.50%

### Demographic Assumptions

#### Mortality

##### Healthy Inactive Mortality (Post-Employment)

- Female Non-Disabled: RP2000 Generational, 100% Annuitant White Collar, Scale BB
- Male Non-Disabled (other than Special Risk): RP2000 Generational, 50% Annuitant White Collar / 50% Annuitant Blue Collar, Scale BB
- Male Non-Disabled (Special Risk): RP2000 Generational, 10% Annuitant White Collar / 90% Annuitant Blue Collar, Scale BB

Healthy Active Mortality (During Employment) *[Updated assumption for this valuation]*

- Female Non-Disabled: RP2000 Generational, 100% Combined Healthy White Collar, Scale BB
- Male Non-Disabled (other than Special Risk): RP2000 Generational, 50% Combined Healthy White Collar / 50% Combined Healthy Blue Collar, Scale BB
- Male Non-Disabled (Special Risk): RP2000 Generational, 10% Combined Healthy White Collar / 90% Combined Healthy Blue Collar, Scale BB
- For Special Risk members, 25% of future active member deaths are assumed to be in the line of duty
- For all other members, 2% of future active member deaths are assumed to be in the line of duty

Disabled Mortality

- Female Disabled (other than Special Risk): RP2000, 100% Disabled Female set forward two years, no projection scale
- Female Disabled (Special Risk): 60% RP2000 Disabled Female set forward two years / 40% Annuitant White Collar with no setback, no projection scale
- Male Disabled (other than Special Risk): RP2000, 100% Disabled Male setback four years, no projection scale
- Male Disabled (Special Risk): 60% RP2000 Disabled Male setback four years / 40% Annuitant White Collar with no setback, no projection scale

**Retirement for Vested Terminated Members (Tier I and Tier II)**

All current vested terminated members are assumed to begin receiving benefits on the normal retirement benefit age for the appropriate class and tier. All future members who terminate employment with a vested benefit are also assumed to commence benefit at the normal retirement benefit age.

**Optional Form of Payment**

All future retirees are assumed to elect the straight life (Option 1) form of benefit. For current retirees and members in DROP, the actual elected form is used.

**Retirement Assumptions (Tier I)**  
**DROP Entry at first retirement eligibility**

Age	Regular		Special Risk and Special Risk Admin		All Other	
	Female	Male	Female	Male	Female	Male
45	0.0%	0.0%	20.0%	23.0%	0.0%	0.0%
46	0.0%	0.0%	20.0%	23.0%	0.0%	0.0%
47	0.0%	0.0%	20.0%	23.0%	0.0%	0.0%
48	27.0%	23.0%	20.0%	30.0%	30.0%	30.0%
49	27.0%	23.0%	20.0%	30.0%	32.5%	32.5%
50	27.0%	23.0%	20.0%	30.0%	35.0%	35.0%
51	27.0%	23.0%	20.0%	40.0%	37.5%	37.5%
52	27.0%	23.0%	30.0%	50.0%	40.0%	40.0%
53	27.0%	23.0%	20.0%	50.0%	42.5%	42.5%
54	27.0%	23.0%	20.0%	50.0%	45.0%	45.0%
55	33.0%	30.0%	31.0%	29.0%	47.5%	47.5%
56	33.0%	30.0%	20.0%	5.0%	50.0%	50.0%
57	48.0%	55.0%	5.0%	5.0%	52.5%	52.5%
58	48.0%	55.0%	5.0%	5.0%	55.0%	55.0%
59	55.0%	55.0%	5.0%	5.0%	57.5%	57.5%
60	55.0%	55.0%	5.0%	5.0%	60.0%	60.0%
61	55.0%	55.0%	5.0%	5.0%	62.5%	62.5%
62	45.5%	41.0%	5.0%	5.0%	50.0%	50.0%
63	5.0%	5.0%	5.0%	5.0%	15.0%	15.0%
64	5.0%	5.0%	5.0%	5.0%	15.0%	15.0%
65	5.0%	5.0%	5.0%	5.0%	15.0%	15.0%
66	5.0%	5.0%	5.0%	5.0%	15.0%	15.0%
67	5.0%	5.0%	5.0%	5.0%	15.0%	15.0%
68	5.0%	5.0%	5.0%	5.0%	15.0%	15.0%
69	5.0%	5.0%	5.0%	5.0%	15.0%	15.0%
70-79	5.0%	5.0%	0.0%	0.0%	15.0%	15.0%
80	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

**Immediate Retirement at first retirement eligibility**

Age	Regular		Special Risk and Special Risk Admin		Elected Officers' (All Subclasses)		Senior Management Service Class	
	Female	Male	Female	Male	Female	Male	Female	Male
45	0.0%	0.0%	4.0%	4.0%	0.0%	0.0%	0.0%	0.0%
46	0.0%	0.0%	4.0%	4.0%	0.0%	0.0%	0.0%	0.0%
47	0.0%	0.0%	4.0%	7.0%	0.0%	0.0%	0.0%	0.0%
48	4.0%	4.0%	4.0%	7.0%	10.0%	10.0%	5.0%	5.0%
49	4.0%	4.0%	4.0%	7.0%	10.0%	10.0%	5.0%	5.0%
50	4.0%	4.0%	7.0%	7.0%	10.0%	10.0%	5.0%	5.0%
51	4.0%	4.0%	7.0%	7.0%	10.0%	10.0%	5.0%	5.0%
52	4.0%	4.0%	7.0%	7.0%	10.0%	10.0%	5.0%	5.0%
53	4.0%	4.0%	7.0%	7.0%	10.0%	10.0%	5.0%	5.0%
54	5.0%	4.0%	7.0%	7.0%	10.0%	10.0%	5.0%	5.0%
55	5.0%	5.0%	7.0%	6.0%	10.0%	10.0%	5.0%	5.0%
56	7.0%	5.0%	6.0%	6.0%	10.0%	10.0%	5.0%	5.0%
57	7.0%	5.0%	6.0%	6.0%	10.0%	10.0%	5.0%	5.0%
58	7.0%	5.0%	6.0%	6.0%	10.0%	10.0%	10.0%	10.0%
59	7.0%	5.0%	6.0%	6.0%	10.0%	10.0%	10.0%	10.0%
60	7.0%	5.0%	6.0%	6.0%	10.0%	10.0%	10.0%	10.0%
61	9.0%	8.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
62	9.0%	11.0%	15.0%	15.0%	10.0%	10.0%	10.0%	10.0%
63	9.0%	10.0%	20.0%	20.0%	10.0%	10.0%	5.0%	5.0%
64	9.0%	10.0%	25.0%	25.0%	10.0%	10.0%	5.0%	5.0%
65	15.0%	10.0%	30.0%	30.0%	10.0%	10.0%	5.0%	5.0%
66	10.0%	10.0%	35.0%	35.0%	10.0%	10.0%	5.0%	5.0%
67	10.0%	10.0%	35.0%	35.0%	10.0%	10.0%	5.0%	5.0%
68	10.0%	10.0%	35.0%	35.0%	10.0%	10.0%	5.0%	5.0%
69	10.0%	10.0%	35.0%	35.0%	10.0%	10.0%	5.0%	5.0%
70-79	10.0%	10.0%	100.0%	100.0%	10.0%	10.0%	5.0%	5.0%
80	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

## Retirement Assumptions (Tier I) (continued)

### Combined DROP/Immediate Retirement at first retirement eligibility

Age	Regular		Special Risk and Special Risk Admin		Elected Officers' (All Subclasses)		Senior Management Service Class	
	Female	Male	Female	Male	Female	Male	Female	Male
45	0.0%	0.0%	24.0%	27.0%	0.0%	0.0%	0.0%	0.0%
46	0.0%	0.0%	24.0%	27.0%	0.0%	0.0%	0.0%	0.0%
47	0.0%	0.0%	24.0%	30.0%	0.0%	0.0%	0.0%	0.0%
48	31.0%	27.0%	24.0%	37.0%	40.0%	40.0%	35.0%	35.0%
49	31.0%	27.0%	24.0%	37.0%	42.5%	42.5%	37.5%	37.5%
50	31.0%	27.0%	27.0%	37.0%	45.0%	45.0%	40.0%	40.0%
51	31.0%	27.0%	27.0%	47.0%	47.5%	47.5%	42.5%	42.5%
52	31.0%	27.0%	37.0%	57.0%	50.0%	50.0%	45.0%	45.0%
53	31.0%	27.0%	27.0%	57.0%	52.5%	52.5%	47.5%	47.5%
54	32.0%	27.0%	27.0%	57.0%	55.0%	55.0%	50.0%	50.0%
55	38.0%	35.0%	38.0%	35.0%	57.5%	57.5%	52.5%	52.5%
56	40.0%	35.0%	26.0%	11.0%	60.0%	60.0%	55.0%	55.0%
57	55.0%	60.0%	11.0%	11.0%	62.5%	62.5%	57.5%	57.5%
58	55.0%	60.0%	11.0%	11.0%	65.0%	65.0%	65.0%	65.0%
59	62.0%	60.0%	11.0%	11.0%	67.5%	67.5%	67.5%	67.5%
60	62.0%	60.0%	11.0%	11.0%	70.0%	70.0%	70.0%	70.0%
61	64.0%	63.0%	15.0%	15.0%	72.5%	72.5%	72.5%	72.5%
62	54.5%	52.0%	20.0%	20.0%	60.0%	60.0%	60.0%	60.0%
63	14.0%	15.0%	25.0%	25.0%	25.0%	25.0%	20.0%	20.0%
64	14.0%	15.0%	30.0%	30.0%	25.0%	25.0%	20.0%	20.0%
65	20.0%	15.0%	35.0%	35.0%	25.0%	25.0%	20.0%	20.0%
66	15.0%	15.0%	40.0%	40.0%	25.0%	25.0%	20.0%	20.0%
67	15.0%	15.0%	40.0%	40.0%	25.0%	25.0%	20.0%	20.0%
68	15.0%	15.0%	40.0%	40.0%	25.0%	25.0%	20.0%	20.0%
69	15.0%	15.0%	40.0%	40.0%	25.0%	25.0%	20.0%	20.0%
70-79	15.0%	15.0%	100.0%	100.0%	25.0%	25.0%	20.0%	20.0%
80	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

### Deferred Retirement subsequent to first retirement eligibility

Age	Regular		Special Risk and Special Risk Admin		All Other	
	Female	Male	Female	Male	Female	Male
45	0.0%	0.0%	3.0%	3.0%	0.0%	0.0%
46	0.0%	0.0%	3.0%	3.0%	0.0%	0.0%
47	0.0%	0.0%	3.0%	3.0%	0.0%	0.0%
48	2.0%	2.0%	4.0%	4.0%	5.0%	5.0%
49	2.0%	2.0%	4.0%	4.0%	5.0%	5.0%
50	2.0%	2.0%	4.0%	4.0%	5.0%	5.0%
51	2.0%	2.0%	4.0%	4.0%	5.0%	5.0%
52	2.0%	2.0%	5.0%	5.0%	5.0%	5.0%
53	2.0%	2.0%	5.0%	5.0%	5.0%	5.0%
54	2.0%	2.0%	5.0%	5.0%	5.0%	5.0%
55	2.0%	2.0%	5.0%	5.0%	5.0%	5.0%
56	2.0%	2.0%	5.0%	5.0%	5.0%	5.0%
57	2.0%	2.0%	5.0%	5.0%	5.0%	5.0%
58	3.5%	2.0%	5.0%	5.0%	5.0%	5.0%
59	5.0%	2.0%	5.0%	5.0%	5.0%	5.0%
60	5.0%	5.0%	7.0%	7.0%	5.0%	5.0%
61	5.0%	5.0%	9.0%	9.0%	5.0%	5.0%
62	12.0%	11.0%	20.0%	20.0%	15.0%	15.0%
63	8.0%	8.0%	20.0%	20.0%	11.0%	11.0%
64	8.0%	8.0%	20.0%	20.0%	11.0%	11.0%
65	15.0%	13.0%	20.0%	20.0%	15.0%	15.0%
66	15.0%	13.0%	25.0%	25.0%	15.0%	15.0%
67	15.0%	13.0%	25.0%	25.0%	15.0%	15.0%
68	15.0%	13.0%	25.0%	25.0%	15.0%	15.0%
69	15.0%	13.0%	25.0%	25.0%	15.0%	15.0%
70-79	15.0%	13.0%	100.0%	100.0%	15.0%	15.0%
80	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

## Retirement Assumptions (Tier II)

### DROP Entry at first retirement eligibility

Age	Regular		Special Risk and Special Risk Admin		All Other	
	Female	Male	Female	Male	Female	Male
45	0.0%	0.0%	20.0%	23.0%	0.0%	0.0%
46	0.0%	0.0%	20.0%	23.0%	0.0%	0.0%
47	0.0%	0.0%	20.0%	23.0%	0.0%	0.0%
48	27.0%	23.0%	20.0%	30.0%	30.0%	30.0%
49	27.0%	23.0%	20.0%	30.0%	32.5%	32.5%
50	27.0%	23.0%	20.0%	30.0%	35.0%	35.0%
51	27.0%	23.0%	20.0%	40.0%	37.5%	37.5%
52	27.0%	23.0%	30.0%	50.0%	40.0%	40.0%
53	27.0%	23.0%	20.0%	50.0%	42.5%	42.5%
54	27.0%	23.0%	20.0%	50.0%	45.0%	45.0%
55	33.0%	30.0%	20.0%	50.0%	47.5%	47.5%
56	33.0%	30.0%	20.0%	50.0%	50.0%	50.0%
57	48.0%	55.0%	20.0%	50.0%	52.5%	52.5%
58	48.0%	55.0%	20.0%	50.0%	55.0%	55.0%
59	55.0%	55.0%	20.0%	50.0%	57.5%	57.5%
60	55.0%	55.0%	31.0%	29.0%	60.0%	60.0%
61	55.0%	55.0%	20.0%	5.0%	62.5%	62.5%
62	55.0%	55.0%	5.0%	5.0%	62.5%	62.5%
63	55.0%	55.0%	5.0%	5.0%	62.5%	62.5%
64	55.0%	55.0%	5.0%	5.0%	62.5%	62.5%
65	45.5%	41.0%	5.0%	5.0%	50.0%	50.0%
66	5.0%	5.0%	5.0%	5.0%	15.0%	15.0%
67	5.0%	5.0%	5.0%	5.0%	15.0%	15.0%
68	5.0%	5.0%	5.0%	5.0%	15.0%	15.0%
69	5.0%	5.0%	5.0%	5.0%	15.0%	15.0%
70-79	5.0%	5.0%	0.0%	0.0%	15.0%	15.0%
80	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

### Immediate Retirement at first retirement eligibility

Age	Regular		Special Risk and Special Risk Admin		Elected Officers' (All Subclasses)		Senior Management Service Class	
	Female	Male	Female	Male	Female	Male	Female	Male
45	0.0%	0.0%	4.0%	4.0%	0.0%	0.0%	0.0%	0.0%
46	0.0%	0.0%	4.0%	4.0%	0.0%	0.0%	0.0%	0.0%
47	0.0%	0.0%	4.0%	7.0%	0.0%	0.0%	0.0%	0.0%
48	4.0%	4.0%	4.0%	7.0%	10.0%	10.0%	5.0%	5.0%
49	4.0%	4.0%	4.0%	7.0%	10.0%	10.0%	5.0%	5.0%
50	4.0%	4.0%	7.0%	7.0%	10.0%	10.0%	5.0%	5.0%
51	4.0%	4.0%	7.0%	7.0%	10.0%	10.0%	5.0%	5.0%
52	4.0%	4.0%	7.0%	7.0%	10.0%	10.0%	5.0%	5.0%
53	4.0%	4.0%	7.0%	7.0%	10.0%	10.0%	5.0%	5.0%
54	5.0%	4.0%	7.0%	7.0%	10.0%	10.0%	5.0%	5.0%
55	5.0%	5.0%	7.0%	6.0%	10.0%	10.0%	5.0%	5.0%
56	7.0%	5.0%	6.0%	6.0%	10.0%	10.0%	5.0%	5.0%
57	7.0%	5.0%	6.0%	6.0%	10.0%	10.0%	5.0%	5.0%
58	7.0%	5.0%	6.0%	6.0%	10.0%	10.0%	10.0%	10.0%
59	7.0%	5.0%	6.0%	6.0%	10.0%	10.0%	10.0%	10.0%
60	7.0%	5.0%	6.0%	6.0%	10.0%	10.0%	10.0%	10.0%
61	9.0%	8.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
62	9.0%	8.0%	15.0%	15.0%	10.0%	10.0%	10.0%	10.0%
63	9.0%	8.0%	20.0%	20.0%	10.0%	10.0%	10.0%	10.0%
64	9.0%	8.0%	25.0%	25.0%	10.0%	10.0%	10.0%	10.0%
65	15.0%	11.0%	30.0%	30.0%	10.0%	10.0%	10.0%	10.0%
66	10.0%	10.0%	35.0%	35.0%	10.0%	10.0%	5.0%	5.0%
67	10.0%	10.0%	35.0%	35.0%	10.0%	10.0%	5.0%	5.0%
68	10.0%	10.0%	35.0%	35.0%	10.0%	10.0%	5.0%	5.0%
69	10.0%	10.0%	35.0%	35.0%	10.0%	10.0%	5.0%	5.0%
70-79	10.0%	10.0%	100.0%	100.0%	10.0%	10.0%	5.0%	5.0%
80	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

## Retirement Assumptions (Tier II) (continued)

### Combined DROP/Immediate Retirement at first retirement eligibility

Age	Regular		Special Risk and Special Risk Admin		Elected Officers' (All Subclasses)		Senior Management Service Class	
	Female	Male	Female	Male	Female	Male	Female	Male
45	0.0%	0.0%	24.0%	27.0%	0.0%	0.0%	0.0%	0.0%
46	0.0%	0.0%	24.0%	27.0%	0.0%	0.0%	0.0%	0.0%
47	0.0%	0.0%	24.0%	30.0%	0.0%	0.0%	0.0%	0.0%
48	31.0%	27.0%	24.0%	37.0%	40.0%	40.0%	35.0%	35.0%
49	31.0%	27.0%	24.0%	37.0%	42.5%	42.5%	37.5%	37.5%
50	31.0%	27.0%	27.0%	37.0%	45.0%	45.0%	40.0%	40.0%
51	31.0%	27.0%	27.0%	47.0%	47.5%	47.5%	42.5%	42.5%
52	31.0%	27.0%	37.0%	57.0%	50.0%	50.0%	45.0%	45.0%
53	31.0%	27.0%	27.0%	57.0%	52.5%	52.5%	47.5%	47.5%
54	32.0%	27.0%	27.0%	57.0%	55.0%	55.0%	50.0%	50.0%
55	38.0%	35.0%	27.0%	56.0%	57.5%	57.5%	52.5%	52.5%
56	40.0%	35.0%	26.0%	56.0%	60.0%	60.0%	55.0%	55.0%
57	55.0%	60.0%	26.0%	56.0%	62.5%	62.5%	57.5%	57.5%
58	55.0%	60.0%	26.0%	56.0%	65.0%	65.0%	65.0%	65.0%
59	62.0%	60.0%	26.0%	56.0%	67.5%	67.5%	67.5%	67.5%
60	62.0%	60.0%	37.0%	35.0%	70.0%	70.0%	70.0%	70.0%
61	64.0%	63.0%	30.0%	15.0%	72.5%	72.5%	72.5%	72.5%
62	64.0%	63.0%	20.0%	20.0%	72.5%	72.5%	72.5%	72.5%
63	64.0%	63.0%	25.0%	25.0%	72.5%	72.5%	72.5%	72.5%
64	64.0%	63.0%	30.0%	30.0%	72.5%	72.5%	72.5%	72.5%
65	60.5%	52.0%	35.0%	35.0%	60.0%	60.0%	60.0%	60.0%
66	15.0%	15.0%	40.0%	40.0%	25.0%	25.0%	20.0%	20.0%
67	15.0%	15.0%	40.0%	40.0%	25.0%	25.0%	20.0%	20.0%
68	15.0%	15.0%	40.0%	40.0%	25.0%	25.0%	20.0%	20.0%
69	15.0%	15.0%	40.0%	40.0%	25.0%	25.0%	20.0%	20.0%
70-79	15.0%	15.0%	100.0%	100.0%	25.0%	25.0%	20.0%	20.0%
80	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

### Deferred Retirement subsequent to first retirement eligibility

Age	Regular		Special Risk and Special Risk Admin		All Other	
	Female	Male	Female	Male	Female	Male
45	0.0%	0.0%	3.0%	3.0%	0.0%	0.0%
46	0.0%	0.0%	3.0%	3.0%	0.0%	0.0%
47	0.0%	0.0%	3.0%	3.0%	0.0%	0.0%
48	2.0%	2.0%	4.0%	4.0%	5.0%	5.0%
49	2.0%	2.0%	4.0%	4.0%	5.0%	5.0%
50	2.0%	2.0%	4.0%	4.0%	5.0%	5.0%
51	2.0%	2.0%	4.0%	4.0%	5.0%	5.0%
52	2.0%	2.0%	5.0%	5.0%	5.0%	5.0%
53	2.0%	2.0%	5.0%	5.0%	5.0%	5.0%
54	2.0%	2.0%	5.0%	5.0%	5.0%	5.0%
55	2.0%	2.0%	5.0%	5.0%	5.0%	5.0%
56	2.0%	2.0%	5.0%	5.0%	5.0%	5.0%
57	2.0%	2.0%	5.0%	5.0%	5.0%	5.0%
58	3.5%	2.0%	5.0%	5.0%	5.0%	5.0%
59	5.0%	2.0%	5.0%	5.0%	5.0%	5.0%
60	5.0%	5.0%	7.0%	7.0%	5.0%	5.0%
61	5.0%	5.0%	9.0%	9.0%	5.0%	5.0%
62	5.0%	5.0%	20.0%	20.0%	5.0%	5.0%
63	5.0%	5.0%	20.0%	20.0%	5.0%	5.0%
64	5.0%	5.0%	20.0%	20.0%	5.0%	5.0%
65	12.0%	11.0%	20.0%	20.0%	15.0%	15.0%
66	8.0%	8.0%	25.0%	25.0%	11.0%	11.0%
67	8.0%	8.0%	25.0%	25.0%	11.0%	11.0%
68	15.0%	13.0%	25.0%	25.0%	15.0%	15.0%
69	15.0%	13.0%	25.0%	25.0%	15.0%	15.0%
70-79	15.0%	13.0%	100.0%	100.0%	15.0%	15.0%
80	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

## Line-of-Duty Disability Annual Rates

Age	SR Male	SR Female	Other Male	Other Female
20	0.010%	0.000%	0.000%	0.000%
21	0.010%	0.000%	0.000%	0.000%
22	0.010%	0.000%	0.000%	0.000%
23	0.010%	0.000%	0.000%	0.000%
24	0.010%	0.000%	0.000%	0.000%
25	0.010%	0.004%	0.001%	0.001%
26	0.010%	0.004%	0.001%	0.001%
27	0.010%	0.004%	0.001%	0.001%
28	0.010%	0.004%	0.001%	0.001%
29	0.010%	0.004%	0.001%	0.001%
30	0.010%	0.004%	0.001%	0.001%
31	0.010%	0.004%	0.001%	0.001%
32	0.010%	0.004%	0.001%	0.001%
33	0.010%	0.004%	0.001%	0.001%
34	0.010%	0.004%	0.001%	0.001%
35	0.010%	0.004%	0.001%	0.001%
36	0.010%	0.004%	0.001%	0.001%
37	0.010%	0.040%	0.001%	0.001%
38	0.020%	0.040%	0.001%	0.001%
39	0.020%	0.040%	0.001%	0.001%
40	0.020%	0.040%	0.001%	0.001%
41	0.020%	0.060%	0.004%	0.001%
42	0.020%	0.060%	0.004%	0.001%
43	0.020%	0.060%	0.004%	0.001%
44	0.040%	0.040%	0.004%	0.001%
45	0.060%	0.040%	0.004%	0.001%
46	0.080%	0.040%	0.004%	0.001%
47	0.100%	0.040%	0.004%	0.001%
48	0.120%	0.040%	0.004%	0.001%
49	0.140%	0.040%	0.004%	0.001%
50	0.140%	0.050%	0.006%	0.006%
51	0.100%	0.060%	0.006%	0.006%
52	0.100%	0.070%	0.006%	0.006%
53	0.100%	0.080%	0.006%	0.006%
54	0.100%	0.080%	0.006%	0.006%
55	0.100%	0.080%	0.006%	0.006%
56	0.100%	0.080%	0.006%	0.006%
57	0.100%	0.080%	0.006%	0.006%
58	0.100%	0.150%	0.006%	0.006%
59	0.100%	0.150%	0.010%	0.015%
60	0.140%	0.150%	0.010%	0.013%
61	0.180%	0.150%	0.010%	0.010%
62	0.220%	0.150%	0.010%	0.010%
63	0.260%	0.150%	0.010%	0.010%
64	0.300%	0.150%	0.010%	0.010%
65	0.260%	0.150%	0.010%	0.010%
66	0.240%	0.100%	0.010%	0.010%
67	0.200%	0.100%	0.010%	0.010%
68	0.100%	0.100%	0.010%	0.010%
69	0.100%	0.100%	0.010%	0.010%
70-79	0.100%	0.100%	0.010%	0.010%
80	0.100%	0.100%	0.001%	0.001%

## Non-Duty Disability Annual Rates

Age	SR Male	SR Female	Other Male	Other Female
20	0.020%	0.000%	0.000%	0.000%
21	0.020%	0.000%	0.010%	0.010%
22	0.020%	0.000%	0.010%	0.010%
23	0.020%	0.000%	0.010%	0.010%
24	0.020%	0.000%	0.010%	0.010%
25	0.020%	0.020%	0.010%	0.010%
26	0.020%	0.020%	0.010%	0.010%
27	0.020%	0.020%	0.010%	0.010%
28	0.030%	0.020%	0.010%	0.010%
29	0.030%	0.020%	0.010%	0.010%
30	0.030%	0.020%	0.010%	0.010%
31	0.030%	0.020%	0.010%	0.010%
32	0.030%	0.020%	0.010%	0.010%
33	0.030%	0.030%	0.010%	0.010%
34	0.030%	0.030%	0.020%	0.010%
35	0.030%	0.030%	0.020%	0.010%
36	0.030%	0.030%	0.020%	0.020%
37	0.030%	0.030%	0.020%	0.020%
38	0.030%	0.030%	0.020%	0.020%
39	0.030%	0.030%	0.020%	0.020%
40	0.030%	0.030%	0.020%	0.020%
41	0.030%	0.030%	0.040%	0.040%
42	0.030%	0.060%	0.040%	0.040%
43	0.030%	0.060%	0.040%	0.040%
44	0.030%	0.060%	0.080%	0.040%
45	0.030%	0.060%	0.080%	0.060%
46	0.030%	0.060%	0.080%	0.060%
47	0.080%	0.060%	0.080%	0.100%
48	0.080%	0.110%	0.080%	0.100%
49	0.080%	0.110%	0.120%	0.100%
50	0.080%	0.110%	0.160%	0.100%
51	0.080%	0.110%	0.200%	0.140%
52	0.080%	0.110%	0.200%	0.140%
53	0.050%	0.110%	0.200%	0.140%
54	0.050%	0.110%	0.200%	0.140%
55	0.050%	0.110%	0.250%	0.160%
56	0.050%	0.110%	0.250%	0.180%
57	0.050%	0.110%	0.250%	0.200%
58	0.050%	0.110%	0.300%	0.220%
59	0.050%	0.110%	0.300%	0.240%
60	0.050%	0.110%	0.300%	0.260%
61	0.050%	0.110%	0.200%	0.200%
62	0.050%	0.110%	0.150%	0.140%
63	0.050%	0.110%	0.100%	0.080%
64	0.050%	0.110%	0.100%	0.080%
65	0.050%	0.110%	0.100%	0.080%
66	0.050%	0.110%	0.040%	0.080%
67	0.050%	0.110%	0.040%	0.040%
68	0.050%	0.110%	0.040%	0.040%
69	0.050%	0.110%	0.040%	0.040%
70-79	0.050%	0.110%	0.040%	0.040%
80	0.050%	0.110%	0.040%	0.040%

**Withdrawal – Other Terminations of Employment Annual Rates**

Combined Years of Service	Regular – Male									
	20	25	30	35	Attained Age		50	55	60	65
					40	45				
0	32.8%	27.2%	25.8%	25.8%	24.4%	24.4%	23.4%	27.4%	27.4%	27.4%
1	25.4%	18.5%	15.4%	14.3%	12.6%	12.5%	12.2%	12.2%	12.2%	12.2%
2	22.7%	17.2%	14.0%	12.8%	12.0%	11.6%	10.7%	10.7%	10.7%	10.7%
3	18.4%	14.6%	13.2%	12.6%	10.7%	10.3%	9.4%	9.3%	9.3%	9.3%
4	15.8%	12.7%	11.8%	10.9%	9.0%	8.8%	7.9%	7.8%	7.8%	7.8%
5	11.7%	9.7%	8.8%	8.5%	7.4%	6.8%	6.0%	6.8%	6.8%	6.8%
6	11.1%	8.5%	7.8%	7.5%	6.7%	6.5%	5.5%	5.4%	5.4%	5.4%
7	11.1%	8.4%	7.1%	6.8%	6.2%	6.0%	5.3%	5.2%	5.1%	5.1%
8	11.0%	7.7%	6.4%	6.2%	5.8%	5.1%	4.6%	4.4%	4.3%	4.3%
9	10.0%	6.3%	5.5%	5.3%	5.3%	5.1%	4.6%	4.3%	4.2%	4.2%
10+	9.8%	6.2%	4.7%	4.2%	3.0%	2.7%	3.0%	4.5%	5.3%	3.7%

Combined Years of Service	Regular – Female									
	20	25	30	35	Attained Age		50	55	60	65
					40	45				
0	30.3%	26.6%	25.4%	25.4%	24.4%	24.4%	23.2%	23.2%	23.2%	23.2%
1	25.8%	19.8%	16.9%	15.9%	14.0%	13.9%	13.4%	13.4%	13.4%	13.4%
2	22.1%	17.1%	14.5%	13.5%	12.1%	11.9%	11.0%	11.0%	11.0%	11.0%
3	17.4%	13.0%	11.6%	11.2%	10.0%	9.8%	8.8%	8.7%	8.7%	8.7%
4	15.4%	12.9%	11.3%	10.9%	9.1%	8.8%	8.4%	8.3%	8.3%	8.3%
5	13.5%	10.7%	9.4%	9.0%	7.0%	6.7%	6.2%	6.1%	6.1%	6.1%
6	11.4%	9.7%	8.7%	8.0%	6.5%	6.5%	5.9%	5.8%	5.8%	5.8%
7	11.3%	9.2%	8.1%	7.8%	6.3%	6.1%	5.5%	5.4%	5.4%	5.4%
8	10.5%	7.8%	7.1%	6.8%	6.1%	5.8%	5.5%	5.4%	5.4%	5.4%
9	10.2%	7.1%	6.5%	6.2%	5.0%	4.7%	4.6%	4.5%	4.5%	4.5%
10+	11.6%	5.3%	5.4%	4.6%	3.3%	3.0%	3.0%	3.0%	3.0%	3.0%

Withdrawal (continued)

Elected Officers' Class: Local – Male											
Combined Years of Service	Attained Age										
	20	25	30	35	40	45	50	55	60	65	
0	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%
1	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%
2	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%
3	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
4	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
5	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%
6	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
7	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
8	13.8%	13.8%	13.8%	13.8%	13.8%	13.8%	13.6%	13.4%	13.3%	11.5%	
9	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%	4.6%	4.4%	4.3%	2.5%	
10+	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.6%	5.3%	5.2%	3.5%	

Elected Officers' Class: Local – Female											
Combined Years of Service	Attained Age										
	20	25	30	35	40	45	50	55	60	65	
0	0	0	0	0	0	0	0	0	0	0	0
1	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
2	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
3	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
4	18.1%	18.1%	18.1%	18.1%	18.1%	18.1%	18.1%	18.1%	18.1%	18.1%	18.1%
5	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%
6	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
7	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
8	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	11.9%	11.7%	11.6%	10.2%	
9	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.1%	2.8%	2.7%	1.0%	
10+	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.1%	3.9%	3.8%	2.4%	



Withdrawal (continued)

Elected Officers' Class: Leg-Atty-Cab – Male										
Combined Years of Service	Attained Age									
	20	25	30	35	40	45	50	55	60	65
0	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%
1	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%
2	11.7%	11.7%	11.7%	11.7%	11.7%	11.7%	11.7%	11.7%	11.7%	11.7%
3	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
4	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
5	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
6	10.6%	10.6%	10.6%	10.6%	10.6%	10.6%	10.6%	10.6%	10.6%	10.6%
7	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%
8	20.2%	20.2%	20.2%	20.2%	20.2%	20.8%	20.0%	18.7%	18.4%	16.7%
9	6.6%	6.6%	6.6%	6.6%	6.6%	7.2%	6.4%	5.2%	4.9%	3.1%
10+	6.7%	6.7%	6.7%	6.7%	6.7%	7.1%	6.6%	5.7%	5.5%	4.2%

Elected Officers' Class: Leg-Atty-Cab – Female										
Combined Years of Service	Attained Age									
	20	25	30	35	40	45	50	55	60	65
0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1	9.1%	9.1%	9.1%	9.1%	9.1%	9.1%	9.1%	9.1%	9.1%	9.1%
2	15.9%	15.9%	15.9%	15.9%	15.9%	15.9%	15.9%	15.9%	15.9%	15.9%
3	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
4	16.3%	16.3%	16.3%	16.3%	16.3%	16.3%	16.3%	16.3%	16.3%	16.3%
5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
6	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
8	17.8%	17.8%	17.8%	17.8%	17.8%	18.4%	17.6%	16.3%	16.0%	14.3%
9	3.5%	3.5%	3.5%	3.5%	3.5%	4.1%	3.3%	2.1%	1.8%	0.0%
10+	10.8%	10.8%	10.8%	10.8%	10.8%	11.4%	10.6%	9.4%	9.1%	7.3%



Withdrawal (continued)

Elected Officers' Class: Judicial – Male											
Combined Years of Service	Attained Age										
	20	25	30	35	40	45	50	55	60	65	
0	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
1	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
2	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
3	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
4	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
5	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
6	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
7	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
8	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
9	1.3%	1.3%	1.3%	1.2%	1.2%	1.2%	1.1%	0.8%	0.7%	0.5%	0.5%
10+	2.0%	2.0%	2.0%	1.9%	1.9%	1.9%	1.7%	1.3%	1.1%	0.7%	0.7%

Elected Officers' Class: Judicial – Female											
Combined Years of Service	Attained Age										
	20	25	30	35	40	45	50	55	60	65	
0	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
1	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
2	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
3	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
4	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%
5	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
6	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
7	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
8	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
9	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.4%	1.1%	1.0%	0.8%	0.8%
10+	2.9%	2.9%	2.9%	2.7%	2.7%	2.7%	2.4%	2.0%	1.8%	1.4%	1.4%



Withdrawal (continued)

Senior Management – Male											
Combined Years of Service	Attained Age										
	20	25	30	35	40	45	50	55	60	65	
0	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%
1	21.0%	17.5%	15.5%	14.6%	14.1%	14.1%	14.1%	14.1%	14.1%	14.1%	14.1%
2	21.0%	17.5%	15.5%	14.6%	14.1%	14.1%	14.1%	14.1%	14.1%	14.1%	14.1%
3	19.5%	18.5%	17.7%	17.1%	16.7%	16.4%	16.2%	16.0%	16.0%	16.0%	16.0%
4	15.5%	14.9%	14.5%	13.6%	12.9%	12.6%	12.4%	12.3%	12.2%	12.2%	12.2%
5	10.9%	10.5%	10.0%	9.7%	9.3%	8.6%	8.2%	8.1%	8.0%	8.0%	8.0%
6	10.6%	10.3%	9.8%	9.3%	9.0%	8.7%	8.4%	8.3%	8.1%	8.1%	8.1%
7	10.5%	10.2%	9.7%	9.2%	8.8%	8.5%	8.3%	8.1%	8.0%	8.0%	8.0%
8	9.6%	9.5%	9.1%	8.8%	8.5%	8.3%	8.1%	8.0%	7.9%	7.8%	7.8%
9	6.6%	6.6%	6.3%	6.1%	5.9%	5.7%	5.6%	5.4%	5.3%	5.3%	5.3%
10+	4.8%	4.8%	4.1%	3.6%	3.2%	2.9%	3.0%	3.1%	3.5%	2.6%	2.6%

Senior Management – Female											
Combined Years of Service	Attained Age										
	20	25	30	35	40	45	50	55	60	65	
0	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%
1	15.5%	13.0%	11.8%	11.1%	10.8%	10.8%	10.8%	10.8%	10.8%	10.8%	10.8%
2	18.3%	16.0%	14.7%	13.8%	13.4%	13.2%	13.2%	13.2%	13.2%	13.2%	13.2%
3	17.1%	16.2%	15.5%	15.0%	14.6%	14.3%	14.1%	14.0%	14.0%	14.0%	14.0%
4	12.1%	11.3%	10.5%	9.9%	9.4%	9.0%	8.7%	8.6%	8.5%	8.5%	8.5%
5	12.1%	11.3%	10.5%	9.9%	9.4%	9.0%	8.7%	8.6%	8.5%	8.5%	8.5%
6	10.9%	10.6%	10.1%	9.7%	9.4%	9.1%	8.8%	8.7%	8.5%	8.5%	8.5%
7	10.3%	10.1%	9.6%	9.2%	8.8%	8.6%	8.4%	8.2%	8.1%	8.1%	8.1%
8	7.7%	7.6%	7.1%	6.8%	6.5%	6.2%	6.0%	5.9%	5.8%	5.7%	5.7%
9	7.4%	7.4%	6.9%	6.5%	6.1%	5.8%	5.5%	5.3%	5.1%	5.1%	5.1%
10+	4.8%	4.8%	3.9%	3.2%	2.7%	2.4%	2.1%	1.9%	1.9%	1.9%	1.9%



Withdrawal (continued)

Special Risk – Male											
Combined Years of Service	Attained Age										
	20	25	30	35	40	45	50	55	60	65	
0	21.4%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%	20.6%
1	10.3%	9.8%	9.5%	8.8%	8.0%	7.3%	6.5%	5.8%	5.3%	5.3%	5.3%
2	8.6%	8.1%	7.7%	7.4%	6.8%	6.0%	5.3%	4.7%	4.7%	4.7%	4.7%
3	8.4%	7.9%	7.5%	7.2%	6.7%	6.0%	5.3%	4.7%	4.7%	4.7%	4.7%
4	7.5%	7.0%	6.7%	6.5%	6.0%	5.5%	5.0%	4.6%	4.6%	4.6%	4.6%
5	5.3%	5.3%	5.3%	5.3%	4.8%	4.3%	3.8%	3.3%	3.3%	3.3%	3.3%
6	5.2%	5.2%	5.2%	5.1%	4.6%	4.1%	3.6%	3.2%	3.2%	3.2%	3.2%
7	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%
8	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%
9	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%
10+	2.3%	2.3%	2.1%	2.0%	1.9%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%

Special Risk – Female											
Combined Years of Service	Attained Age										
	20	25	30	35	40	45	50	55	60	65	
0	21.3%	21.3%	21.3%	21.3%	21.3%	21.3%	21.3%	21.3%	21.3%	21.3%	21.3%
1	15.5%	14.2%	13.2%	12.2%	11.2%	10.2%	9.2%	8.4%	8.4%	8.4%	8.4%
2	12.3%	11.6%	10.6%	9.6%	8.6%	7.6%	6.6%	5.8%	5.8%	5.8%	5.8%
3	10.3%	9.8%	9.3%	8.8%	8.3%	7.6%	6.6%	5.6%	5.6%	5.6%	5.6%
4	9.7%	9.2%	8.7%	8.4%	7.6%	7.0%	6.4%	5.4%	5.4%	5.4%	5.4%
5	6.1%	6.1%	6.1%	6.1%	6.1%	6.1%	6.1%	5.3%	5.3%	5.3%	5.3%
6	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.1%	5.1%	5.1%	5.1%
7	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
8	4.2%	4.2%	4.2%	4.2%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%
9	4.2%	4.2%	4.2%	4.1%	4.1%	4.1%	4.0%	4.0%	4.0%	4.0%	4.0%
10+	1.9%	1.9%	1.7%	1.5%	2.5%	2.5%	1.6%	4.0%	4.0%	4.0%	4.0%



Withdrawal (continued)

Special Risk Administrative – Male											
Combined Years of Service	Attained Age										
	20	25	30	35	40	45	50	55	60	65	
0	14.6%	13.9%	13.9%	13.9%	13.9%	13.9%	13.9%	13.9%	13.9%	13.9%	13.9%
1	11.3%	10.8%	10.3%	9.9%	9.7%	9.5%	9.4%	9.4%	9.4%	9.4%	9.4%
2	10.4%	9.7%	9.3%	8.9%	8.7%	8.5%	8.4%	8.4%	8.4%	8.4%	8.4%
3	9.7%	9.1%	8.7%	8.3%	7.9%	7.8%	7.7%	7.6%	7.6%	7.6%	7.6%
4	8.8%	8.3%	8.0%	7.8%	7.6%	7.4%	7.4%	7.4%	7.4%	7.4%	7.4%
5	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
6	4.4%	4.4%	4.4%	4.2%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%
7	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%
8	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%
9	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%
10+	3.9%	3.9%	3.6%	3.4%	3.2%	3.3%	3.6%	7.5%	7.5%	7.5%	7.5%

Special Risk Administrative – Female											
Combined Years of Service	Attained Age										
	20	25	30	35	40	45	50	55	60	65	
0	22.5%	22.5%	22.5%	22.5%	22.5%	22.5%	22.5%	22.5%	22.5%	22.5%	22.5%
1	19.4%	18.0%	17.1%	16.5%	16.1%	15.9%	15.7%	15.7%	15.7%	15.7%	15.7%
2	17.5%	16.9%	16.5%	16.2%	15.9%	15.8%	15.7%	15.7%	15.7%	15.7%	15.7%
3	20.3%	19.8%	19.3%	19.0%	18.7%	18.6%	18.4%	18.4%	18.4%	18.4%	18.4%
4	20.8%	20.2%	19.8%	19.4%	19.0%	18.8%	18.7%	18.7%	18.7%	18.7%	18.7%
5	18.8%	18.8%	18.8%	18.8%	18.8%	18.8%	18.8%	18.8%	18.8%	18.8%	18.8%
6	18.7%	18.7%	18.7%	18.7%	18.7%	18.7%	18.7%	18.7%	18.7%	18.7%	18.7%
7	17.9%	17.9%	17.9%	17.9%	17.9%	17.9%	17.9%	17.9%	17.9%	17.9%	17.9%
8	17.8%	17.8%	17.7%	17.7%	17.7%	17.6%	17.6%	17.6%	17.6%	17.6%	17.6%
9	17.8%	17.8%	17.8%	17.8%	17.7%	17.7%	17.6%	17.6%	17.6%	17.6%	17.6%
10+	18.4%	18.4%	18.1%	17.8%	17.6%	17.7%	18.0%	21.0%	21.0%	21.0%	21.0%



Individual Member Salary Increase Assumptions

- (Based on 2.60% inflation assumption)

Combined Years of Service	-- Elected Officers' Class --													
	Regular		Special Risk		Special Risk Admin		Local		Leg-Atty-Cab		Judicial		Senior Management	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
0	7.80%	7.60%	7.60%	7.80%	4.60%	7.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%		
1	5.50%	5.70%	5.90%	6.50%	4.60%	7.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	6.60%	7.10%
2	5.00%	5.30%	5.60%	6.10%	4.60%	7.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	6.20%	6.40%
3	5.00%	5.10%	5.60%	6.00%	4.60%	7.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	6.20%	6.10%
4	4.90%	5.00%	5.60%	6.00%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	5.30%	5.40%
5	4.80%	4.90%	5.60%	6.00%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	5.30%	5.00%
6	4.80%	4.80%	5.60%	5.90%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	5.30%	5.00%
7	4.70%	4.80%	5.50%	5.70%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.80%	4.70%
8	4.60%	4.70%	5.50%	5.70%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.80%	4.70%
9	4.60%	4.70%	5.50%	5.70%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.80%	4.70%
10	4.60%	4.50%	5.50%	5.60%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.80%	4.70%
11	4.50%	4.50%	5.30%	5.60%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.80%	4.70%
12	4.40%	4.50%	5.30%	5.40%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.80%	4.70%
13	4.40%	4.50%	5.20%	5.40%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.80%	4.70%
14	4.40%	4.50%	5.20%	5.30%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.80%	4.30%
15	4.40%	4.40%	5.20%	5.30%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.80%	4.30%
16	4.40%	4.40%	5.00%	5.30%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.80%	4.30%
17	4.40%	4.40%	5.00%	5.30%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.30%	4.30%
18	4.30%	4.30%	5.00%	5.30%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.30%	4.30%
19	4.30%	4.30%	5.00%	5.20%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.30%	4.30%
20	4.30%	4.30%	5.00%	5.20%	4.60%	6.00%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.30%	4.30%
21	4.20%	4.30%	5.00%	5.10%	4.60%	5.30%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.30%	4.30%
22	4.20%	4.30%	5.00%	5.00%	4.60%	5.30%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.30%	4.30%
23	4.10%	4.20%	5.00%	5.00%	4.60%	5.30%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.30%	4.30%
24	4.10%	4.10%	5.10%	5.40%	4.60%	5.30%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.30%	4.30%
25	4.00%	4.00%	5.10%	5.40%	4.60%	5.30%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.30%	4.00%
26	3.90%	4.00%	5.10%	5.40%	4.60%	5.30%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.30%	4.00%
27	3.80%	4.00%	5.10%	5.40%	4.60%	5.30%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.30%	4.00%
28	3.70%	3.90%	5.10%	5.40%	4.60%	5.30%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	4.30%	4.00%
29	4.00%	4.40%	5.10%	5.40%	4.60%	5.30%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	5.20%	4.70%
30+	4.00%	4.40%	5.10%	5.40%	4.60%	5.30%	4.10%	4.10%	5.20%	4.70%	4.10%	4.10%	5.20%	4.70%



**Unused Annual Leave Available at Retirement**

Membership Class	Hours
Regular	230
Special Risk	290
Senior Management	290
Others Not Listed Above	230

**Eligible Survivors**

It is assumed that 80% of deceased active members will have survivors eligible for lifetime benefits upon their death. Males are assumed to be three years older than their female spouses.

**Commencement of Survivor Benefits**

It is assumed that survivors of deceased active members will defer commencement of benefits until the following:

Membership Class / Tier	Member Age
Special Risk / Tier 1	45
Special Risk / Tier 2	50
Other classes/ Tier 1 and 2	55

**Military Service and Out-of-State Service Credits**

Active members are assumed to have purchased the following additional years of service credit.

Type of Service Credit	Special Risk Class		All other classes	
	Men	Women	Men	Women
Military Service Credit <sup>1</sup>	0.2818	0	0.1853	0
Out-of-State Service Credit <sup>2</sup>	0	0	0.0910	0.0910

<sup>1</sup> Pre-1987 hires only; service is eligible for the COLA.

<sup>2</sup> Service for pre-July 1, 2011 enrollees is eligible for the COLA; assumption applies to both tiers.

No extra service credit was assumed for TRS and IFAS participants.

**Changes to the Actuarial Assumptions**

The 2014 Experience Study was the most recent experience study review and informs most assumptions used in this valuation. For this valuation, the 2017 FRS Actuarial Assumption Conference adopted a new assumption for investment return.

## Appendix B: Summary of Plan Provisions

All actuarial calculations are based upon our understanding of Florida Statutes regarding the benefit and eligibility provisions of the retirement systems. These provisions are briefly summarized below for reference purposes, along with corresponding references to the Statutes. This summary encompasses the major provisions; it does not attempt to cover all of the detailed provisions.

### Florida Retirement System (FRS)

The benefit, eligibility, and contribution provisions of the FRS are set forth in Chapter 121 of the Florida Statutes. Provisions relating to other State-administered retirement systems are set forth in other sections of the Florida Statutes, under Chapters 112, 122, and 238.

#### Effective Date

The effective date of the FRS was December 1, 1970. The FRS was created with closure and consolidation of the Teachers' Retirement System, the State and County Officers and Employees' Retirement System, and the Highway Patrol Pension Fund. In 1972, the Judicial Retirement System was also consolidated with the FRS. The FRS was created to provide a defined benefit retirement, disability, and survivor program for participating public employees. Social Security coverage is also required for all members.

Beginning in 2002, the FRS became one system with two primary programs, the existing defined benefit FRS Pension Plan and a defined contribution plan alternative known as the FRS Investment Plan (IP). The earliest that any member could participate in the IP was July 1, 2002.

As of July 1, 2007, the Institute for Food and Agricultural Sciences Supplemental Retirement Program was consolidated under the FRS as a closed group.

(Section 121.011(2))

#### Membership

Membership is a condition of employment for all new state, county, or other participating agency employees filling regularly established positions and employed on or after December 1, 1970, or who elected to transfer from an existing system. Employees may be full-time or part-time and can be elected, appointed, or employed in state government, county government, a state university, or a community college. A city or special district may join the FRS at its option.

Effective July 1, 1978, a member in an existing retirement system who is re-employed after termination of employment may remain in that system, provided his or her member contributions have not been withdrawn.

Members of the FRS Pension Plan when the FRS Investment Plan was created were provided an educational period about their plan choice options prior to a 90-day election period to elect between the FRS Pension Plan and the FRS Investment Plan (IP). Members newly hired after the IP became effective are provided five months after their month of hire to file an election between the two primary programs. Members who do not make an election default into the FRS Pension Plan.

After the initial active or default election to participate in the FRS Pension Plan or the FRS Investment Plan, the employee has one opportunity, at the employee's discretion before termination or retirement, to choose to move from the FRS Pension Plan to the FRS Pension Plan or vice versa.

(Sections 121.051, 121.4501)

## Classification

There are five separate classes of members: Regular Class, Special Risk Class, Special Risk Administrative Support Class, Elected Officers' Class, and Senior Management Service Class. In addition, the Deferred Retirement Option Program (DROP) is available to FRS Pension Plan members who meet the requirements for normal retirement under the FRS Pension Plan.

**Regular Class** – members who are not classified as members of the Special Risk Class, Special Risk Administrative Support Class, Elected Officers' Class, or Senior Management Service Class.

**Special Risk Class** – members employed as law enforcement officers, emergency medical technicians, paramedics, firefighters, firefighter trainers, fire prevention inspectors, correctional officers, correctional probation officers, certain professional health care positions within the Department of Children and Family Services and the Department of Corrections, or certain forensic positions within a law enforcement agency, or a medical examiner's office who meet the criteria set forth in the Florida Retirement System law and administrative rules.

**Special Risk Administrative Support Class** – former Special Risk Class members employed as law enforcement officers, firefighters, correctional officers, or emergency medical technicians who have been moved or been re-assigned to non-Special Risk administrative support positions within a Florida Retirement System Special Risk employing agency.

**Elected Officers' Class** – members include the Governor, Lieutenant Governor, cabinet officers, legislators, Supreme Court justices, district court of appeals judges, circuit judges, county court judges, state attorneys, public defenders, and elected county officers. Also included are city and special district officers if the employer chose to place their elected officials in this class. All such elected officers may withdraw from the Florida Retirement System, elect membership in the Senior Management Service Class or, if state officers, elect membership in the Senior Management Service Optional Annuity Program.

**Senior Management Service Class** – members who hold positions in the Senior Management Service of the State of Florida; community college presidents; appointed school board superintendents; county and city managers; selected managerial staff of the Legislature; the Auditor General and managerial staff; the Executive Director of the Ethics Commission; the State University System Executive Service and university presidents; selected managerial staff of the State Board of Administration; judges of compensation claims; selected managerial staff with the Judicial Branch; Chief Deputy Court Administrator; capital collateral regional counsels and assistant capital collateral regional counsels; assistant state attorneys; assistant public defenders; assistant statewide prosecutors or assistant attorneys general; and non-elective managerial positions designated for SMSC membership by local government agencies. Members in this class have either chosen not to participate or are not eligible to participate in the elective Senior Management Service Optional Annuity Program for state senior managers or to withdraw from the FRS if employed by non-state employers. This class became effective February 1, 1987, and members of an existing retirement system and members of the Special Risk or Special Risk Administrative Support Classes who were employed prior to February 1, 1987, could elect to remain in such system or class.

**Deferred Retirement Option Program (DROP)** – allows members of the FRS Pension Plan in any of the above five classes to elect to retire and have their FRS benefits accumulate in the FRS Trust Fund, earning interest, while the member continues to work for an FRS employer. DROP membership is for a specific and limited period.

(Sections 121.021(12), 121.0515, 121.052, 121.055, 121.091 (13))

**Contributions**

From January 1, 1975, for the state and for school boards, and from October 1, 1975, for other agencies, through June 30, 2011, the total cost of the System was paid by the participating employers.

Beginning July 1, 2011, all FRS Pension Plan and FRS Investment Plan members, except those FRS Pension Plan members participating in DROP, are required to pay member contributions equal to 3% of compensation. TRS members already pay required employee contributions. Member contributions do not accrue interest except for TRS members.

(Section 121.071 (2))

The employer contribution rates enacted for the July 1, 2017 – June 30, 2018 plan year are as follows:

	Regular	Special Risk	Special Risk Administrative	Elected Officers Class Judicial	Elected Officers Class Leg-Atty-Cab	Local	Senior Management	DROP
Defined Benefit Plan								
- Normal Cost Rate	2.75%	11.57%	3.09%	11.73%	6.27%	8.37%	4.05%	4.17%
- UAL Rate	<u>3.93</u>	<u>11.42</u>	<u>42.81</u>	<u>28.75</u>	<u>55.87</u>	<u>49.25</u>	<u>22.16</u>	<u>7.43</u>
- Total DB Rate	6.68	22.99	45.90	40.48	62.14	57.62	26.21	11.60
Investment Plan								
- Employer Rate	3.60%	13.48%	5.43%	11.05%	6.94%	8.95%	4.98%	n/a
- UAL Rate	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>n/a</u>
- Total IP Rate	3.60	13.48	5.43	11.05	6.94	8.95	4.98	n/a
Blended Uniform Contribution Rates								
- Normal Cost Rate	2.90%	11.86%	3.83%	11.67%	6.45%	8.54%	4.29%	4.17%
- UAL Rate	<u>3.30</u>	<u>9.69</u>	<u>29.08</u>	<u>26.25</u>	<u>42.69</u>	<u>35.24</u>	<u>16.70</u>	<u>7.43</u>
- Total Rate	6.20	21.55	32.91	37.92	49.14	43.78	20.99	11.60

The above rates exclude the 0.06% administrative charge for Investment Plan administration and education (except DROP), and the 1.66% for the financing of the Florida Retiree Health Insurance Subsidy program.

(Sections 121.71, 121.74)

**Compensation**

“Compensation” means the monthly salary paid a member by his or her employer for work performed arising from that employment.

(a) Compensation shall include:

1. Overtime payments paid from a salary fund.
2. Accumulated annual leave payments.
3. Payments in addition to the employee’s base rate of pay if all the following apply:
  - a. The payments are paid according to a formal written policy that applies to all eligible employees equally;
  - b. The policy provides that payments shall commence no later than the 11th year of employment;
  - c. The payments are paid for as long as the employee continues his or her employment; and
  - d. The payments are paid at least annually.

4. Amounts withheld for tax sheltered annuities or deferred compensation programs, or any other type of salary reduction plan authorized under the Internal Revenue Code.
  5. Payments made in lieu of a permanent increase in the base rate of pay, whether made annually or in 12 or 26 equal payments within a 12-month period, when the member's base pay is at the maximum of his or her pay range. When a portion of a member's annual increase raises his or her pay range and the excess is paid as a lump sum payment, such lump sum payment shall be compensation for retirement purposes.
- (b) Compensation for a member participating in the FRS Pension Plan or the FRS Investment Plan may not include:
1. Fees paid professional persons for special or particular services or salary payments made from a faculty practice plan authorized by the Board of Governors of the State University System for eligible clinical faculty at a college in a state university that has a faculty practice plan; or
  2. Any bonuses or other payments prohibited from inclusion in the member's average final compensation.
- (c) For all purposes under this chapter, the member's compensation or gross compensation contributed as employee-elective salary reductions or deferrals to any salary reduction, deferred compensation, or tax-sheltered annuity program authorized under the Internal Revenue Code shall be deemed to be the compensation or gross compensation which the member would receive if he or she were not participating in such program and shall be treated as compensation for retirement purposes under this chapter. Any public funds otherwise paid by an employer into an employee's salary reduction, deferred compensation, or tax-sheltered annuity program on or after July 1, 1990 (the date as of which all employers were notified in writing by the division to cease making contributions to the System Trust Fund based on such amounts), shall be considered a fringe benefit and shall not be treated as compensation for retirement purposes under this chapter. However, if an employer was notified in writing by the division to cease making such contributions as of a different date, that employer shall be subject to the requirements of said written notice.
- (d) For any person who first becomes a member on or after July 1, 1996, compensation for any plan year shall not include any amounts in excess of the Section 401(a)(17), Internal Revenue Code limitation (as amended by the Omnibus Budget Reconciliation Act of 1993), which limitation of \$150,000 effective July 1, 1996, shall be adjusted as required by federal law for qualified government plans and shall be further adjusted for changes in the cost of living in the manner provided by Section 401(a)(17)(B), Internal Revenue Code. For any person who first became a member prior to July 1, 1996, compensation for all plan years beginning on or after July 1, 1990, shall not include any amounts in excess of the compensation limitation (originally \$200,000) established by Section 401(a)(17), Internal Revenue Code prior to the Omnibus Budget Reconciliation Act of 1993, which limitation shall be adjusted for changes in the cost of living since 1989, in the manner provided by Section 401(a)(17) of the Internal Revenue Code of 1991. This limitation, which has been part of the Florida Retirement System since plan years beginning on or after July 1, 1990, shall be adjusted as required by federal law for qualified government plans.

"Annual compensation" means the total compensation paid a member during a year. A "year" is 12 continuous months.

(Section 121.021(22) and (23))

## FRS Pension Plan

### Normal Retirement Benefit

#### ***Eligibility – Members initially enrolled before July 1, 2011 (Tier I)***

- Regular Class
  1. 30 years of creditable service at any age.
  2. Age 62 and 6 or more years of creditable service.  
(Section 121.021(29)(a)(1))
- Special Risk Class
  1. 25 years of special risk service at any age; or
  2. Age 55 and 6 or more years of special risk service; or
  3. Age 52 and 25 years of creditable service, including special risk service and up to a maximum of four years of active duty wartime military service credit.
  4. 30 years of any creditable service, at any age, or age 62 and 6 or more years of creditable service (same requirement as the Regular Class).  
(Section 121.021(29)(b)(1))
- Special Risk Administrative Support Class  
(with six or more years of Special Risk Class service, the same requirements as apply to the Special Risk Class, otherwise same as apply to the Regular Class)  
(Sections 121.0515(8) and 121.021(29)(b)(1))
- Elected Officers' Class  
(same requirements as apply to Regular Class)  
(Section 121.021(29)(a)(1))
- Senior Management Service Class  
(same requirements as apply to Regular Class)  
(Section 121.021(29)(a)(1))

#### ***Eligibility – Members initially enrolled on and after July 1, 2011 (Tier II)***

- Regular Class
  1. 33 years of creditable service at any age.
  2. Age 65 and 8 or more years of creditable service.  
(Section 121.021(29)(a)(2))
- Special Risk Class
  1. 30 years of special risk service at any age; or
  2. Age 60 and 8 or more years of special risk service; or
  3. 33 years of any creditable service, at any age, or age 65 and 8 or more years of creditable service (same requirement as the Regular Class).  
(Section 121.021(29)(b)(2))

- Special Risk Administrative Support Class  
(with eight or more years of Special Risk Class service, the same requirements as apply to the Special Risk Class, otherwise same as apply to the Regular Class)  
(Sections 121.0515(8) and 121.021(29)(b)(2))
- Elected Officers' Class  
(same requirements as apply to Regular Class)  
(Section 121.021(29)(a)(2))
- Senior Management Service Class  
(same requirements as apply to Regular Class)  
(Section 121.021(29)(a)(2))

**Normal Form**

Straight life benefit (Option 1), payable on the last state working day of each month, with a guarantee that benefits paid will at least equal member contributions.

(Section 121.091(1))

**Optional Forms**

10-year certain and life benefit (Option 2), 100% joint and contingent benefit (Option 3), or 66-2/3% joint and survivor benefit (Option 4). If the joint annuitant is the member's non-disabled child, payment ceases upon attainment of the joint annuitant's 25th birthday under the 100% and 66- 2/3% joint and survivor benefit.

(Section 121.091(6))

**Dual Retirement**

In the event a member accumulates retirement benefits to commence at different normal retirement ages by virtue of having performed duties for an employer which would entitle him or her to benefits as both a Special Risk Class member and a member of another class, the amount of the benefits payable shall be computed separately with respect to each such age, and the sum of such computed amounts shall be paid. Note that this does not apply to a Special Risk Administrative Support Class member with at least 6 years of Special Risk Class Membership (8 years for members enrolled on or after July 1, 2011) when the Special Risk and Special Risk Administrative Support Classes are the only memberships held because such a member is treated as a Special Risk Class member.

(Section 121.091(2))

**Regular Benefit Amount**

The monthly FRS Pension Plan allowance is the product of:

1. Average final compensation
  - a. For members initially enrolled before July 1, 2011, the average of the highest five plan years of creditable service;
  - b. For members initially enrolled on or after July 1, 2011, the average of the highest eight plan years of creditable service;
2. Creditable service during the applicable period; and
3. The appropriate benefit percentage for periods of service.

All benefits are limited to 100% of average final compensation.  
 (Sections 121.021(17), (24) and (25), 121.091(1))

The appropriate benefit percentages are as follows:

- For Members initially enrolled before July 1, 2011, for Creditable Service as a Regular Class member Subsequent to November 30, 1970:

Retirement at:	Percentage
Age 62 with 6 years of creditable service, or 30 years of creditable service	1.60%
Age 63 with 6 years of creditable service, or 31 years of creditable service	1.63%
Age 64 with 6 years of creditable service, or 32 years of creditable service	1.65%
Age 65 with 6 years of creditable service, or 33 years of creditable service	1.68%

- For Members initially enrolled on or after July 1, 2011, for Creditable Service as a Regular Class member Subsequent to November 30, 1970:

Retirement at:	Percentage
Age 65 with 8 years of creditable service, or 33 years of creditable service	1.60%
Age 66 with 8 years of creditable service, or 34 years of creditable service	1.63%
Age 67 with 8 years of creditable service, or 35 years of creditable service	1.65%
Age 68 with 8 years of creditable service, or 36 years of creditable service	1.68%

(Section 121.091(1))

Service as a Special Risk Class member:

Retirement on or After July 1, 2001 with Service Performed During:	Percentage
December 1, 1970 to September 30, 1974	2.00%
October 1, 1974 and thereafter	3.00%

(Section 121.091(1))

- For Members initially enrolled before July 1, 2011, for Creditable Service as a Special Risk Administrative Support Class member Subsequent to November 30, 1970:

Retirement at:	Percentage
Age 55 with 6 years of creditable special risk service, or age 52 with 25 years of creditable service, which may include up to four years of active duty wartime military service, or 25 years of creditable special risk service	1.60%
Age 56 with 6 years of creditable special risk service, or age 53 with 26 years of creditable service, which may include up to four years of active duty wartime military service, or 26 years of creditable special risk service	1.63%
Age 57 with 6 years of creditable special risk service, or age 54 with 27 years of creditable service, which may include up to four years of active duty wartime military service, or 27 years of creditable special risk service	1.65%
Age 58 with 6 years of creditable special risk service, or age 55 with 28 years of creditable service, which may include up to four years of active duty wartime military service, or 28 years of creditable special risk service	1.68%

- For Members initially enrolled on or after July 1, 2011, for Creditable Service as a Special Risk Administrative Support Class member Subsequent to November 30, 1970:

Retirement at:	Percentage
Age 60 with 8 years of creditable special risk service, or age 57 with 30 years of creditable service, which may include up to four years of active duty wartime military service, or 30 years of creditable special risk service	1.60%
Age 61 with 8 years of creditable special risk service, or age 58 with 31 years of creditable service, which may include up to four years of active duty wartime military service, or 31 years of creditable special risk service	1.63%
Age 62 with 8 years of creditable special risk service, or age 59 with 32 years of creditable service, which may include up to four years of active duty wartime military service, or 32 years of creditable special risk service	1.65%
Age 63 with 8 years of creditable special risk service, or age 60 with 33 years of creditable service, which may include up to four years of active duty wartime military service, or 33 years of creditable special risk service	1.68%

(Section 121.0515(8) and 121.091(1))

- For Service as an Elected Officers' Class member:  
3% for each year of creditable service in such class, except 3-1/3% for service in the judicial class.  
Military service credit is at the rate for Regular Class members.  
(Sections 121.052(5)(a) and (d), 121.091(1))
- For Service as a Senior Management Service Class member:  
2% for each year of creditable service in such class, after January 31, 1987.  
(Section 121.055(4)(d))

## Early Retirement

### ***Eligibility***

For members initially enrolled before July 1, 2011, six years of creditable service for all classes of membership.

For members initially enrolled on or after July 1, 2011, eight years of creditable service for all classes of membership.

(Section 121.021(30))

### ***Benefit Amount***

The normal retirement benefit accrued to the date of early retirement, reduced by 5/12% for each month that the early retirement date precedes the normal retirement date based upon age. The normal retirement date is as follows:

1. Special Risk Class members:
  - a. Initially enrolled before July 1, 2011: Age 55
  - b. Initially enrolled on or after July 1, 2011: Age 60
2. Members in all other Classes
  - a. Initially enrolled before July 1, 2011: Age 62
  - b. Initially enrolled on or after July 1, 2011: Age 65

(Sections 121.021(30), 121.091(3))

## Non-Duty Disability Retirement

### ***Eligibility***

Members are eligible if totally and permanently disabled after completing at least 8 years of creditable service (or after 6 years if disability retirement is ordered for a judge by the Supreme Court).

### ***Benefit Amount***

Same as for normal retirement, but based on average final compensation and creditable service to the date of disability retirement.

### ***Minimum Benefit Amount***

25% of average final compensation.

If the Supreme Court orders disability retirement for a judge, the minimum is two-thirds of compensation at disability. This benefit for a defined benefit plan member is not paid from the FRS Trust Fund. This benefit for

an Investment Plan member is paid from the FRS Trust Fund after the member's IP account balance is transferred to the FRS Trust Fund.

(Section 121.091(4))

### **Line-of-Duty Disability**

#### ***Eligibility***

Members are eligible if totally and permanently disabled during the actual performance of duty. There is no service credit requirement.

#### ***Benefit Amount***

Same as for normal retirement, but based on average final compensation and creditable service to the date of disability retirement.

#### ***Minimum Benefit Amount***

42% of average final compensation, except for the Special Risk and the Special Risk Administrative Support classes whose members are entitled to 65% of average final compensation.

If the Supreme Court orders disability retirement for a judge, the minimum is two-thirds of compensation at disability. This benefit for a defined benefit plan member is not paid from the FRS Trust Fund.

(Section 121.091(4))

### **Post-Retirement Death Benefits**

Based on the optional form elected.

### **Non-Duty Pre-Retirement Death Benefits**

#### ***Eligibility***

Employment is terminated by death after vested for all classes of membership.

#### ***Benefit Amount***

The normal or early retirement benefit amount for which the member would have been eligible had the member retired on his or her date of death and elected the 100% joint and survivor (Option 3) form of payment in favor of his or her beneficiary who is the surviving spouse or other eligible dependent. The monthly benefit is normally payable to the member's beneficiary for the beneficiary's lifetime. If the beneficiary is the member's non-disabled child, payment ceases upon attainment of the beneficiary's 25th birthday.

If the member is more than 10 years away from normal retirement age, the reduction is 5% for each year the member would be younger than the normal retirement age at retirement. There are exceptions if within 10 years of normal retirement:

1. For members initially enrolled before July 1, 2011, who were within 10 years of normal retirement eligibility, the reduction for early retirement is applied from the earlier of age 62 (age 55 for Special Risk Class and Special Risk Administrative Support Class members) or the date on which the member would have completed 30 years of creditable service, had he or she continued employment.
2. For members initially enrolled on or after July 1, 2011, who were within 10 years of normal retirement eligibility, the reduction for early retirement is applied from the earlier of age 65 (age 60 for Special Risk

Class and Special Risk Administrative Support Class members) or the date on which the member would have completed 33 years of creditable service, had he or she continued employment. The value of this benefit may not be less than the member's accumulated contributions, if any.

(Sections 121.091(3) and (7))

### **Line-of-Duty Pre-Retirement Death Benefits**

#### ***Eligibility***

Member died during the actual performance of duty. There is no service credit requirement.

#### ***Benefit Amount***

The surviving spouse will receive one-half of the member's monthly compensation at death. If the spouse dies, or if there is no surviving spouse, the monthly benefits continue until the youngest child is 18.

Effective July 1, 2016, an additional benefit equal to one-half the member's monthly compensation at death is payable to the surviving dependent(s) of Special Risk Class members killed in the line of duty on or after July 1, 2013. For such Special Risk Class members, surviving child payments may be extended to age 25 if the child is unmarried and enrolled as a full-time student.

A surviving spouse may elect to receive a non-duty death benefit in lieu of the duty death benefit.

(Section 121.091(7))

### **Vesting**

#### ***Eligibility***

For members initially enrolled before July 1, 2011, six years of creditable service for all classes of membership. For members initially enrolled on or after July 1, 2011, eight years of creditable service for all membership classes.

#### ***Benefit Amount***

The normal or early retirement benefit amount based on average final compensation and creditable service to the date of termination.

(Sections 121.021(45), 121.091(5))

### **DROP – Deferred Retirement Option Program**

#### ***Eligibility***

Except as allowed by statute, notably for K-12 instructional personnel<sup>1</sup>, members have a limited eligibility window during which they can elect to enter the DROP. A member initially becomes eligible to enter DROP in the same month he or she first becomes eligible to file for unreduced immediate retirement benefits. Eligibility windows differ by tier and membership class, and are initially reached via satisfying either service-only criteria or age-plus-service criteria.

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<sup>1</sup> Instructional personnel in grades K-12 may defer DROP participation to any age.

For most members achieving DROP entry eligibility via service-only criteria, the window to enter DROP lasts more than 12 months, with the window's length varying by individual. (The window must be at least 12 months in length.) The window for members satisfying service-only eligibility criteria is shown in the table below.

<b>DROP Entry Eligibility Window for Members Satisfying Service-Only Criteria</b>			
<b>Membership Class</b>	<b>Tier</b>	<b>Window Opens</b>	<b>Window Closes</b>
Special Risk	Tier I	25 Years of Service	53 <sup>rd</sup> Birthday*
Special Risk	Tier II	30 Years of Service	56 <sup>th</sup> Birthday*
All Other Classes	Tier I	30 Years of Service	58 <sup>th</sup> Birthday*
All Other Classes	Tier II	33 Years of Service	61 <sup>st</sup> Birthday*

\*Or 12 months after the window opens, if later than the date listed above for the member

Members who do not reach unreduced retirement eligibility through service-only eligibility criteria become eligible to enter DROP upon satisfaction of age-plus-service criteria. For those members, the eligibility window to enter DROP lasts for 12 months.

<b>DROP Entry Eligibility Window for Members Satisfying Age-Plus-Service Criteria</b>			
<b>Membership Class</b>	<b>Tier</b>	<b>Window Opens</b>	<b>Window Closes</b>
Special Risk	Tier I	Age 55 and 6 Years of Service	After 12 months
Special Risk	Tier II	Age 60 and 8 Years of Service	After 12 months
All Other Classes	Tier I	Age 62 and 6 Years of Service	After 12 months
All Other Classes	Tier II	Age 65 and 8 Years of Service	After 12 months

The maximum length of DROP participation is five years. As such, members who satisfy service-only criteria and enter DROP prior to age 60 are required to exit DROP and terminate FRS-covered employment prior to becoming eligible for Medicare benefits at age 65.

**Benefit Amount**

Effective July 1, 1998, eligible members can retire without terminating their employment during DROP participation. Monthly retirement benefits will be invested in the FRS Trust Fund, earning tax-deferred interest while the member continues to work for a maximum of 60 months. The interest credit for those entering the DROP prior to July 1, 2011, is 6.5% annually. For those entering the DROP after that date, it is 1.3% annually. Upon completion of the maximum five-year period, DROP participation ends and participants must terminate employment with all FRS employers. At that time, the participant will receive payment of the accumulated DROP benefits, and begin receiving his FRS monthly retirement benefit (in the same amount as determined at retirement, plus annual cost-of-living increases).

Effective July 1, 2003, participants employed in eligible instructional positions with a district school board, the Florida School for the Deaf and Blind, or a developmental research school can extend their participation beyond their initial 60-month period, for up to an additional 36 months. The employer must approve the request for DROP extension as well as the period of extension granted to an eligible DROP participant, if any, within the 36-month limit.

### ***Disabled While in DROP***

Participants that became disabled while participating in DROP will continue to accumulate the same monthly benefit in the FRS Trust Fund until termination. Since the normal retirement benefit commenced upon DROP participation, a disability benefit will not be issued.

### ***Death While in DROP***

The designated beneficiary of a participant who dies while participating in DROP will receive all accumulated DROP benefits, and a continuing monthly benefit, if the participant had elected Option 2, 3, or 4. Survivors of DROP participants are not eligible for FRS line-of-duty death benefits.

(Section 121.091 (13))

### **Return of Employee Contributions**

A member who terminates employment but is not eligible to retire, receive a vested retirement allowance, or receive a disability pension will be entitled to a refund of any employee contributions. The beneficiary of a member who passes away before satisfying the requirement for a pre-retirement death benefit will be entitled to a refund of any employee contributions made by the member. No interest is credited on employee contribution accounts.

A vested terminated participant may elect to receive a return of employee contributions in lieu of a retirement benefit.

(Sections 121.071(2)(b), 121.091(7)(a), Sections 121.091(5)(a) and (c))

### **Cost-of-Living Adjustment**

Senate Bill 2100 (2011) eliminated post-retirement benefit increases on benefits earned on and after July 1, 2011. FRS Pension Plan benefits earned before July 1, 2011 will receive post-retirement benefit increases of 3% per year. Tier II members (those initially enrolled on and after July 1, 2011) will receive no post-retirement benefit increases. Tier I members (those initially enrolled before July 1, 2011) will receive post-retirement benefit increases equal to 3% per year multiplied by a fraction, the numerator of which is service through June 30, 2011 and the denominator of which is total service at retirement. Cost-of-Living Adjustments take effect annually on July 1. A pro-rated rate may apply in the initial year of applicability.

(Section 121.101)

### **Additional Benefit Amount**

In addition, members may receive an additional retirement allowance under the pre-1971 existing systems. The benefit is a percentage of average final compensation times the creditable service in that system up to November 30, 1970. The system percentages are:

#### ***State and County Officers and Employees' Retirement System:***

2.00% for creditable service rendered under Division A prior to Social Security coverage; and 1.50% for creditable service rendered under Division B subsequent to Social Security coverage.

#### ***Teachers Retirement System:***

Plan E: 2.00%

(Sections 121.091(1)(c), 122.28, 238.07(7)(a))

## Minimum Benefit

### *Eligibility*

The month following attainment of age 65 by a pensioner or, in the case of a beneficiary receiving the survivor's portion of a member's benefit, the 65th anniversary of the deceased member's birth. The member must have earned at least 10 years of creditable service and retired under normal retirement.

### *Benefit Amount*

An eligible benefit recipient will receive a benefit adjustment to bring the benefit to the calculated minimum benefit. Effective July 1, 2017, the minimum monthly benefit is \$31.34 multiplied by years of creditable service prior to application of the reduction factor for electing an optional form of payment. For retirements on or after July 1, 1987, creditable service for the minimum benefit calculation does not include any service earned on or after that date.

(Section 112.362)

## FRS Investment Plan (IP)

The FRS Investment Plan (IP) is a defined contribution plan offered to eligible members as an alternative to the FRS Pension Plan. The plan is qualified under sec. 401(a) of the Internal Revenue Code.

### **Benefits**

Under the IP, benefits accrue in individual member accounts funded by employer and employee contributions made on or after July 1, 2011, and earnings thereon. Benefits are provided through employee-directed investments offered by approved investment providers. Vested benefits are payable upon termination or death as a lump-sum distribution, direct rollover distribution, or periodic distribution. In addition to normal benefits and death benefits, the plan also provides disability coverage as described below.

(Sections 121.4501, 121.591)

### **Contributions**

The employer contributions deposited in each participant's IP account are based upon allocation rates established by law for each membership class. This statutorily prescribed percentage of the participant's gross compensation for the reporting month is deducted from the total amount paid by the employer on behalf of all members in the same class of membership based on the uniform contribution rate established by law. Current IP allocation rates are set forth in the following charts. The allocation rates shown in the first chart below do not include the 0.06% charge for FRS Investment Plan administration and education, the separate employer contribution assessed to fund the IP disability program, or the contribution of 1.66% for the financing of the Florida Retiree Health Insurance Subsidy program.

(Sections 121.71, 121.72)

Effective July 1, 2012, the employer allocations to the IP accounts are based on contribution rates as follows:

Classification	2017-2018 Plan Year Rates
Regular	3.30%
Special Risk	11.00%
Special Risk Administrative Support	4.95%
Elected Officers'	
- Judicial	10.23%
- Leg/Atty/Cab	6.38%
- Local	8.34%
Senior Management Service	4.67%

The employer contribution rates to fund the disability benefit under the IP are as follows:

Classification	2017-2018 Plan Year Rates
Regular	0.25%
Special Risk	1.33%
Special Risk Administrative Support	0.45%
Elected Officers'	
- Judicial	0.73%
- Leg/Atty/Cab	0.41%
- Local	0.41%
Senior Management Service	0.26%

(Section 121.73)

Effective July 1, 2017 the employer contribution rates to fund the line of duty death benefit under the IP are as follows:

Classification	2017-2018 Plan Year Rates
Regular	0.05%
Special Risk	1.15%
Special Risk Administrative Support	0.03%
Elected Officers'	
- Judicial	0.09%
- Leg/Atty/Cab	0.15%
- Local	0.20%
Senior Management Service	0.05%

(Section 121.735)

## Non-Duty Disability Retirement

### ***Eligibility***

Investment Plan participants who have completed at least eight years of creditable service (or six years of creditable service if disability retirement is ordered for a judge by the Supreme Court) are eligible for regular disability benefits if they become totally and permanently disabled due to injury or illness suffered while actively employed in an FRS-covered position. Upon approval for disability retirement, the IP participant may choose either to retain his/her IP account balance or to surrender his/her account balance to the FRS Pension Plan and receive guaranteed lifetime monthly disability benefits, assuming the member remains disabled.

### ***Benefit Amount***

If the disabled IP participant chooses to retain his/her account balance, he/she may elect to receive the normal benefit payable under the IP. If he/she elects to surrender the account balance and receive lifetime monthly disability benefits, the amount of each monthly payment is calculated in the same manner as provided for regular disability retirement under the FRS Pension Plan and is subject to the same threshold benefit amounts.

(Sections 121.091(4), 121.591(1) and (2))

## Line-of-Duty Disability

### ***Eligibility***

IP participants are eligible for in-line-of-duty disability benefits if they become totally and permanently disabled due to injury or illness suffered during the actual performance of duty while actively employed in an FRS-covered position. There is no service credit requirement for in-line-of-duty disability benefits. Upon approval for disability retirement, the IP member may choose either to retain his/her IP account balance or to surrender his/her account balance to the FRS Pension Plan and receive guaranteed lifetime monthly disability benefits, assuming the member remains disabled.

### ***Benefit Amount***

If the disabled IP participant elects to retain his/her account balance, he/she may elect to receive the normal benefit payable under the IP. If he/she elects to surrender the account balance and receive lifetime monthly disability benefits, the amount of each monthly payment is calculated in the same manner as provided for line-of-duty disability retirement under the FRS Pension Plan, and is subject to the same threshold benefit amounts.

(Sections 121.091(4), 121.591(1) and (2))

## Line-of-Duty Death

### ***Eligibility***

IP participants are eligible for in-line-of-duty death benefits if they die during the actual performance of duty while actively employed in an FRS-covered position. There is no service credit requirement for in-line-of-duty death benefits. The beneficiary of the IP member may choose either to retain the member's IP account balance or to surrender his/her account balance to the FRS Pension Plan and receive guaranteed monthly death benefits, payable for the life of the surviving spouse or, if the spouse dies or there is no spouse, until the 18<sup>th</sup> birthday of the member's youngest surviving child. Such payments may be extended until the 25<sup>th</sup> birthday of the youngest child of a Special Risk Class member if the child is unmarried and enrolled as a full-time student.

### **Benefit Amount**

If the beneficiary of the IP participant elects to retain his/her account balance, he/she may elect to receive the normal benefit payable under the IP. If he/she elects to surrender the account balance and receive the annuity from the FRS Pension Plan, the amount of each monthly payment is calculated in the same manner as provided for line-of-duty death benefits under the FRS Pension Plan, and is subject to the same threshold benefit amounts.

(Sections 121.091(7), 121.591(1), (3) and (4))

### **Teachers' Retirement System (TRS)**

The benefit and contribution provisions of the Statutes for this closed system are set forth in Chapter 238 of the Florida Statutes. Certain provisions are from other sections of the Florida Statutes.

#### **Effective Date**

The effective date of the Retirement System was July 1, 1939.

(Section 238.02)

#### **Membership**

All employees who were teachers in public schools, employees of professional non-profit teachers associations, county superintendents, Department of Education employees and the staff of the Teachers' Retirement System, and who were employed prior to December 1, 1970, are members of the Teachers' Retirement System. The benefit and contribution provisions of the Statutes are set forth in Chapter 238 of the Florida Statutes. Certain provisions are drawn from other sections of the Florida Statutes. TRS retirees are included with the Regular Membership Class in the valuation.

### **State and County Officers and Employees' Retirement System (SCOERS)**

The benefit and contribution provisions of the Statutes are set forth in Chapter 122 of the Florida Statutes. Certain provisions are drawn from other sections of the Florida Statutes. This is a closed system that no longer includes any members in the high hazard or legislative categories. Effective with the July 1, 2013 valuation, there are no longer any actively employed members of this system. SCOERS retirees are included with the Regular Membership Class in the valuation.

#### **Effective Date**

The effective date of the Retirement System was July 1, 1955.

(Section 122.01(2))

#### **Membership**

All full-time employees of the state and its counties not covered by another system who were employed prior to December 1, 1970.

### **Institute of Food and Agricultural Sciences Supplemental Retirement Program (IFAS)**

The benefit and contribution provisions of the Statutes are set forth in Chapter 121 of the Florida Statutes. Certain provisions are drawn from other sections of the Florida Statutes. This is a closed system. IFAS retirees are included with the Regular Membership Class in the valuation.

#### **Effective Date**

The effective date of the Supplemental Retirement Program was July 1, 1985.

(Section 121.40)

**Membership**

Employees hired on or before July 1, 1983 who:

- a. hold both state and federal appointments while employed at the Institute,
- b. are not entitled to any benefit from a state-supported retirement system or Social Security based on service as an employee of the Institute, and
- c. are participants in the Federal Civil Service Retirement System.

## Appendix C: Membership Data

This valuation is based upon the membership of the Pension Plan as of July 1, 2017.

The membership of the FRS Pension Plan includes employees of the State of Florida and participating political subdivisions. The membership is divided into several categories by membership class and subclass.

Tables C-1 through C-5 present distributions of annuitants (including beneficiaries of deceased members), and potential annuitants (terminated vested members). Shown in the tables are the numbers of persons receiving benefits and the total annual benefits.

Table C-6 summarizes the DROP membership and provides total annual benefits.

Table C-7 presents a summary by category of active membership, payroll, and accumulated employee contributions.

Tables C-8 through C-17 contain summaries of the active members in each category of membership. Values shown in the tables are the numbers of members and their average annual salaries. Table C-17 is the grand total of active members included in this valuation.

**Table C-1**  
**Florida Retirement System Pension Plan**  
**Annuitants at July 1, 2017**  
**Regular and Early Retirement by Age**

<b>Age</b>	<b>Number of Persons</b>	<b>Annual Benefits (in Thousands)</b>
Under 50	2,800	\$38,401
50 to 54	5,193	153,437
55 to 59	20,368	514,810
60 to 64	52,741	1,245,322
65 to 69	95,183	2,141,797
70 to 74	87,121	1,929,231
75 to 79	55,570	1,151,737
80 & Up	69,604	1,442,641
<b>Total</b>	<b>388,580</b>	<b>\$8,617,376</b>

**Table C-2**  
**Florida Retirement System Pension Plan**  
**Annuitants at July 1, 2017**  
**Disability Retirement by Age**

<b>Age</b>	<b>Number of Persons</b>	<b>Annual Benefits (in Thousands)</b>
Under 50	701	11,864
50 to 54	1,221	22,181
55 to 59	2,281	36,030
60 to 64	3,204	50,898
65 to 69	2,844	44,962
70 to 74	2,117	33,668
75 to 79	1,112	17,067
80 & Up	731	9,855
<b>Total</b>	<b>14,211</b>	<b>\$226,525</b>

**Table C-3**  
**Florida Retirement System Pension Plan**  
**Potential Annuitants at July 1, 2017**  
**Vested Terminated Members by Age for the Regular,**  
**Senior Management Service, and Elected Officers' Classes**

Age	Number of Persons	Annual Benefits (in Thousands) <sup>1</sup>
Under 30	415	\$993
30 to 34	3,328	13,148
35 to 39	7,973	40,094
40 to 44	11,409	62,677
45 to 49	16,154	97,452
50 to 54	20,911	131,390
55 to 59	19,438	133,638
60 & Up	22,951	125,443
Total	102,579	\$604,835

<sup>1</sup> Deferred to Age 62

**Table C-4**  
**Florida Retirement System Pension Plan**  
**Potential Annuitants at July 1, 2017**  
**Vested Terminated Members by Age for the**  
**Special Risk & Special Risk Administrative Support Classes**

Age	Number of Persons	Annual Benefits (in Thousands) <sup>2</sup>
Under 30	51	\$422
30 to 34	420	4,122
35 to 39	680	7,607
40 to 44	1,088	12,370
45 to 49	1,625	21,862
50 to 54	1,202	16,439
55 to 59	489	6,365
60 & Up	478	5,048
Total	6,033	\$74,235

<sup>2</sup> Deferred to Age 55

**Table C-5**  
**Florida Retirement System Pension Plan**  
**Annuitants and Potential Annuitants at July 1, 2017**  
**All Types of Retirement by System**

System	Annuitants	Potential Annuitants	Total
<b>Number of Persons</b>			
Regular	360,062	101,099	461,161
Senior Management Service	4,421	1,129	5,550
Special Risk	35,593	6,018	41,611
Special Risk Administrative	169	15	184
EOC: Judicial	898	45	943
EOC: Legislative/Attorneys/Cabinet	218	88	306
EOC: Local	1,430	218	1,648
<b>Total</b>	<b>402,791</b>	<b>108,612</b>	<b>511,403</b>
<b>Annual Benefits (in Thousands)</b>			
Regular	\$6,940,187	\$577,873	\$7,518,060
Senior Management Service	222,374	21,419	243,793
Special Risk	1,535,035	74,100	1,609,135
Special Risk Administrative	6,695	135	6,830
EOC: Judicial	83,566	2,294	85,860
EOC: Legislative/Attorneys/Cabinet	8,251	1,002	9,253
EOC: Local	47,793	2,247	50,040
<b>Total</b>	<b>\$8,843,901</b>	<b>\$679,070</b>	<b>\$9,522,971</b>

**Table C-6**  
**Florida Retirement System Pension Plan**  
**Annuitants at July 1, 2017**  
**DROP Members**

Age	Number of Persons	Annual Benefits (in Thousands)
Under 50	419	\$26,834
50 to 54	2,643	139,193
55 to 59	7,541	281,077
60 to 64	14,955	348,225
65 to 69	7,716	153,149
70 to 74	156	2,518
75 to 79	17	259
80 & Up	5	74
<b>Total</b>	<b>33,452</b>	<b>\$951,329</b>

**Table C-7**  
**Florida Retirement System Pension Plan**  
**Summary of Active Members at July 1, 2017**

System	Number of Persons	Annual Salary (in Thousands) <sup>1</sup>	Accumulated Employee Contributions (in Thousands)
Regular	450,467	\$19,152,497	\$2,632,652
Senior Management Service	5,731	516,727	74,923
Special Risk	60,720	3,664,881	503,195
Special Risk Administrative	68	3,046	509
EOC: Judicial	707	99,986	15,224
EOC: Legislative/Attorneys/Cabinet	116	6,275	977
EOC: Local	786	41,457	6,038
Teachers' Retirement System (TRS)	13	1,430	4,383
Institute of Food and Agricultural Sciences (IFAS)	14	1,557	0
<b>Total</b>	<b>518,622</b>	<b>\$23,487,856</b>	<b>\$3,237,901</b>

<sup>1</sup> The salary shown in Tables C-7 through C-17 represents the salaries of the FRS DB plan members on July 1, 2017. The payroll on which normal costs are determined (\$24,049,285,000) equals the salaries for these DB plan members (excluding TRS and IFAS), adjusted to the middle of the plan year. The payroll on which UAL costs are charged additionally includes the payroll of certain other groups, and is described in Section 4 of the report.

**Table C-8**  
**Florida Retirement System Pension Plan**  
**Member Counts and Average Salaries at July 1, 2017**  
**Regular Class**

Count	Years of Service												
	Age	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 & Up	All Years
	Under 20	995											995
	20 to 24	13,817	132										13,949
	25 to 29	30,366	4,942	189									35,497
	30 to 34	22,570	14,231	5,641	141								42,583
	35 to 39	16,907	10,805	16,414	4,393	90							48,609
	40 to 44	14,368	8,954	13,132	12,667	3,385	72						52,578
	45 to 49	14,082	9,474	13,034	12,891	12,039	3,656	161					65,337
	50 to 54	11,868	8,582	12,651	12,089	10,709	10,737	2,884	88				69,608
	55 to 59	9,012	7,315	11,919	12,265	10,854	10,479	4,362	594	9			66,809
	60 to 64	4,283	4,788	7,573	7,423	6,201	6,199	1,561	672	111	2		38,813
	65 & Up	<u>2,157</u>	<u>2,540</u>	<u>4,028</u>	<u>2,851</u>	<u>1,704</u>	<u>1,096</u>	<u>601</u>	<u>354</u>	<u>237</u>	<u>107</u>	<u>14</u>	<u>15,689</u>
<b>Total Count</b>		140,425	71,763	84,581	64,720	44,982	32,239	9,569	1,708	357	109	14	450,467

Average Salary (\$)	Years of Service												
	Age	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 & Up	All Years
	Under 20	9,967											9,967
	20 to 24	22,374	22,688										22,377
	25 to 29	32,102	37,991	37,478									32,950
	30 to 34	33,123	42,404	43,718	46,296								37,672
	35 to 39	32,418	41,691	47,878	49,803	51,973							41,307
	40 to 44	31,950	40,504	46,940	53,237	54,845	57,181						43,788
	45 to 49	31,830	39,115	44,447	50,614	59,118	59,603	55,213					45,749
	50 to 54	31,472	37,877	42,314	46,860	54,386	62,909	61,302	60,899				46,552
	55 to 59	30,695	37,636	41,972	45,348	51,340	59,275	66,249	63,239	57,610			46,608
	60 to 64	28,744	37,658	41,763	45,202	50,111	56,793	63,872	65,695	56,469	66,216		45,559
	65 & Up	<u>20,086</u>	<u>31,645</u>	<u>38,435</u>	<u>41,835</u>	<u>46,888</u>	<u>54,327</u>	<u>64,425</u>	<u>79,041</u>	<u>83,415</u>	<u>88,079</u>	<u>120,934</u>	<u>40,463</u>
<b>Avg. Annual Salary</b>		30,717	39,560	44,241	48,357	54,074	59,872	64,070	67,360	74,386	87,677	120,934	42,517



**Table C-9**  
**Florida Retirement System Pension Plan**  
**Member Counts and Average Salaries at July 1, 2017**  
**Special Risk Class**

Count	Years of Service											All Years	
	Age	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50		50 & Up
	Under 20	36	1										37
	20 to 24	4,115	12										4,127
	25 to 29	7,448	1,711	50									9,209
	30 to 34	4,107	3,313	2,170	25								9,615
	35 to 39	1,892	2,040	3,737	1,259	17							8,945
	40 to 44	1,029	1,205	2,674	2,790	1,064	6						8,768
	45 to 49	824	938	1,952	2,438	2,952	687	7					9,798
	50 to 54	523	633	1,184	1,232	1,738	961	125					6,396
	55 to 59	241	415	563	432	407	295	106	10				2,469
	60 to 64	67	183	265	197	153	124	40	15	3			1,047
	65 & Up	<u>10</u>	<u>45</u>	<u>98</u>	<u>72</u>	<u>38</u>	<u>22</u>	<u>15</u>	<u>6</u>	<u>3</u>			<u>309</u>
<b>Total Count</b>		20,292	10,496	12,693	8,445	6,369	2,095	293	31	6			60,720

Average Salary (\$)	Years of Service											All Years	
	Age	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50		50 & Up
	Under 20	23,284	39,100										23,712
	20 to 24	35,558	36,734										35,561
	25 to 29	41,934	50,072	56,161									43,523
	30 to 34	44,323	56,216	66,164	68,101								53,412
	35 to 39	43,792	56,029	71,011	73,574	72,186							62,200
	40 to 44	43,519	56,097	70,697	77,614	80,729	95,522						68,936
	45 to 49	45,888	56,329	69,566	77,425	83,834	88,626	104,061					73,923
	50 to 54	48,790	59,288	67,266	74,586	82,178	81,628	81,179					72,858
	55 to 59	47,746	59,506	67,245	70,458	70,595	72,406	79,756	85,405				66,383
	60 to 64	45,101	55,238	62,840	66,743	66,115	76,767	79,196	81,295	121,284			64,295
	65 & Up	<u>27,675</u>	<u>52,017</u>	<u>62,650</u>	<u>70,522</u>	<u>71,474</u>	<u>82,575</u>	<u>78,500</u>	<u>112,787</u>	<u>114,227</u>			<u>66,551</u>
<b>Avg. Annual Salary</b>		41,755	55,431	69,084	75,807	81,487	82,386	80,803	88,716	117,756			60,357



**Table C-10**  
**Florida Retirement System Pension Plan**  
**Member Counts and Average Salaries at July 1, 2017**  
**Special Risk Administrative Support Class**

Age	Years of Service											All Years
	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 & Up	
Under 20												
20 to 24												
25 to 29	1	2										3
30 to 34		5	4									9
35 to 39		1	6	5								12
40 to 44		1	3	3	5							12
45 to 49			1	3	12	2						18
50 to 54		1	3			4						8
55 to 59			2	1		1						4
60 to 64						1						1
65 & Up						1						1
<b>Total Count</b>	<b>1</b>	<b>10</b>	<b>19</b>	<b>12</b>	<b>17</b>	<b>9</b>						<b>68</b>

Age	Years of Service											All Years
	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 & Up	
Under 20												
20 to 24												
25 to 29	35,507	35,772										35,684
30 to 34		39,817	38,290									39,138
35 to 39		37,341	43,750	40,537								41,877
40 to 44		39,996	42,247	51,221	47,499							46,491
45 to 49			44,513	39,558	52,145	51,560						49,558
50 to 54		33,805	40,034			56,474						47,475
55 to 59			43,366	40,290		47,088						43,528
60 to 64						37,624						37,624
65 & Up						42,723						42,723
<b>Avg. Annual Salary</b>	<b>35,507</b>	<b>38,177</b>	<b>41,776</b>	<b>42,943</b>	<b>50,778</b>	<b>50,717</b>						<b>44,794</b>



**Table C-11**  
**Florida Retirement System Pension Plan**  
**Member Counts and Average Salaries at July 1, 2017**  
**Elected Officers' Class: Judicial Subclass**

Count	Years of Service											All Years
	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 & Up	
Age												
Under 20												
20 to 24												
25 to 29												
30 to 34	1	1										2
35 to 39	12	5	2									19
40 to 44	20	10	15	11								56
45 to 49	18	21	25	30	22	1						117
50 to 54	25	21	20	30	25	22						143
55 to 59	15	28	28	34	34	29	13					181
60 to 64	7	16	22	32	22	22	8	4				133
65 & Up		11	20	10	6	9						56
<b>Total Count</b>	98	113	132	147	109	83	21	4				707

Average Salary (\$)	Years of Service											All Years
	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 & Up	
Age												
Under 20												
20 to 24												
25 to 29												
30 to 34	127,046	120,042										123,544
35 to 39	133,498	154,586	138,020									139,524
40 to 44	125,286	140,339	138,805	140,956								134,673
45 to 49	134,745	129,881	143,172	141,662	144,467	123,124						139,175
50 to 54	127,348	143,480	144,548	143,705	144,502	144,042						141,121
55 to 59	133,661	144,929	144,554	140,483	141,630	142,494	143,297					141,975
60 to 64	147,231	144,618	145,371	146,116	143,653	143,900	141,487	146,080				144,818
65 & Up		143,882	145,274	146,886	144,794	144,310						145,082
<b>Avg. Annual Salary</b>	131,422	141,518	143,784	143,079	143,444	143,241	142,607	146,080				141,423



**Table C-12**  
**Florida Retirement System Pension Plan**  
**Member Counts and Average Salaries at July 1, 2017**  
**Elected Officers' Class: Legislators/Attorney/Cabinet Subclass**

Count	Years of Service											All Years
	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 & Up	
Age												
Under 20												
20 to 24												
25 to 29	2											2
30 to 34	4	2										6
35 to 39	7	6	1									14
40 to 44	6	2	6	2	1							17
45 to 49	5	5	3	2								15
50 to 54	5		7			4						16
55 to 59	4	5	4	3	3	2	1					22
60 to 64	1	5	2	2	2	2						14
65 & Up		2	5	2						1		10
<b>Total Count</b>	<b>34</b>	<b>27</b>	<b>28</b>	<b>11</b>	<b>6</b>	<b>8</b>	<b>1</b>			<b>1</b>		<b>116</b>

Average Salary (\$)	Years of Service											All Years
	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 & Up	
Age												
Under 20												
20 to 24												
25 to 29	29,697											29,697
30 to 34	24,417	29,697										26,177
35 to 39	23,521	27,937	19,137									25,101
40 to 44	29,391	109,705	69,900	86,633	29,697							59,889
45 to 49	25,275	27,585	86,774	154,140								55,527
50 to 54	27,189		28,188			145,907						57,306
55 to 59	28,955	27,585	36,663	62,789	67,672	154,140	154,140					57,009
60 to 64	29,697	54,586	29,697	154,140	91,919	137,018						80,584
65 & Up		29,697	29,697	97,505						154,140		55,703
<b>Avg. Annual Salary</b>	<b>26,644</b>	<b>39,059</b>	<b>44,668</b>	<b>106,655</b>	<b>69,425</b>	<b>145,743</b>	<b>154,140</b>			<b>154,140</b>		<b>54,096</b>



**Table C-13**  
**Florida Retirement System Pension Plan**  
**Member Counts and Average Salaries at July 1, 2017**  
**Elected Officers' Class: Local Subclass**

Count	Years of Service											All Years
	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 & Up	
Age												
Under 20												
20 to 24	1											1
25 to 29	2											2
30 to 34	8	7	1									16
35 to 39	20	7	8	5								40
40 to 44	20	19	8	8	5							60
45 to 49	34	27	12	12	11	7	1					104
50 to 54	34	22	12	12	8	19	12					119
55 to 59	36	23	22	16	17	20	9	3	1			147
60 to 64	22	17	26	25	15	7	6	4				122
65 & Up	24	47	42	23	24	9	2	3	1			175
<b>Total Count</b>	201	169	131	101	80	62	30	10	2			786

Average Salary (\$)	Years of Service											All Years
	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 & Up	
Age												
Under 20												
20 to 24	6,000											6,000
25 to 29	16,863											16,863
30 to 34	47,836	45,581	23,521									45,330
35 to 39	25,576	34,299	38,528	73,667								35,704
40 to 44	40,079	38,147	93,872	41,892	83,395							50,491
45 to 49	35,851	60,470	76,352	59,433	71,240	99,392	140,440					58,662
50 to 54	39,013	37,695	67,507	66,193	79,113	94,686	102,494					62,370
55 to 59	40,163	44,043	61,585	61,213	61,103	90,587	83,170	100,853	95,583			59,798
60 to 64	34,162	36,738	47,390	64,613	57,677	86,068	67,721	107,576				53,507
65 & Up	28,147	40,016	43,145	53,841	47,574	51,248	15,575	49,498	3,600			42,246
<b>Avg. Annual Salary</b>	35,591	42,983	55,024	59,842	60,990	86,617	85,213	88,136	49,592			52,744



**Table C-14**  
**Florida Retirement System Pension Plan**  
**Member Counts and Average Salaries at July 1, 2017**  
**Senior Management Service Class**

Count	Years of Service											All Years	
	Age	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50		50 & Up
	Under 20												
	20 to 24	2											2
	25 to 29	456	9										465
	30 to 34	421	222	19	2								664
	35 to 39	130	180	176	33								519
	40 to 44	80	83	152	208	60	2						585
	45 to 49	52	81	131	224	272	101	5					866
	50 to 54	69	78	119	139	219	329	77	1				1,031
	55 to 59	53	68	94	120	150	287	112	14				898
	60 to 64	23	54	78	87	89	106	34	16	2			489
	65 & Up	5	29	46	47	31	22	13	11	7	1		212
<b>Total Count</b>		1,291	804	815	860	821	847	241	42	9	1		5,731

Average Salary (\$)	Years of Service											All Years	
	Age	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50		50 & Up
	Under 20												
	20 to 24	42,213											42,213
	25 to 29	43,415	59,560										43,728
	30 to 34	47,497	59,617	65,616	77,917								52,159
	35 to 39	54,373	63,303	77,227	94,623								67,779
	40 to 44	86,275	81,211	82,680	87,639	95,121	76,608						85,982
	45 to 49	90,199	87,944	93,891	100,111	105,726	103,740	93,780					99,587
	50 to 54	98,832	96,847	101,400	100,678	103,630	110,776	100,463	41,864				104,124
	55 to 59	116,705	108,555	99,917	103,248	107,663	113,481	118,638	99,109				109,958
	60 to 64	125,929	116,685	97,271	107,701	113,543	123,246	110,038	150,978	97,024			113,855
	65 & Up	125,030	138,692	114,859	132,041	111,745	162,708	124,151	169,015	200,298	131,020		132,955
<b>Avg. Annual Salary</b>		58,145	79,961	90,841	99,874	105,820	113,682	111,399	135,814	177,348	131,020		90,163



**Table C-15**  
**Florida Retirement System Pension Plan**  
**Member Counts and Average Salaries at July 1, 2017**  
**TRS – Teachers’ Retirement System**

Count	Years of Service											All Years
	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 & Up	
Age												
Under 20												
20 to 24												
25 to 29												
30 to 34												
35 to 39												
40 to 44												
45 to 49												
50 to 54												
55 to 59												
60 to 64												
65 & Up	1									9	3	13
<b>Total Count</b>	1									9	3	13

Average Salary (\$)	Years of Service											All Years
	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 & Up	
Age												
Under 20												
20 to 24												
25 to 29												
30 to 34												
35 to 39												
40 to 44												
45 to 49												
50 to 54												
55 to 59												
60 to 64												
65 & Up	2,865									89,008	208,665	109,995
<b>Avg. Annual Salary</b>	2,865									89,008	208,665	109,995



**Table C-16**  
**Florida Retirement System Pension Plan**  
**Member Counts and Average Salaries at July 1, 2017**  
**IFAS – Institute of Food and Agricultural Sciences**

Count	Years of Service											
	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 & Up	All Years
Age												
Under 20												
20 to 24												
25 to 29												
30 to 34												
35 to 39												
40 to 44												
45 to 49												
50 to 54												
55 to 59												
60 to 64							5					5
65 & Up							8	1				9
<b>Total Count</b>							13	1				14

Average Salary (\$)	Years of Service											
	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 & Up	All Years
Age												
Under 20												
20 to 24												
25 to 29												
30 to 34												
35 to 39												
40 to 44												
45 to 49												
50 to 54												
55 to 59												
60 to 64							100,996					100,996
65 & Up							121,462	80,343				116,893
<b>Avg. Annual Salary</b>							113,590	80,343				111,215



**Table C-17**  
**Florida Retirement System Pension Plan**  
**Member Counts and Average Salaries at July 1, 2017**  
**Grand Totals of All Active Participants**

Count	Years of Service												
	Age	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 & Up	All Years
	Under 20	1,031	1										1,032
	20 to 24	17,935	144										18,079
	25 to 29	38,275	6,664	239									45,178
	30 to 34	27,111	17,781	7,835	168								52,895
	35 to 39	18,968	13,044	20,344	5,695	107							58,158
	40 to 44	15,523	10,274	15,990	15,689	4,520	80						62,076
	45 to 49	15,015	10,546	15,158	15,600	15,308	4,454	174					76,255
	50 to 54	12,524	9,337	13,996	13,502	12,699	12,076	3,098	89				77,321
	55 to 59	9,361	7,854	12,632	12,871	11,465	11,113	4,603	621	10			70,530
	60 to 64	4,403	5,063	7,966	7,766	6,482	6,461	1,654	711	116	2		40,624
	65 & Up	2,197	2,674	4,239	3,005	1,803	1,159	639	375	248	118	17	16,474
<b>Total Count</b>		162,343	83,382	98,399	74,296	52,384	35,343	10,168	1,796	374	120	17	518,622

Average Salary (\$)	Years of Service												
	Age	Under 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 & Up	All Years
	Under 20	10,432	39,100										10,460
	20 to 24	25,400	23,859										25,388
	25 to 29	34,149	41,121	41,386									35,216
	30 to 34	35,050	45,196	49,982	49,917								40,719
	35 to 39	33,756	44,265	52,384	55,331	55,184							44,781
	40 to 44	33,126	42,768	51,370	58,088	61,491	60,542						47,831
	45 to 49	32,934	41,251	48,305	55,708	64,838	65,154	58,776					50,144
	50 to 54	32,776	40,058	45,087	50,176	59,232	65,926	63,237	60,686				49,697
	55 to 59	31,822	39,801	43,790	47,006	53,047	61,313	68,104	64,586	61,408			48,382
	60 to 64	29,716	39,488	43,309	46,955	51,708	58,617	65,693	68,631	58,845	66,216		47,231
	65 & Up	20,439	33,756	40,365	44,412	48,856	57,585	66,532	81,987	86,765	89,073	136,416	42,623
<b>Avg. Annual Salary</b>		32,380	42,092	47,979	52,284	58,415	62,756	65,971	69,628	77,427	88,692	136,416	45,289



## Appendix D: Projections

Table D-1 presents a projection of total costs of the employers covered by the FRS Pension Plan (exclusive of the Investment Plan) during the five-year period following the actuarial valuation date, July 1, 2017. The contributions shown beginning with plan year 2018-2019 are based on the assumption that the contribution levels calculated in this report are extended throughout the projection period. The contributions shown for plan year 2017-2018 are based on the legislated rates (before blending) on page B-3 of this report.

Table D-2 reflects, for each membership class and DROP, the outstanding UAL balance of all amortization bases combined as of July 1, 2017. The table develops the associated duration of the amortization of the combined amortization bases.

Beginning in the July 1, 1998 actuarial valuation with the emergence of the surplus, all UAL bases in existence as that time were considered to be fully amortized. While the Plan was in surplus, the UAL amortization payment or credit was made from the surplus for certain post-1998 benefit increases and the 1998 and 2003 experience studies prior to any use of the surplus for contribution rate reductions or any other FRS uses. Now that the plan is no longer in surplus, the UAL payment is made by employers as part of the contribution rate.

Table D-3 estimates the UAL payment / (available surplus) for the next three plan years based on Florida law. The estimates are projections of the July 1, 2017 valuation results, and assume experience occurs as stated in the July 1, 2017 valuation.

All three tables reflect that no surplus is available for rate reduction. The amortization methodology recognizes the time value of money.

**Table D-1**  
**Florida Retirement System Pension Plan**  
**Projection of Retirement Costs (Excluding Member Contributions)**  
**July 1, 2017**  
**Based on Contribution Rates Before Blending**

(All Amounts in Millions)

	2017 -2018	2018 -2019	2019 -2020	2020 -2021	2021 -2022
A. Employer Normal Cost <sup>1</sup>	\$1,101	\$1,190	\$1,229	\$1,269	\$1,310
B. UAL Payment / (Surplus Utilization) <sup>2</sup>	\$1,664	\$1,843 <sup>2</sup>	\$1,903 <sup>2</sup>	\$1,965 <sup>2</sup>	\$2,029 <sup>2</sup>
C. Total	\$2,765	\$3,033	\$3,132	\$3,234	\$3,339

<sup>1</sup> Includes DROP contributions on behalf of DROP members.

<sup>2</sup> UAL Payment increase is based on assumed increasing payroll, but does not reflect the recognition and funding of deferred investment gains/losses.

**Table D-2**  
**Florida Retirement System Pension Plan**  
**Funding of UAL / (Surplus) by Duration of Amortization**  
**July 1, 2017**  
 (\$ in thousands)

			Special Risk	-- Elected Officers' Class --			Senior	DROP
	Regular	Special Risk	Administrative	Judicial	Leg-Atty-Cab	Local	Management	
Valuation Date Outstanding UAL Balance / (Surplus)	\$15,357,470	\$7,283,506	\$16,919	\$469,184	\$61,732	\$368,701	\$1,960,483	\$2,467,879
UAL Cost / (Savings) Rate (see Table 4-11)	4.19%	12.44%	39.25%	29.83%	58.61%	52.90%	23.76%	7.96%
Projected UAL Payroll PY 2018 - 2019*	\$23,412,818	\$3,945,979	\$3,230	\$106,884	\$7,098	\$47,827	\$566,672	\$2,188,124
Annual Payment / (Savings) for PY 2018 - 2019	\$980,462	\$490,844	\$1,268	\$31,881	\$4,160	\$25,298	\$134,651	\$174,213
Amortization Period Calculated Assuming								
Level Dollar	NA **	NA **	39	NA **	NA **	NA **	NA **	NA **
Level Percent of Payroll	25	22	19	22	22	22	22	21

\* The UAL payroll includes salaries for defined contribution program members who pay only the UAL contribution rate.

\*\* Current annual payment / (savings) will never accumulate to the UAL if the earned interest rate is 7.50%.

**Table D-3**  
**Florida Retirement System Pension Plan**  
**Projected Annual Payments of UAL Amortization Bases<sup>1</sup>**  
**July 1, 2017**

**Projected PY 2018-2019 and Forward Based on 07/01/2017 Valuation Results and 07/01/2017 Assets**

	<u>2018 - 2019</u>	<u>2019 - 2020</u>	<u>2020 - 2021</u>
1 Estimated Surplus Available Rate Stabilization Mechanism <sup>2</sup>	\$0.0	\$0.0	\$0.0
2 (Increase)/Decrease in Available Surplus from prior year	\$0.0	\$0.0	\$0.0
<b>UAL Bases</b>			
3 12% Increase in Special Risk benefits (in pay status before 07/01/2000) <sup>3</sup>	\$30.4	\$31.4	\$32.5
4 Special Risk Minimum In-Line-of-Duty Disability Increased to 65% <sup>4</sup>	(\$0.2)	(\$0.2)	(\$0.3)
5 1993 - 1998 Experience Study Assumption Changes <sup>5</sup>	(\$38.5)	(\$39.7)	(\$41.0)
6 1998 - 2003 Experience Study Assumption Changes <sup>5</sup>	(\$286.4)	(\$295.7)	(\$305.3)
7 2003 - 2008 Experience Study Assumption Changes	\$485.7	\$501.5	\$517.8
8 2009 Experience (Gain)/Loss	\$1,524.1	\$1,573.6	\$1,624.8
9 Unrecognized (Gains)/Losses while in Surplus	(\$445.8)	(\$460.3)	(\$475.3)
10 2009 Plan Change (House Bill 479)	(\$92.2)	(\$95.2)	(\$98.3)
11 2010 Experience (Gain)/Loss	\$80.5	\$83.1	\$85.8
12 2010 Plan Change (Senate Bill 2100)	(\$88.1)	(\$91.0)	(\$94.0)
13 2011 Experience (Gain)/Loss	\$191.0	\$197.3	\$203.7
14 2012 Experience (Gain)/Loss	(\$7.5)	(\$7.7)	(\$8.0)
15 2013 Experience (Gain)/Loss	\$184.4	\$190.4	\$196.6
16 2008 - 2013 Experience Study Assumption/Method Changes	\$129.3	\$133.5	\$137.9
17 2014 Experience (Gain)/Loss	(\$175.4)	(\$181.1)	(\$187.0)
18 2015 Experience (Gain)/Loss	\$35.1	\$36.2	\$37.4
19 Special Risk 100% In-Line-Of-Duty Death (2016)	\$2.6	\$2.7	\$2.8
20 2016 Assumption Changes	\$69.3	\$71.6	\$73.9
21 2016 Experience (Gain)/Loss	\$76.4	\$78.8	\$81.4
22 Special Risk 100% In-Line-Of-Duty Death (2017)	\$5.3	\$5.5	\$5.7
23 2017 Assumption Changes	\$133.3	\$137.7	\$142.1
24 2017 Experience (Gain)/Loss	\$29.4	\$30.4	\$31.4
<b>Subtotal [(3) through (24)]</b>	<b>\$1,842.7</b>	<b>\$1,902.8</b>	<b>\$1,964.6</b>
25 Across the Board Rate Reduction of 0% <sup>6</sup>	<u>\$0.0</u>	<u>\$0.0</u>	<u>\$0.0</u>
<b>Total [Subtotal + (25)]</b>	<b>\$1,842.7</b>	<b>\$1,902.8</b>	<b>\$1,964.6</b>
26 UAL payment / (Surplus Available) [(1) + Total] =	\$1,842.7	\$1,902.8	\$1,964.6

1 Numbers exclude contributions to the Investment Plan.

2 Projected surplus based on 07/01/2017 valuation results. Using amortization method that reflects interest.

3 In the absence of a surplus there is an additional cost to the Special Risk Class of 0.77% attributable to the 12% increase in pre-2000 retired benefits.

4 In the absence of a surplus there is an additional cost to the Special Risk Administrative Class of 0.15% and an additional cost to the Special Risk Class of -0.01% attributable to the Increase in Minimum ILOD Disability Benefit.

5 In the absence of a surplus there is an additional charge or credit to each class. See Tables 4-2 through 4-10 for details.

6 No surplus available for rate reduction.

## Appendix E: Comparisons/Reconciliation

This Appendix contains certain comparative information required by the state. The table below compares actual investment return, aggregate payroll growth, and individual salary increases with the actuarial assumptions.

The next table reconciles the flow of participants from the 2016 actuarial valuation to the 2017 actuarial valuation, while the last table cross-references the required sections of 112.64 with this report.

**Table E-1**  
**Florida Retirement System Pension Plan**  
**One-Year Comparisons**

**1. Annual Rate of Investment Return on Actuarial Value of Assets**

Period Ending	Actual	Assumed
---------------	--------	---------

June 30, 2015	8.62%	7.65%
June 30, 2016	6.99%	7.65%
June 30, 2017	8.21%	7.60%

**2. Annual Rate of Payroll Growth**

Period Ending	Actual <sup>1</sup>	Assumed <sup>1</sup>
---------------	---------------------	----------------------

June 30, 2015	2.28%	3.25%
June 30, 2016	1.10%	3.25%
June 30, 2017	4.10%	3.25%

**3. Individual Rates of Salary Increases for Regular Members and Special Risk Members**

Year Ended June 30	Rate of Increase During Year		
	Regular Members	Special Risk	Assumed <sup>2</sup>
2015	4.8%	5.9%	4.59%
2016	4.7%	5.5%	4.59%
2017	5.8%	8.6%	4.59%

<sup>1</sup> The payroll base compared is used for UAL cost calculations and includes payroll for DROP members and certain defined contribution plan participants for whom only UAL contributions are due.

<sup>2</sup> Individual rates of salary increase vary by age and service. Single Assumed rate shown above reflects the population and assumptions adopted study with each experience study. The most recent experience was for the period July 1, 2008 through June 30, 2013.

**Table E-2**  
**Florida Retirement System Pension Plan**  
**Data Reconciliation**

	Active Participants	Disabled Participants	Retired Participants and Beneficiaries	DROP	Terminated Vested Participants	Total
Number reported as of July 1, 2016	514,629	13,919	378,870	31,609	108,692	1,047,719
New Entrants <sup>1</sup>	62,895	0	0	0	0	62,895
Exits from Active Status <sup>2</sup> or DROP	(49,384)	300	14,930	(7,721)	9,022	(32,853)
DROP Entry	(9,518)	0	0	9,518	0	0
Cessation of benefit payments	NA	(605)	(12,069)	0	0	(12,674)
Other reported status changes, including changes from Terminated Vested status	0	597	6,849	46	(9,102)	(1,610)
Number reported as of July 1, 2017	518,622	14,211	388,580	33,452	108,612	1,063,477

<sup>1</sup> Includes rehires

<sup>2</sup> Includes retirement, vested termination, IP transfer, non-vested termination and death

**Table E-3**  
**Florida Retirement System Pension Plan**  
**Cross Reference to Section 112.64 Reporting Requirements**

<u>Code Ref</u>		<u>Page/Section</u>
<b>1 General Information:</b>		
1.003 (3g)	Includes certification by the enrolled actuary (signed and dated)?	Cover Letter
1.003 (11)	Do procedures follow commonly accepted procedures and determinations?	Cover Letter
1.003 (4g)	Disclosure of events not taken into account by actuary?	Cover Letter
1.003 (4g)	Disclosure of trends not assumed to continue (by actuary)?	Executive Summary
<b>2 Assumptions:</b>		
1.003 (3e)	Description and explanation of all actuarial assumptions?	Appendix A
1.003 (3f)	Is there a comparison of actual to expected salary increases over the preceding 3-year period?	E-1
1.003 (3f)	Is there a comparison of actual to expected investment returns over the preceding 3-year period?	E-1
1.003 (6)	Do assumptions factor in actual experience?	Appendix A
1.003 (6)	Is impact of inflation considered?	A-3
1.003 (6)	Any consistent experience gains or losses to suggest assumption changes?	No
1.003 (7)	Listing of changed assumptions?	A-18
<b>3 Plan Provisions &amp; Funding Method:</b>		
1.003 (4c)	Contain a summary of plan provisions?	Appendix B
1.003 (4d)	Contain a detailed summary of funding method?	Appendix A
1.003 (5)	Does funding method provide a contribution sufficient to meet the NC and amortize the UAL?	Section 4
<b>4 Assets &amp; Method:</b>		
1.003 (3a)	Is the MVA breakdown included (by cash, bonds, stocks, and other)?	2-2
1.003 (3a)	Is the "statement value" breakdown included?	No
1.003 (3a)	Is the derivation of AVA included?	2-3
1.003 (8)	Are administrative expenses being paid on a current basis?	2-1
	Asset reconciliation, including:	<b>Exhibit</b>
1.003 (4j)	- contributions by source	2-1
1.003 (4j)	- interest and dividends	2-1
1.003 (4j)	- realized gains / (losses)	2-1
1.003 (4j)	- unrealized appreciation	2-1
1.003 (4j)	- pension payments	2-1
1.003 (4j)	- contribution refunds	2-1
1.003 (4j)	- expenses	2-1
1.003 (4j)	- other receipts (identified)	2-1 (transfer)
1.003 (4j)	- other disbursements (identified)	2-1 (IP)

<b>Code Ref</b>		<b>Page/Section</b>
	<b>5 UAL &amp; Amortization Schedule:</b>	<b>Exhibit</b>
1.003 (3b)	Include a plan to amortize any UAL?	4-2 & D-3
	Does amortization schedule of UAL exist (as of the valuation date) ...	<b>Page</b>
1.003 (3c)	- on an annual basis for the next 3-years?	Exhibit D-3
1.003 (3c)	- for the final year?	No
1.003 (3c)	Is a statement as to how method was derived included?	A-2
		Section 4
1.003 (3d)	Is a description of actions taken to reduce the UAL included?	Exec Summary
	Reconciliation of UAL (must include items below):	<b>Exhibit</b>
1.003 (4h)	- UAL for prior valuation (w/ start date)	Page 6
1.003 (4h)	- Normal Cost, contributions, & accrued interest	Page 6
1.003 (4h)	- Impact of changes (assumption, funding method, amendments, gain/loss)	4-2—4-10
1.003 (4h)	- UAL for current valuation	4-2—4-10
	<b>6 Results:</b>	<b>Exhibit</b>
1.003 (4a)	Valuation Date clearly indicated?	Page 1
1.003 (4e)	Are results separated by employee group?	3-2 and Sections 4 & 5
1.003 (4f)	Is there disclosure of any benefit and expense provided by and/or paid from plan assets for which no liabilities or current costs have been established?	Cover Letter
1.003 (4i)	Projection of emerging liabilities/cash flow needs for next 10-15 years (optional)	No
1.003 (4l)	Summary of principal results (for current and prior valuation) including:	
	- participant data (counts, total pay, total annual benefits by group)	Appendix C
	- assets (market and actuarial)	2-2, 2-3
	- PVB (split: active by decrement, tv, ret & ben, dis, and total)	3-2
	- PV of future benefit payments	3-2
	- AL and UAL, i.e., including amount, date, amortization period	3-2, 4-2
	- PVVB (by group), non-vested PVAB, Total PVAB	5-1, 5-2
1.003 (4l)	Reconciliation of PVAB, including:	
	- PVAB at beginning of year	5-3
	- changes due to amendment and/or assumptions	5-3
	- change due to decrease in discount period and benefits accrued	5-3
	- Benefits paid	5-3
	- Other changes	5-3
	- Net increase (decrease)	5-3
	- PVAB at end of year	5-3
1.003 (4l)	Pension Cost	
	- Normal cost (shown for each benefit and amount for admin expense)	4-1
	- Payment to amortize UAL	4-2—4-10
	- Expected plan sponsor contribution (i.e. total of above pieces with interest, also as % of pay)	4-11
	- Amount to be contributed by members (total and % of pay)	Pages B-3—B-4
1.003 (4l)	Past Contributions	
	- Required plan sponsor & member contribution	4-12
	- Actual contributions made by: plan sponsor, members, other	4-12
1.003 (4k)	Active member accumulated contributions with interest	5-2
1.003 (4l)	Net actuarial gain / loss	4-2—4-10

<b><u>Code Ref</u></b>		<b>Page/Section</b>
1.003 (4l)	Other (PVFS & PVFC at attained age and at entry age, PVFC from other sources, PVF Expected BP)	3-2
	<b>7 Data:</b>	<b>Exhibit</b>
1.003 (4i)	Are membership demographics and financial statistics included?	Appendix C
1.003 (4i)	Age/service table for actives included?	C-7—C-17
1.003 (4i)	Data reconciliation?	E-2
	<b>8 Contribution Rate:</b>	<b>Page</b>
1.003 (4a)	Applicable beginning and ending dates for recommended contribution indicated?	4
1.003 (4b)	Are ER and EE contribution rates adequate to meet benefits?	4
1.003 (4b)	Are contribution rate changes necessary to achieve or preserve funding?	Yes, Executive Summary and Exhibit 4-11
1.003 (7)	Is the impact of assumption or cost method changes indicated?	7, Exhibit 3-1
1.003 (9)	Were costs to be paid at a later date adjusted for interest and/or salary?	Yes 3—4
1.003 (10)	Is the effective date of recommended changes no later than the next fiscal year?	Yes 3—4

## Appendix F: Glossary

The following definitions are largely excerpts from a list adopted in 1981 by the major actuarial organizations in the United States. In some cases the definitions have been modified for specific applicability to the FRS.

### **Accrued Benefit**

The amount of an individual's benefit (whether or not vested) as of a specific date, determined in accordance with the terms of a pension plan and based on compensation and service to that date.

### **Accumulated Benefit Obligation (ABO)**

The actuarial present value of benefits attributed by the pension benefit formula to employee service rendered before a specified date and based on employee service and compensation prior to that date.

### **Actuarial Assumptions**

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disability, and retirement; changes in compensation, rates of investment earnings, and asset appreciation or depreciation; procedures used to determine the Actuarial Value of Assets; and other relevant items.

### **Actuarial Cost Method**

A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Liability.

### **Actuarially Equivalent**

Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.

### **Actuarial Gain/Loss**

A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions during the period between two Actuarial Valuation Dates, as determined in accordance with a particular Actuarial Cost Method.

### **Actuarial Liability (AL)**

That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Normal Costs.

### **Actuarial Present Value of Pension Plan Benefits**

Total projected benefits include all benefits estimated to be payable to plan members as a result of their service through the valuation date and their expected future service. The actuarial present value of total projected benefits as of the valuation date is the present value of the cost to finance benefits payable in the future, discounted to reflect the expected effects of the time value (present value) of money and the probabilities of payment.

### **Actuarial Valuation**

The determination, as of a valuation date, of the Normal Cost, Actuarial Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

### **Actuarial Value of Assets (AVA)**

The value of cash, investments, and other property belonging to a pension plan, as used by the actuary for the purpose of an Actuarial Valuation.

### **Amortization**

Paying an interest-bearing liability by gradual reduction through a series of installments, as opposed to one lump-sum payment.

### **Amortization Payment**

That portion of the pension plan contribution which is designed to pay interest on and to amortize the Unfunded Actuarial Liability.

Level Percent of Pay: Produces a level series of payments when expressed as a percent of payroll.  
Cash payment increases in line with payroll growth assumption.

Level Dollar: Produces a decreasing pattern of payments when expressed as a percent of payroll.  
Cash payment remains level.

### **Annual Pension Cost (APC)**

Under GASB, when the Net Pension Obligation is positive, the APC is equal to the Annual Required Contribution plus the Interest on the beginning Net Pension Obligation minus the amortization of the Net Pension Obligation. When the Net Pension Obligation is negative, the APC is equal to the Annual Required Contribution minus the Interest on the beginning Net Pension Obligation plus the amortization of the Net Pension Obligation.

### **Annual Required Contribution (ARC)**

Under GASB, this amount is equal to the Normal Cost plus the Amortization Payment. GASB does not require contributions to be equal to the ARC; however it requires the calculation and reporting of the ARC.

### **Entry Age Normal Actuarial Cost Method (EAN)**

A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit ages. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future Normal Costs is called the Actuarial Liability.

### **Funded Ratio**

Ratio of the assets of a pension plan to its liabilities.

### **Government Accounting Standards Board (GASB)**

This Board sets standards of state and local accounting and financial reporting.

### **Interest Rate**

The rate used to discount projected benefit payments to determine the present value in a valuation.

### **Market Value of Assets (MVA)**

The price for which an asset could be sold at a particular date. May also be referred to as the Fair Value of Assets.

**Normal Cost (NC)**

That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

**Net Pension Obligation (NPO)**

Under GASB, the cumulative difference between Annual Pension Cost and the employer's contributions to the plan, including the pension liability or asset at transition, if any.

**Present Value (PV)/ Actuarial Present Value (APV)**

The value of an amount or series of amounts of cash flows payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions, including selected interest rate.

**Projected Benefits**

Those pension plan benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and anticipated future compensation and service credits.

**Unfunded Actuarial Liability**

The excess of the Actuarial Liability over the Actuarial Value of Assets. When the Actuarial Value of Assets exceeds Actuarial Liabilities a surplus exists.

**Valuation Date**

The date as of which the liabilities are determined.



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December 6, 2017

**Via E-Mail**

Ms. Elizabeth Stevens  
State Retirement Director  
Florida Department of Management Services, Division of Retirement

Re: **Blended Proposed Statutory Rates for the 2018-2019 Plan Year Reflecting a Uniform UAL Rate for All Membership Classes and DROP**

Dear Director Stevens:

As requested, we have calculated the uniform or “blended” proposed statutory employer rates for the 2018-2019 plan year based on the statutory contributions for the FRS Investment Plan and the actuarially calculated 2018-2019 rates for the defined benefit FRS Pension Plan, as specified in the FRS 2017 Actuarial Valuation Report. The blended rates reflect a uniform Unfunded Actuarial Liability (UAL) Contribution Rate for all payroll bases on which the Blended UAL Contribution Rate is assessed.

**Analysis**

We determined the uniform blended 2018-2019 employer rate for each membership class and subclass of the Florida Retirement System by projecting contributions for both the FRS Pension Plan and the FRS Investment Plan. We did this by dividing the projected combined amount that would be contributed for both the FRS Pension Plan and the FRS Investment Plan by the total projected combined payroll for both plans. The uniform blended rate calculation assumes plan year 2018-2019 contributions for the FRS Pension Plan will be made at the actuarially calculated rate levels. The actuarially calculated rate levels are based on the July 1, 2017 actuarial valuation of the FRS Pension Plan, as presented in Table 4-11 of the FRS 2017 Actuarial Valuation Report. The FRS Investment Plan rates are the sum of the rates in Sections 121.72, 121.73, and 121.735 of Florida Statutes and assume those rates continue in effect during plan year 2018-2019. The employer contribution rates shown in the attached table are net of the 3% of payroll employee contribution rate.

The payroll for some employee groups is subject to only the UAL Cost component of the FRS Pension Plan’s contribution rate (e.g. participants in SUSORP, SMSOAP, and SCCORP, and reemployed retirees not eligible for renewed membership in a state-sponsored retirement program). The payroll for those employee groups is included in the calculation of the Blended UAL Contribution Rate, but is excluded from the calculation of the Blended Normal Cost Contribution Rate.

Based on the data provided to us for this study, as of July 1, 2017 FRS Investment Plan payroll comprised between 16% and 17% of total payroll. On a headcount basis, FRS Investment Plan members constitute between 18% and 19% of active FRS membership.

## **Results**

Table I shows the results of our study based on actual levels of participation in the FRS Pension Plan and the FRS Investment Plan as of July 1, 2017, projected to plan year 2018-2019 using the long-term payroll growth assumption of 3.25%. Please note, Senate Bill 7022 enacted by the 2017 Florida legislature changed the default plan for initial enrollments on and after January 1, 2018 from the FRS Pension Plan to the FRS Investment Plan for all membership classes other than Special Risk. The enactment may change future rates of payroll growth as new entrants who would have defaulted into the FRS Pension Plan under prior statute will now default into the FRS Investment Plan in the absence of an active election. Due to the effective date of the enactment and the election window afforded to newly enrolled members, any resulting shift in plan membership is not anticipated prior to the start of the 2018-2019 plan year.

Section A of the table includes the Normal Cost Rates as of July 1, 2017 of the FRS Pension Plan. Section A does not include the UAL Cost. UAL Cost Rates are applied to a larger total payroll than the Normal Cost Rates and are developed in a later section. Section A, line 3 shows the total employer Normal Cost of the FRS Pension Plan as the product of Normal Cost Rates and projected Normal Cost payroll.

Similarly, Section B calculates the total employer cost of the FRS Investment Plan as the product of applicable employer contribution rates in effect since July 1, 2017 and the projected FRS Investment Plan payroll. FRS Investment Plan payroll is projected as described above.

Section C of the table shows the sum of the FRS Pension Plan employer Normal Cost and FRS Investment Plan employer cost as dollars and as a percentage of total projected combined payroll (FRS Pension Plan projected Normal Cost payroll plus FRS Investment Plan projected payroll).

Section D of the table shows the UAL Cost as of July 1, 2017 of the FRS Pension Plan, as shown in Table 4-11 of the FRS 2017 Actuarial Valuation Report.

Section E shows the projected payroll of the FRS Investment Plan. There is no UAL Cost attributable to the FRS Investment Plan.

Section F calculates the "Blended" UAL Cost as dollars and as a percentage of total payroll (FRS Pension Plan projected UAL payroll plus FRS Investment Plan projected payroll).

Section G shows the final Blended Uniform Contribution Rates as the sum of the "Blended" Normal Cost Contribution Rates from Line (C3) and the "Blended" UAL Contribution Rates from Line (F3). The employers of employee groups subject to only the UAL Contribution Rate would contribute the "Blended" UAL Contribution Rates shown in Line (G2) of the table on applicable payroll. The Total Adjusted Contribution Rates shown in Line (G3) of the table will be applied to all other payroll subject to employer contributions.

The contribution rates shown in Table I exclude the 0.06% contribution rate for FRS Investment Plan administration and education (applied to all classes except DROP) and the 1.66% contribution rate for the Florida Retiree Health Insurance Subsidy (HIS) program, which apply across the board to the FRS Pension Plan and the FRS Investment Plan.

The calculations are based on census and payroll data provided to us by the Florida Department of Management Services, Division of Retirement for the July 1, 2017 actuarial valuation. We have not audited or verified this data and other information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete. These calculations are based on the Ultimate Entry Age actuarial cost allocation method, as described in the FRS 2017 Actuarial Valuation Report for use in developing 2018-2019 actuarially calculated contribution rates for the FRS Pension Plan.

We performed a limited review of the data used directly in our analysis for reasonableness and consistency and have not found material defects in the data. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

Except where otherwise noted in this letter, this analysis is based on the FRS Pension Plan provisions, actuarial methods and actuarial assumptions as summarized in the FRS 2017 Actuarial Valuation Report as published on December 1, 2017. Further, the data used in these calculations were based on FRS Pension Plan data as summarized in the FRS 2017 Actuarial Valuation Report and FRS Investment Plan census data as of July 1, 2017 as provided to us by the Florida Department of Management Services, Division of Retirement. The results of our study depend on future experience conforming to those actuarial assumptions discussed earlier in this letter. Future actuarial measurements may differ significantly from the current measurements presented in this analysis due to many factors, including: plan experience differing from that anticipated by the economic or 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) and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements.

Milliman's work product was prepared exclusively for the internal business use of Florida Department of Management Services, Division of Retirement. It is a complex technical analysis that assumes a high level of knowledge concerning the Florida Retirement System's operations, and uses Division data, which Milliman has not audited. To the extent that Milliman's work is not subject to disclosure under applicable public record laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exceptions:

- (a) The Florida Department of Management Services, Division of Retirement may provide a copy of Milliman's work, in its entirety, to the System's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit the System.



Ms. Elizabeth Stevens  
Division of Retirement  
December 6, 2017  
Page 4

(b) The Florida Department of Management Services, Division of Retirement may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

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

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

We are consulting actuaries for Milliman, Inc. We are also members of the American Academy of Actuaries, and meet their Qualification Standards to render the actuarial opinion contained herein.

Please call if you would like to further discuss this project.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read "Matt Larrabee".

Matt Larrabee, FSA, EA, MAAA  
Principal and Consulting Actuary

A handwritten signature in blue ink, appearing to read "Daniel Wade".

Daniel Wade, FSA, EA, MAAA  
Principal and Consulting Actuary

A handwritten signature in blue ink, appearing to read "Kathryn Hunter".

Kathryn Hunter, FSA, EA, MAAA  
Consulting Actuary

Enclosures

**FLORIDA RETIREMENT SYSTEM**  
FISCAL IMPACT ANALYSIS

**Proposed Statutory Blended Normal Cost Plus UAL Rates for 2018-2019 Plan Year**  
Please see the attached letter for details regarding data, assumptions, methodology, and plan provisions used  
(Dollars in Thousands)

	Regular	Special Risk	Special Risk Administrative	-----Elected Officers' Class----			Senior Management	Composite (excluding DROP)	DROP	Composite (including DROP)
				Judicial	Leg-Atty-Cab	Local				
<b>Proposed Blended Statutory Normal Cost Contribution Rates</b>										
<b>A. Defined Benefit FRS Pension Plan Normal Cost</b>										
1. Employer Cost										
a. Normal Cost Rate <sup>1</sup>	2.91%	11.95%	3.05%	12.10%	6.58%	8.32%	4.27%	4.41%	4.41%	4.41%
b. Rate Reduction Techniques	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
c. Total Adjusted Contribution Rate <sup>2</sup>										
-PYE 2019	2.91%	11.95%	3.05%	12.10%	6.58%	8.32%	4.27%	4.41%	4.41%	4.41%
2. Projected Payroll	\$20,235,564	\$3,890,123	\$3,230	\$105,352	\$6,636	\$43,682	\$546,300	\$24,830,887	\$2,188,124	\$27,019,011
3. Total Employer Normal Cost [(1c) x (2)]										
-PYE 2019	\$588,855	\$464,870	\$99	\$12,748	\$437	\$3,634	\$23,327	\$1,093,970	\$96,496	\$1,190,466
<b>B. Defined Contribution FRS Investment Plan (IP) Employer Cost</b>										
1. Employer Rates effective July 1, 2017 (Sec 121.72, Sec 121.73 and Sec 121.735)	3.60%	13.48%	5.43%	11.05%	6.94%	8.95%	4.98%	4.91%	0.00%	4.91%
2. Projected Payroll	\$4,602,839	\$684,375	\$1,051	\$10,972	\$1,501	\$17,925	\$185,871	\$5,504,534	\$0	\$5,504,534
3. Total Employer Cost [(1) x (2)]										
-PYE 2019	\$165,702	\$92,254	\$57	\$1,212	\$104	\$1,604	\$9,256	\$270,189	\$0	\$270,189
<b>C. Total System Normal Cost (FRS Pension Plan + FRS Investment Plan)</b>										
1. Total Normal Cost Contribution [(A3) + (B3)]	\$754,557	\$557,124	\$156	\$13,960	\$541	\$5,238	\$32,583	\$1,364,159	\$96,496	\$1,460,655
2. Total System Projected Payroll [(A2) + (B2)]	\$24,838,403	\$4,574,498	\$4,281	\$116,324	\$8,137	\$61,607	\$732,171	\$30,335,421	\$2,188,124	\$32,523,545
3. "Blended" Normal Cost Contribution Rate As a Percentage of Total Payroll [(C1) / (C2)] <sup>2</sup>	3.04%	12.18%	3.64%	12.00%	6.65%	8.50%	4.45%	4.50%	4.41%	4.49%

<sup>1</sup> As reported in the July 1, 2017 actuarial valuation report - Table 4-11

<sup>2</sup> Rates shown do not include the Health Insurance Subsidy contribution rate or FRS Investment Plan education and administration assessment.

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**FLORIDA RETIREMENT SYSTEM**  
FISCAL IMPACT ANALYSIS

**Proposed Statutory Blended Normal Cost Plus UAL Rates for 2018-2019 Plan Year**  
Please see the attached letter for details regarding data, assumptions, methodology, and plan provisions used  
(Dollars in Thousands)

	Regular	Special Risk	Special Risk Administrative	-----Elected Officers' Class----			Senior Management	Composite (excluding DROP)	DROP	Composite (including DROP)
			Judicial	Leg-Atty-Cab	Local					
<b>Proposed Blended Statutory UAL Contribution Rates</b>										
<b>D. Defined Benefit FRS Pension Plan UAL Cost</b>										
1. Employer UAL Cost <sup>1 &amp; 2</sup>	4.19%	12.44%	39.25%	29.83%	58.61%	52.90%	23.76%	5.94%	7.96%	6.09%
2. Projected Payroll	\$23,412,818	\$3,945,979	\$3,230	\$106,884	\$7,098	\$47,827	\$566,672	\$28,090,508	\$2,188,124	\$30,278,632
3. Total Employer UAL Cost [(1) x (2)] -PYE 2019	\$980,997	\$490,880	\$1,268	\$31,883	\$4,160	\$25,300	\$134,641	\$1,669,129	\$174,175	\$1,843,304
<b>E. Defined Contribution FRS Investment Plan Pro</b>	\$4,602,839	\$684,375	\$1,051	\$10,972	\$1,501	\$17,925	\$185,871	\$5,504,534	\$0	\$5,504,534
<b>F. Total System UAL Cost (FRS Pension Plan + FRS Investment Plan)</b>										
1. Total UAL Contribution [(D3)]	\$980,997	\$490,880	\$1,268	\$31,883	\$4,160	\$25,300	\$134,641	\$1,669,129	\$174,175	\$1,843,304
2. Total System Projected Payroll [(D2) + (E)]	\$28,015,657	\$4,630,354	\$4,281	\$117,856	\$8,599	\$65,752	\$752,543	\$33,595,042	\$2,188,124	\$35,783,166
3. "Blended" UAL Contribution Rate As a Percentage of Total Payroll [(F1) / (F2)] <sup>2</sup>	3.50%	10.60%	29.62%	27.05%	48.38%	38.48%	17.89%	4.97%	7.96%	5.15%
<b>Proposed Blended Statutory Uniform Contribution Rates <sup>3</sup></b>										
<b>G: Total Employer Contribution Rate (FRS Pension Plan + FRS Investment Plan)</b>										
1. "Blended" Normal Cost Contribution Rate [(C3)]	3.04%	12.18%	3.64%	12.00%	6.65%	8.50%	4.45%	4.50%	4.41%	4.49%
2. "Blended" UAL Contribution Rates [(F3)]	<u>3.50%</u>	<u>10.60%</u>	<u>29.62%</u>	<u>27.05%</u>	<u>48.38%</u>	<u>38.48%</u>	<u>17.89%</u>	<u>4.97%</u>	<u>7.96%</u>	<u>5.15%</u>
3. Total Adjusted Contribution Rate <sup>2</sup> -PYE 2019 [(G1) + (G2)]	6.54%	22.78%	33.26%	39.05%	55.03%	46.98%	22.34%	9.47%	12.37%	9.64%

<sup>1</sup> As reported in the July 1, 2017 actuarial valuation report - Table 4-11

<sup>2</sup> Rates shown do not include the Health Insurance Subsidy contribution rate or FRS Investment Plan education and administration assessment.

<sup>3</sup> Employers of employee groups subject to only the UAL contribution rate will pay the rates shown in line (G2).

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