Employees' Retirement System of Rhode Island

Retirement Board Meeting

May 15, 2017

9:00 A.M.

Seth Magaziner, General Treasurer, Chairman

Frank J. Karpinski, Executive Director

ERSRI Memorandum

Date: May 8, 2017

To: Retirement Board

From: Frank J. Karpinski, Executive Director

Subject: May 2017 Monthly Board Meeting

The Monthly Meeting of the Retirement Board will be held at **9:00 a.m.** on **Monday, May 15, 2017** on the 2nd Floor Board Room at 50 Service Avenue, Warwick. The estimated time of the Board meeting will be 2 ½ hours.

Parking is available in front of our building. Additional parking is available in the parking lot as you pass through the gate which will open using your identification. You can enter either by the back parking lot entrance to come up the stairs to the 2nd floor or you can walk around to the main entrance which is in the front of the building to enter.

If you are unable to attend the May meeting, please contact me at 462-7610.

EMPLOYEES' RETIREMENT SYSTEM OF RHODE ISLAND

RETIREMENT BOARD MONTHLY MEETING

Monday, May 15, 2017
9:00 a.m.
2nd Floor Conference Room
50 Service Avenue, Warwick, RI

I. Chairperson Call to Order

II. *Approval of the Draft Regular Meeting Minutes and the Draft Executive Session Minutes of the April 12, 2017 Retirement Board Meeting

III. Chairperson's Report

IV. Executive Director's Report

- Approval of the Member Services Subcommittee Charter
- Financial Market Analysis and Review by Pension Consulting Alliance (PCA)
- Presentation and Potential Approval of the Actuarial Experience Study by Gabriel, Roeder, Smith and Company for The Six–Year Period Ending June 30, 2016

V. Administrative Decisions

None this Month

VI. Approval of the April Pensions as Presented by ERSRI

VII. Legal Counsel Report

- * *United States of America v. Ambulai R. Sheku,* CR No. 16-091S; Consideration of potential pension revocation action pursuant to R.I.G.L. §36-10.1-1, et seq. the Public Employee Pension Revocation and Reduction Act (PEPRRA).

VIII. Committee Reports

Disability Subcommittee -- See Attachment I

Governance Subcommittee

Member Services Subcommittee

IX. Adjournment

**Board members may seek to convene in Executive Session pursuant to Rhode Island General Laws §42-46-5 (a)(2) to discuss pending and potential litigation involving the Retirement Board.*

Attachment I

Disability Applications and Hearings on Monday, May 8, 2017

Laura Barzykowski

Joyce Garrett

Claudette Iacovone

Francis Mansi Jr.

Cynthia Meeks

Rosemary Colon

Peter Gesualdi

Mary Demers

Jane Murray

Ronald Rounds

Debra Lancia

Employees' Retirement Board of Rhode Island
Monthly Meeting Minutes
Wednesday, April 12, 2017
10:00 a.m.
2nd Floor Conference Room, 50 Service Avenue

The Monthly Meeting of the Retirement Board was called to order at 10:03 a.m. Wednesday, April 12, 2017, in the 2nd Floor Conference Room, 50 Service Avenue, Warwick, RI.

I. Roll Call of Members

The following members were present at roll call: General Treasurer Seth Magaziner; Vice Chair William B. Finelli; Roger P. Boudreau; Mark A. Carruolo; Brian M. Daniels; Michael DiBiase; Paul L. Dion, Ph.D.; Thomas M. Lambert; John P. Maguire; Marianne F. Monte; Thomas A. Mullaney; Claire M. Newell; Marcia B. Reback; Jean Rondeau and Dr. Laura Shawhughes.

Also in attendance: Frank J. Karpinski, ERSRI Executive Director and Attorney Michael P. Robinson, Board Counsel.

Recognizing a quorum, Treasurer Magaziner called the meeting to order.

II. Approval of Minutes

On a motion by Jean Rondeau and seconded by Roger P. Boudreau, it was unanimously

VOTED: To approve the draft regular minutes of the March 15, 2017 meeting of the Retirement Board of the Employees' Retirement System of Rhode Island.

III. Chairperson's Report

Treasurer Magaziner had no update report to the Board.

IV. Executive Director's Report

Director Karpinski apprised the Board they were in possession of the Pension Application Report, the Disability Subcommittee Report dated April 7, 2017 and a presentation comprised of the FY2018 *Budget Amendment Recommendation* and FY2018 Expense Budget amendment. The Director reminded the Board that the annual Board training is on May 12, 2017 at the W. Alton Jones Campus Whispering Pines, located at URI.

The Director apprised the Board that included in their book, they have been provided the final versions of the Subcommittee charters for their consideration. On a motion by Marcia B. Reback and seconded by Roger P. Boudreau, it was unanimously

VOTED: To approve the Employees' Retirement System of Rhode Island Charters for the Administration, Audit, Risk and Compliance

Subcommittee; the Disability Subcommittee and the Governance Subcommittee.

Director Karpinski updated the Board regarding on the MERS delinquency report noting that both the Bristol Police and the Town of Scituate are now current.

Director Karpinski then apprised the Board on a matter concerning the Town of North Providence Fire retirees. He said that benefit payments for some retirees included an overtime component which is not permitted by the statute. He noted that the error originated with the Town, which sent ERSRI data that incorrectly included overtime. ERSRI staff has been in touch with the Town's Mayor and Finance Director, who have communicated that they are working on producing corrected data. Once the corrected data has been provided to ERSRI, a plan will be developed to offset future benefit payments for the previous overpayments and return any excess employer contributions to the Town. Excess employee contributions will be returned to the Town to distribute to the members as taxable income.

Director Karpinski said the May 2017 Board meeting will commence at 9:00 a.m. and will be dedicated to consideration of the fiscal year 2016 Experience Study by Gabriel, Roeder, Smith and Company. He said there will be no subcommittee meetings scheduled.

Director Karpinski apprised the Board that the Administration Subcommittee will be convening to consider procuring electronic board books.

FY2018 Budget Amendment Recommendation

Treasurer Magaziner prefaced the amendment discussion by apprising the Board that under the new committee structure, future budget proposals will be reviewed by the Administrative Subcommittee before the full Board. However, given that the proposed FY18 budget amendment must be submitted to the legislature by early May to be included in the FY2018 budget, this matter is being brought directly to the Board for an expedited review. He thanked the Board members for their diligence and understanding.

Director Karpinski apprised the Board that customer service is a top priority and for too long inaccurate data and understaffing have created a less than ideal member service outcome. To help optimize the member experience and provide more counseling and education services, a proposed budget amendment is being presented to the Board for their consideration. The Director recommended adding three new retirement counselors, one of which would be a data analyst having a technical background.

Director Karpinski also apprised the Board that Assistant Executive Director Diane Bourne will be retiring effective May 26, 2017. He said that Kate Brock, the Director of Member Services, will be named the Assistant Executive Director, while retaining the duties of the Director of Member. This will effectively eliminate one management position, which will help offset the cost of the additional counselors.

The proposed revised budget for FY18 that reflects these changes is $10,854,122 which is still below the statutory budget cap of $13,459,223.

Mr. Dion asked about the counselors' also offering DC Plan education. Treasurer Magaziner said there is now a DC Plan coordinator in-house who will be working with the DC vendor to coordinate education for members. Additionally, there is a plan to have DC counselors from the vendor domiciled at ERSRI to be side by side with the counseling team.

On a motion by Jean Rondeau and seconded by Claire M. Newell, it was unanimously

VOTED: To approve the Budget Amendment recommendation as presented.

V. Administrative Decisions

None this month.

VI. Approval of the March Pensions as Presented by ERSRI

On a motion by William B. Finelli and seconded by Roger P. Boudreau, it was unanimously

VOTED: To approve the March pensions as presented.

VII. Legal Counsel Report

Attorney Robinson had no updates to the April 2017 Litigation Report included in the Board book.

Treasurer Magaziner apprised the Board of the action regarding the City of Cranston related to pension reform, wherein the Judge granted a motion to dismiss the case. The Treasurer said his General Counsel Amy L. Crane, Esq., will provide an update.

Attorney Robinson suggested that a motion would be in order for the Board to convene in Executive Session to discuss the pending litigation matters identified on the agenda pursuant to Rhode Island General Laws section §42-46-5 (a)(2).

Consistent with Rhode Island General Laws section §42-46-5 (a)(2) regarding pending litigation involving the Retirement System, a motion was made by Roger P. Boudreau and seconded by Jean Rondeau to convene the Board in Executive Session to discuss C.A. No. 16-130-ML, *Cranston Firefighters, IAFF Local 1363, and International Brotherhood of Police Officers Local 301* vs *Gina Raimondo, in her capacity as Governor of the State of Rhode Island, Seth Magaziner, in his capacity as the General Treasurer of the State of Rhode Island, the Employees' Retirement System of Rhode Island, as* identified on the agenda.

A roll call vote was taken to enter Executive Session, and the following members were present and voted Yea: General Treasurer Seth Magaziner; Vice Chair William B. Finelli; Roger P. Boudreau; Mark A. Carruolo; Brian M. Daniels; Michael DiBiase; Paul L. Dion, Ph.D.; Thomas M. Lambert; John P. Maguire; Marianne F. Monte; Thomas A. Mullaney; Claire M. Newell; Marcia B. Reback; Jean Rondeau and Dr. Laura Shawhughes. It was unanimously

VOTED: To convene the Board into Executive Session pursuant to Rhode Island General Laws section §42-46-5 (a)(2) to discuss the matter of C.A. No. 16-130-ML, *Cranston Firefighters, IAFF Local 1363, and International Brotherhood of Police Officers Local 301* vs *Gina Raimondo, in her capacity as Governor of the State of Rhode Island, Seth Magaziner, in his capacity as the General Treasurer of the State of Rhode Island, the Employees' Retirement System of Rhode Island* which involves pending litigation involving the Board.

[Executive Session]

The Board thereafter convened in executive session.

[Return to Open Session]

Upon returning to open session, Board Counsel Michael P. Robinson noted for the record that two unanimous votes had been taken in Executive Session. A motion was made by Roger P. Boudreau and seconded by John P. Maguire to seal the executive session minutes pursuant to R.I.G.L. §§42-46-4(b) and 42-46-5 (a)(2), as the discussion involved confidential attorney client communications, and discussions related to the System's litigation strategy, the premature disclosure of which would jeopardize such strategy.

A roll call vote was taken to seal the minutes, and the following members were present and voted Yea: General Treasurer Seth Magaziner; Vice Chair William B. Finelli; Roger P. Boudreau; Mark A. Carruolo; Brian M. Daniels; Michael DiBiase; Paul L. Dion, Ph.D.; Thomas M. Lambert; John P. Maguire; Marianne F. Monte; Thomas A. Mullaney; Claire M. Newell; Marcia B. Reback; Jean Rondeau and Dr. Laura Shawhughes. It was unanimously

VOTED: To seal the executive session minutes.

A second motion was made by John P. Maguire and seconded by Marianne F. Monte and it was unanimously

VOTED: To exit executive session and return to open session.

Mr. Maguire requested a copy of the final order from Superior Court on the entire pension reform litigation. Treasurer Magaziner said a copy will be provided.

VIII. Committee Report

Disability Subcommittee:

The Disability Subcommittee recommended the following actions on disability applications for approval by the full Board as a result of its meeting on Friday, April 7, 2017:

Name	Membership Group	Type	Action
1. Ernest Ragosta	Teacher	Accidental/Denied	Ordinary/Denied
2. Michael Proulx	Municipal	Accidental	Approve
3. Charles Bianchi	Municipal	Accidental	Approve
4. Joseph Amato	State	Ordinary	Approve
5. Mark Adams	Municipal	Ordinary	Approve
6. Joan Davia	Teacher	Ordinary	Approve
7. James Martin	State	Ordinary	Approve
8. Rosemary Pari	State	Ordinary	Deny
9. Rosa Del Carmen Cruz Vida	Teacher	Ordinary	Deny
10. Janice Comella	Municipal	Ordinary	Approve

On a motion by William B. Finelli and seconded by Roger P. Boudreau, it was unanimously

VOTED: To approve the recommendation of the Disability Subcommittee meeting of Friday, April 7, 2017 on items 1, 6 and 9.

John P. Maguire recused himself from the vote on numbers 1, 6 and 9.

On a motion by William B. Finelli and seconded by Roger P. Boudreau, it was unanimously

VOTED: To approve the recommendation of the Disability Subcommittee meeting of Friday, April 7, 2017 on item 7.

Claire M. Newell recused herself from the vote on number 7.

On a motion by William B. Finelli and seconded by Roger P. Boudreau, it was unanimously

VOTED: To approve the recommendation of the Disability Subcommittee meeting of Friday, April 7, 2017 on item 8.

Claire M. Newell and Treasurer Seth Magaziner recused themselves from the vote on number 8.

On a motion by William B. Finelli and seconded by Roger P. Boudreau, it was unanimously

VOTED: To approve the recommendation of the Disability Subcommittee meeting of Friday, April 7, 2017 on items 2, 3, 5 and 10.

A motion was made by William B. Finelli and seconded by Marcia B. Reback to approve item 4 (Joseph Amato) for an ordinary disability. A roll call was taken, and the following voted Yea: General Treasurer Seth Magaziner; Vice Chair William B. Finelli; Roger P. Boudreau; Mark A. Carruolo; Michael DiBiase; Thomas M. Lambert; John P. Maguire; Marianne F. Monte; Thomas A. Mullaney; Claire M. Newell; Marcia B. Reback and Dr. Laura Shawhughes. The following voted Nay: Brian M. Daniels; Paul L. Dion, Ph.D. and Jean Rondeau.

VOTED: To approve the recommendation of the Disability Subcommittee meeting of Friday, April 7, 2017 on item 4.

Mr. Finelli apprised the Board that the Disability Subcommittee voted to elect Dr. Laura Shawhughes as Vice Chairperson and voted to move the May meeting from Friday May 5, 2017 to Monday May 8, 2017.

Governance Subcommittee:

Chairman Maguire said the Governance Subcommittee met on March 15, 2017 for its first meeting. The Subcommittee first voted to elect Brian M. Daniels as Vice Chairman. He then said the Subcommittee reviewed and finalized the draft Governance charter which was approved earlier in the meeting.

Mr. Maguire said the Subcommittee discussed and reviewed the Legislative Subcommittee's January 2017 meeting and discussed the best way to address legislation. He said that a more comprehensive analysis should be done prior to the next legislative session to properly vet any recommendations by the Subcommittee and/or Board and said the Subcommittee would meet in early fall to begin the process for the 2018 session. The Subcommittee decided to postpone, until this morning, the overview of the Governance Subcommittee duties. The Subcommittee also decided

there are many duties required of them, and it was best to prioritize the two most important goals, namely the evaluation of Executive Director Karpinski and development of a strategic plan.

Administration Subcommittee:

Chairman Mullaney said the Administration met on March 15, 2017 for its first meeting. The Subcommittee first voted to elect Paul L. Dion, Ph.D. as the Vice Chairman of the Administration, Audit, Risk and Compliance Subcommittee. He then said the Subcommittee reviewed and finalized the draft Administration, Audit, Risk and Compliance Subcommittee charter which was approved earlier in the meeting.

Chairman Mullaney said the Subcommittee noted that it included the two State Employee representatives and recommended that if a vacancy should arise on another subcommittee, one of the State Employee representatives should be moved there to diversify their roles. Lastly Chairman Mullaney said a presentation was provided by Zachary J. Saul, Chief Financial Officer, on an overview of system finance and administration process. He said the Subcommittee discussed a September 2017 meeting to review the budget for review by the Board.

IX. Adjournment

There being no other business to come before the Board, on a motion by Roger P. Boudreau and seconded by William P. Finelli, the meeting adjourned at 11:16 a.m.

Respectfully submitted,

Frank J. Karpinski
Executive Director

EMPLOYEES' RETIREMENT SYSTEM OF RHODE ISLAND
CHARTER FOR THE MEMBER SERVICES SUBCOMMITTEE

INTRODUCTION & AUTHORITY

1) The primary purpose of the Member Services Subcommittee ("Subcommittee") is to assist the Retirement Board ("Board") in fulfilling its oversight responsibilities with respect to retirement benefit administration; retirement system performance; and communications with members, employers and other stakeholders.

2) All actions taken by the Subcommittee shall comply with applicable law, including the Rhode Island General Laws. In the event of a conflict between the terms of this Charter and the Rhode Island General Laws, the Rhode Island General Laws shall control.

COMPOSITION & MEETINGS

3) The Subcommittee shall consist of at least five members of the Board. The Board chair shall serve on the Subcommittee ex-officio.

4) The Board Chairperson shall recommend a chairperson for each of the standing committees and special committees, with the advice and consent of the Board. Each committee shall select a vice chairperson. The chair shall preside at all meetings. In the absence of the chair, the vice chair shall preside.

5) The Executive Director shall designate an employee of the Employees' Retirement System of the State of Rhode Island (the "System") to assist the Subcommittee with the performance of its duties.

6) Subcommittee meetings shall be conducted in accordance with the Rhode Island General laws governing Open Meetings §42-46-1 *et seq.*, General Administrative Rules of the Retirement Board and other legal requirements.

7) The Subcommittee shall meet as many times per year as the Subcommittee chair deems necessary or appropriate to perform the Subcommittee's duties. The Subcommittee shall meet at such times as determined by the Subcommittee chair, after consulting with the Executive Director and Subcommittee members. Meetings shall be subject to the Open Meetings Law. RIGL § 42-46-1 *et seq.*

8) The chair shall develop an annual agenda calendar for Subcommittee meetings, which shall be incorporated into the Board's annual Agenda Calendar (as defined in 120-RICR-10-00-1.1 , General Administrative Rules of the Retirement Board). The chair shall generally oversee the performance of the work assigned to the Subcommittee in the Agenda Calendar.

DUTIES AND RESPONSIBILITIES

The Subcommittee has the following responsibilities:

Retirement Benefit Administration

9) Oversee the System's administration of retirement benefits to members.

10) Review member services policies, including responding to member inquiries, processing member requests, providing member reports, managing retired member actions and providing member education services. Propose any changes to member services policies to the Board.

11) Oversee the System's administration of employer services.

12) Review employer services policies, including recruiting/enrolling new employers, managing employer relations, coordinating actuarial information, managing employer contracts and compliance services, managing employer data and providing employer support services. Propose any changes to employer services policies to the Board.

13) Maintain an awareness of issues affecting System members and employers and propose any strategies for improving System satisfaction to the Board.

Retirement System Performance

14) Oversee the performance and delivery of System services.

15) Oversee overall operations and cost effectiveness of the System.

16) Periodically evaluate defined contribution plan members' retirement readiness.

17) Identify strategic goals regarding System performance and oversee implementation of strategy to achieve such goals.

Communications

18) Collaborate with System staff to develop and periodically review the Board's communication plan. The communication plan shall contemplate the views of stakeholder groups, which may include active System members, retirees, legislators, employers and consultants.

Reporting

19) With respect to reporting, the Subcommittee chair shall:

a) Report to the Board about Subcommittee activities, issues, and related recommendations at each regularly scheduled Board meeting following a Subcommittee meeting;

b) Provide copies of Subcommittee meeting minutes to the Executive Director to be distributed or made available to all Board members; and

c) To the extent feasible, provide draft agendas for upcoming Subcommittee meetings to be distributed or made available to all Board members prior to the Board meeting that immediately precedes the Subcommittee meeting.

Other Responsibilities

20) Periodically review System regulations, policies and procedures related to retirement benefit administration; retirement system performance; and communications with members, employers and other stakeholders. The Subcommittee shall recommend any changes to such System regulations, policies and procedures to the Board.

21) Perform such other activities related to the Subcommittee's functions and duties as are reasonably appropriate or are requested by the Board from time to time.

SELF-EVALUATION

22) At least every two years, review the existing Charter and propose any amendments to Governance Subcommittee for consideration.

23) The Subcommittee and each Subcommittee Member shall comply with the Board's Self-Evaluation Policy and processes and participate in any independent fiduciary reviews.

HISTORY

24) This Charter was adopted by the Board on May 15, 2017.

GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

Memorandum

Date: May 15, 2017

To: Employees Retirement System of Rhode Island Board of Trustees

From: GRS Consulting

Re: Description for New Assumptions for Use in the 2017 Actuarial Valuation – 7.00% with contribution increase stagger

The following is an outline of the recommendations made by GRS in the draft experience study report, except for a 7.00% investment return assumption, for use in the June 30, 2017 actuarial valuations:

1. Decrease the general inflation assumption from 2.75% to 2.50%.
2. Decrease the nominal investment return assumption from 7.50% to 7.00%.
3. Decrease the general wage growth assumption from 3.25% to 3.00%.
4. Changes to salary increase assumptions:
    a. For State Employees, lower the ultimate component of the salary schedules from 3.50% to 3.25%. Slight change in step rates.
    b. For Teachers, lower the ultimate component of the salary schedules from 3.50% to 3.00%.
    c. For General MERS Employees, lower the ultimate component of the salary schedules from 3.50% to 3.25%. Slight change in step rates.
    d. For MERS Public Safety Employees, no change to the current 4.00% ultimate component.
5. Reduce the payroll growth rate assumption from 3.25% to 3.00% for groups except Teachers. For Teachers, reduce from 3.00% to 2.50% payroll growth rate.
6. Decrease the assumption for the contingent post-retirement benefit adjustments to be 2.15% per year.
7. Update the post-retirement mortality tables to variants of the RP-2014 table. For the improvement scale, update to the ultimate rates of the MP-2016 projection scale.
8. For State Employees, Teachers, and General MERS retirement rates, decrease the probability of retirement during the first year of eligibility. Remove load at first eligibility for MERS PF.
9. Slightly modify the rates of disability for most groups based on the experience of the individual group.

All of these changes would be included in the June 30, 2017 actuarial valuation. However, the impact on contribution rates would be uniformly reflected in the contribution rates over the five year period beginning with the Fiscal Year 2020 contribution rates. The change in the normal cost will be fully reflected in the Fiscal Year 2020 contribution rates. The impact from the increase in UAAL will be spread over the five years in such a way to create approximately the same increase in contribution rate each of the five years. Each new layer will be over a maximum of 20 years. For State Employees and Teachers, each successive layer will have one less year of amortization. Each individual MERS unit will have its own schedule.

GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

Memorandum

Date: May 15, 2017

To: Employees Retirement System of Rhode Island Board of Trustees

From: GRS Consulting

Re: Description for New Assumptions for Use in the 2017 Actuarial Valuation – 7.25%

The following is an outline of the recommendations made by GRS in the draft experience study report, including a 7.25% investment return assumption, for use in the June 30, 2017 actuarial valuations:

1. Decrease the general inflation assumption from 2.75% to 2.50%.
2. Decrease the nominal investment return assumption from 7.50% to 7.25%.
3. Decrease the general wage growth assumption from 3.25% to 3.00%.
4. Changes to salary increase assumptions:
    a. For State Employees, lower the ultimate component of the salary schedules from 3.50% to 3.25%. Slight change in step rates.
    b. For Teachers, lower the ultimate component of the salary schedules from 3.50% to 3.00%.
    c. For General MERS Employees, lower the ultimate component of the salary schedules from 3.50% to 3.25%. Slight change in step rates.
    d. For MERS Public Safety Employees, no change to the current 4.00% ultimate component.
5. Reduce the payroll growth rate assumption from 3.25% to 3.00% for groups except Teachers. For Teachers, reduce from 3.00% to 2.50% payroll growth rate.
6. Decrease the assumption for the contingent post-retirement benefit adjustments to be 2.15% per year.
7. Update the post-retirement mortality tables to variants of the RP-2014 table. For the improvement scale, update to the ultimate rates of the MP-2016 projection scale.
8. For State Employees, Teachers, and General MERS retirement rates, decrease the probability of retirement during the first year of eligibility. Remove load at first eligibility for MERS PF.
9. Slightly modify the rates of disability for most groups based on the experience of the individual group.

All of these changes would be included in the June 30, 2017 actuarial valuation and fully recognized in the Fiscal Year 2020 contribution rates.

EMPLOYEES' RETIREMENT SYSTEM OF RHODE ISLAND

2017Actuarial Experience Study

Joe Newton

May 15, 2017

GRS

Gabriel Roeder Smith & Company
Consultants & Actuaries
www.gabrielroeder.com

Agenda

- General Findings
- Inflation
- Investment Return
- Wage Assumptions
- Mortality
- Impact and Timing
- Alternative Strategy

Funding Policy

- The *primary* purpose of the annual actuarial valuation is to either (1) set or (2) assess the adequacy of the contribution policy
  - "Funding" or "contribution allocation procedure"
- The "Funding Policy" of a Pension Plan is a systematic set of procedures used to determine the contributions which will be made in a specific year and series of years

Purpose of Experience Study

- Actuarial Assumptions and Methods are utilized to develop each of the outputs of an actuarial valuation process
- An Experience Study is a regularly scheduled review of the Assumptions and Methods
  - ERSRI practice is to perform the analysis every three years
- General process for setting assumptions and methods
  - Actuary makes recommendations
  - Board considers actuary's recommendation and makes the final decision for the system

Per ASOP 27: Reasonable Assumptions

- An assumption is reasonable if
  - It takes into account historical and current economic data that is relevant as of the measurement date
  - It reflects the actuary's estimate of future experience
  - It is appropriate for the purpose of the measurement
  - It reflects the actuary's professional judgement
  - It has no significant bias (i.e., it is not significantly optimistic or pessimistic)
    - Although some allowance for adverse experience may be appropriate

General Findings

- Future economic growth likely to continue to be suppressed compared to historical levels
  - Future price inflation and investment returns are likely to be lower than currently assumed
  - Current wage inflation and projected payroll growth need to be lowered
- Retirees continue to live longer, and the expectations for the rates of future improvement should be increased
- Members are pushing off retirement
- Most of the other assumptions continue to be appropriate

Summary of Recommendations

- Major Recommendations
  - Lower inflation assumption from 2.75% to 2.50%
    - Lowers nominal investment return assumption from 7.50% to 7.25%
    - Lowers nominal wage inflation assumption from 3.25% to 3.00%
    - Lowers expected CPI Cola formula from 2.40% to 2.30% (Net Contingent 2.15%)
  - Update mortality assumptions to more recent tables and projection scales
  - New marriage, family makeup, and election assumptions for the TSBP
  - Consider lowering real investment return assumption from 4.75% to 4.50% (7.00% nominal)

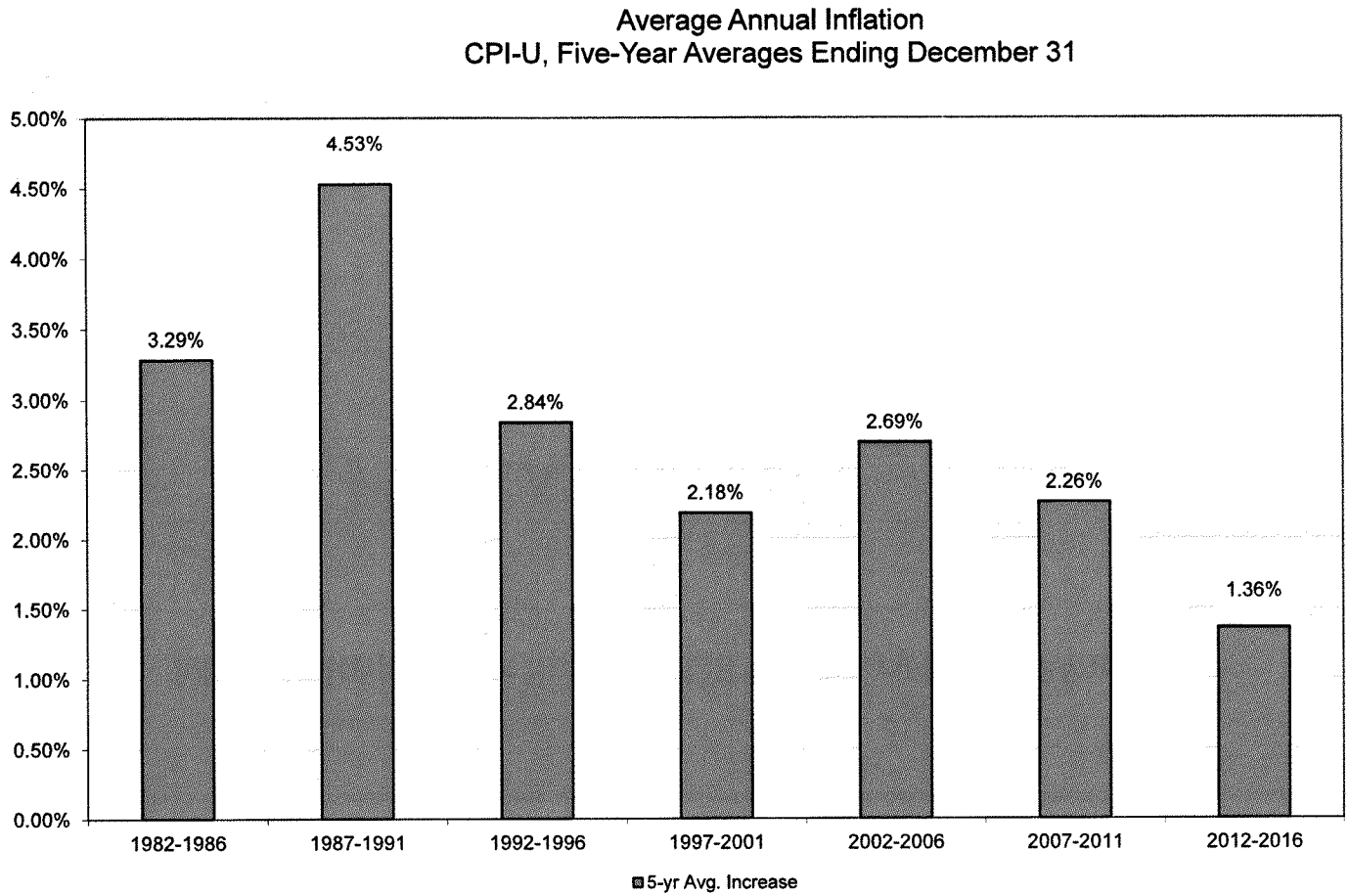
- Moderate Recommendations
  - Make small changes to individual merit and promotion portion of salary scales
    - Net decline in expected salary increases over an individual's career for State Employees, Teachers, Judges, and MERS General
    - For MERS PF and State Police, recommend increasing the individual merit and promotion component by 0.25% so that nominal expected increase of 4.00% is unchanged
  - Lower nominal payroll growth rate to 3.00% for all groups except Teachers.
    - Teachers project to be even more suppressed based on current demographics, so recommend using 2.50% for them specifically
  - Decrease probability of retirement (extend working career) for most groups

- Minor Recommendations
  - Small adjustments to disability patterns (fewer disabilities)

Inflation

- The assumed inflation rate (currently 2.75% per year) is not used directly in the actuarial valuation, but it impacts the development of:
  - Investment return assumption
  - Cost of Living Adjustments
  - Salary increase assumptions
  - Payroll growth rate (budget growth rate)

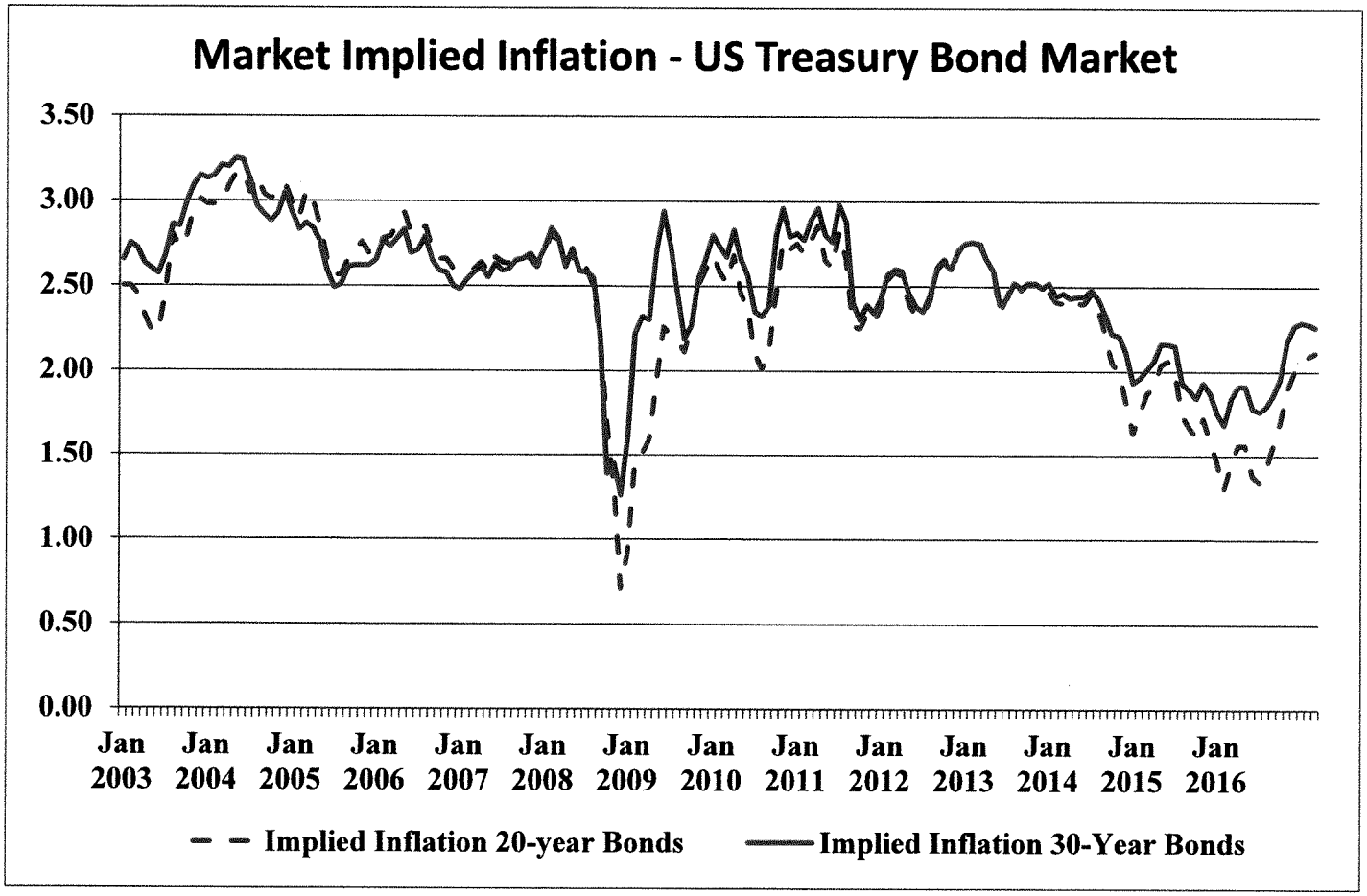
Historical Inflation



Average for past 25 years has been 2.27%

GRS

Bond Market Expectations



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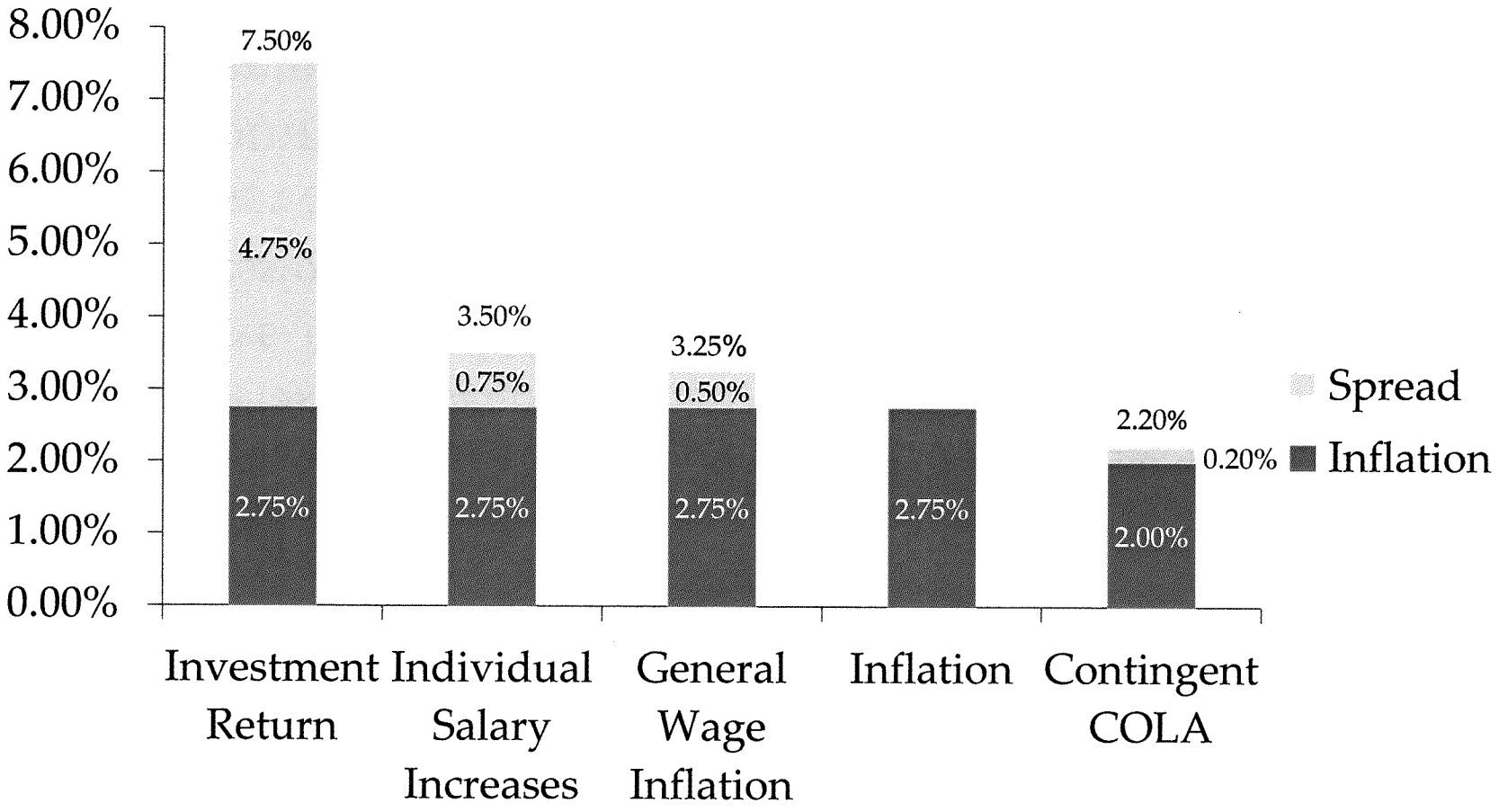
Recommendation

- We looked at several indicators
  - Investment firms: 2.0% - 2.8%
    - PCA: 2.25%
  - 2016 Social Security Trustee's Report: 2.60% (lowered by 0.1% each of the last two years)
  - TIPs vs. Nominal US Treasuries: 2.00% (20 year)-2.26% (30 year)
  - Professional forecasters: 2.15% (10 year)
- While several data points could point to even lower values, we recommend lowering this assumption to 2.50%
  - Closer to recent levels
  - Closer to levels expected in the bond market
  - Closer to investment consultants and professional forecaster estimates
  - Reasonable range is 2.25%- 2.50%

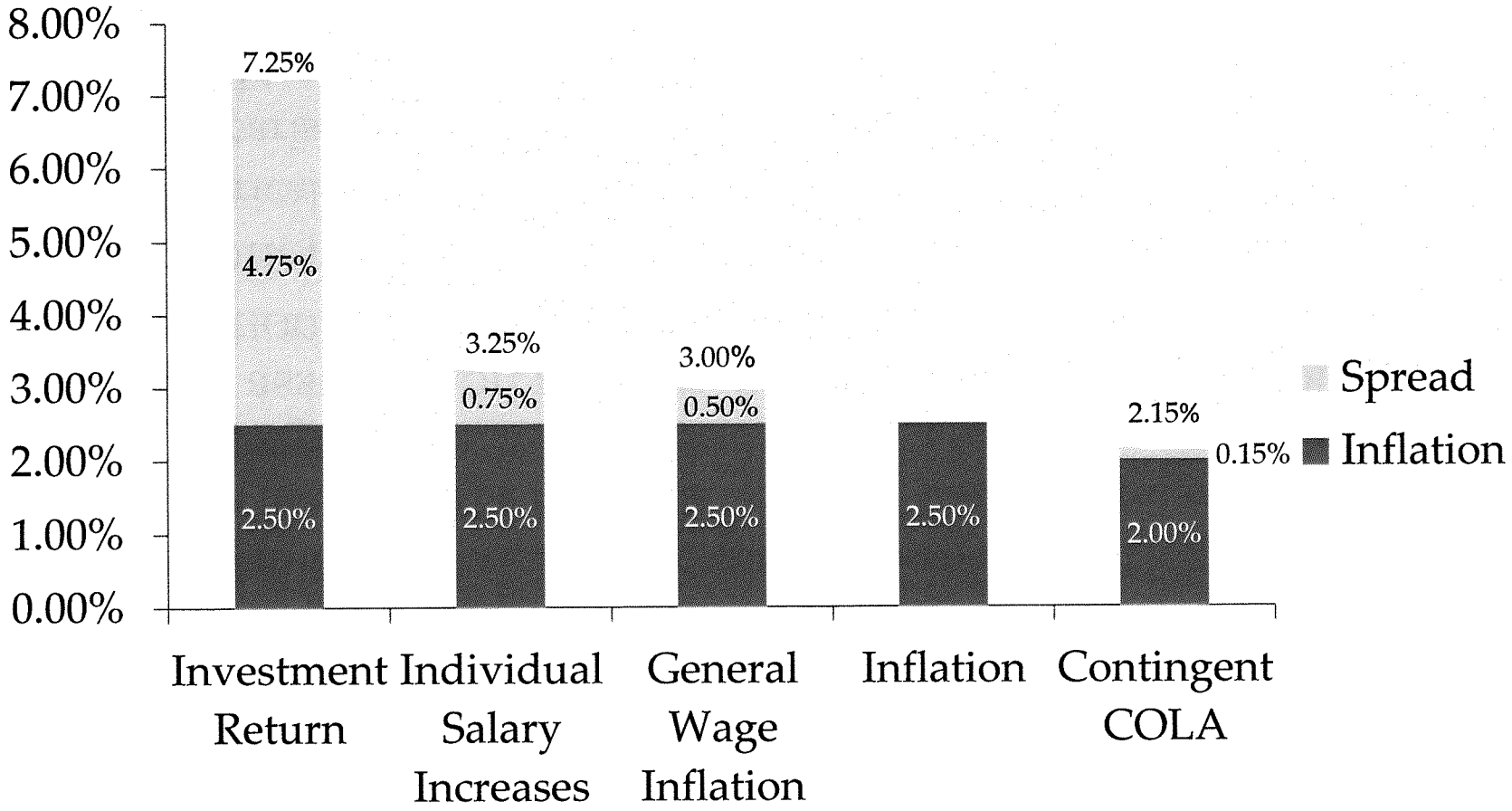
Inflation is the first building block for other economic assumptions



Current Assumption Set for State Employees

GRS

Decreasing the inflation assumption, by default, lowers the nominal values for the other economic assumptions



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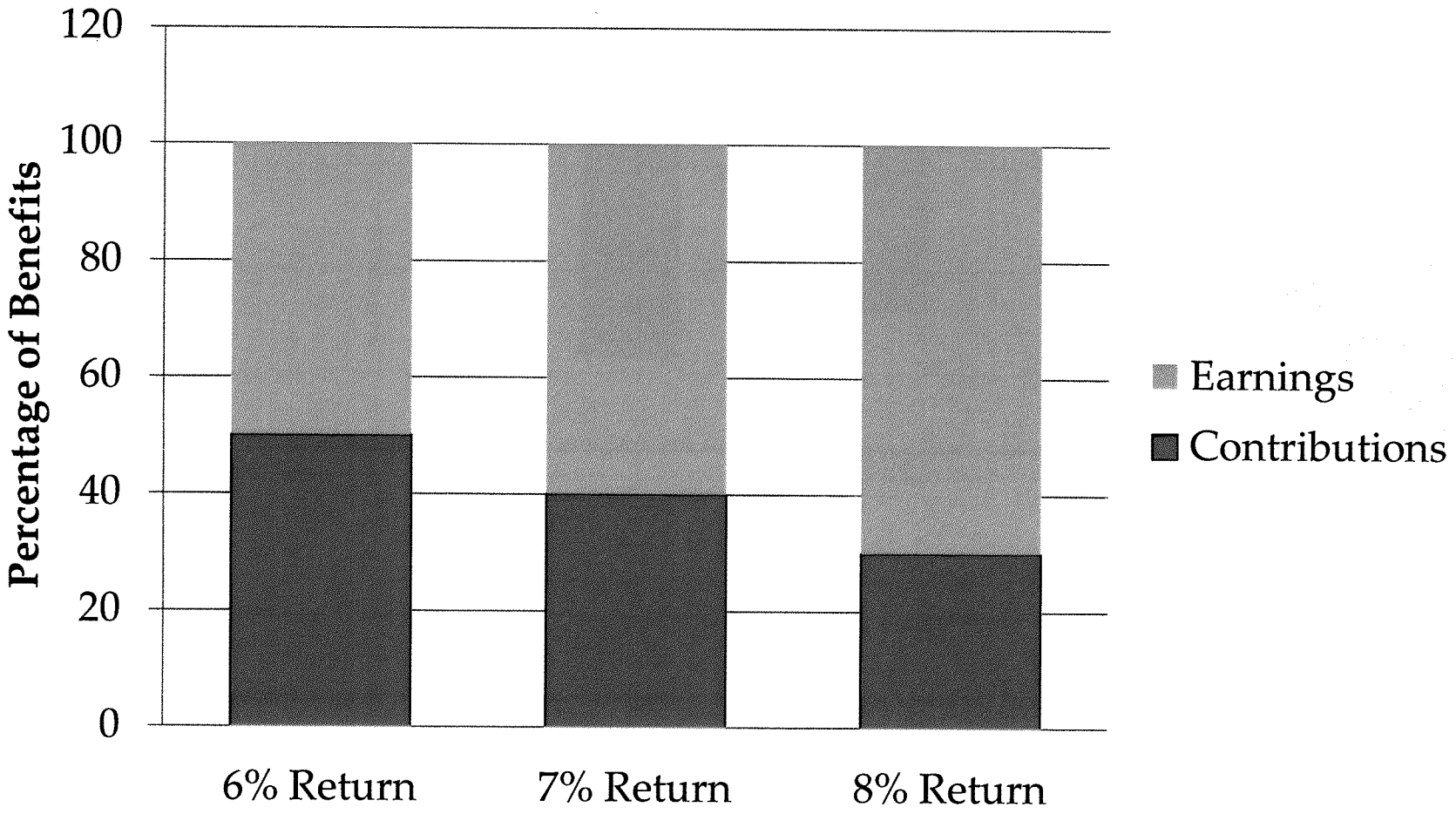
Investment Return Assumption Review Process

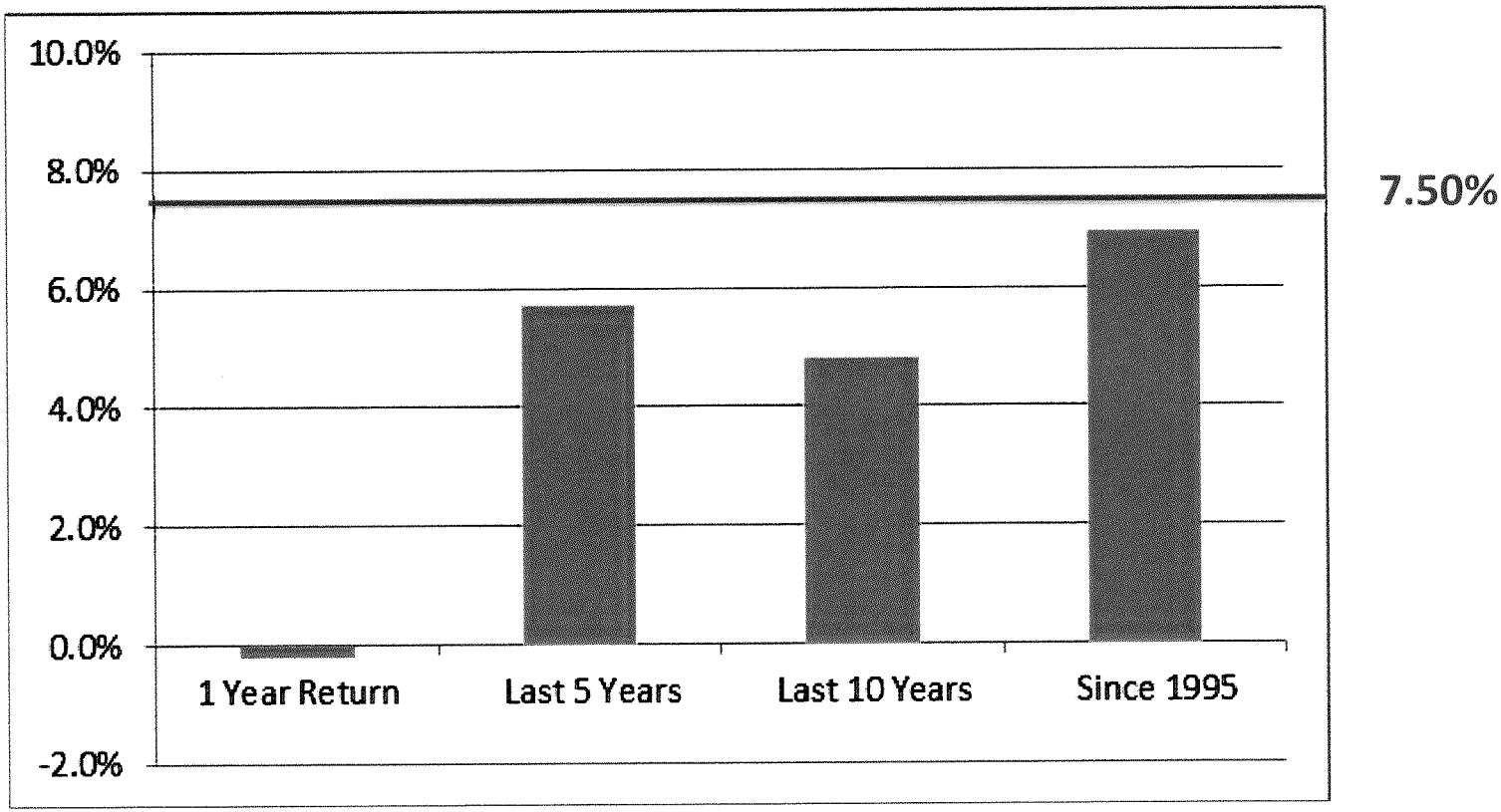
- The assumption selected should be reasonable
  - See definition of reasonable assumption on slide 5
  - While there may be no single "correct" answer, actuary must select a single point
- Current assumption is 7.50% based on a 2.75% inflation assumption (real return of 4.75%)
- Assumption is selected using a process that considers:
  - Historical investment performance
  - Comparison with peers
  - ERSRI target asset allocation
  - Most importantly: economic capital market expectations
    - Utilize a building block approach that reflects expected inflation, real rates of return, and plan related expenses
    - Take into account the volatility of the expected returns produced by the investment portfolio

How does this impact pension funding?



GRS

History of Market Returns (Net)

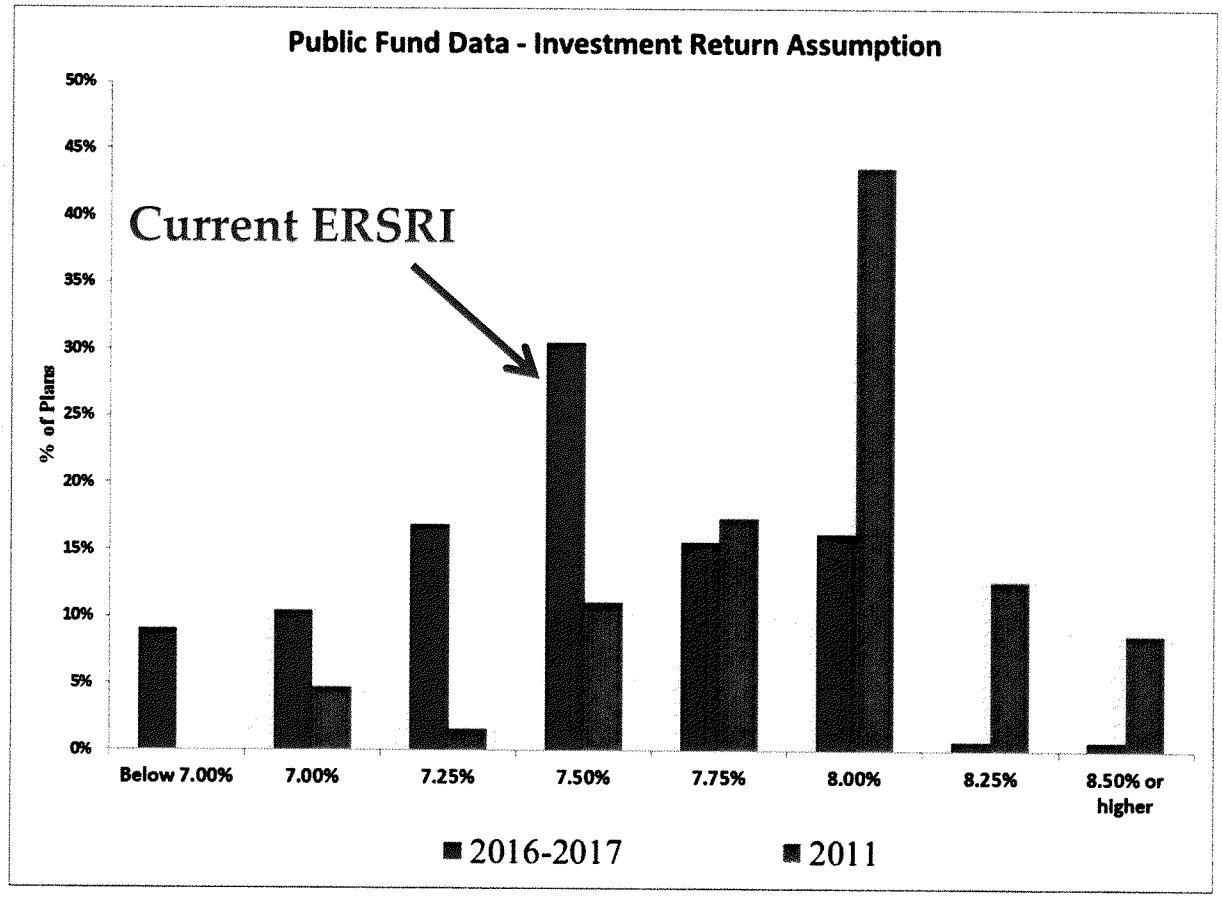


Returns are measured for each fiscal year ending June 30, 2016
20-year geometric average: 6.2%
Return FYTD in 2017 so far is above the 7.50%

GRS

Investment Return Assumption

Comparison to Peers

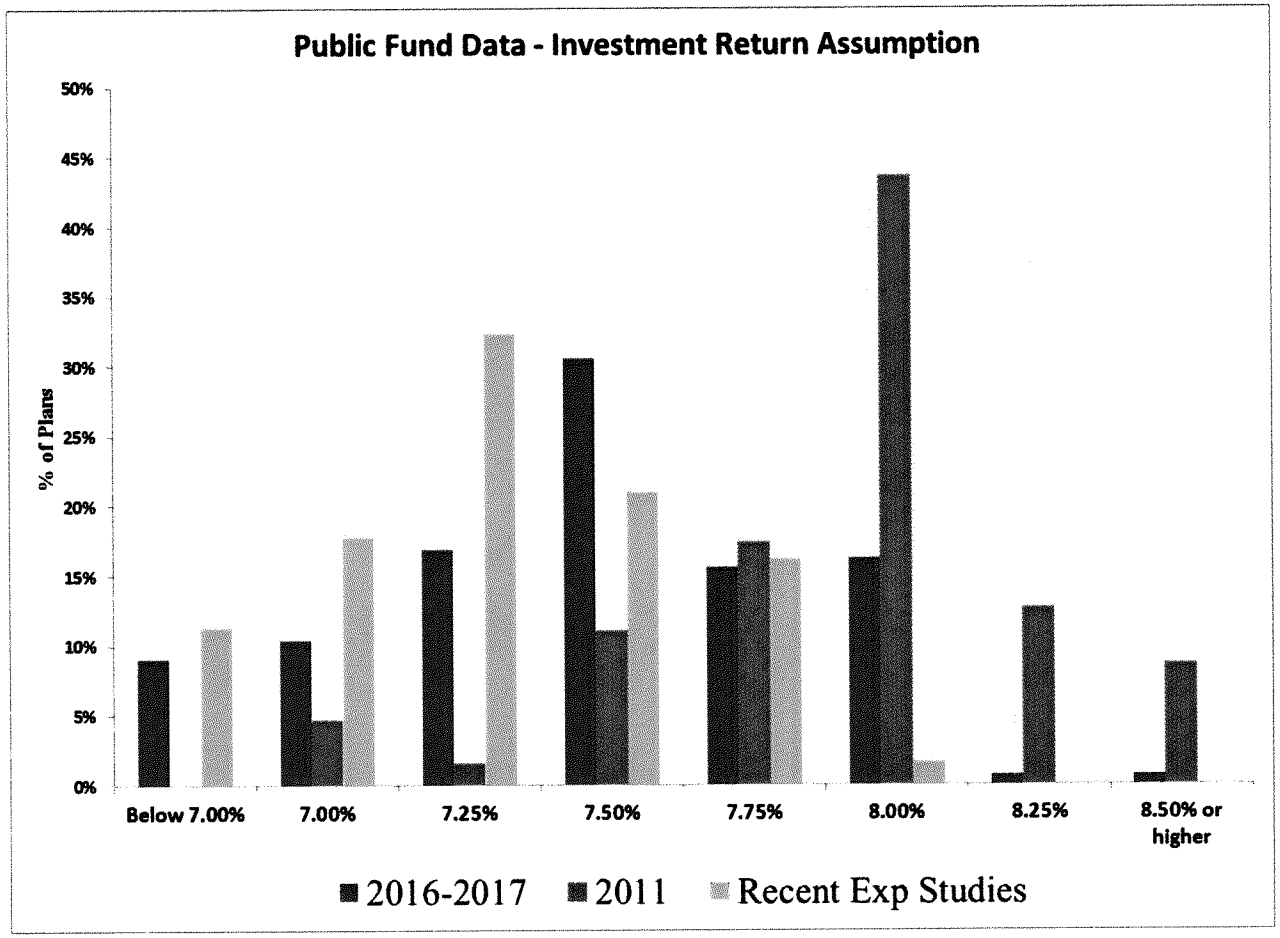


Source: 2017 Public Plans Database

GRS

Investment Return Assumption

Comparison to Peers



Recent Exp studies is the compilation from Systems that have performed experience studies in the last 24 months

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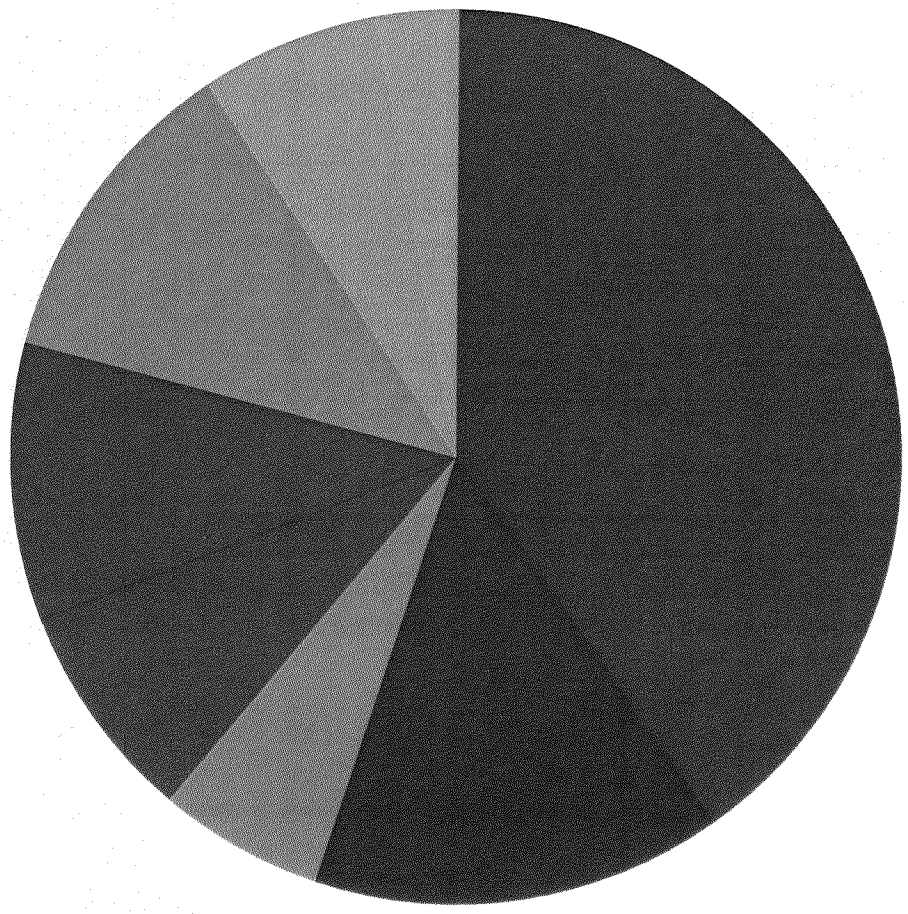
Recent changes to other states

Plan name	Assumed Return	Plan name	Assumed Return
South Dakota PERS	6.50%	NY State & Local ERS	7.00%
Texas Municipal RS	6.75%	Wisconsin Retirement System	7.20%
Kentucky ERS	6.75%	Utah Noncontributory	7.20%
Maine State and Teacher	6.88%	North Carolina Teachers and State Employees	7.25%
Connecticut SERS	6.90%	Utah Noncontributory	7.25%
New York City ERS	7.00%	South Carolina RS	7.25%
Virginia Retirement System	7.00%	Colorado State	7.25%
Hawaii ERS	7.00%	California Teachers	7.25%
California PERF	7.00%	Pennsylvania School Employees	7.25%
Louisiana State Employees	7.00%	Oklahoma PERS	7.25%

Capital Market Assumptions – Investment Consultants

- Projected real returns will be developed using ERSRI's target investment allocation and 2017 capital market return assumptions developed by the following investment consulting firms:
  - BNY Mellon
  - JP Morgan
  - RVK
  - Mercer
  - HEK
  - Wilshire
  - NEPC
  - PCA

Current Target Portfolio



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From PCA's A/L Study

** Using GRS' Inflation Assumption of 2.75%*

Strategic Classes	Sub-Classes	Assets Modeled	10-Year Expected Risk & Return		
			Arithmetic Return	Standard Deviation	Compound Return
Growth Class	US Equity	US Equity	9.00%	18.50%	7.62%
	NonUS Equity	NonUS Equity	10.00%	21.00%	8.24%
	Private Growth	Private Equity	12.60%	26.00%	10.00%
		Non-Core Real Estate	10.10%	20.80%	8.38%
		Opportunistic Private Credit	10.10%	20.80%	8.38%
Income Class	REITs	REITs	8.40%	20.00%	6.78%
	High Yield Infrastructure	High Yield Infrastructure	9.90%	25.00%	7.43%
	High Yield	High Yield	7.30%	15.30%	6.33%
	Private Credit	Private Credit	7.30%	15.30%	6.33%
Risk Reduction Class	Crisis Protection	Treasury Duration	4.50%	18.00%	3.13%
		Systematic Trend Following	7.90%	18.00%	6.58%
	Inflation Protection	Bank Loans	6.80%	15.60%	5.79%
		Core Real Estate	6.10%	12.00%	5.49%
		Core Infrastructure	6.75%	9.25%	6.39%
		TIPS	3.65%	6.00%	3.49%
	Volatility Protection	IG Fixed Income	3.50%	4.00%	3.43%
		Absolute Return	5.35%	9.75%	4.95%
		Cash	2.50%	1.00%	2.50%

- Produced a median compound return of 7.3% based on a 2.75% inflation assumption (real return of 4.55%)
- Would have been 7.05% based on a 2.50% inflation assumption (real return of 4.55%)

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Distribution of Expected Returns

Investment Consultant	Distribution of 10-Year Average Geometric Net Nominal Return			Probability of exceeding	Probability of exceeding	Probability of exceeding
	40th	50th	60th	7.50%	7.25%	7.00%
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	5.18%	6.21%	7.25%	37.7%	40.0%	42.4%
2	5.63%	6.52%	7.41%	39.0%	41.7%	44.5%
3	5.65%	6.62%	7.60%	41.0%	43.5%	46.1%
4	6.13%	7.03%	7.93%	44.7%	47.5%	50.3%
5	6.06%	7.02%	7.98%	44.9%	47.6%	50.2%
6	5.90%	6.99%	8.08%	45.2%	47.6%	49.9%
7	6.25%	7.20%	8.16%	46.9%	49.5%	52.2%
8	6.73%	7.75%	8.78%	52.5%	54.9%	57.4%
Average	**5.94%**	**6.92%**	**7.90%**	**44.0%**	**46.5%**	**49.1%**

Average Expected Real Return of 4.42%
Numbers above based on 2.50% inflation assumption

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Horizons Survey

- We calculated the expected returns based on information provided in survey of investment professionals
  - Compilation of 29 sources
- Based on ERSRI's target allocation and the average result from the survey, the expected compound return is 7.04% over a 10 year time horizon
- Based on a 2.50% inflation assumption
  - The survey's inflation expectation is 2.16%, which would produce an expected return of 6.70% (expected real return of 4.54%)

Time Horizon

- The capital market assumptions provided by the investment consultants have 5-10 year time horizons
- The average duration of the System is 18 years
  - This is the amount of time until the average interest-discounted benefit payment will be made on an open group basis
- The 6.92% average expected geometric mean is made up of the risk-free rate and a risk premium
- As of January, the 10-year zero coupon US Treasury yield was 2.59%, thus, the implied risk premium of the current average return expectation is 6.92% less 2.59% = 4.33%
- On the same date, the 18-year zero coupon US Treasury yield was 2.89%
- Making an assumption that the risk premium remains constant over different time horizons, we have adjusted the capital market assumptions for the difference in the risk free rate of return by adding 0.30%
- Produces an expected return of 6.92% + 0.30%=7.22%

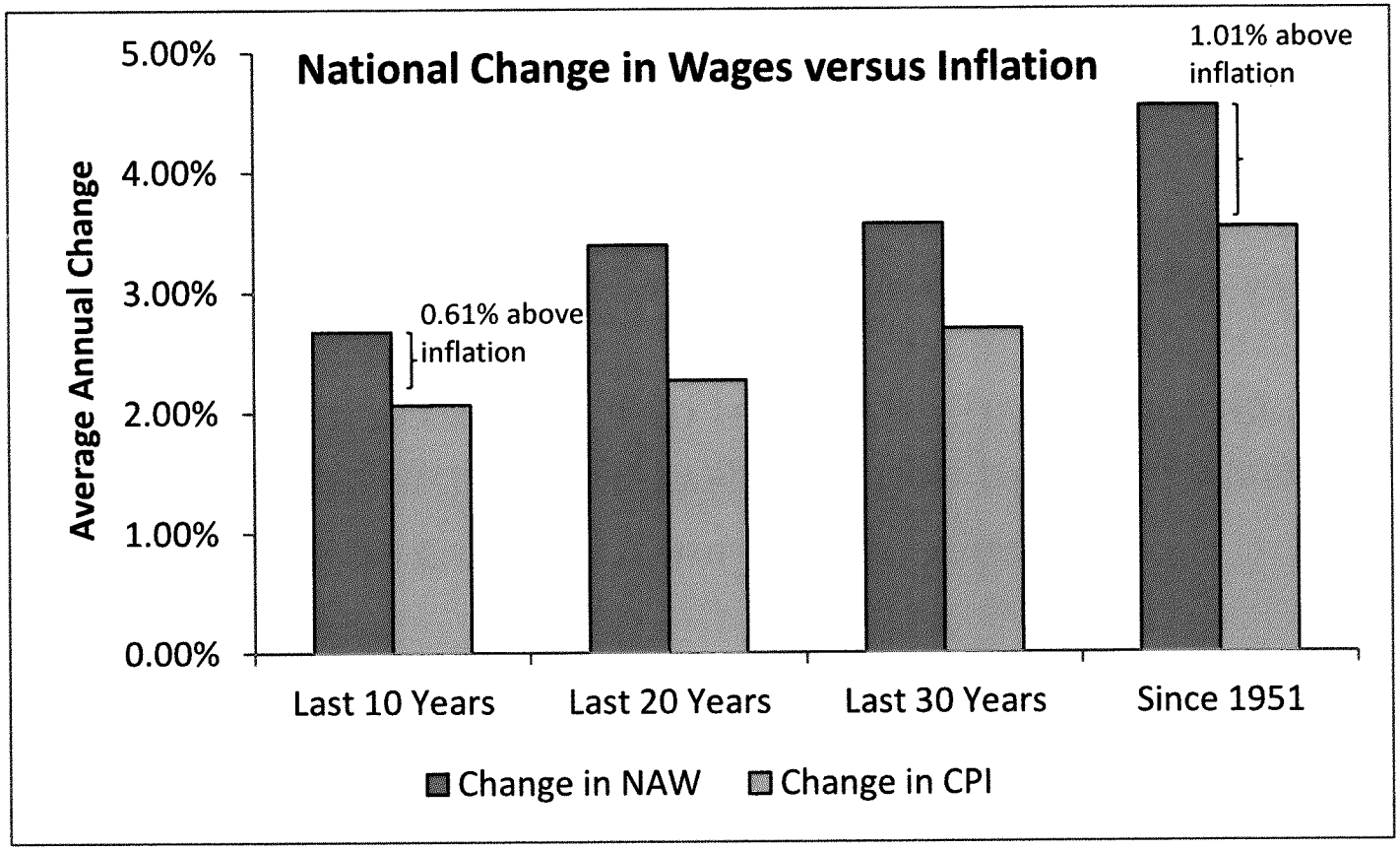
Actuary' Recommendation

- GRS recommends decreasing the investment return assumption to at least to 7.25%
  - 7.25% would leave the expected real return assumption at 4.75%
  - The 7.25% is above the geometric mean of 6.92% over the next 10 years, with a 46.5% probability of meeting or exceeding 7.25%
  - The 7.25% is approximately equal to the geometric mean of 7.22% over the next 18 years, with a 50% probability of meeting or exceeding 7.25%
  - If the Board is uncomfortable with the adjustments made for time, they should consider a move to 7.00%
  - If the Board is uncomfortable with a 50% (lower over the next 10 years) probability, they should consider a move to 7.00%
- The next experience study is scheduled in three years

Wage Assumptions

- Building block approach for assumptions for projecting wages
  - They should be consistent and tied to inflation
  - General Wage Inflation (GWI): Inflation plus real wage growth in the general economy, also represents overall budget growth of the Plan Sponsor
    - Used to project revenue growth and determine funding period
    - Currently 3.25% (2.75% + 0.50%)
    - 3.00% after change to inflation (2.50% + 0.50%)
  - Salary Scale for Individuals: GWI plus a component for individual merit and promotion plus a step schedule based on service
    - Typically, the longer the step schedule, the lower the individual merit and promotion component as more is pushed into steps

National Statistics



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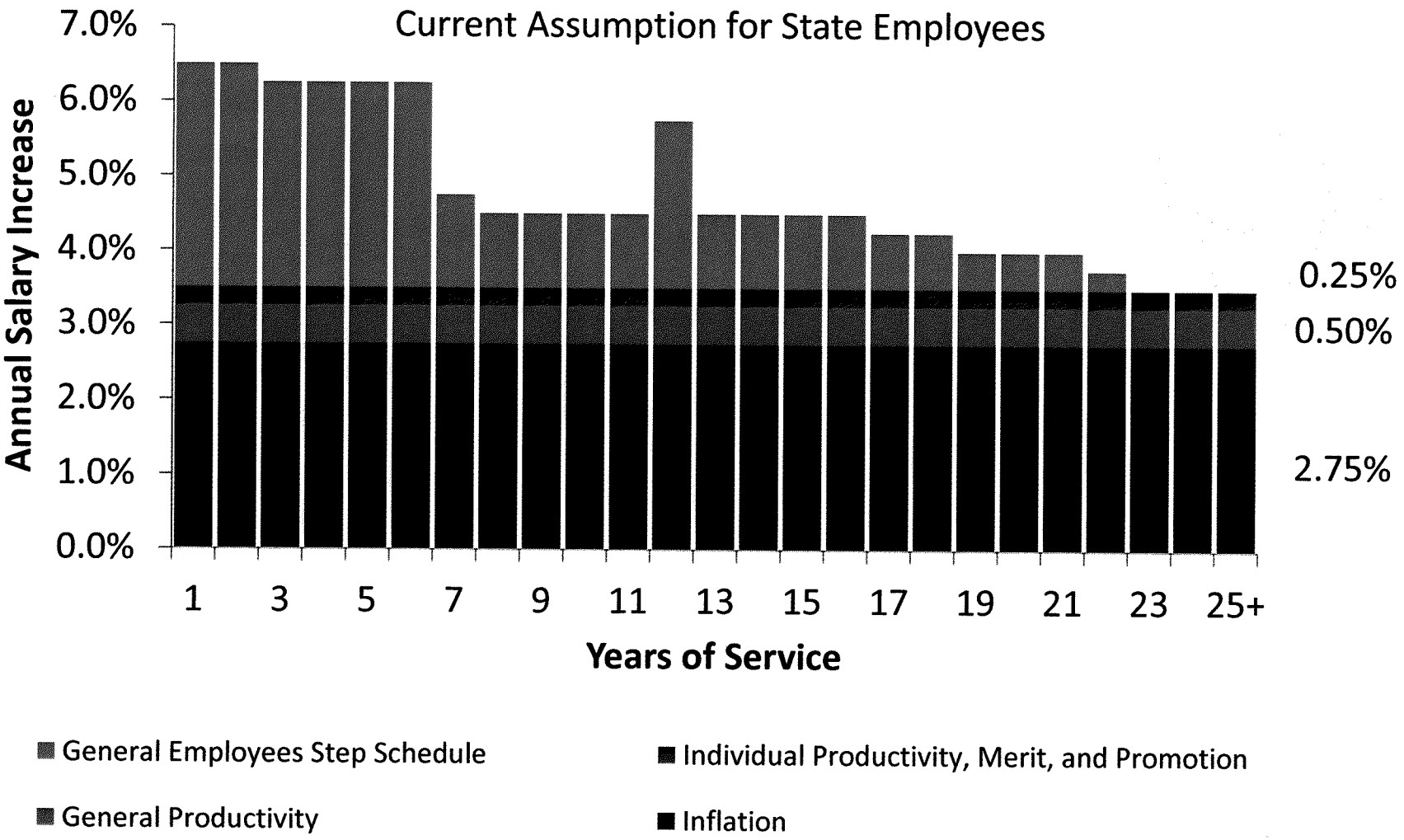
Structure of Assumptions for Individuals



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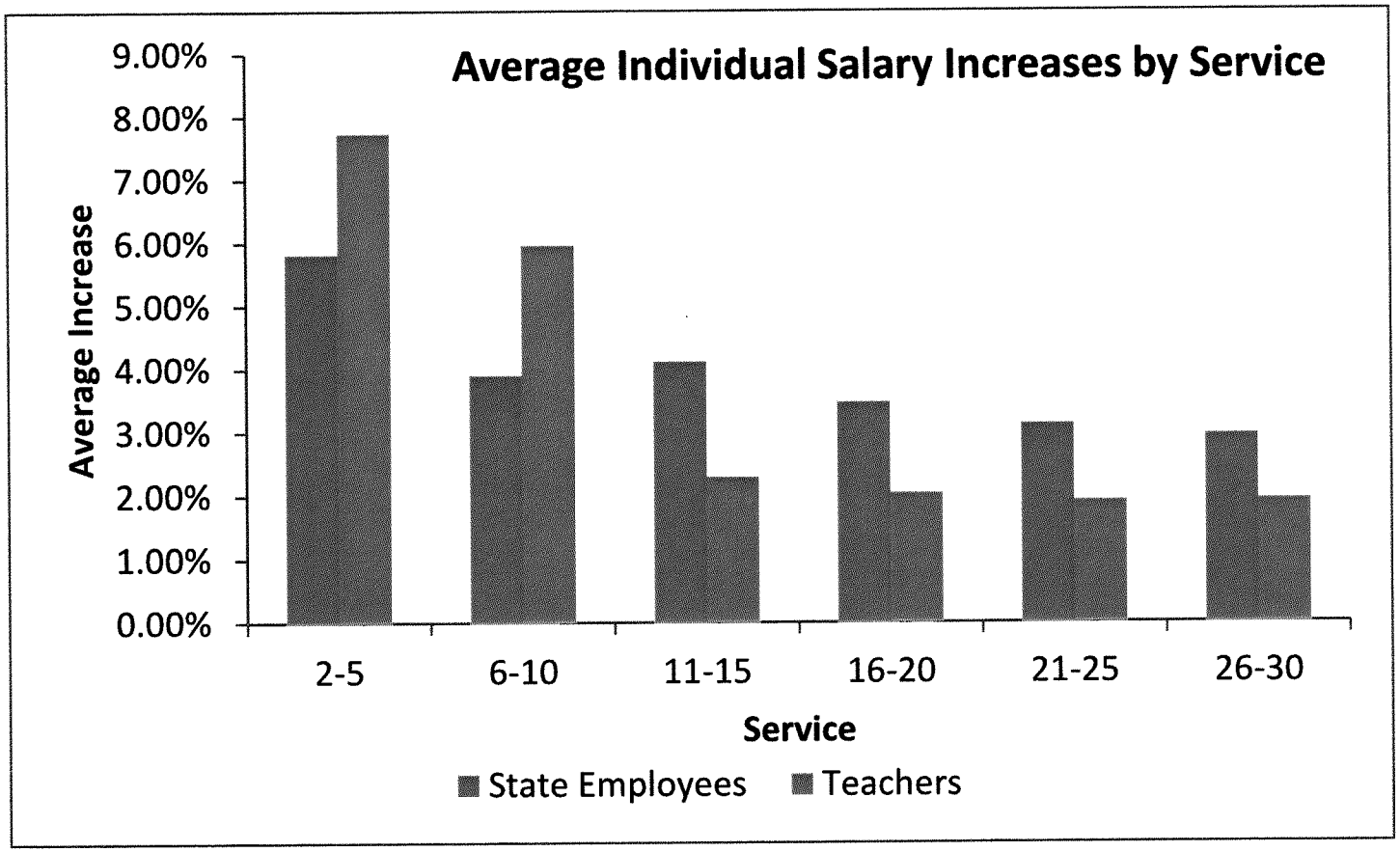
ERSRI Member Specific for Last 10 Years



Under proposed assumptions, both groups will have the same average increase over their career (approx 4.20%), the pattern is just distributed differently

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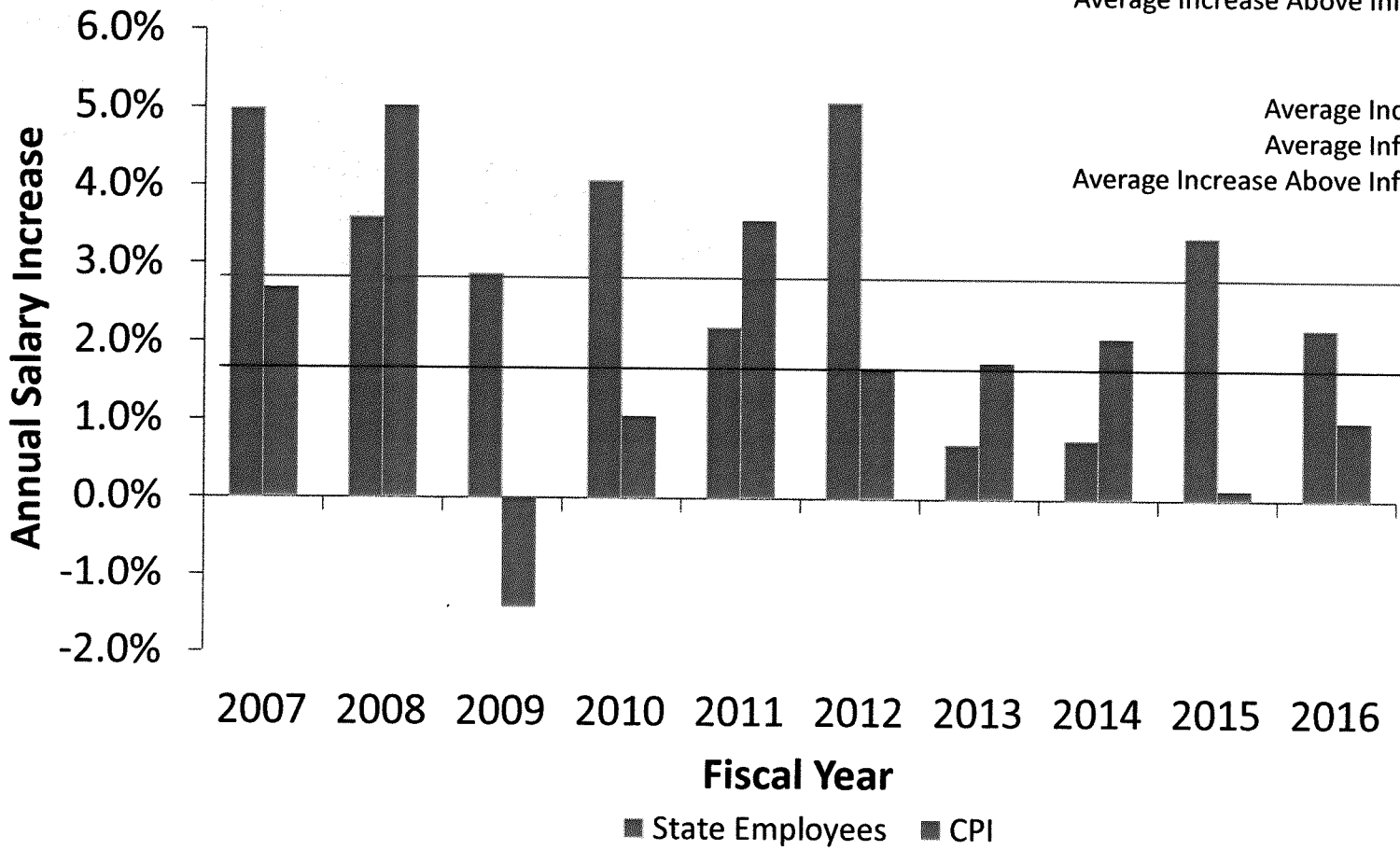
ERSRI Experience: Long Service Members by Fiscal Year

(Annual Change in Salaries Paid FY2007-FY2016)

All Years:
Average Increase: 2.97%
Average Inflation: 1.74%
Average Increase Above Inflation: 1.23%

Last 6 Years:
Average Increase: 2.38%
Average Inflation: 1.69%
Average Increase Above Inflation: 0.69%



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ERSRI Member Specific

- Overall, current assumptions *above inflation* have been close to experience (real)
- Teachers have more increases pushed into the steps during the first 10 years of service, so recommend lowering long service increase
- MERS P&F have been outpacing assumption on a real basis, recommend no change to nominal assumption

Long Service Individual Salary Scale (10-Year Experience)				
	State Employees	Teachers	MERS General	MERS P&F
Current Assumption	3.50%	3.50%	3.50%	4.00%
Less Assumed Inflation	2.75%	2.75%	2.75%	2.75%
Assumed General Productivity/Merit/Promotion above Inflation	**0.75%**	**0.75%**	**0.75%**	**1.25%**
Actual Productivity Above Inflation for last 10 Years	**1.23%***	**0.47%**	**0.85%**	**2.08%**
Recommended Component	0.75%	0.50%	0.75%	1.50%
Recommended Nominal Assumption	3.25%	3.00%	3.25%	4.00%

* 0.69% last 6 years

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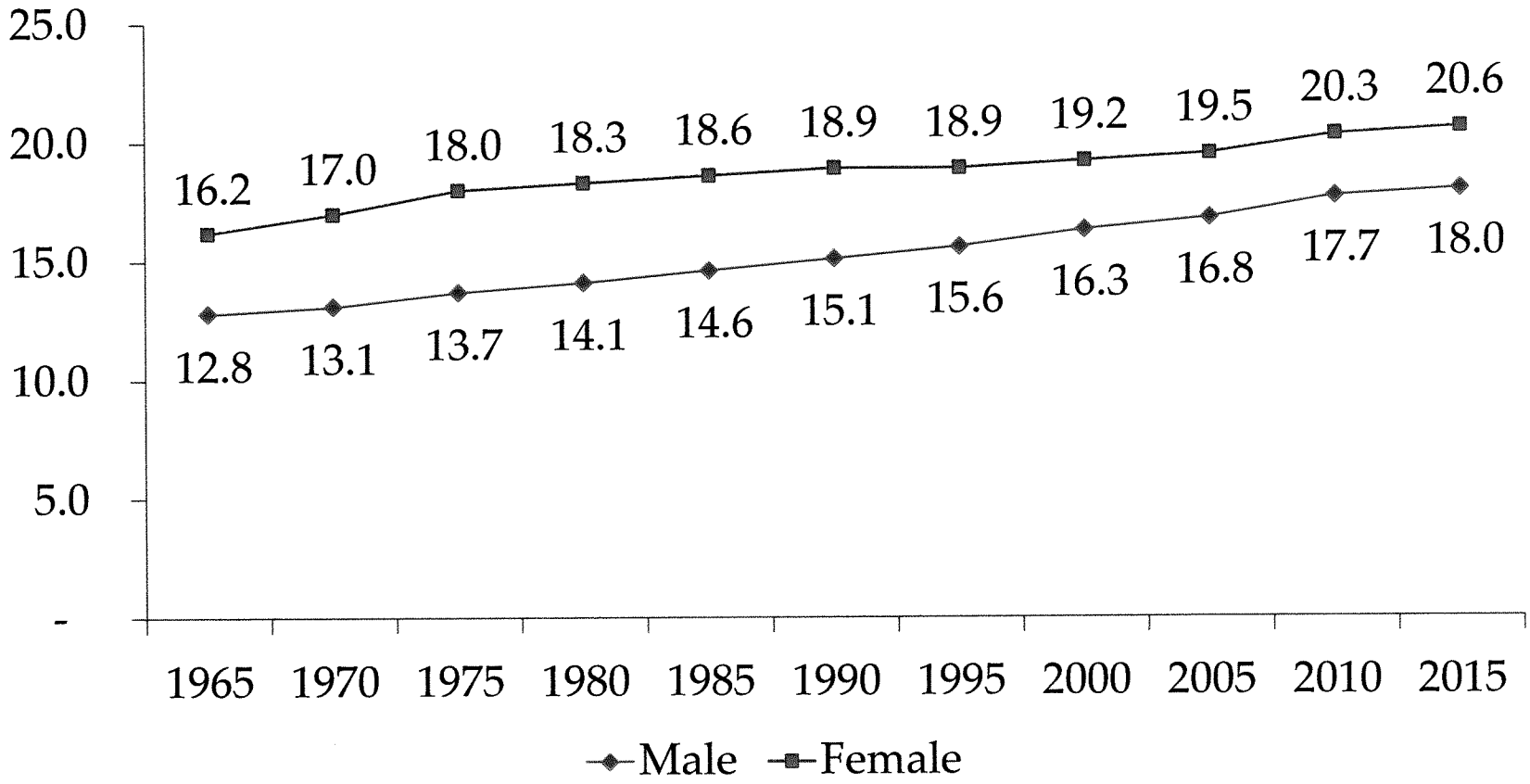
Post-retirement mortality

- In setting the longevity assumption, the actuary must make two decisions:
  - How long are annuitants currently living?
    - Heavily dependent on actual data
  - What improvement in longevity is expected in the future?
    - Heavily dependent on the underlying *trends* in the data, as well as more subjective decisions
- We already use a generational approach to this assumption
  - Assumption that life expectancy will continue to improve in the future
- The amount of data dictates how much credibility the actuary can apply to the results
  - ERSRI has partial credibility for determining current longevity, but less credibility for determining future rates of improvement

Life Expectancy for the General US Population - from Age 65



Source: National Vital Statistics Reports

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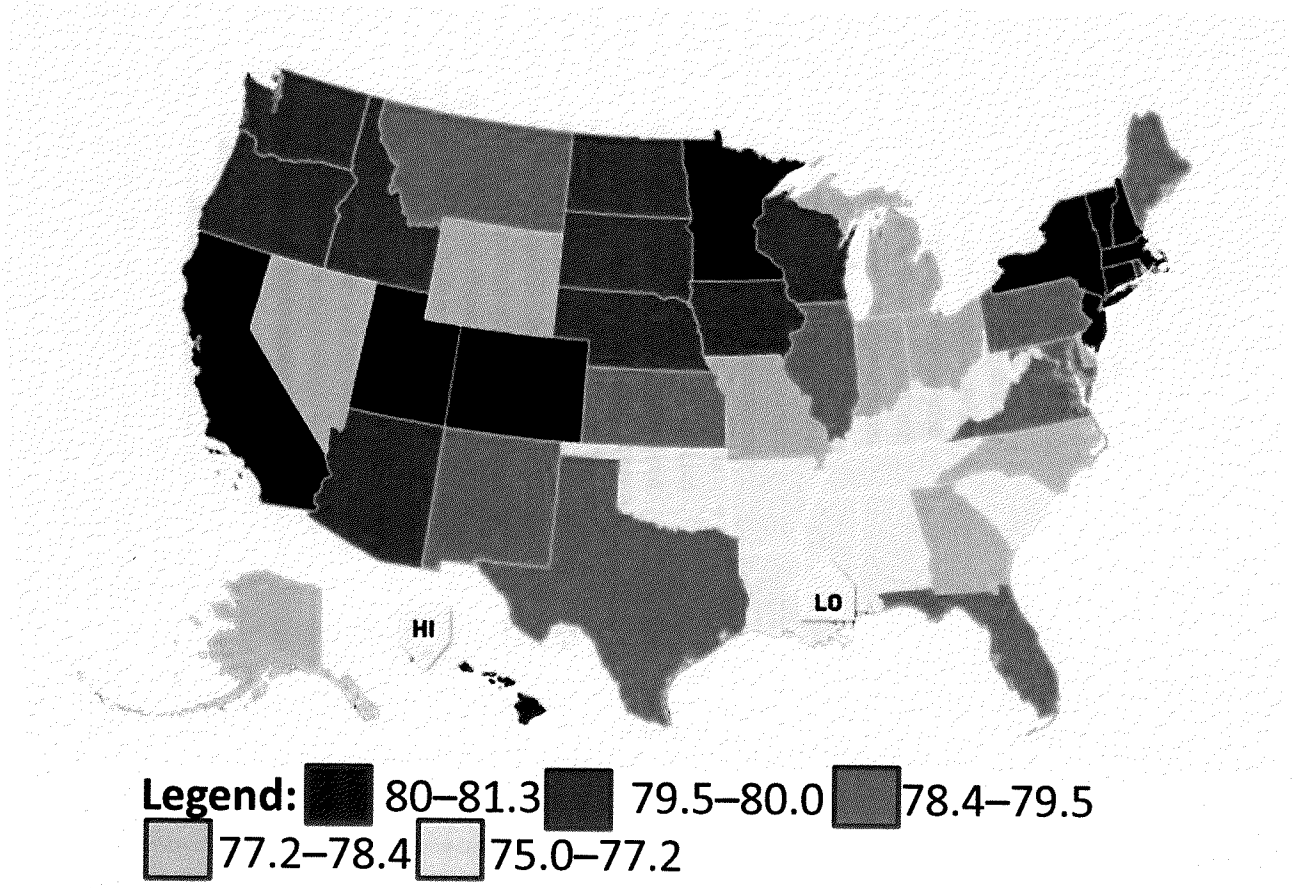
Life Expectancy by State



Above data from National Vital Statistics

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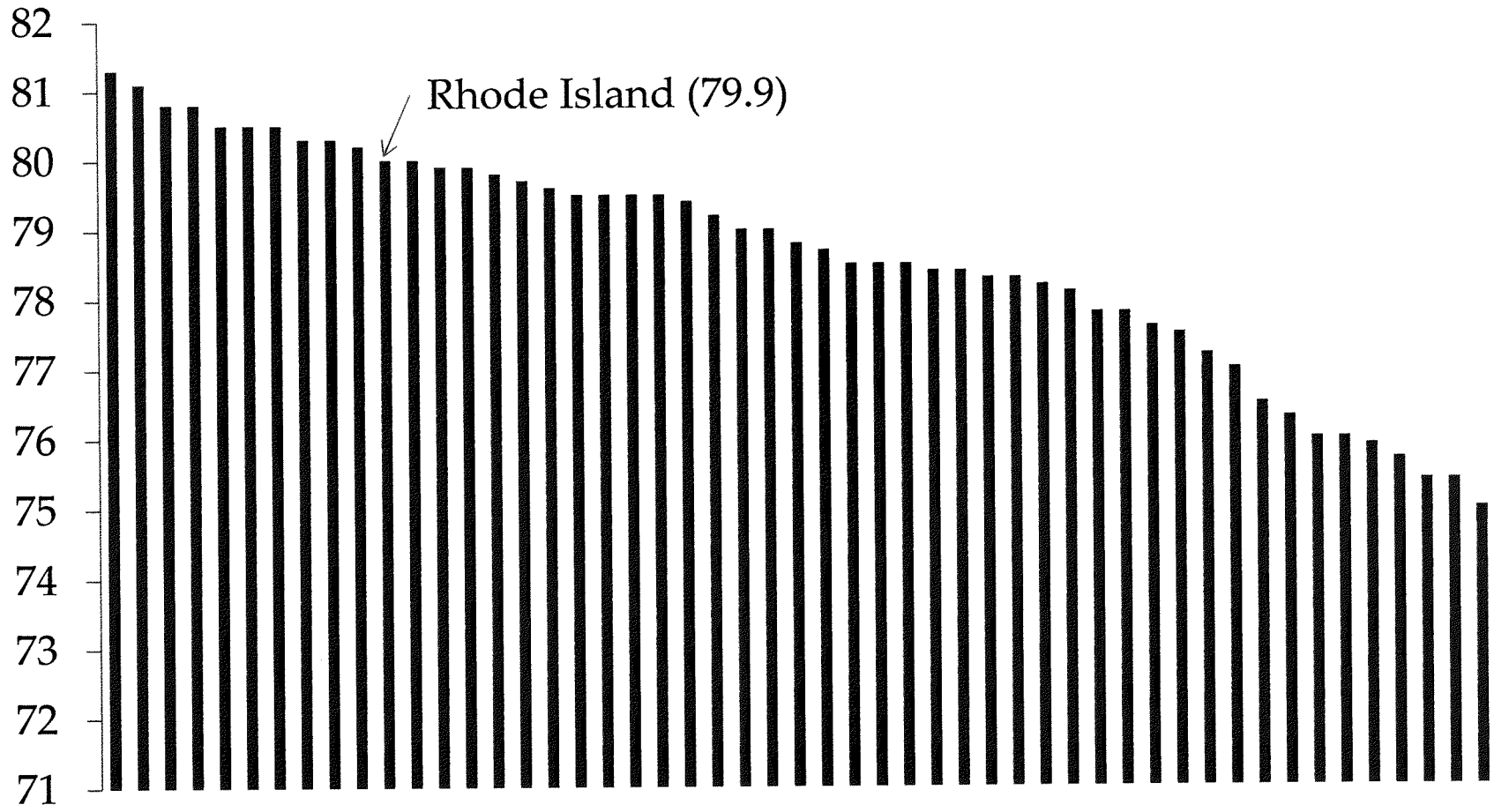
Life Expectancy by State

(measured in years from birth)



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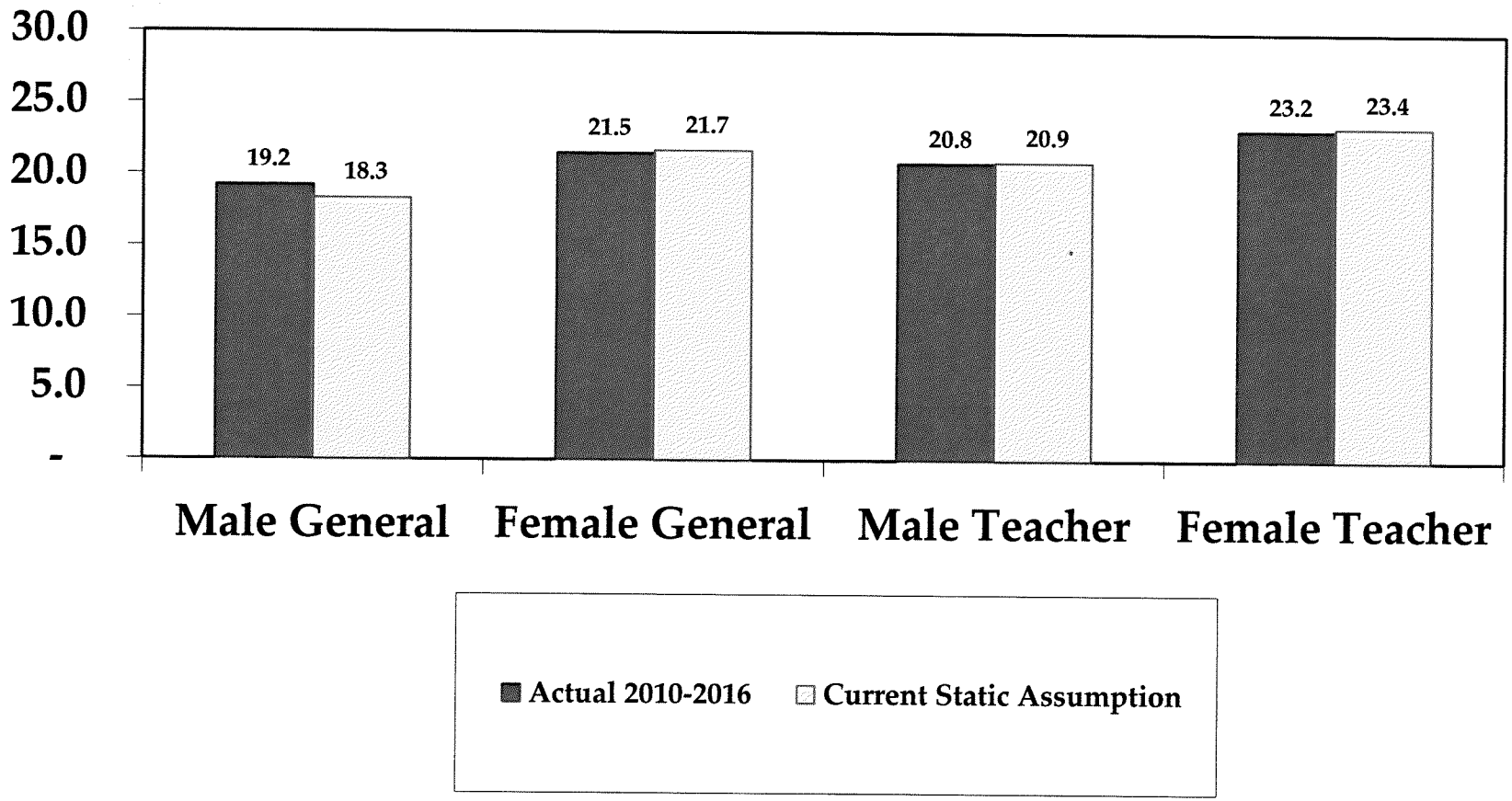
Post Retirement Mortality

Average Life Expectancy in Years from Current Age 65



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Options for post-retirement mortality assumptions

Current Life Expectancy	Future Improvement in Life Expectancy
RP 2014 Tables:	High (Scale BB)
High (White Collar)	Medium (U-MP)
Medium (Normal)	Low (Scale AA)
Low (Blue Collar)	Custom Scale
Variant of one of the Above	
Custom Table	

U-MP is a scale created by taking the ultimate values of the most recently published MP projection scales

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Actual ERSRI Experience vs Published Tables: Remaining Life Expectancy in Years

Females

Current Age	ERSRI Teachers	ERSRI Non-Teachers	RP-2014 Blue Collar	RP-2014 Standard	RP-2014 White Collar
60	26.8	25.8	25.2	26.2	27.3
65	23.2	21.5	21.1	22.0	22.9
70	19.5	17.4	17.1	18.0	18.8

Males

Current Age	ERSRI Teachers	ERSRI Non-Teachers	RP-2014 Blue Collar	RP-2014 Standard	RP-2014 White Collar
60	24.5	23.3	22.9	24.0	25.7
65	20.8	19.2	19.0	20.0	21.4
70	17.2	15.5	15.3	16.2	17.3

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Post-retirement Mortality – Base Table

- Recommend updating the base mortality table to variants of the most recently published RP-2014 tables
  - Teachers: White Collar Adjustment for Males and Females
  - Female Non-Teachers: Base RP-2014 Tables
  - Male Non-Teachers: Blue Collar Adjustment

- For the projected improvement assumption, we are recommending U-MP (medium)

- We are recommending ERSRI continue to use a fully generational approach to project future mortality improvement
  - With this fully generational projection approach, a gradual and consistent improvement over time would be in the valuation process
  - Greatly diminishes the risk of having to have another large update in a future experience study

Alternative Funding Strategy

- As the draft results of the experience study began to circulate, including the impact on contribution rates in 2020, there have been two concerns voiced
  - The impact of the recommendations on the contributions for FY2020
  - The 50%, or lower, probability of achieving the 7.25%, especially over the next 5-10 years
- We have provided an alternative strategy that addresses the concerns above, but does not impair other current strategic objectives:
  - The closed period on the current large RIRSA amortization layer
  - Being able to factually state that participating employers in ERSRI have met their ADEC each year
  - Expected timeframe to achieve 80% funded status
  - Being transparent in our processes and in financial disclosures

GRS

Alternative Strategy

- Lowering the investment return assumption is the best way to increase the probability of achieving the assumption:
  - This increases the probability of achieving the assumption in all scenarios
  - However, by default, this would increase contribution requirements over the short term

Projected FY2020 Contribution Rate	Current	@ 7.25%	@ 7.00%
State Employees	26.11%	27.77%	29.00%
Teachers	24.04%	25.83%	27.22%
MERS Gen	12.76%	13.98%	15.07%
MERS PF	17.83%	20.05%	22.65%

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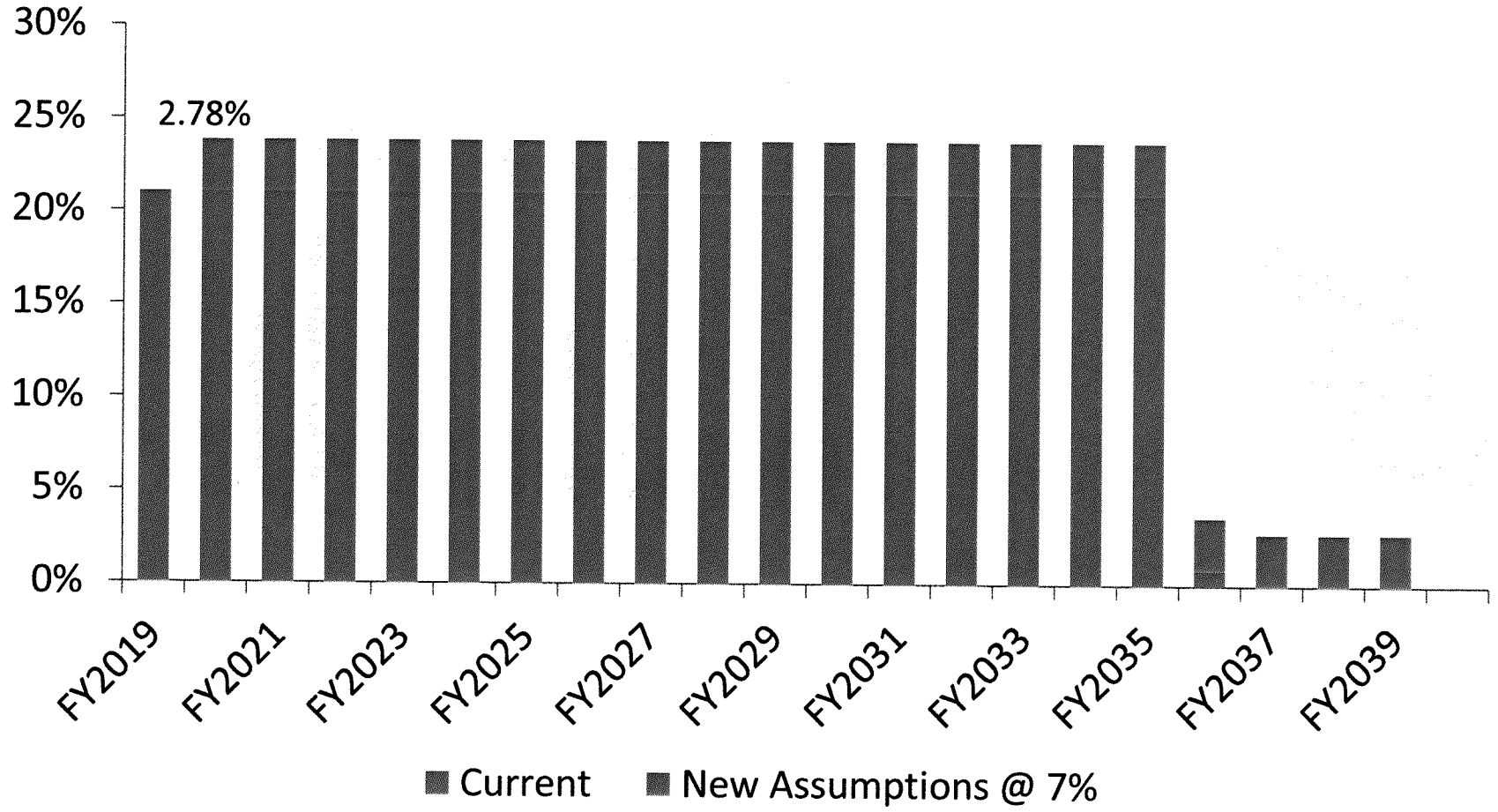
Alternative Strategy: Staggering

- The current funding policy would fully recognize the increase in normal cost in FY2020 and then amortize the increase in UAAL from the new assumptions over the 20 year period FY2020 – FY2039
- An optional strategy would be to split this increase in UAAL into multiple parts and start the amortization of each individual part at different points in the future
- Example: fully recognize the increase in normal cost in FY2020 and then split the UAAL into 4 parts and setup 4 individual amortization schedules over FY2021-FY2040, FY2022-FY2041, FY2023-FY2042, FY2024-2043
  - Interest will accrue at the discount rate each year the payment is deferred, so will have to contribute more dollars in a later year

Pattern of Recognition and Impact on Projected Funded Status

- The previous, simplified example would have very low impact in 2020, followed by an increasing pattern in 2021 – 2024
- In addition, the strategy would push the expected 80% funded date back by a year
- We have formulated an approach where the amount of each year's layer is varied to create a level contribution rate impact over each of the five years
- We have also decreased the amortization period for the staggered layers to push the 80% funded date back up one year
  - First layer is 20, but second is 19, third is 18, etc.

Projected Amortization Layer Contribution Rates: Default Policy



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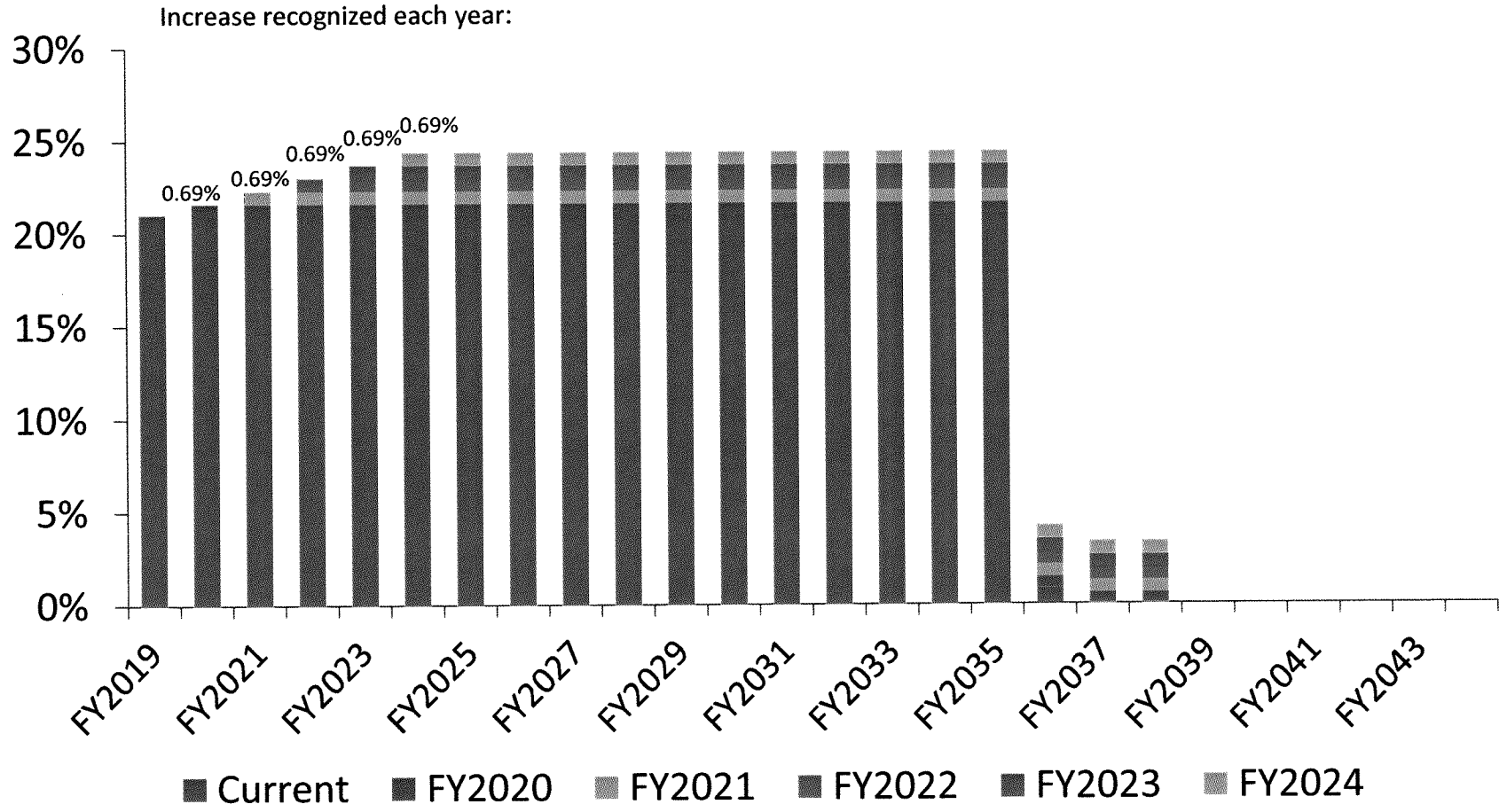
Projected Amortization Layer Contribution Rates: Staggered



0.11% increase in FY2020 due to change in normal cost

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Alternative Strategy: Combination

- Combining a lower investment return assumption with the example stagger would increase the probability of achieving the assumption and produce the following pattern of contribution rate increases due to assumption changes:

	FY2020	FY2021	FY2022	FY2023	FY2024
State Employees	0.69%	0.69%	0.69%	0.69%	0.69%
Teachers	0.74%	0.74%	0.74%	0.74%	0.74%
MERS Gen	0.56%	0.52%	0.52%	0.52%	0.52%
MERS PF	2.16%	0.76%	0.76%	0.76%	0.76%

Numbers above based on the 7% scenario with level rate staggering

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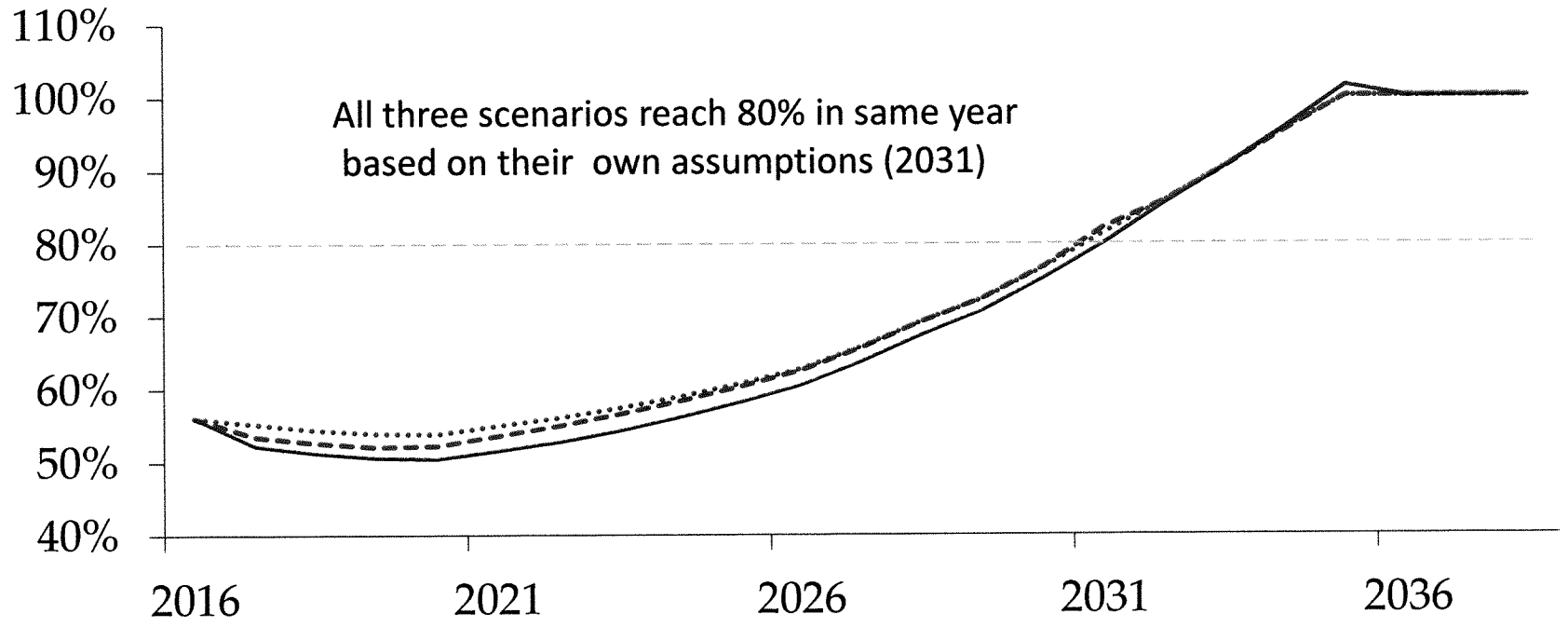
Projected Funded Ratio: State Employees



- Assumes ADEC met each year and actual investment return equal to assumption each year

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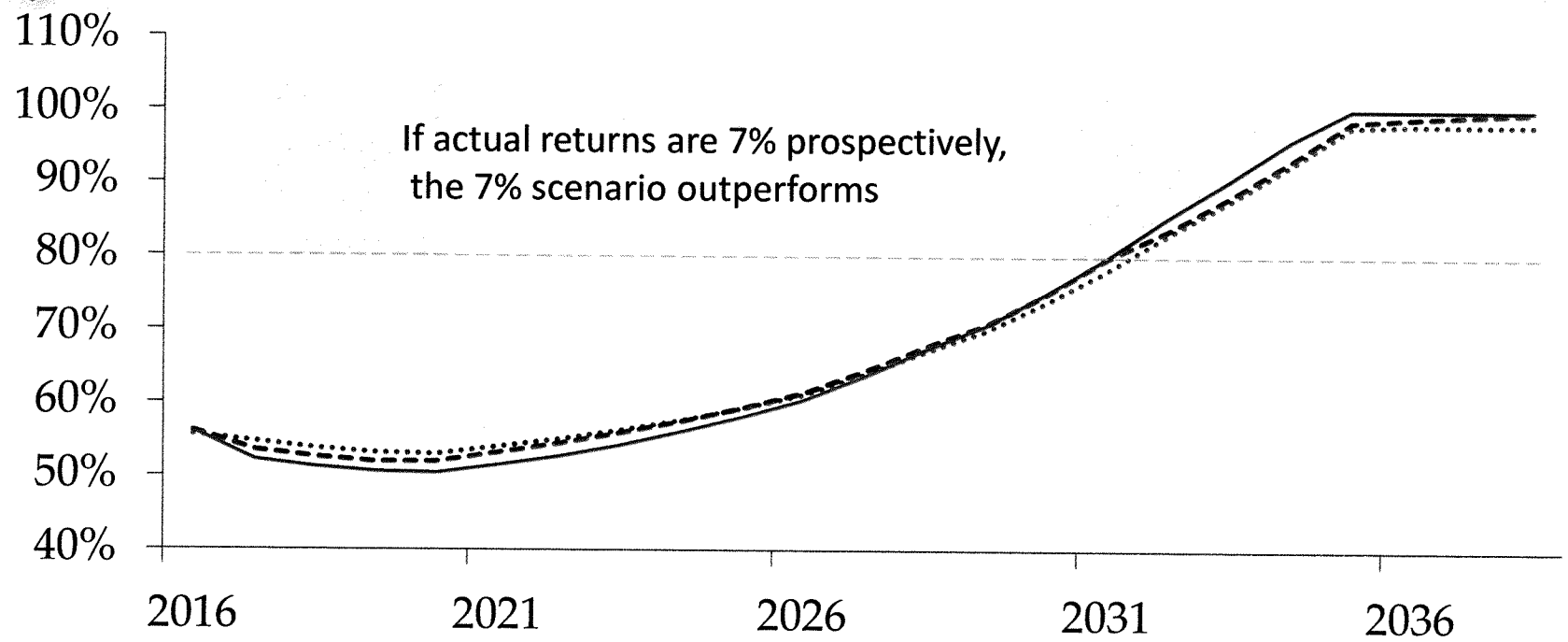
Projected Funded Ratio: State Employees: 7% actual returns for all scenarios



- Assumes ADEC met each year and actual investment return of 7.00% during each year

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Timing of Impact

- These recommendations are being made for use in the upcoming June 30, 2017 actuarial valuations
- We are not recommending, nor anticipating, a change to the FY2019 contributions that have already been approved by the Board
- The first impact will be in the FY2020 contribution rates
- We are showing the projected FY2020 rates. The actual FY 2020 rates will be determined in the valuation including known 2017 experience and demographics.

Actuarial Impact – State Employees

State Employees				
Item	Current Assumptions and Methods	Recommended Assumptions and Methods @ 7.25%	Recommended Assumptions and Methods @ 7.00%	Recommended Assumptions and Methods @ 7.00%
				w/ Stagger
Normal cost	8.59%	8.61%	9.07%	9.07%
Unfunded actuarial accrued liability	$1,936 million	$2,067 million	$2,173 million	$2,173 million
Funded ratio	56.0%	54.4%	53.2%	53.2%
Projected FY 2020 Annual Required Contribution				
a. Percent of payroll	26.11%	27.77%	29.00%	26.80%
b. Projected Payroll	$763 million	$756 million	$756 million	$756 million
c. Estimated dollar amount	$199.2 million	$209.9 million	$219.2 million	$202.6 million

These are illustrative only. The 2016 valuation results will not be restated and actual 2020 Contributions will be determined in the 2017 valuation.

Ultimate Rate in Stagger Scenario is 29.56%

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Actuarial Impact – Teachers

Teachers				
Item	Current Assumptions and Methods	Recommended Assumptions and Methods @ 7.25%	Recommended Assumptions and Methods @ 7.00%	Recommended Assumptions and Methods @ 7.00%
				w/ Stagger
Normal cost	7.84%	7.73%	8.19%	8.19%
Unfunded actuarial accrued liability	$2,694 million	$2,857 million	$3,018 million	$3,018 million
Funded ratio	58.3%	56.9%	55.6%	55.6%
Projected FY 2020 Annual Required Contribution				
a. Percent of payroll	24.04%	25.83%	27.22%	24.78%
b. Projected Payroll	$1,103 million	$1,082 million	$1,082 million	$1,082 million
c. Estimated dollar amount	$265.2 million	$279.6 million	$294.6 million	$268.2 million

These are illustrative only. The 2016 valuation results will not be restated and actual 2020 Contributions will be determined in the 2017 valuation.

Ultimate Rate in Stagger Scenario is 27.74%

GRS

Actuarial Impact – MERS General

MERS General				
Item	Current Assumptions and Methods	Recommended Assumptions and Methods @ 7.25%	Recommended Assumptions and Methods @ 7.00%	Recommended Assumptions and Methods @ 7.00%
				w/ Stagger
Normal cost	8.82%	8.92%	9.36%	9.36%
Unfunded actuarial accrued liability	$178 million	$211 million	$238 million	$238 million
Funded ratio	84.40%	82.00%	80.20%	80.20%
Projected FY 2020 Annual Required Contribution				
a. Percent of payroll	12.76%	13.98%	15.07%	13.32%
b. Projected Payroll	$265 million	$263 million	$263 million	$263 million
c. Estimated dollar amount	$33.9 million	$36.7 million	$39.6 million	$35.0 million

These are illustrative only. The 2016 valuation results will not be restated and actual 2020 Contributions will be determined in the 2017 valuation.

Ultimate Rate in Stagger Scenario is 15.40%

GRS

Actuarial Impact – MERS P/F

MERS Police and Fire				
Item	Current Assumptions and Methods	Recommended Assumptions and Methods @ 7.25%	Recommended Assumptions and Methods @ 7.00%	Recommended Assumptions and Methods @ 7.00%
				w/ Stagger
Normal cost	18.58%	19.40%	20.46%	20.46%
Unfunded actuarial accrued liability	$120 million	$135 million	$154 million	$154 million
Funded ratio	80.30%	78.40%	76.10%	76.10%
Projected FY 2020 Annual Required Contribution				
a. Percent of payroll	17.83%	20.05%	22.65%	19.99%
b. Projected Payroll	$111 million	$109 million	$109 million	$109 million
c. Estimated dollar amount	$19.8 million	$21.8 million	$24.7 million	$21.8 million

These are illustrative only. The 2016 valuation results will not be restated and actual 2020 Contributions will be determined in the 2017 valuation.

Ultimate Rate in Stagger Scenario is 23.03%

GRS

Actuarial Impact – TSBP

Teacher Survivor Benefit Plan			
Item	Current Assumptions and Methods	Recommended Assumptions and Methods @ 7.25%	Recommended Assumptions and Methods @ 7.00%
Unfunded actuarial accrued liability	-$100 million	-$90 million	-$84 million
Funded ratio	153.3%	146.0%	141.2%
Illustrated FY 2020 Annual Required Contribution			
a. Annual Member Contribution	$96	$96	$96

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Summary

- Combined with our other recommendations, we are comfortable with either assumption, 7.25% or 7.00%
- We are comfortable with a reasonable phase-in to the higher contribution amounts in conjunction with the 7.00% scenario
- We believe either of these scenarios provide a better reflection of future experience and will provide more stability when compared to the current assumption set

Actuary's Qualifications

- The study was conducted in accordance with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board
- All signing actuaries meet the Qualification Standards of the American Academy of Actuaries

GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

EMPLOYEES' RETIREMENT SYSTEM OF RHODE ISLAND

ACTUARIAL EXPERIENCE INVESTIGATION
FOR THE SIX–YEAR PERIOD ENDING JUNE 30, 2016

GRS

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April 7, 2017

Retirement Board
50 Service Avenue, 2nd Floor
Warwick, RI 02886-1021

Subject: Results of 2017 Actuarial Experience Study for ERSRI

Dear Members of the Board:

We are pleased to present our report on the results of the 2017 Actuarial Experience Investigation Study for the Employees' Retirement System of Rhode Island (ERSRI). It includes a discussion of recent experience, it presents our recommendations for new actuarial assumptions and methods, and it provides information about the actuarial impact of these recommendations on the liabilities and other key actuarial measures. This report contains the results of the experience study for all groups covered under ERSRI, including State Employees, Teachers, MERS, State Police, State Judges, and the Teacher Survivor Benefit Plan.

Using the recommended set of actuarial assumptions should present a more accurate portrayal of ERSRI's financial condition and should reduce the magnitude of future experience gains and losses.

This study was conducted in accordance with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. The undersigned meet all of the Qualification Standards of the American Academy of Actuaries. In addition, the undersigned have extensive experience as retained public sector actuaries for several large, statewide public retirement systems.

We wish to thank the ERSRI staff for their assistance in providing data for this study.

Respectfully submitted,

Joseph P. Newton, FSA, MAAA, EA

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SECTION I
EXECUTIVE SUMMARY

Section I
Summary of Recommendations

Our recommended changes to the current actuarial assumptions may be summarized as follows:

Economic Assumptions

1. We recommend decreasing the general inflation assumption from 2.75% to 2.50%. This will bring the assumption closer in line with experience over the last two decades as well as expectations in the financial market and from professional forecasters.

2. We recommend decreasing the nominal investment return assumption from 7.50% to 7.25%. Based on a blending of the current capital market assumptions from eight consulting firms, a 7.25% investment return is very close to the median expected geometric return of 7.16% based on the target asset allocation. Based on the results of the recent asset allocation study by PCA and the Rhode Island SIC, the median expected return net of all expenses using a 2.50% inflation assumption was 6.96%. These numbers are also consistent with results using a collective industry survey of 26 sources, which produced a 7.14% expected return. All three of these numbers are 10 year numbers while the duration of the liability of ERSRI is a longer time frame. A relatively small adjustment of 0.1% to 0.3% for difference in timeframe supports the 7.25% recommended assumption under all three sets of analysis above. Please note this assumption is net of administrative expenses, which are assumed to be 0.11% of plan assets per annum.

3. Based on recent national, regional, and local trends, we continue to find the real (above price inflation) general wage growth assumption of 0.50% to be reasonable. This is the portion of wage growth tied to general productivity increases across all members. Therefore, consistent with the decrease in inflation, the nominal general wage inflation assumption will decrease from 3.25% to 3.00% (Inflation + 0.50%). This assumption represents the average increase in wages in the general Rhode Island, regional, and national economy. It is used to index salaries for each cohort of new entrants in projections and as a starting block for the individual salary increase assumptions and for the payroll growth assumption for each System separately to determine projected amortization schedules of the unfunded liability.

4. The assumed salary increase schedules for individuals include an ultimate component that begins with the general wage inflation assumption above and may add on additional increases for individual merit (which would include promotions) and then an additional component for step rates based on service.

    a. For State Employees, we are recommending lowering the ultimate component of the salary schedules by the same 0.25% as the change in the general wage inflation, but we are recommending no change to the current 0.25% individual merit and promotion

component. This creates an assumed salary increase assumption of 3.25% per annum for longer service members (3.00% GWI plus 0.25%). Over the past decade, members with 25 years of service have received increases of 2.97%, or 1.23% above the 1.74% inflation experience. However, much of that was from the first four years of the experience, after which there was a change to the policy for increases due to longevity. The last 6 years shows an average increase of 0.69% above inflation. We are also recommending very small changes to the step-rate component. The net change is an approximate 0.34% decrease in the average annual salary increase received by the member over their career (4.57% to 4.23%).

b. Similarly for Teachers, we are recommending lowering the ultimate component of the salary schedules by the same 0.25% as the change in the general wage inflation, but in addition, we are recommending lowering the current 0.25% individual merit and promotion component down to 0.00%. The Teacher salary experience shows high salary increases for the first ten years of their career, and then leveling off to a very consistent and low experience thereafter. Over the past decade, members with more than 10 years of service have received increases of 2.21%, or 0.47% above the 1.74% inflation experience. We are recommending no change to the step-rate component. The net change is an approximate 0.50% decrease in the average annual salary increase received by the member over their career (4.69% to 4.19%).

c. For General MERS Employees, the experience and the current assumptions are very similar to State Employees, and thus we are recommending keeping the same 0.75% above inflation assumption. This creates an assumed salary increase assumption of 3.25% per annum for longer service members (3.00% GWI plus 0.25%).

d. For Public Safety Employees, we are recommending an increase from 1.25% above inflation to 1.50% above inflation for the ultimate component. For this group, the step rate portion is much shorter (only 3-6 years) and thus there are more across the board increases and less portioning by service. Combined with the 0.25% decrease in inflation, the net is no change in the ultimate salary scale. We are also recommending no change to the step component

5. In conjunction with the reduced general wage inflation assumptions, we are recommending a reduction in the payroll growth rate assumption from 3.25% to 3.00% for groups except Teachers. For Teachers, consistent with the additional 0.25% recommended in the salary scale, and based on the current demographics for the group, we are recommending a 2.50% payroll growth rate assumption. Changing the payroll growth assumption has no impact on the liabilities, but does assume there is lower growth in the future payroll to amortize the UAAL, which results in an increase in the current contribution requirements.

6. We recommend a decrease in the assumption for the contingent post-retirement benefit adjustments to be 2.15% per year.

Mortality Assumptions

7. Since the last material change to the post-retirement mortality tables for non-disabled retirees in 2011, the longevity experience for the retirees of ERSRI have tracked rather close to the assumptions for most groups, only recently beginning to show a need for strengthening. However, the experience for Male Non-Teachers has shown more deviation. In 2014, new industry standard mortality tables were issued that produced longer longevity expectations than older tables. In general, the national and local trends through 2011/2012 showed high rates of improvement compared to past expectations, but there has been a slowing of improvement since. The recent ERSRI experience is a reasonable match to variants of the RP-2014 tables and we are recommending updating the assumptions. For the improvement scale, we are recommending using the ultimate rates of the MP projection scale, which have stronger improvement factors than the Scale AA currently being used, especially for females, but are closer to recent experience and future expectations from demographers than the Scale AA. This change increased contribution rates.

8. We recommend updating the post-retirement mortality tables for disabled retirees to the RP-2014 tables for disabled lives.

9. We recommend updating the pre-retirement mortality tables for active employees to the RP-2014 tables.

Other Demographic Assumptions

10. For State Employees, Teachers, and General MERS, we now have three full years of data after the effective date of RIRSA. The current assumption has a flat percentage for all years once the member is eligible, except for the first year the member can retire unreduced, which has a substantially higher rate. The data for all groups shows members during this first year of eligibility are not electing to retire in the numbers expected by the current assumptions. We have recommended decreases in this probability during the first year of eligibility. This change decreased contribution rates.

11. For MERS Police and Fire, both RIRSA and the mediation both made material modifications to the retirement eligibility conditions. Thus, as of June 30, 2016, there has not been enough data under a single set of conditions to meaningfully analyze the data. We recommend no change to the age based rates at his time. Although, we recommend lowering the assumption that recognizes the demand for members who would have been assumed to retire at an earlier age under the rules in effect before the enactment RIRSA.

12. For State Employees, General MERS and Police and Fire MERS, we recommend no change to the rates of termination. For Teachers, we have made very minor changes during the first few

years of the member's career. This change will have a slightly negative impact on liabilities and contribution rates.

13. In general, the numbers of members becoming disabled has been declining. We recommend slightly modifying the rates of disability for most groups based on the experience of the individual group.

14. We recommend no change to the current marriage assumption and spousal age difference.

15. For the Teacher Survivor Benefit Plan, we recommend modifications to the current marriage, refund, and number of children assumptions. The current assumptions were developed based on a survey now almost 20 years old and are a static assumption across all ages. Using recent elections for members of the Plan and data from the national census, we have made modifications to the election assumptions, in addition to making the elections/eligibilities vary by age.

Actuarial Methods and Policies

16. We recommend no change to the current asset smoothing method.

17. We recommend no change to the current funding method. The individual Entry Age Normal cost method (EAN) is the current funding method being used to allocate the actuarial costs of the System. The Entry Age Normal method will generally produce relatively level contribution amounts as a percentage of payroll from year to year, and allocates costs among various generations of taxpayers in a reasonable manner. It is by far the most commonly used actuarial cost method for large public retirement systems. We continue to believe this is the most appropriate funding method.

Impact on Liabilities and Contributions

Item	Current Assumptions and Methods	Recommended Assumptions and Methods	Increase/Decrease
State Employees			
Unfunded actuarial accrued liability	$1,936 million	$2,067 million	$131 million
Funded ratio	56.00%	54.40%	-1.60%
Illustrated FY 2019 ARC	25.75%	27.35%	1.60%
Teachers			
Unfunded actuarial accrued liability	$2,694 million	$2,857 million	$163 million
Funded ratio	58.30%	56.90%	-1.40%
Illustrated FY 2019 ARC	23.51%	25.26%	1.75%
MERS General			
Unfunded actuarial accrued liability	$178 million	$211 million	$33 million
Funded ratio	84.40%	82.00%	-2.40%
Illustrated FY 2019 ARC	12.23%	13.45%	1.22%
MERS Police and Fire			
Unfunded actuarial accrued liability	$120 million	$135 million	$15 million
Funded ratio	80.30%	78.40%	-1.90%
Illustrated FY 2019 ARC	17.20%	19.42%	2.22%
Teacher Survivor Benefit Plan			
Unfunded actuarial accrued liability	-$71 million	-$63 million	$8 million
Funded ratio	137.94%	132.55%	-5.40%
Illustrated FY 2019 Member Contribution	$96	$96	$0

SECTION II
INTRODUCTION

Section II
Introduction

Summary of Process

A periodic review and selection of the actuarial assumptions is one of many important components of understanding and managing the financial aspects of the Employees' Retirement System of Rhode Island (ERSRI). Use of outdated or inappropriate assumptions can result in understated costs which will lead to higher future contribution requirements or perhaps an inability to pay benefits when due; or, on the other hand, produce overstated costs which place an unnecessarily large burden on the current generation of members, employers, and taxpayers.

A single set of assumptions is typically not expected to be suitable forever. As the actual experience unfolds or the future expectations change, the assumptions should be reviewed and adjusted accordingly.

It is important to recognize that the impact from various outcomes and the ability to adjust from experience deviating from the assumption are not symmetric. Due to compounding economic forces, legal limitations, and moral obligations outcomes from underestimating future liabilities are much more difficult to manage than outcomes of overestimates, and that un-symmetric risk should be considered when the assumption set, investment policy and funding policy are created. As such, the assumption set used in the valuation process needs to represent the best estimate of the future experience of the System and be at least as likely, if not more than likely, to overestimate the future liabilities versus underestimate them.

Using this strategic mindset, each assumption was analyzed compared to the actual experience of ERSRI and general experience of other large public employee retirement systems. Changes in certain assumptions and methods are suggested upon this comparison to remove any bias that may exist and to perhaps add in a slight margin for future adverse experience where appropriate. Next, the assumption set as a whole was analyzed for consistency and to ensure that the projection of liabilities was reasonable and consistent with historical trends.

The following report provides our recommended changes to the current actuarial assumptions.

In determining liabilities and contribution rates for retirement plans, actuaries must make assumptions about the future. Among the assumptions that must be made include:

- Retirement rates
- Mortality rates
- Turnover rates
- Disability rates
- Investment return rate
- Salary increase rates
- Inflation rate

For some of these assumptions, such as the mortality rates, past experience provides important evidence about the future. For others, such as the investment return assumption, the link between past and future results is much weaker. In either case, actuaries should review the plan's assumptions periodically and determine whether these assumptions are consistent with actual past experience and with anticipated future experience.

The last such actuarial experience investigation was performed in conjunction with the June 30, 2014 actuarial valuation. For this experience study, we have analyzed ERSRI's experience for the six-year period from June 30, 2010 through June 30, 2016 (FY 2011 – FY 2016). Note that the first three years were also included in the last experience study.

In conducting experience studies, actuaries generally use data over a period of several years. This is necessary in order to gather enough data so that the results are statistically significant. In addition, if the study period is too short, the impact of the current economic conditions may lead to misleading results. It is known, for example, that the health of the general economy can impact salary increase rates and withdrawal rates. Using results gathered during a short-term boom or bust will not be representative of the long-term trends in these assumptions. Also, the adoption of legislation, such as plan improvements or changes in salary schedules, will sometimes cause a short-term distortion in the experience. For example, if an early retirement window was opened during the study period, we would usually see a short-term spike in the number of retirements followed by a dearth of retirements for the following two-to-four years. Using a longer period prevents giving too much weight to such short-term effects. On the other hand, using a much longer period would water down real changes that may be occurring, such as mortality improvement or a change in the ages at which members retire. In our view, using a six-year period is reasonable.

In a few instances, we chose to use a longer period, up to ten to twenty years, in order to further increase the soundness of our conclusions.

In an experience study, we first determine the number of deaths, retirements, etc. that occurred during the period. Then we determine the number expected to occur, based on the current actuarial assumptions. The number of "expected" decrements is determined by multiplying the probability of the occurrence at the given age, by the "exposures" at that same age. For example, let's look at a rate of retirement of 15% at age 55. The number of exposures can only be those members who are age 55 and eligible for retirement at that time. Thus they are considered "exposed" to that assumption. Finally, we calculate the A/E ratio, where "A" is the actual number (of retirements, for

example) and "E" is the expected number. If the current assumptions were "perfect", the A/E ratio would be 100%. When it varies much from this figure, it is a sign that new assumptions may be needed. (However, in some cases we prefer to set our assumptions to produce an A/E ratio a little above or below 100%, in order to introduce some conservatism.) Of course we not only look at the assumptions as a whole, but we also review how well they fit the actual results by gender, by age, and by service.

If the data leads the actuary to conclude that new tables are needed, the actuary may "graduate" or smooth the results, since the raw results can be quite uneven from age to age or from service to service.

Please bear in mind that, while the recommended assumption set represents our best estimate, there are other reasonable assumptions sets that could be supported.

Organization of Report

Section III contains our findings and recommendations for each actuarial assumption. The impact of adopting our recommendations on liabilities and contribution rates is shown in Section IV. Section V summarizes the recommended changes. Section VI presents a summary of all the actuarial assumptions and methods, including the recommended changes. Finally, tables summarizing the analysis of the assumptions are in Section VII.

Section VII Exhibits

The exhibits in Section VII should generally be self-explanatory. For example, on page 83, we show the exhibit analyzing the termination rates for Teachers. The second column shows the total number of Teachers who terminated during the study period. This excludes members who died, became disabled or retired. Column (3), labeled "Total Count" shows the total exposures. This is the number of Teachers who could have terminated during any of the years. On this exhibit, the exposures exclude anyone eligible for retirement. A member is counted in each year he could have terminated, so the total shown is the total exposures for the six-year period. Colum (4) shows the probability of termination based on the raw data. That is, it is the result of dividing the actual number of terminations (col. 2) by the number exposed (col. 3). Column (5) shows the current termination rate and column (6) shows the new recommended termination rate. Columns (7) and (8) show the expected numbers of terminations based on the current and proposed termination assumptions. Columns (9) and (10) show the Actual-to-Expected ratios under the current and proposed termination assumptions.

SECTION III

ANALYSIS OF EXPERIENCE AND RECOMMENDATIONS

Section III
Analysis of Experience and Recommendations

We will begin by discussing the economic assumptions: inflation, the investment return rate, the salary increase assumptions, the payroll growth rate, etc. Then we will discuss the demographic assumptions: mortality, disability, termination, retirement, etc. Finally, we will discuss the actuarial methods used.

INFLATION AND INVESTMENT RETURN ASSUMPTIONS

Actuarial Standards of Practice (ASOP) No. 27, Selection of Economic Assumptions for Measuring Pension Obligations, provides guidance to actuaries on giving advice on selecting economic assumptions for measuring obligations for defined benefit plans.

Generally, the economic assumptions are much more subjective in nature than the demographic assumptions. As no one knows what the future holds, it is necessary for the actuary to estimate possible future economic outcomes. These estimates are based on a mixture of past experience, future expectations, and professional judgment. The actuary should consider a number of factors, including the purpose and nature of the measurement, and appropriate recent and long-term historical economic data. However, the standard explicitly advises the actuary not to give undue weight to recent and/or historical experience.

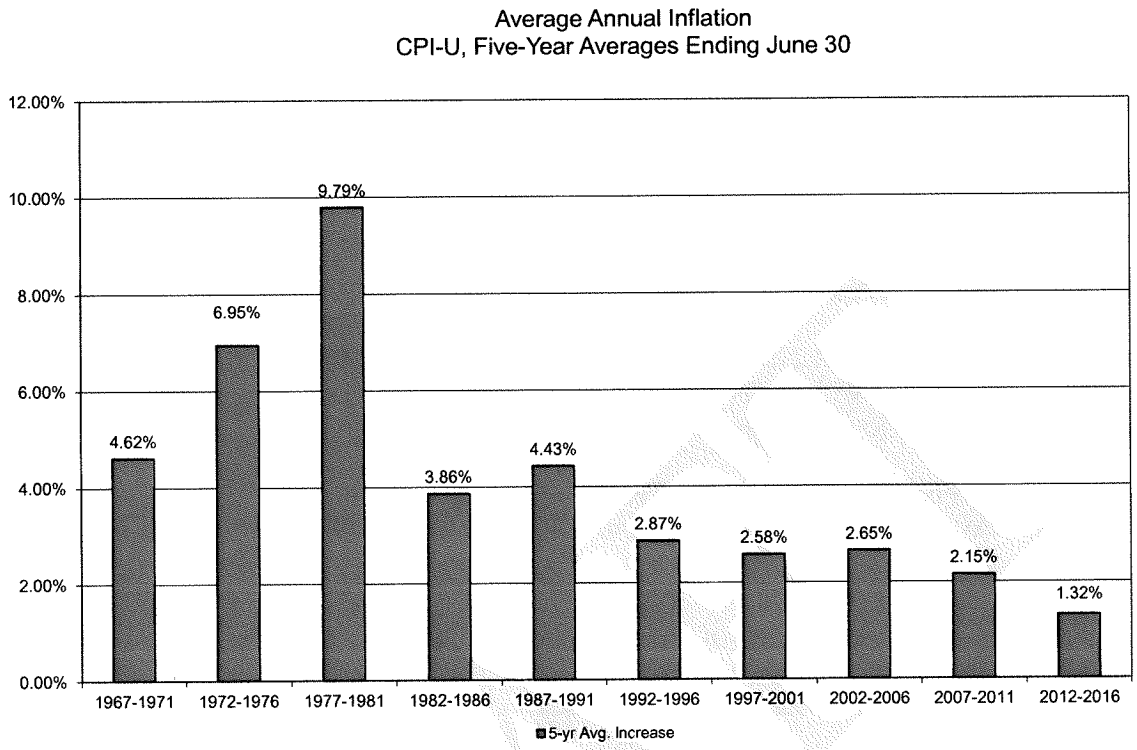
Although recognizing that there is not one right answer, the current standard calls for the actuary to develop a best-estimate for each economic assumption. Each economic assumption should individually satisfy this standard. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period.

INFLATION ASSUMPTION

By "inflation," we mean price inflation, as measured by annual increases in the Consumer Price Index (CPI). This inflation assumption underlies most of the other economic assumptions. It impacts investment return, salary increases, payroll growth, and cost-of-living increases. The current annual inflation assumption is 2.75%.

Actual Change in CPI-U

The chart below shows the average annual inflation in each of the ten consecutive five-year periods over the last fifty years:



The following table shows the average inflation over various periods, ending June 30, 2016:

Periods Ending June 30, 2016	Average Annual Increase in CPI-U
Last five (5) years	1.32%
Last ten (10) years	1.74%
Last fifteen (15) years	2.04%
Last twenty (20) years	2.18%
Last twenty-five (25) years	2.32%
Last thirty (30) years	2.66%

Source: Bureau of Labor Statistics, CPI-U, all items, not seasonally adjusted

As you can see, inflation has been relatively low over the last thirty years.

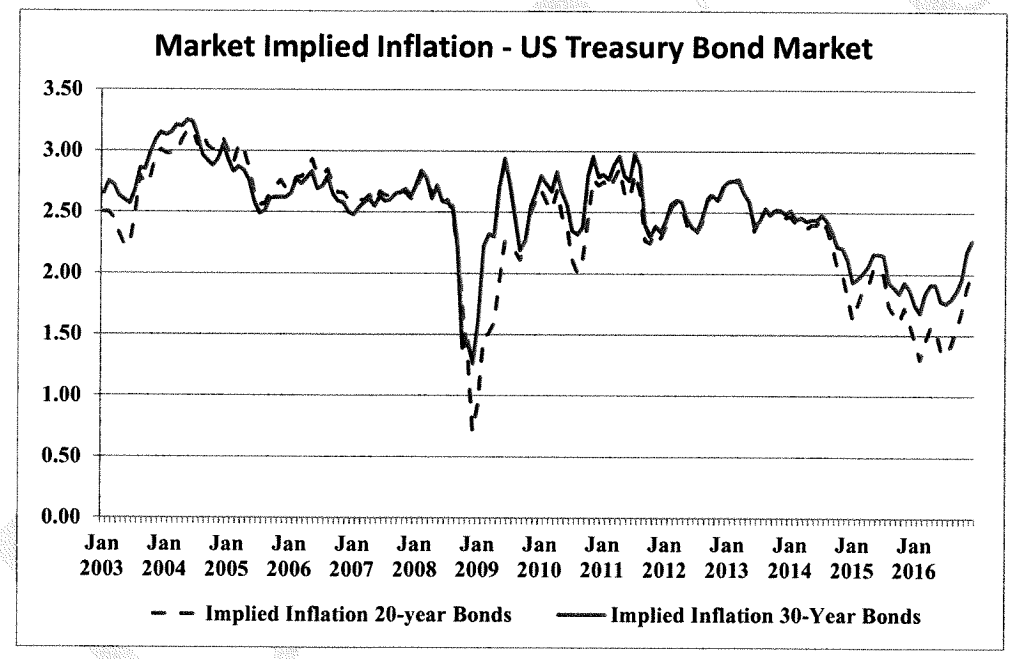
Forecasts from Investment Consulting Firms

Most investment consulting firms, in setting their capital market assumptions, assume that inflation will be less than 2.75%. A 2016 survey of capital market assumptions of twelve investment consulting firms who develop longer-term assumptions (20 years or more) performed by Horizon Actuarial Services, LLC, shows that the expected rate of inflation, as measured by CPI-U, for the next 20 years ranged from 2.0% to 2.8% with a median expectation of 2.3%.

PCA, ERS' investment consultant, assumes that inflation will increase at the rate of 2.25% per year over the next ten years.

Expectations Implied in the Bond Market

Another source of information about future inflation is the market for US Treasury bonds. For example, the July 1, 2015 yield for 20-year inflation indexed Treasury bonds was 0.94% plus actual inflation. The yield for 20-year non-indexed US Treasury bonds was 2.92%. Simplistically, this means that on that day the bond market was predicting that inflation over the next twenty years would average 1.96% [(1 + 2.92%) / (1 + 0.94%) - 1] per year. The difference in yield for 30 year bonds implies 2.00% inflation over the next 30 years. This is consistent with most forecasts of inflation and overall economic growth being lower over the next decade. The chart below shows the historical market implied inflation from January 1, 2003 through December 31, 2016.



However, this analysis is known to be imperfect as it ignores the inflation risk premium that buyers of US Treasury bonds often demand as well as possible differences in liquidity between US Treasury bonds and TIPS. Also, notice the strong increase in this spread since the election.

Forecasts from Social Security Administration

In the Social Security Administration's 2016 Trustees Report, the Office of the Chief Actuary is projecting a long-term average annual inflation rate of 2.6% under the intermediate cost assumption. For the 2nd year in a row, the Chief Actuary for the Social Security Administration

reduced this assumption by 0.10% from the prior year and also narrowed the low cost and high cost scenarios to 2.0% and 3.2%, respectively.

Survey of Professional Forecasters and Fed Policy

The Philadelphia Federal Reserve conducts a quarterly survey of the Society of Professional Forecasters. Their most recent forecast (fourth quarter of 2016) was for inflation over the next ten years (2016 to 2025) to average 2.15%. Most observers expect inflation to continue to be low as the economy works out of the recession. However, the Society of Professional Forecasters is implicitly assuming a 2.10% inflation rate from 2016-2020, so it is not just the next 5-7 years that is depressing inflation forecasts.

Additionally, the Fed has openly stated that they have a target 2.00% inflation rate.

Comparison of Inflation Expectations from 2014 to 2017

Finally, the table below provides a comparison of the inflation expectations documented in the 2014 experience study report and the current inflation expectations.

	Inflation Expectations		
Source	**2014**	**2017**	**Change**
(1)	(2)	(3)	(4)
ERSRI' Investment Consultant	2.75%	2.25%	-0.50%
Implied Inflation 20-Year Treasuries	2.26%	2.00%	-0.26%
SSA Trustees Report	2.80%	2.60%	-0.20%
Survey of Professional Forecasters	2.30%	2.15%	-0.15%

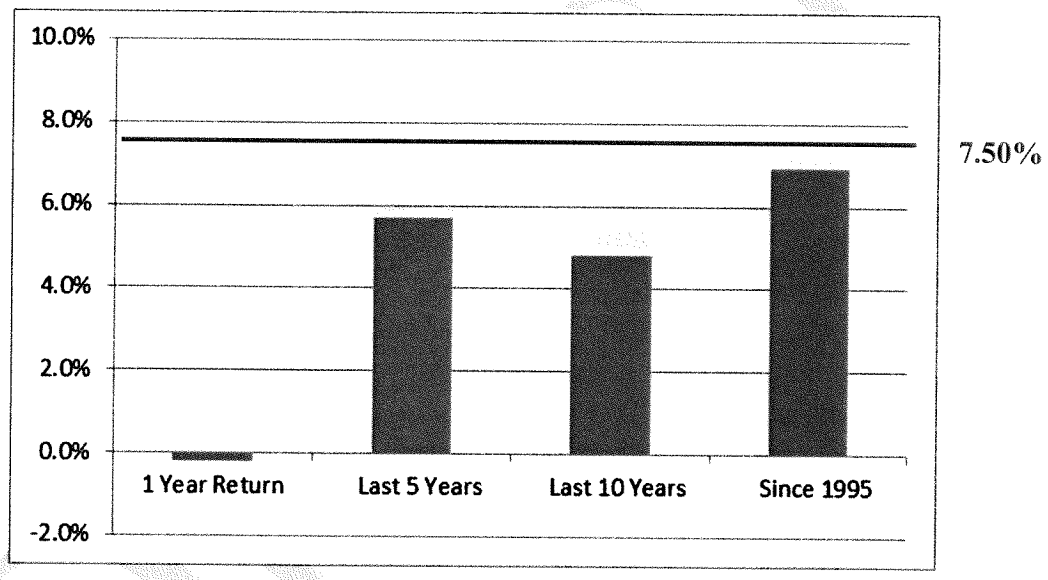
Recommendation

Using these sources, we recommend reducing the current 2.75% assumption to 2.50%, placing it closer to recent inflation levels and closer to the levels expected in the financial markets. As you will see, this change also affects other economic assumptions, including the payroll growth rate assumption for amortizing the unfunded actuarial accrued liability.

INVESTMENT RETURN ASSUMPTION

The investment return assumption is one of the principal assumptions used in any actuarial valuation of a retirement plan. It is used to discount future expected benefit payments to the valuation date in order to determine the liabilities of the plans. Even a small change to this assumption can produce significant changes to the liabilities and contribution rates. Currently, it is assumed that future investment returns will average 7.50% per year, net of investment and administrative expenses. The current assumption assumes inflation of 2.75% per annum and an annual real rate of return of 4.75%, net of expenses. As the inflation assumption has already been discussed, much of this analysis will focus on the real rate of return assumption of 4.75% per annum.

The chart below shows a history of ERSRI' market returns through FY 2016.

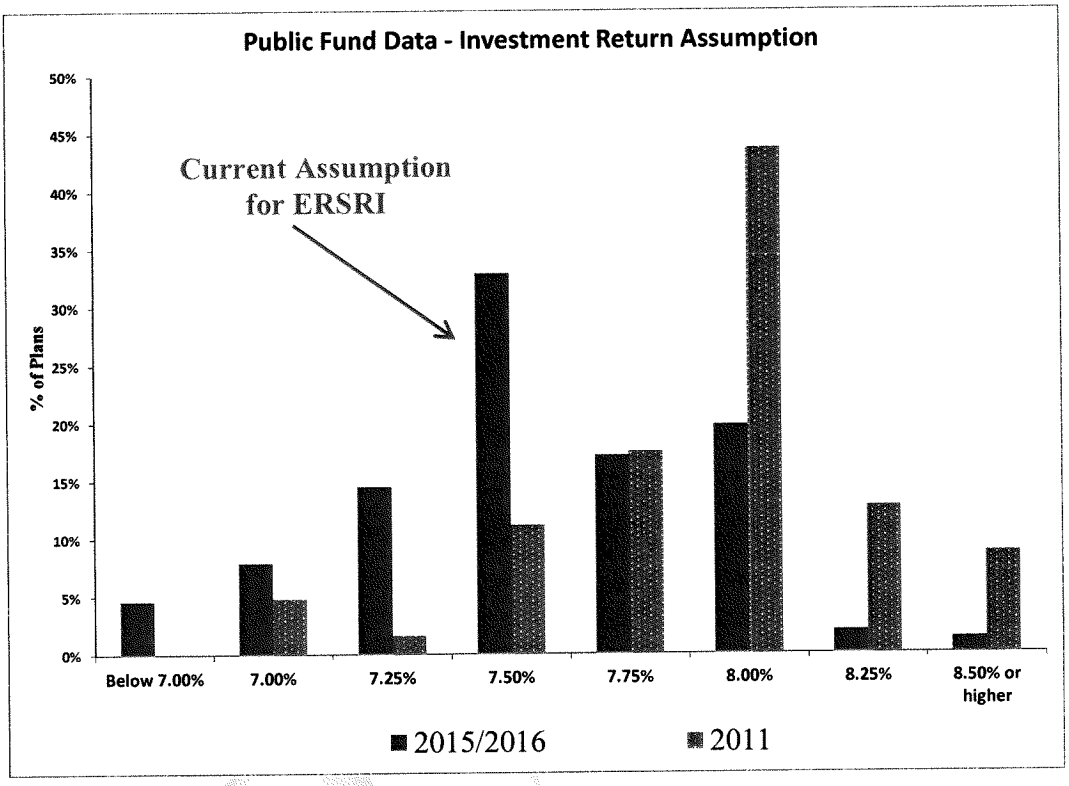


Even so, past performance, even averaged over a twenty-year period, is not a reliable indicator of future performance for this assumption. The actual asset allocation of the trust fund will significantly impact the overall performance, so returns achieved under a different allocation are not meaningful. More importantly, the real rates of return for many asset classes, especially equities, vary so dramatically from year to year that even a twenty-year period is not long enough to provide reasonable guidance.

Comparison to Peers

We do not recommend the selection of an investment return assumption based on prevalence information. However, it is still informative to identify where the investment return assumption for ERSRI is compared to its peers. The chart on the following page shows the distribution of the investment return assumptions in the Public Plans Data as of December 2016 updated to reflect

known changes to return assumptions that other retirement systems have made, but not yet included in the downloaded survey data.



Source: 2015 Public Plans Database (n=152), with known adjustments after 2015. Median investment return assumption: 7.50% nominal return.

We have included the same information from the 2011 survey to show the national trends in this assumption. The median rate of return is 7.50% and the average is 7.54%. However, if the data is filtered to only look at Systems that that performed experience studies in the last 18-24 months, the average is closer to 7.25%.

Expenses

Since the trust fund pays expenses in addition to member benefits and refunds, we must make some assumption about these. Almost all actuaries treat investment expenses as an offset to the investment return assumption. That is, the investment return assumption represents expected return after payment of investment expenses.

For investment expenses, investment consulting firms periodically issue reports that describe their capital market assumptions. The estimates for core investments (i.e., fixed income, equities, and real estate) are generally based on anticipated returns produced by passive index funds that are net of investment related fees. The investment return expectations for the alternative asset class such as private equity and hedge funds are also net of investment expenses. Therefore, we did not make any adjustments to account for investment related expenses. Some of the

Retirement Systems may also employ active management investment strategies that result in higher investment expenses compared to strategies that invest in passive index funds. We have assumed that active management strategies would result in the same returns, net of investment expenses, as passive management strategies.

On the other hand, there is a divergence of practice on the handling of administrative expenses. Some actuaries make an assumption that administrative expenses will be some fixed or increasing dollar amount. Others assume that the administrative expenses will be some percentage of the plan's actuarial liabilities or normal cost. And others treat administrative expenses like investment expenses, as an offset to the investment return assumption. The historical practice for ERSRI has been to set the investment return assumption as the net return after payment of both investment and administrative expenses. The following chart shows the administrative expenses for the last six years expressed as a percentage of the assets, adjusted for cash flow, each year:

Fiscal Year	Administrative
2016	0.09%
2015	0.10%
2014	0.11%
2013	0.12%
2012	0.12%
2011	0.13%
Average	0.11%

Based on this information, we have assumed that 0.11% (11 basis points) of each year's investment return will be used to pay administrative expenses. This assumption is then used in setting the investment return assumption.

Asset Allocation

We believe the most appropriate approach to selecting an investment return assumption is to identify expected returns given the funds' asset allocation mapped to forward-looking capital market assumptions. Below is a summary of the asset allocation for ERSRI that was used in the analysis.

ASSET CLASS	ERSRI
US Equity	20.0%
Non-US Equity	20.0%
Private Growth	15.0%
Income Class	6.0%
Crisis Risk Offset	8.0%
Inflation Protection	10.0%
IG Fixed Income	11.5%
Absolute Return	6.5%
Cash	3.0%
Total	100.0%

Because GRS is a benefits consulting firm and does not develop or maintain our own capital market assumptions, we utilized the forward-looking return expectations developed by the following investment consulting firms:

- BNY Mellon
- JP Morgan
- Mercer Consulting
- RV Kuhns
- Hewitt EnnisKnupp
- New England Pension Consultants (NEPC)
- Pension Consulting Alliance (PCA)
- Wilshire

These investment consulting firms periodically issue reports that describe their capital market assumptions. That is, their estimates of expected returns, volatility, and correlations. While these assumptions are developed based upon historical analysis, many of these firms also incorporate forward-looking adjustments to better reflect near-term expectations.

Given the plan's current asset allocation and the investment consultant's capital market assumptions, the development of the average compound nominal return, net of investment and administrative expenses, is provided in the following table. The table provides the 40th, 50th, and 60th percentiles of the 10-year geometric average of the expected nominal return, net of expenses, as well as the probability of exceeding the current 7.50% assumption and the proposed 7.25% assumption.

Expected Annual Geometric Returns and Return Probabilities
(Based on 10-Year Capital Market Assumptions)

Investment Consultant	Distribution of 10-Year Average Geometric Net Nominal Return			Probability of exceeding 7.50%	Probability of exceeding 7.25%
	40th	50th	60th		
(1)	(2)	(3)	(4)	(5)	(6)
1	5.18%	6.21%	7.25%	37.7%	40.0%
2	5.63%	6.52%	7.41%	39.0%	41.7%
3	5.65%	6.62%	7.60%	41.0%	43.5%
4	6.13%	7.03%	7.93%	44.7%	47.5%
5	6.06%	7.02%	7.98%	44.9%	47.6%
6	5.90%	6.99%	8.08%	45.2%	47.6%
7	6.25%	7.20%	8.16%	46.9%	49.5%
8	6.73%	7.75%	8.78%	52.5%	54.9%
Average	**5.94%**	**6.92%**	**7.90%**	**44.0%**	**46.5%**

However, the capital market assumptions provided by the investment consultants and used in the analysis above are based on 7 to 10 year investment horizon. Investment consultants develop their forecast assumptions with this time horizon in part because most pension investment management teams use this time period for developing and monitoring their investment strategies.

On the other hand, the investment return assumption used in the actuarial valuation has a much longer investment horizon. Therefore, it may be necessary to identify and reflect differences in the economy and financial markets over the short-term and long-term time horizon.

Expected investment returns can be thought of as the sum of a risk-free rate of return and a risk premium. This is the fundamental premise in the Capital Asset Pricing Model (CAPM) that is used in Modern Portfolio Theory. Riskier investments have a higher risk premium to compensate the investor for the increased uncertainty. Generally, the risk premium for each asset class is constant over long periods of time. But there can be differences in the risk free return, depending on the investor's time horizon. We define a risk-free investment as one where the expected return is known with absolute certainty. This also means that the risk-free investment has no default and reinvestment risk. Based on this definition, we believe it is reasonable to benchmark a risk-free rate using zero coupon U.S. Treasury securities. Thus a 10-year risk-free rate is equal to the current yield of a 10-year zero coupon US Treasury bond.

For this analysis, we have chosen the 10-year yield as our short-term point because it is the same investment horizon for the return expectations provided by the investment consultant. For the longer-term point, we have chosen the 18-year yield because it is close to an approximation of the duration of the liabilities of ERSRI, meaning the average, interest-discounted benefit payment of ERSRI is expected to be paid 18 years from the valuation date. As of January 9, 2017, the yields of the 10-year and 18-year zero coupon Treasury bonds were 2.59% and 2.89%,

respectively. Therefore, it is reasonable to assume that even as small an adjustment to the investment time horizon as 8 years, from 10 years to 18 years, the risk free rate of return, and corresponding expected return on the portfolio would be 0.30% higher.

Adding 0.30% to the 6.92% median expected return above produces an 18-year expected median return of 7.22%.

Two investment consulting firms, Hewitt EnnisKnupp and NEPC, develop capital market assumptions with a 30-year investment horizon. Therefore, we can use their information to validate our adjustment to reflect a longer time horizon. The expected median 30 year returns for the two firms are 7.26% and 7.35%.

Based on this analysis, we recommend that ERSRI reduce is investment return assumption to 7.25%, which is comprised of an unchanged 4.75% net real return and a 2.50% inflation assumption.

Also, while there is slightly less than a 50% (46.5%) likelihood of attaining a 7.25% investment return over the next 10 years, the probability is projected to be closer to 50% over a longer time horizon. Since ERSRI is anticipated to continue to exist well into the future, has a post-retirement benefit increase provision that is contingent on investment performance, and a strong funding policy for making up shortfalls if they occur, a longer term horizon is appropriate for setting this assumption.

We believe this recommendation satisfies the best-estimate requirement under ASOP No. 27. Also, this recommendation is consistent with the recommendations regarding the use of an investment return assumption that is estimated to be realizable at least 50% of the time from a report released by the Society of Actuaries Blue Ribbon Panel on public pension plan funding in February 2014.

Post-Retirement Benefit Increases

Most members of ERSRI are eligible for post-retirement increases if the individual plan they participate in is over 80% funded (State, Teachers, JRBT, and STPL are all commingled to determine if they meet this requirement).

The increase is calculated as the sum of (1) half of the average compounded investment return during the prior five fiscal years, net of expenses, in excess of a subtrahend equal to the investment return assumption less 2.0%, with the result not less than 0% nor greater than 4% and (2) half of the increase in the September CPI-U for the year prior to the COLA, but not more than 3.0%. The five year average return is represented as the annual rate of return on the actuarial value of assets. We perform one system-wide calculation so all retirees who receive an adjustment will receive the same adjustment.

We will continue to assume the investment related portion is 2.0%. For the CPI related component, we currently assume this will average 2.40% over time, and with the new 2.50% assumption, we will decrease this assumption to 2.30% per year.

Thus, the assumption for future post-retirement benefit increases will be 2.15% (the average of 2.00% and 2.30%).

Regarding the 80% funded contingency, the 2016 valuation for State Employees, Teachers, JRBT, and STPL assumed the post-retirement increases would be suspended for 11 years. Based on projections from the 2016 valuation and a modified version based on the recommended assumption set in this report, we recommend the continued use of this assumption, meaning the 2017 valuations will assume the increases will be suspended for 10 years following the valuation date. The number of years the post-retirement increases are expected to be suspended will continue to decrease by 1 year in each future valuation.

For MERS, most of the MERS units are either already 80% funded or are very close to being so and thus will be 80% funded over a short period of time. As such, we have not reflected any suspension in the increases except for one that may be known to occur the year following the valuation. We recommend continuing this methodology.

General Wage Inflation

Historically, General Wage Inflation almost always exceeds price inflation. This is because wage inflation is in theory the result of (a) price inflation, and (b) productivity gains being passed through to wages. For the last 10 years, for the national economy as a whole, wage inflation has outpaced price inflation by about 0.60%, and for the last 20 years, wage inflation has exceeded price inflation by about 1.13%. Since 1951, wage inflation has been about 1.01% larger than price inflation each year.

The valuation currently assumes that General Wage Inflation (GWI) will be 0.50% above price inflation. The 0.50% represents the real wage growth over time in the general economy, or, is the assumption on how much the pay scales themselves will change year to year, not necessarily how much the pay increases received by individuals are. Another way to look at this assumption is the projected growth rate of the budget of the plan sponsor. This assumption is used primarily to index each cohort of new entrants used in projections, as a building block for the individual salary increase assumption and as a starting point in determining the payroll growth assumption.

The current assumption is consistent with national trends and we recommend no change to the spread above inflation. However, the 0.25% decrease in the inflation assumption decreases the nominal GWI assumption from 3.25% to 3.00%. This change will lower projected total covered payroll in the projection and thus lower the projected contribution revenue expected to be received over the amortization period.

Salary increase rates

In order to project future benefits, the actuary must project future salary increases. Salaries may increase for a variety of reasons:

- Across-the-board increases for all employees;

- Across-the-board increases for a given group of employees;
- Increases to a minimum salary schedule;
- Additional pay for additional duties;
- Step or service-related increases;
- Increases for acquisition of advanced degrees or specialized training;
- Promotions; or
- Merit increases, if available.

Our salary increase assumption is meant to reflect all of these types of increases.

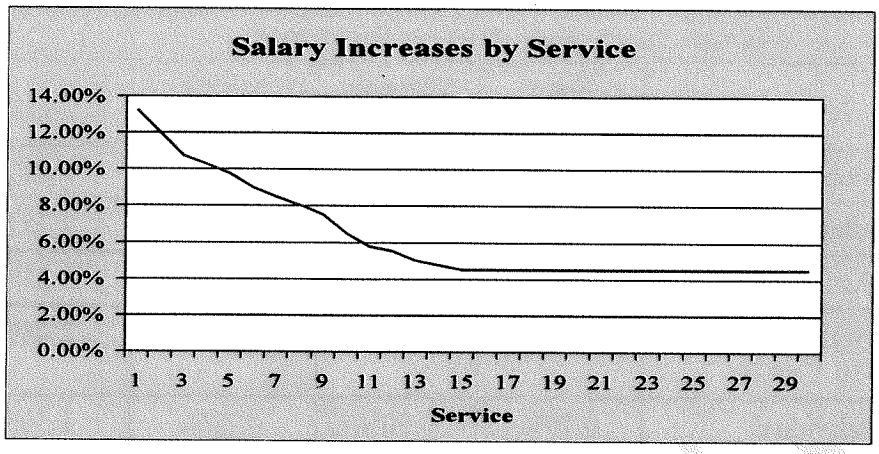
The actuary should not look at the overall increases in payroll in setting this assumption, because payroll can grow at a rate different from the average pay increase for individual members. There are two reasons for this. First, when older, longer-service employees terminate, retire or die, they are generally replaced with new employees who have a lower salary. Because of this, in most populations that are not growing in size, the growth in total payroll is smaller than the average pay increase for members. Second, payroll can change due to an increase or decrease in the size of the group. Therefore, to analyze salary increases, we examine the actual increase in salary for each member who is active in two consecutive fiscal years.

Salary increases for governmental employees can vary significantly from year to year. When the employer's tax revenues stall or increase slowly, salary increases often are small or nonexistent. During good times, salary increases can be larger. Our experience across many governmental plans also shows several occasions in which salary increases will be low for a period of several years followed by a significant increase in one year. Therefore, for this assumption in particular, we prefer to use data over a longer period in establishing our assumptions. We used a ten-year period for this analysis.

Most actuaries recommend salary increase assumptions that include an element that depends on the member's age or service, especially for large, public retirement systems. It is typical to assume larger pay increases for younger or shorter-service employees. This is done in order to reflect pay increases that accompany step increases, changes in job responsibility, promotions, demonstrated merit, etc. The experience shows salaries have been more closely correlated to service (rather than age), as promotions and productivity increases tend to be greater in the first few years of a career, even if the new employee is older than the average new hire.

We analyzed the salary increases based on the change in the member's reported pay from one year to the next. That is, we looked at each member who appeared as an active member in two consecutive valuations individually, and measured his/her salary increase. Then we grouped the increases for all members with the same service, and determined their average increase.

If we graph the increases by service, we usually get a graph where the increases are larger for shorter service employees and then level out at a lower level after a period that may be ten to twenty-five years. It might look like this, although in practice not this smooth:



Therefore, we divide the task of setting the salary increase into two pieces:

1. Determining the assumption for long-service employees
2. Determining the additional increases to be applied to shorter-service employees

The next two subsections will discuss these components of the salary assumption.

Salary increase assumptions for long-service employees (ultimate salary scale)

Many of the factors that result in pay increases are largely inapplicable or have diminished importance for longer-service employees. Step or service-related increases have stopped or are minimal. Promotions occur with less frequency. Additional training or acquisition of advanced degrees usually occurs early in the career. In theory, then, salary increases for longer-service employees are almost entirely driven by wage inflation, with only a small factor for individual merit. We will define the last value in our salary increase assumption as the ultimate component. This will be made up of price inflation plus general productivity plus individual merit. We may also refer to the sum of the general productivity and the individual merit as the individual productivity component.

For State Employees, our study shows that for members with at least twenty-five years of service, the average annual salary increase during the ten-year period was 2.97%. Inflation during this 10-year period averaged 1.74%. Therefore, long-service employees received an average salary increase of 1.23% above inflation (individual productivity component). However, much of that was from the first four years of the experience and there was a change to the longevity increases around that time. The last 6 years shows an average increase of 0.69% above inflation. As a result, we are proposing no change to the current 0.75% individual productivity component. The new 3.25% assumption is composed of the new 2.50% inflation rate plus 0.75% for individual productivity growth. The following table summarizes this for all of the groups:

Ultimate Salary Scale (10-Year Experience)				
	State Employees	Teachers	MERS General	MERS P&F
Current Assumption	3.50%	3.50%	3.50%	4.00%
Less Assumed Inflation	2.75%	2.75%	2.75%	2.75%
Assumed Individual Productivity	0.75%	0.75%	0.75%	1.25%
Actual Productivity Above Inflation for last 10 Years	1.23 %	0.47%	0.85%	2.08%
Recommended Individual Productivity Assumption	0.75%	0.50%	0.75%	1.50%
Recommended Ultimate Salary Increase Assumption	3.25%	3.00%	3.25%	4.00%

Salary increase assumptions for shorter-service employees

To analyze the service-related salary assumption, we looked at the excess in the average increases for shorter-service employees over the average for longer-service employees. For example, Teachers with three years of service received an average annual increase of 8.28%, which was 6.08% more than the average increase of 2.21% for Teachers with eleven or more years of service.

We then determined new service-related assumptions reflecting this data. In all cases, the impact was very small.

Details of our analysis are shown in Section VII.

Payroll growth rate

The salary increase rates discussed above are assumptions applied to individuals and are used in projecting future benefits. We use a separate payroll growth assumption in determining the annual payment needed to amortize the unfunded actuarial accrued liability. The amortization payments are calculated to be a level percentage of payroll. Therefore, as payroll increases over time, these amortization payments will also increase.

In theory, payroll growth in the absence of membership growth should approximate the wage inflation assumption (proposed to be 3.00%). However, we may make adjustments based on the demographics of the individual population. For example, the current Teacher population is disproportioned to older ages based on hiring and staffing patterns over the last decade. Because of this, we anticipate slower growth over the next fifteen to twenty years.

To analyze this, we need to take into account future projections. We projected the payroll for current members based on the assumed salary increases for the individuals and their assumed termination or retirement rates. We then added in enough new employees each year to replace

them. Pay for the first group of new members was initialized based on actual average pay for current new members, and thereafter pay was projected based on the salary assumption and expected retirements and terminations for this cohort of new members. For each subsequent cohort of new members needed to replace the retired and terminated members we increased the starting average pay by the wage inflation assumption of 3.00%.

Based on this analysis, we found that payroll over the next twenty years was reasonably close to the 3.00% wage inflation assumption except for Teachers, which projected much lower growth rates. Therefore we are recommending setting this assumption at 3.00% for State Employees and MERS. For Teachers, we are recommending a 2.50% per year assumption.

This change has no impact on the liabilities of the System, but does impact the contribution rates because it is used to project out future payrolls that will be the basis of future contributions. By assuming there will be less payroll in the future to make contributions on, the contribution rate must increase to reproduce the appropriate amount of dollars into the fund. This change and the change to the assumed salary increases for individual members largely offset each other.

Post-retirement mortality rates (service retirees)

The longer retirees live and receive their benefits, the larger the liability of the plan, thus increasing the contributions necessary to fund the plan.

When choosing an appropriate mortality assumption, actuaries typically use standard mortality tables, unlike when choosing other demographic assumptions. They may choose to adjust these standard mortality tables, however, to reflect various characteristics of the covered group, and to provide for expectations of future mortality improvement (both up to and after the measurement date). If the plan population has sufficient credibility to justify its own mortality table, then the use of such a table also could be appropriate. Factors that may be considered in selecting and/or adjusting a mortality table include the demographics of the covered group, the size of the group and the statistical credibility of its experience, and future mortality improvement.

Credibility

When choosing an appropriate mortality assumption, actuaries typically use standard mortality tables, unlike when choosing other demographic assumptions. They may choose to adjust these standard mortality tables, however, to reflect various characteristics of the covered group, and to provide for expectations of future mortality improvement (both up to and after the measurement date). If the plan population has sufficient credibility to justify its own mortality table, then the use of such a table also could be appropriate. Factors that may be considered in selecting and/or adjusting a mortality table include the demographics of the covered group, the size of the group, the statistical credibility of its experience, and the anticipated rate of future mortality improvement.

We first measured the credibility of the dataset to determine whether standard, unadjusted tables should be used or if statistical analysis of ERSRI specific data was warranted. Based on a practice note issued by the American Academy of Actuaries in the Fall of 2011, a dataset needs 96

expected deaths for each gender to be within +/- 20% of the actual pattern with 95% confidence. We believe +/- 20% is a rather large range to be considered fully credible. Other sources state higher requirements, such as 1,000 deaths per gender. The following table gives the number of deaths needed by gender to have a given level of confidence that the data is +/- X% of the actual pattern.

Standard Score	Confidence	99% – 101%	97% – 103%	95% – 105%	90% – 110%	80% – 120%
0.674	75%	4,543	505	182	45	11
1.282	80%	16,435	1,826	657	164	41
1.645	90%	27,060	3,007	1,082	271	68
1.96	95%	38,416	4,268	1,537	384	96
2.576	99%	66,358	7,373	2,654	664	166

Using this information, 1,082 deaths are needed by gender to have 90% confidence that the data is within +/- 5% of the actual pattern. For this analysis, we used seven years of data to increase the credibility. During the period, there were 1,631 male deaths and 1,831 female deaths for the Non-Teacher group, indicating they are a fully credible group. For the Teacher group, there were 547 male deaths and 805 female deaths, giving them high credibility as well.

For this analysis, we have weighted the analysis by the amount of the member's monthly annuity. This is consistent with the development of all national tables as data shows a clear correlation between income and longevity. By weighting the data by annuity amounts, we are giving more weight to members who have larger annuities (and thus have larger liabilities).

We use separate mortality tables for Teachers and All Other Employees. Life expectancy for Teachers is on average longer than for other state and local government employees. We currently include Public Safety employees in the All Other Employee category. While historically, retirees from Public Safety occupations had a lower life expectancy than the general population, most recent data sources do not show a statistical difference between Public Safety retirees and the general population. In fact, if recent trends continue, it is likely today's 40 year old Public Safety employee will have a longer life expectancy once they retire than today's general employee. The largest data set to confirm this trend is the 2010 experience study produced by the Staff Actuaries at the California Public Employees' Retirement System (CALPERS). The life expectancy in years from a given age was higher for all Public Safety classifications that the general population. The following table is from the report, which can be found here: https://www.calpers.ca.gov/docs/forms-publications/calpers-experience-study-2010.pdf

Expected Age at Death (In Years) For Service Retirements, Males

Current Age	General Employees	All Safety Members	Firefighters	Police Officers	County Peace Officers
50	80.1	81.4	81.7	82.0	81.1
55	81.1	81.8	82.1	82.3	81.5
60	81.9	82.4	82.7	82.7	82.0
65	83.0	83.2	83.5	83.4	82.9

This has been confirmed by several other studies of large populations produced by various actuaries, including ourselves. The data used directly in this experience study is not statistically credible for measuring the Public Safety retirees separately, and thus we are utilizing these other reports to support not to distinguish between retirees from a Public Safety position and Other Municipal Employees in our mortality assumptions.

Of course, we also use separate tables for males and females. Separate tables discussed in the following section are used for disabled retirees. The current tables are based on adjusted versions of the RP-2000 mortality tables, projected with Scale AA.

To analyze the data, we began by determining the expected number of deaths in each year at each age for males and females. The analysis uses only the retirees, not the beneficiaries, joint annuitants, or survivors. For this one analysis, we also grouped the retired State Employees with retirees in MERS, because the results were similar, and combining the groups gave us more data, giving us more confidence in the results.

Base Tables

There are newer industry tables published by the Society of Actuaries than we currently use. While there is no requirement to update to the new tables, best practice is to default to the newer tables unless there is a compelling reason to not do so. Thus, we have compared the data from the study period to variants of the newer RP-2014 mortality tables. We compared the ratio of the actual deaths to the expected deaths—the A/E ratio—tells us whether the assumptions are reasonable. One hundred percent in aggregate might indicate a match between the assumption and experience. We also examined the results in five-year age groups, checking how well the pattern in the table matched actual experience. Most importantly, we look at life expectancies in the actual data and the tables, looking for a good fit. A summary of the comparison of life expectancies is shown below:

Group	Other Employees		Teachers	
Variant	Male Blue Collar	Female Base Table	Male White Collar	Female white Collar
Life Expectancy of 65 year old retiree in years (actual)	19.2	21.5	20.8	23.2

Life Expectancy of 65 year old retiree in years (proposed)	19.0	22.0	21.4	22.9
A/E ratio	98%	103%	106%	95%

As shown, this produces a reasonable match, especially when viewed on a combined basis. For example, male Teachers are a little high while female Teachers are a little low. The combination would be very close to expected. We recommend moving to the variants of the RP-2014 tables shown above.

For three of the groups, the difference between the old assumption and the new assumption is rather small, however, for Male Non-Teachers, the experience had outpaced the assumption quite a bit. Based on the old assumption, the life expectancy for a 65 year old was 18.3 years, so the change to 19.0 is material. We chose the Blue Collar variant because it produced a much better match than the Base version of the table. The significant portion of the male ERSRI population is Public Safety and Corrections, so we believe this to be reasonable. If we had chosen the Base version of the table for this group, the life expectancy would have been 20.0 years for a 65 year old, much higher than the experience.

More detail is shown on the tables in Section VII. One point to make is the data above is only comparing the results at age 65. We also looked at this across the entire age spectrum. The change to Male Non-Teachers will increase contribution rates, while the changes to the other three have much less impact.

Recommended Mortality Improvement Assumption

We use a fully generational approach to this assumption. Because of this strategy of building in continuous improvement, life expectancies for today's younger active members are expected to be materially longer than those of today's retirees, and this has a significant impact on costs and liabilities. We currently use Scale AA which was published with RP-2000.

Since we last set this assumption, there have been new projection scales published; all that show higher rates of improvement than Scale AA. In one of the most recent versions (the MP-2014 scales) include a two dimensional grid that provide different rates of improvement for each age each year for the next decade or so, before settling into an ultimate rate in the year 2027. Since the original scales were published, there have been two new versions published, MP-2015 and MP2016, reflected new years of data as they have become available. In both updates, rates of projection were materially decreased, meaning the original MP-2014 were found to be too conservative. More importantly, it has been stated that new projection scales are going to be published each year. We find this to be a very poor strategy and a misunderstanding of what assumptions in a funding valuation are used for. Consistency in results and dependable contribution patterns have to have value in the process. As such, we do not recommend using the entire grid of the MP tables or annual updates of the assumptions.

We do feel it prudent to attempt to use the most recent data available, and as such, we recommend utilizing the MP tables, just only using the ultimate values once the select period is over. We are

calling this Ultimate MP, or MPU. This still closer to recent experience (and a more conservative pattern) than the current Scale AA, so this change will increase costs.

Post-retirement mortality rates (disabled retirees)

This is a relatively minor assumption, and it has little impact on the liabilities of ERSRI. Because of the small numbers of disabled retirees and disabled deaths, we combined all the ERSRI and MERS disabled lives for our analysis. We are recommending this assumption to the RP-2014 table for Disabled lives, with the same projection scale as healthy lives.

Active mortality rates

We are recommending this assumption to the RP-2014 table for Active Employees. For Techers, we will use 75% of the table. We will not project improvement for this assumption as it adds substantially complexity without any impact on liabilities or contributions. Details are shown in Section VII.

Disability rates

We analyzed disability separately for males and females, State Employees, Teachers, MERS General and MERS P&F, and ordinary and accidental disability.

We compared the number of actual and expected disabilities by group, taking into account the fact that members with less than five years of service and members eligible for retirement are not eligible for ordinary disability.

For disability, there is often a lag time between when the member leaves active service to when the member is approved for disability. In many cases, this timeframe can span over a valuation cycle, meaning a member is active in year 1, shows as an inactive in year 2, and then a disabled member in year 3. We have used the actual disabled records in the 2016 valuation data for members with dates of disability in the six-year period January 1, 2009 through December 31, 2014 as an approximation of our actual disabilities as the FY16 experience likely doesn't completely include members who are in processing as of June 30, 2016.

For this assumption, an A/E close to, but less than, 100% is preferable. The analysis shows a reasonably close match across the groups, given the relatively small numbers. We have made recommendations on a few of the groups, and for those have provided the A/E ratio based on the proposed assumptions. For most groups, the size is too small to give full credibility so in most cases the recommended assumption only partially reflect the recent experience. Although there are detailed tables on each of the groups in Section VII, here are tables showing some summary information:

State Employees				
Group/Type	Actual Number	Expected Number	A/E Ratio	A/E on Proposed Assumption
State male ordinary	40	44	91%	
State female ordinary	53	77	69%	85%
State male accidental	23	46	50%	68%
State female accidental	28	40	70%	90%
Teacher male ordinary	16	21	76%	
Teacher female ordinary	39	64	61%	75%
Teacher male accidental	2	4	50%	100%
Teacher female accidental	3	13	23%	33%
MERS General male ordinary	17	37	46%	63%
MERS General female ordinary	21	27	78%	91%
MERS General male accidental	12	21	57%	67%
MERS General female accidental	4	12	33%	44%
MERS P&F ordinary	4	4	100%	
MERS P&F accidental	35	38	92%	
Total disabilities	297	448	66%	79%

These changes will have a minor impact on the liabilities and contribution requirements, decreasing both. Details are shown in Section VII.

Retirement pattern

Due to the passage of several Articles over the past few years which impacted the benefit provisions of the retirement system and the retiree medical benefits, we don't have substantial experience from this analysis period. However, experience from the past three years has been substantially lower than previous assumptions. The previous assumptions were a conservative estimate of the impact the changes from RIRSA would have on behavior. We are recommending lowering these expectations, especially at the year a member is first eligible to retire, for State Employees, Teachers, and General MERS. We are also recommending changes to the patterns for Correctional Officers.

However, for MERS Police and Fire, there has been no experience past the date of the Mediation settlement which changed the retirement eligibilities. We recommend no changes to the age based rates at this time. Although, we recommend lowering the assumption that recognizes the demand for members who would have been assumed to retire at an earlier age under the rules in effect before the enactment RIRSA.

Termination rates

Termination rates reflect members who leave for any reason other than death, disability or service retirement. They apply whether the termination is voluntary or involuntary, whether the

member is vested or non-vested, and whether the member takes a refund or keeps his/her account balance on deposit and takes a deferred benefit.

We use separate termination rates for males and females and for all four groups. The current rates are structured as a function of service. No terminations are assumed once a member becomes eligible for retirement. The current tables were based on ERSRI experience and developed in prior experience studies. For this analysis, we have used data from the prior experience study and extended the experience period to ten years as termination patterns tend to be very cyclical with the overall economy.

Our analysis showed that the experience has been very close to the expectations based on the assumptions and we are recommending no changes expect for the first three years of service for Teachers. You can see the full detail in the tables in Section VII.

Spousal age difference

Currently, we assume that male members are three years older than their spouses and female members are three years younger than their spouses. This is reasonable, based on general census statistics and we are not recommending changing this assumption.

Refund of contributions

We currently assume that members who are vested and terminate in the future will choose the more valuable of a refund or a deferred annuity. This is a bit conservative, since some people do choose a refund when the deferred benefit is worth more, but we are recommending no change in this assumption.

Other assumptions

There are other technical assumptions made in the course of a valuation, such as the timing of terminations and retirements during the year, and the timing of pay increases. We reviewed these and are recommending no changes.

Actuarial cost method

The individual Entry Age Normal cost method (EAN) is the current funding method being used to allocate the actuarial costs of the Fund. Under this method, the normal cost for each member is determined to be the level percentage of payroll which, if contributed from the date of entry to the date of retirement, would accumulate assets sufficient to pay the retirement benefits when due. Use of this method is required by statute. The Entry Age Normal method will generally produce relatively level contribution amounts as a percentage of payroll from year to year, and allocates costs among various generations of taxpayers in a reasonable fashion. It is by far the most commonly used actuarial cost method for large public retirement systems. We continue to believe this is the best funding method for ERSRI and recommend no change.

Actuarial Value of Assets

Actuaries generally recommend using a smoothed actuarial value of assets (AVA), rather than market value (MVA), in order to dampen the fluctuations in measurements such as the required contribution amount and the funded status of the system.

The current method smooths the differences between the expected returns (based on the annual investment return assumption) and actual returns, net of expenses, over a five-year period. For example, if the actual return is 12.50% in one year, then currently 7.50% is reflected immediately in the AVA, and the other 5.00% is recognized in 20% increments over five years, beginning with 20% for the current year.

The actuarial value of assets is based on the market value of assets with a five-year phase-in of actual investment return in excess of (less than) expected investment income. Offsetting unrecognized gains and losses are immediately recognized, with the shortest remaining bases recognized first and the net remaining bases continuing to be recognized on their original timeframe. Expected investment income is determined using the assumed investment return rate and the market value of assets (adjusted for receipts and disbursements during the year). The returns are computed net of administrative and investment expenses.

Amortization period

The unfunded actuarial accrued liability is being amortized over a closed 25-year period from June 30, 2010. The current amortization period is 19 years. New gains and losses will be "laddered" on individual 20 year bases once the period on the large base decreases below 20. We are not recommending any change to this in connection with the current experience study.

Election Assumptions for the Teacher Survivor Benefit plan

We reviewed the current election and family distribution assumptions for the Teacher Survivor Benefit Plan. The current assumptions have tracked fairly well with the experience over the last decade, but have become dated compared to recent census data. In addition, the current assumptions are static across all age ranges, while census data would suggest the married percent and family distributions would be quite varied based on age. We have produced new assumptions based on a combination of TSB data and national census statistics, based on age, as shown below.

	By Attained Age									
	20	25	30	35	40	45	50	55	60	65
Spouse Only	5%	14%	14%	10%	11%	15%	32%	75%	75%	70%
Spouse and 1 Child	5%	12%	20%	17%	22%	23%	18%	0%	0%	0%
Spouse and 2 or More Children	4%	13%	36%	46%	41%	35%	24%	0%	0%	0%
One Child Alone	5%	6%	3%	7%	8%	10%	6%	0%	0%	0%
Two Children Alone	3%	7%	4%	7%	6%	3%	1%	0%	0%	0%
Three or More Children Alone	1%	4%	4%	5%	4%	1%	1%	0%	0%	0%
Dependent Parent Alone	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
No Dependents/Refund	77%	44%	19%	8%	8%	13%	18%	25%	25%	30%

SECTION IV

ACTUARIAL IMPACT OF RECOMMENDATIONS

Section IV
Impact of Proposed Changes to Actuarial Assumptions

Under Rhode Island General Laws, the employer contribution rates are certified annually by the State of Rhode Island Retirement Board. These rates are determined actuarially, based on the plan provisions in effect as of the valuation date, the actuarial assumptions adopted by the Board, and the methodology set forth in the statutes. The Board's current policy is that the contribution rates determined by a given actuarial valuation become effective two years after the valuation date. For example, the rates determined by the June 30, 2017 actuarial valuation will be applicable for the year beginning July 1, 2019 and ending June 30, 2020.

The actuarial cost method and the amortization period are set by statute. Contribution rates and liabilities are computed using the Entry Age Normal actuarial cost method. The employer contribution rate is the sum of two pieces: the employer normal cost rate and the amortization rate. The normal cost rate is determined as a percent of pay. The employer normal cost is the difference between this and the member contribution rate. The amortization rate is determined as a level percent of pay. It is the amount required to amortize the unfunded actuarial accrued liability over a closed period. The amortization rate is adjusted for the two-year deferral in contribution rates. Separate employer contribution rates are determined for State Employees, Teachers, Judges, State Police, and individual MERS units.

Effect of the proposed assumptions

We are not recommending the June 30, 2016 valuation be reinstated, but instead, these recommended assumptions be used in this upcoming June 30, 2017 valuation. Shown below is a table that compares key results from the June 30, 2016 actuarial valuation with these same results recalculated using the recommended actuarial assumptions and methods. As you can see, the assumption changes generally increase the contribution requirements and liabilities.

State Employees			
Item	Current Assumptions and Methods	Recommended Assumptions and Methods	Increase/Decrease
Normal cost	8.59%	8.61%	0.02%
Unfunded actuarial accrued liability	$1,936 million	$2,067 million	$131 million
Funded ratio	56.00%	54.40%	-1.60%
Illustrated FY 2019 Annual Required Contribution			
a. Percent of payroll	25.75%	27.35%	1.60%
b. Projected Payroll	$739 million	$734 million	-$5 million
c. Estimated dollar amount	$190.3 million	$200.7 million	$10.4 million

Teachers			
Item	Current Assumptions and Methods	Recommended Assumptions and Methods	Increase/Decrease
Normal cost	7.84%	7.73%	-0.11%
Unfunded actuarial accrued liability	$2,694 million	$2,857 million	$163 million
Funded ratio	58.30%	56.90%	-1.40%
Illustrated FY 2019 Annual Required Contribution			
a. Percent of payroll	23.51%	25.26%	1.75%
b. Projected Payroll	$1,072 million	$1,056 million	-$16 million
c. Estimated dollar amount	$251.9 million	$266.6 million	$14.7 million

MERS General			
Item	Current Assumptions and Methods	Recommended Assumptions and Methods	Increase/Decrease
Normal cost	8.82%	8.92%	0.10%
Unfunded actuarial accrued liability	$178 million	$211 million	$33 million
Funded ratio	84.40%	82.00%	-2.40%
Illustrated FY 2019 Annual Required Contribution			
a. Percent of payroll	12.23%	13.45%	1.22%
b. Projected Payroll	$257 million	$255 million	-$2 million
c. Estimated dollar amount	$31.4 million	$34.2 million	$2.8 million

MERS Police and Fire			
Item	Current Assumptions and Methods	Recommended Assumptions and Methods	Increase/Decrease
Normal cost	18.58%	19.40%	0.82%
Unfunded actuarial accrued liability	$120 million	$135 million	$15 million
Funded ratio	80.30%	78.40%	-1.90%
Illustrated FY 2019 Annual Required Contribution			
a. Percent of payroll	17.20%	19.42%	2.22%
b. Projected Payroll	$107 million	$106 million	-$1 million
c. Estimated dollar amount	$18.4 million	$20.5 million	$2.1 million

The figures above were calculated as of June 30, 2016, using the same benefit provisions and the same member and financial data that were being used to prepare the regular June 30, 2016 actuarial valuation report. We are not recommending the June 30, 2016 valuation be reinstated, but instead, these recommended assumptions be used in this upcoming June 30, 2017 valuation.

SECTION V

SUMMARY OF RECOMMENDATIONS

Section V
Summary of Recommendations

Our recommendations for changes in the assumptions may be summarized as follows:

1. We recommend decreasing the general inflation assumption from 2.75% to 2.50%.

2. We recommend decreasing the nominal investment return assumption from 7.50% to 7.25%.

3. We recommend not changing the real (above price inflation) general wage growth assumption of 0.50%.

4. Recommended changes to salary increase assumptions:

    a. For State Employees, we are recommending lowering the ultimate component of the salary schedules by the same 0.25% as the change in the general wage inflation, but we are recommending no change to the current 0.25% individual merit and promotion component. This creates an assumed salary increase assumption of 3.25% per annum for longer service members.

    b. For Teachers, we are recommending lowering the ultimate component of the salary schedules by the same 0.25% as the change in the general wage inflation, but in addition, we are recommending lowering the current 0.25% individual merit and promotion component down to 0.00%.

    c. For General MERS Employees, the experience and the current assumptions are very similar to State Employees, and thus we are recommending keeping the same 0.75% above inflation assumption. This creates an assumed salary increase assumption of 3.25% per annum for longer service members (3.00% GWI plus 0.25%).

    d. For MERS Public Safety Employees, we are recommending an increase from 1.25% above inflation to 1.50% above inflation for the ultimate component.

5. We recommend a reduction in the payroll growth rate assumption from 3.25% to 3.00% for groups except Teachers. For Teachers, consistent with the additional 0.25% recommended in the salary scale, and based on the current demographics for the group, we are recommending a 2.50% payroll growth rate.

6. We recommend a decrease in the assumption for the contingent post-retirement benefit adjustments to be 2.15% per year.

7. We recommend using variants of the RP-2014 table. For the improvement scale, we recommend using the ultimate rates of the MP-2016 projection scale.

8. We recommend updating the post-retirement mortality tables for disabled retirees to the RP-2014 tables for disabled lives.

9. We recommend updating the pre-retirement mortality tables for active employees to the RP-2014 tables.

10. For State Employees, Teachers, and General MERS retirement rates, we recommended decreasing the probability of retirement during the first year of eligibility.

11. For MERS Police and Fire retirement rates, we recommend no change to the age based rates at this time. Although, we recommend lowering the assumption that recognizes the demand for members who would have been assumed to retire at an earlier age under the rules in effect before the enactment RIRSA.

12. For State Employees, General MERS and Police and Fire MERS, we recommend no change to the rates of termination. For Techers, we have made very minor changes during the first few years of the member's career.

13. We recommend slightly modifying the rates of disability for most groups based on the experience of the individual group.

14. We recommend no change to the current marriage assumption and spousal age difference.

15. We recommend no change to the current asset smoothing method.

16. We recommend no change to the current funding method.

SECTION VI

SUMMARY OF ASSUMPTIONS AND METHODS INCORPORATING THE RECOMMENDED ASSUMPTIONS

Section VI
Summary of Assumptions and Methods
Incorporating the Recommended Assumptions

I. Valuation Date

The valuation date is June 30th of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

II. Actuarial Cost Method

The actuarial valuation uses the Entry Age actuarial cost method. Under this method, the employer contribution rate is the sum of (i) the employer normal cost rate, and (ii) a rate that will amortize the unfunded actuarial accrued liability (UAAL).

1. First, the actuarial present value of future benefits is determined by discounting the projected benefits for each member back to the valuation date using the assumed investment return rate as the discount rate. For active members, the projected benefits are based on the member's age, service, gender and compensation, and based on the actuarial assumptions. The calculations take into account the probability of the member's death, disability, or termination of employment prior to becoming eligible for a retirement benefit, as well as the possibility of the member will remain in service and receive a service retirement benefit. Future salary increases are anticipated. The present value of the expected benefits payable to all active members is added to the present value of the expected future payments to retired participants and beneficiaries to obtain the present value of all expected benefits. Liabilities for future members are not included.

2. The employer contributions required to support the benefits are determined as a level percentage of salary, and consist of a normal contribution and an amortization contribution.

3. The normal contribution is determined using the Entry Age Normal method. Under this method, a calculation is made to determine the rate of contribution which, if applied to the compensation of each individual member during the entire period of anticipated covered service, would be required to meet the cost of all benefits payable on his behalf. The salary-weighted average of these rates is the normal cost rate. This calculation reflects the plan provisions that apply to each individual member.

4. The employer normal cost rate is equal to (i) the normal cost rate, minus (ii) the member contribution rate.

5. The actuarial accrued liability is equal to the present value of all benefits less the present value of future normal costs. The unfunded actuarial accrued liability (UAAL) is then determined as (i) the actuarial accrued liability, minus (ii) the actuarial value of assets.

6. The amortization contribution rate is the level percentage of payroll required to reduce the UAAL to zero over the remaining amortization period. The UAAL was initially being amortized over the remainder of a closed 30-year period from June 30, 1999. In conjunction with The Rhode Island Retirement Security Act of 2011, the amortization period was reset to 25 years as of June 30, 2010. The employer contribution rate determined by this valuation will not be effective until two years after the valuation date. The determination of the contribution rate reflects this deferral. The unfunded actuarial accrued liability (UAAL) and covered payroll are projected forward for two years, and we then determine the amortization charge required to amortize the UAAL over the remaining amortization period from that point. In projecting the UAAL, we increase the UAAL for interest at the assumed rate and we decrease it for the amortization payments. The amortization payments for these two years are determined by subtracting the current employer normal cost from the known contribution rates for these years, based on the two prior actuarial valuations. Contributions are assumed to be made monthly throughout the year.

III. Actuarial Value of Assets

The actuarial value of assets is based on the market value of assets with a five-year phase-in of actual investment return in excess of (less than) expected investment income. Offsetting unrecognized gains and losses are immediately recognized, with the shortest remaining bases recognized first and the net remaining bases continue to be recognized on their original timeframe. Expected investment income is determined using the assumed investment return rate and the market value of assets (adjusted for receipts and disbursements during the year). The returns are computed net of administrative and investment expenses.

IV. Actuarial Assumptions

A. Economic Assumptions

1. Investment return: 7.25% per year, compounded annually, composed of an assumed 2.50% inflation rate and a 4.75% net real rate of return. This rate represents the assumed return, net of all investment and administrative expenses.

2. Salary increase rate:

For MERS P&F: The sum of (i) a 4.00% wage inflation assumption (composed of a 2.50% price inflation assumption and a 1.50% additional general increase), and (ii) a service-related component as shown below:

MERS P&F		
Years of Service	Service-Related Component	Total Increase
1	10.00%	14.00%
2	9.00	13.00
3	7.00	11.00
4	4.00	8.00
5	2.50	6.50
6	3.00	7.00
7	0.50	4.50
8	0.50	4.50
9 or more	0.00	4.00

For State Employees and MERS General: The sum of (i) a 3.25% wage inflation assumption (composed of a 2.50% price inflation assumption and a 0.75% additional general increase), and (ii) a service-related component as shown on next page.

For Teachers: The sum of (i) a 3.00% wage inflation assumption (composed of a 2.50% price inflation assumption and a 0.50% additional general increase), and (ii) a service-related component as shown on next page.

Salary Increase Rates						
	State Employees		Teachers		MERS General	
Service	Service-Related Component	Total Increase	Service-Related Component	Total Increase	Service-Related Component	Total Increase
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	1.00%	4.25%	10.00%	13.00%	4.00%	7.25%
2	2.00%	5.25%	9.00%	12.00%	3.00%	6.25%
3	3.00%	6.25%	6.25%	9.25%	2.75%	6.00%
4	2.75%	6.00%	5.50%	8.50%	2.50%	5.75%
5	2.75%	6.00%	5.00%	8.00%	2.25%	5.50%
6	2.50%	5.75%	5.00%	8.00%	2.00%	5.25%
7	1.25%	4.50%	4.50%	7.50%	1.25%	4.50%
8	1.00%	4.25%	4.25%	7.25%	0.75%	4.00%
9	1.00%	4.25%	4.00%	7.00%	0.50%	3.75%
10	1.00%	4.25%	4.00%	7.00%	0.50%	3.75%
11	1.00%	4.25%	0.00%	3.00%	0.25%	3.50%
12	2.00%	5.25%	0.00%	3.00%	0.25%	3.50%
13	1.25%	4.50%	0.00%	3.00%	0.25%	3.50%
14	1.00%	4.25%	0.00%	3.00%	0.25%	3.50%
15	1.00%	4.25%	0.00%	3.00%	0.25%	3.50%
16	1.00%	4.25%	0.00%	3.00%	0.00%	3.25%
17	0.50%	3.75%	0.00%	3.00%	0.00%	3.25%
18	0.50%	3.75%	0.00%	3.00%	0.00%	3.25%
19	0.50%	3.75%	0.00%	3.00%	0.00%	3.25%
20	0.50%	3.75%	0.00%	3.00%	0.00%	3.25%
21	0.50%	3.75%	0.00%	3.00%	0.00%	3.25%
22	0.25%	3.50%	0.00%	3.00%	0.00%	3.25%
23	0.25%	3.50%	0.00%	3.00%	0.00%	3.25%
24	0.25%	3.50%	0.00%	3.00%	0.00%	3.25%
25 or more	0.00%	3.25%	0.00%	3.00%	0.00%	3.25%

Salary increases are assumed to occur once a year, on July 1. Therefore the pay used for the period year following the valuation date is equal to the reported pay for the prior year, increased by the salary increase assumption. For employees with less than one year of service, the reported rate of pay is used rather than the fiscal year salary paid.

3. Payroll growth rate: In the amortization of the unfunded actuarial accrued liability, payroll is assumed to increase 3.00% for State Employees, MERS P&F and MERS General and 3.00% for Teachers per year. This increase rate is solely due to the effect of wage inflation on salaries, with no allowance for future membership growth.

4. Post-retirement Benefit Increase: Post-retirement benefit increases are assumed to be 2.15%, per annum, while the plan has a funding level that exceeds 80%; however, an interim COLA will be granted in four-year intervals while the COLA is suspended. The first such COLA will be applicable in Calendar Year 2017. As of June 30, 2016, it is assumed that the COLAs will be suspended for 11 years due to the current funding level of the plans. The actual COLA will be determined based on the plan's five-year average investment rate of return (return on actuarial assets) minus 5.5% and will range from zero to 4.0%.

B. Demographic Assumptions

1. Post-termination mortality rates (non-disabled)

   a. Male State Employees, MERS General and MERS P&F: RP-2014 Combined Healthy for Males with Blue Collar adjustments, projected with Scale Ultimate MP16.

   b. Female State Employees, MERS General and MERS P&F: RP-2014 Combined Healthy for Females, projected with Scale Ultimate MP16.

   c. Male Teachers: RP-2014 Combined Healthy for Males with White Collar adjustments, projected with Scale Ultimate MP16.

   d. Female Teachers: RP-2014 Combined Healthy for Females with White Collar adjustments, projected with Scale Ultimate MP16.

The following table provides the life expectancy for individuals retiring in future years based on the assumption with full generational projection:

Life Expectancy for an Age 65 Retiree in Years					
Group	Year of Retirement				
	2010	2015	2020	2025	2030
State Employee - Male	21.0	21.4	21.8	22.3	22.7
State Employee - Female	24.1	24.5	24.9	25.3	25.8
Teacher - Male	23.4	23.8	24.2	24.6	25.0
Teacher - Female	25.1	25.5	25.9	26.2	26.6

2. Post-retirement mortality (disabled lives): One set of rates is used for all employees

   a. Males: RP-2014 Disabled Reitree Table for males, projected with Scale Ultimate MP16.

   b. Females: RP-2014 Disabled Reitree Table for males, projected with Scale Ultimate MP16.

Sample rates from base table are shown below:

Number of Deaths per 100		
Age	Males	Females
25	0.20	0.09
30	0.49	0.23
35	0.86	0.42
40	1.27	0.66
45	1.68	0.92
50	2.04	1.19
55	2.34	1.45
60	2.66	1.70
65	3.17	2.09
70	4.03	2.82
75	5.43	4.10

3. Pre-retirement mortality: Use the RP-2014 employee table for males and females. Teacher rates are 75% of the base table. Sample rates are shown below:

Number of Deaths per 100				
	Non-Teachers		Teachers	
Age	Males	Females	Males	Females
25	0.05	0.02	0.04	0.01
30	0.05	0.02	0.03	0.02
35	0.05	0.03	0.04	0.02
40	0.06	0.04	0.05	0.03
45	0.10	0.07	0.07	0.05
50	0.17	0.11	0.13	0.08
55	0.28	0.17	0.21	0.13
60	0.47	0.24	0.35	0.18
65	0.83	0.37	0.62	0.28
70	1.39	0.63	1.04	0.47

4. Disability rates: Sample rates are shown below. Ordinary disability rates are not applied to members eligible for retirement. One half the accidental disabilities are assumed to be totally and permanently disabled from any occupation.

Age	Number of Disabilities per 1,000							
	State Ordinary Males	State Accidental Males	State Ordinary Females	State Accidental Females	Teachers Ordinary Males	Teachers Accidental Males	Teachers Ordinary Females	Teachers Accidental Females
25	0.32	0.14	0.36	0.11	0.27	0.03	0.18	0.03
30	0.39	0.17	0.44	0.13	0.33	0.03	0.22	0.03
35	0.53	0.23	0.6	0.18	0.45	0.05	0.3	0.05
40	0.77	0.33	0.88	0.26	0.66	0.07	0.44	0.07
45	1.26	0.54	1.44	0.43	1.08	0.11	0.72	0.11
50	2.14	0.92	2.44	0.73	1.83	0.18	1.22	0.18
55	3.54	1.52	4.04	1.21	3.03	0.3	2.02	0.3
60	4.94	2.12	5.64	1.69	4.23	0.42	2.82	0.42
65	8.09	3.47	9.24	2.77	6.93	0.69	4.62	0.69

Age	MERS General, Ordinary, Males	MERS General, Accidental, Males	MERS General, Ordinary, Females	MERS General, Accidental, Females	MERS P&F, Ordinary, Males and Females	MERS P&F, Accidental, Males and Females
25	0.45	0.14	0.23	0.05	0.26	1.7
30	0.55	0.17	0.28	0.06	0.33	2.2
35	0.75	0.23	0.38	0.08	0.44	2.9
40	1.1	0.33	0.55	0.11	0.66	4.4
45	1.8	0.54	0.9	0.18	1.08	7.2
50	3.05	0.92	1.53	0.31	1.82	12.1
55	5.05	1.52	2.53	0.51	1.82	12.1
60	7.05	2.12	3.53	0.71	1.82	12.1
65	11.55	3.47	5.78	1.16	1.82	12.1

5. Termination rates (for causes other than death, disability, or retirement) are a function of the member's service. Termination rates are not applied to members eligible for retirement. Rates are shown below:

Service	State Employees	Teachers	MERS General	MERS P&F
1	0.160000	0.150000	0.175000	0.100000
2	0.101160	0.100000	0.118774	0.047300
3	0.080768	0.075000	0.101396	0.036903
4	0.068839	0.064811	0.086148	0.030821
5	0.060375	0.048163	0.072887	0.026506
6	0.053810	0.038256	0.061471	0.023158
7	0.048446	0.031695	0.051757	0.020424
8	0.043911	0.027033	0.043604	0.018111
9	0.039983	0.023553	0.036868	0.016108
10	0.036518	0.020857	0.031408	0.014342
11	0.033418	0.018708	0.027082	0.012761
12	0.030614	0.016956	0.023746	0.011332
13	0.028054	0.015500	0.021259	0.010026
14	0.025699	0.014271	0.019479	0.008826
15	0.023519	0.013220	0.018263	0.007714
16	0.021489	0.012312	0.017470	0.006679
17	0.019590	0.011518	0.016956	0.005711
18	0.017807	0.010820	0.016579	0.004802
19	0.016125	0.010200	0.016198	0.003944
20	0.014535	0.009646	0.015669	0.000000
21	0.013026	0.009149	0.014851	0.000000
22	0.011590	0.008700	0.013602	0.000000
23	0.010222	0.008292	0.011778	0.000000
24	0.008914	0.007920	0.009239	0.000000
25	0.007662	0.007580	0.005841	0.000000

6. Retirement rates (unreduced):

For State Employees (except Correctional Officers) and MERS General: a flat 20% per year retirement probability for members eligible for unreduced retirement. A 35% retirement probability at first eligibility will be only applied if they have reached age 65 or with at least 25 years of service.

For Teachers: a flat 25% per year retirement probability for members under the age of 67 eligible for unreduced retirement, a flat 35% per year retirement probability for members at age 67 or older eligible for unreduced retirement. A 40% retirement probability at first eligibility will be only applied if they have reached age 65 or with at least 25 years of service.

For MERS P&F: Unisex, service based rates are used for police and fire. Rates depend on whether the unit had elected the optional 20-year retirement provisions. All members are assumed to retire upon reaching age 65 with at least ten years of service. Because of the enactment of the RIRSA in 2011, the retirement assumption was modified for members not eligible for retirement by July 1, 2012. Members who would have been assumed to retire at an earlier age under the rules in effect before the enactment of the provision changes are assumed to retire when first eligible for an unreduced benefit. This demand is recognized by adding a 5% probability for every year the member has been deferred.

MERS P&F		
Service	Units with the Optional 20-year retirement election	Units without the Optional 20-year retirement election
20	12.0%	
21	10.0%	
22	10.0%	
23	10.0%	
24	12.0%	
25	14.0%	50.0%
26	16.0%	16.0%
27	18.0%	18.0%
28	20.0%	20.0%
29	20.0%	20.0%
30+	35.0%	35.0%

For Correctional Officers: A set of unisex rates, indexed by service, as shown below. All members still active are assumed to retire at age 65 with 10 years of service. Because of the enactment of Article 7 in 2009 and the RIRSA in 2011, the retirement assumption was modified for members whose retirement ages were delayed. Members who would have been assumed to retire prior to under the rules in effect before the enactment of the provision changes are assumed to retire when first eligible for an unreduced benefit. This demand is recognized by adding a 5% probability for every year the member has been deferred.

Corrections	
Service	Ret. Rate
20	2.00%
21	2.00%
22	2.00%
23	2.00%
24	2.00%
25	3.00%
26	3.00%
27	3.00%
28	4.00%
29	5.00%
30	6.00%
31	7.00%
32	8.00%
33	9.00%
34	10.00%
35	30.00%
36	25.00%
37	25.00%
38	25.00%
39	25.00%
40	100.00%

For members with 10 or more years of contributory service on June 30, 2012 and that reach their Article 7 Retirement Date within three years of June 30, 2012, 5% are assumed to retire upon first attainment of their Article 7 Retirement Date and receive their benefits accrued as of June 30, 2012.

7. Reduced retirement Members are eligible to retire with reduced benefit five years prior to their normal retirement age. Rates are on the years from normal retirement age, as shown below:

Year from Normal Retirement Age	Ret. Rate
5	2%
4	2%
3	2%
2	3%
1	4%

C. Other Assumptions

1. Valuation payroll (used for determining the amortization contribution rate): Prior aggregate fiscal year payroll projected forward one year using the overall payroll growth rate.

2. Percent married: For State Employees and Teachers, 85% of employees are assumed to be married. For MERS employees (both MERS General and MERS P&F), 80% of employees are assumed to be married.

3. Age difference: Male members are assumed to be three years older than their spouses, and female members are assumed to be three years younger than their spouses.

4. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an annuity. The spousal annuity death benefit for vested married participants is valued using a static optional form conversion factor of 0.84 and 0.78 for males and females respectively.

5. For active death benefits, the liability is initially calculated based on the ordinary death benefit provisions, and then a 7.5% load is applied to account for duty related benefits.

6. Percent electing deferred termination benefit: Vested terminating members are assumed to elect a refund or a deferred benefit, whichever is more valuable at the time of termination.

7. Recovery from disability: None assumed.

8. Remarriage: It is assumed that no surviving spouse will remarry and there will be no children's benefit.

9. Assumed age for commencement of deferred benefits: Members electing to receive a deferred benefit are assumed to commence receipt at the first age at which unreduced benefits are available.

10. Investment and administrative expenses: The assumed investment return rate represents the anticipated net return after payment of all investment and administrative expenses.

11. Inactive members: Liabilities for inactive members are approximated as a multiple of their member contribution account balances. For non-vested inactive members, the multiple is 1.0. For vested inactive members, the multiple is 8.0 for members with 25 or more years of service, 3.0 for vested inactive members age 45 or older with less than 25 years of service, and 1.0 for other vested inactive members younger than age 45.

12. Decrement timing: For all non-teachers employees (State Employees, MERS General, and MERS P&F), decrements are assumed to occur at the middle of the year. For Teachers the retirement and termination decrements are assumed to occur at the beginning of the year, while death and disability are assumed to occur at the middle of the year.

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

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

15. Incidence of Contributions: Contributions are assumed to be received continuously throughout the year based upon the computed percent of

payroll shown in this report, and the actual payroll payable at the time contributions are made.

16. Benefit Service: All members are assumed to accrue one year of eligibility service each year.

17. All calculations were performed without regard to the compensation limit in IRC Section 401(a)(17) and the benefit limit under IRC Section 415.

D. Participant Data

Participant data was supplied on electronic files. There are separate files for (i) active and inactive members, and (ii) members and beneficiaries receiving benefits.

The data for active members included name, an identification number, gender, a code indicating whether the member was active or inactive, a code indicating employee type (State Employee, Teacher, MERS General or MERS P&F), date of birth, service, salary, date of last contribution, accumulated member contributions without interest, accrued benefit multiplier as of June 30, 2014, Final Average Compensation as of June 30, 2012, Article 7 Retirement Date, and the Rhode Island Retirement Security Act Retirement Date. For retired members and beneficiaries, the data included name, an identification number, gender, date of birth, date of retirement, amount of benefit, the amount of adjustment after age 62 for anyone electing the Social Security option, a code indicating the option elected and the type of retiree (service retiree, disabled retiree, beneficiary), and if applicable, the joint pensioner's date of birth and gender.

Salary supplied for the current year was based on the earnings for the fiscal year preceding the valuation date. However, for members with less than one year of service, the current rate of salary was used. This salary was adjusted by the salary increase rate for one year.

In defining who was an active member, members with a date of last contribution in the final quarter of the fiscal year were considered active. Otherwise, the member was defined as inactive.

To correct for incomplete and inconsistent data, we first attempted to pulled data from prior valuation files and then made general assumptions to fill in the rest. These modifications had no material impact on the results presented.

SECTION VII

SUMMARY OF DATA AND EXPERIENCE

List of Tables

List of Tables (Continued)

NON-DISABLED STATE EMPLOYEES AND MERS
POST-RETIREMENT MORTALITY - MALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
50-54	309	38,500	0.0080	0.0023	0.0048	90	194	343%	159%
55-59	597	105,232	0.0057	0.0038	0.0069	421	760	142%	79%
60-64	1,896	233,064	0.0081	0.0070	0.0099	1,740	2,406	109%	79%
65-69	3,521	273,407	0.0129	0.0138	0.0152	3,718	4,192	95%	84%
70-74	4,544	182,914	0.0248	0.0229	0.0239	4,188	4,403	109%	103%
75-79	4,894	136,910	0.0357	0.0416	0.0387	5,734	5,367	85%	91%
80-84	6,679	104,833	0.0637	0.0783	0.0642	8,145	6,794	82%	98%
85-89	7,306	65,750	0.1111	0.1393	0.1079	8,951	7,027	82%	104%
90-94	4,519	23,124	0.1954	0.2352	0.1792	5,169	3,983	87%	113%
95-99	1,197	4,605	0.2599	0.3366	0.2628	1,477	1,155	81%	104%
100-104	132	262	0.5038	0.4274	0.3577	105	86	126%	153%
Totals	35,594	1,168,601				39,738	36,367	90%	98%

Proposed Rate fit to 06/30/2012, the mid point of the study period

NON-DISABLED STATE EMPLOYEES AND MERS
POST-RETIREMENT MORTALITY - FEMALE

Age	Actual Deaths	Total Count	Actual Rate	Assumed Rate		Expected Deaths		Actual/Expected	
				Current	Proposed	Current (3) * (5)	Proposed (3) * (6)	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
50-54	44	24,216	0.0018	0.0015	0.0031	41	79	107%	56%
55-59	363	99,930	0.0036	0.0030	0.0042	310	435	117%	83%
60-64	1,055	194,183	0.0054	0.0054	0.0062	1,079	1,249	98%	84%
65-69	2,039	214,747	0.0095	0.0098	0.0098	2,106	2,134	97%	96%
70-74	2,185	173,498	0.0126	0.0166	0.0159	2,874	2,766	76%	79%
75-79	3,361	129,472	0.0260	0.0275	0.0260	3,539	3,368	95%	100%
80-84	4,582	102,052	0.0449	0.0466	0.0439	4,779	4,529	96%	101%
85-89	5,941	73,149	0.0812	0.0837	0.0772	6,011	5,604	99%	106%
90-94	4,452	28,358	0.1570	0.1384	0.1354	3,771	3,669	118%	121%
95-99	1,598	5,585	0.2861	0.2020	0.2169	1,063	1,142	150%	140%
100-104	348	1,020	0.3412	0.2418	0.3163	240	305	145%	114%
Totals	25,968	1,046,210				25,813	25,280	101%	103%

Proposed Rate fit to 06/30/2012, the mid point of the study period

NON-DISABLED TEACHERS
POST-RETIREMENT MORTALITY - MALE

Age	Actual Deaths	Total Count	Actual Rate	Assumed Rate		Expected Deaths		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
50-54	0	2,752	0.0000	0.0026	0.0032	8	10	0%	0%
55-59	200	46,635	0.0043	0.0039	0.0044	181	218	110%	92%
60-64	1,124	217,591	0.0052	0.0042	0.0060	910	1,379	124%	82%
65-69	2,470	314,198	0.0079	0.0063	0.0092	2,108	2,948	117%	84%
70-74	2,890	214,595	0.0135	0.0163	0.0155	3,336	3,337	87%	87%
75-79	4,542	133,700	0.0340	0.0255	0.0267	3,490	3,599	130%	126%
80-84	5,147	83,439	0.0617	0.0586	0.0477	4,777	3,991	108%	129%
85-89	3,889	42,261	0.0920	0.1115	0.0883	4,584	3,679	85%	106%
90-94	2,130	13,642	0.1561	0.1926	0.1595	2,498	2,087	85%	102%
95-99	729	2,312	0.3153	0.2835	0.2533	616	549	118%	133%
100-104	82	189	0.4339	0.3654	0.3577	66	64	124%	128%
Totals	23,203	1,071,314				22,574	21,861	103%	106%

Proposed Rate fit to 06/30/2012, the mid point of the study period

NON-DISABLED TEACHERS
POST-RETIREMENT MORTALITY - FEMALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
50-54	0	11,222	0.0000	0.0017	0.0023	26	28	0%	0%
55-59	409	143,442	0.0029	0.0042	0.0031	600	482	68%	85%
60-64	1,939	548,244	0.0035	0.0035	0.0049	1,993	2,816	97%	69%
65-69	2,963	525,336	0.0056	0.0047	0.0080	2,522	4,179	117%	71%
70-74	3,087	264,575	0.0117	0.0098	0.0131	2,479	3,439	125%	90%
75-79	3,195	152,486	0.0210	0.0155	0.0221	2,416	3,374	132%	95%
80-84	4,066	109,730	0.0371	0.0385	0.0389	4,268	4,314	95%	94%
85-89	5,176	70,729	0.0732	0.0853	0.0706	5,827	4,911	89%	105%
90-94	4,021	29,685	0.1355	0.1482	0.1285	4,289	3,708	94%	108%
95-99	2,527	8,781	0.2878	0.2251	0.2135	1,866	1,767	135%	143%
100-104	642	1,678	0.3826	0.3137	0.3163	494	497	130%	129%
Totals	28,025	1,865,908				26,780	29,515	105%	95%

Proposed Rate fit to 06/30/2012, the mid point of the study period

ALL EMPLOYEES
POST-RETIREMENT DISABILITY MORTALITY - MALE

Age	Actual Deaths	Total Count	Actual Rate	Assumed Rate		Expected Deaths		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
50-54	220	15,341	0.0143	0.0252	0.0218	388	339	57%	65%
55-59	296	19,498	0.0152	0.0319	0.0248	624	490	47%	60%
60-64	631	22,723	0.0278	0.0386	0.0286	870	658	73%	96%
65-69	490	17,283	0.0284	0.0418	0.0349	722	607	68%	81%
70-74	436	8,727	0.0500	0.0466	0.0456	405	399	108%	109%
75-79	307	5,991	0.0512	0.0545	0.0625	327	374	94%	82%
80-84	230	3,306	0.0696	0.0793	0.0899	258	297	89%	77%
85-89	227	1,434	0.1583	0.1188	0.1350	165	190	138%	119%
90-94	135	493	0.2738	0.1783	0.2039	83	96	163%	141%
95+	0	0	N\A	0.2675	0.2807	0	0	N\A	N\A
Totals	2,972	94,796				3,842	3,450	77%	86%

Proposed Rate fit to 06/30/2012, the mid point of the study period

ALL EMPLOYEES
POST-RETIREMENT DISABILITY MORTALITY - FEMALE

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
50-54	210	8,503	0.0247	0.0165	0.0134	140	114	150%	184%
55-59	295	15,900	0.0186	0.0186	0.0158	295	252	100%	117%
60-64	456	23,235	0.0196	0.0208	0.0188	484	436	94%	105%
65-69	357	18,520	0.0193	0.0231	0.0236	427	437	84%	82%
70-74	272	11,850	0.0230	0.0261	0.0332	309	394	88%	69%
75-79	256	7,271	0.0352	0.0342	0.0483	249	351	103%	73%
80-84	225	3,733	0.0603	0.0528	0.0726	197	271	114%	83%
85-89	154	2,144	0.0718	0.0774	0.1049	166	225	93%	68%
90-94	132	687	0.1921	0.1164	0.1543	80	106	165%	125%
95+	72	286	0.2517	0.2203	0.2657	63	76	114%	95%
Totals	2,429	92,129				2,410	2,662	101%	91%

Proposed Rate fit to 06/30/2012, the mid point of the study period

STATE EMPLOYEES AND MERS
MALE PRE-RETIREMENT MORTALITY (COMBINED ORDINARY AND DUTY)

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0002	0.0003	-	-	N/A	N/A
20-24	-	322	0.0000	0.0003	0.0005	-	-	N/A	N/A
25-29	-	1,596	0.0000	0.0003	0.0004	-	1	N/A	0%
30-34	2	1,888	0.0011	0.0003	0.0005	1	1	200%	200%
35-39	-	2,299	0.0000	0.0005	0.0006	1	1	0%	0%
40-44	1	3,211	0.0003	0.0008	0.0007	3	2	33%	50%
45-49	10	4,773	0.0021	0.0012	0.0012	6	6	167%	167%
50-54	4	5,703	0.0007	0.0019	0.0021	11	12	36%	33%
55-59	23	5,440	0.0042	0.0031	0.0034	17	19	135%	121%
60-64	19	3,862	0.0049	0.0055	0.0059	21	22	90%	86%
65-69	9	1,465	0.0061	0.0105	0.0102	15	14	60%	64%
70-74	8	409	0.0196	0.0179	0.0170	7	7	114%	114%
75 and over	3	-	N/A	0.0318	0.0285	-	-	N/A	N/A
Totals	79	30,968				82	85	96%	93%

STATE EMPLOYEES AND MERS
FEMALE PRE-RETIREMENT MORTALITY (COMBINED ORDINARY AND DUTY)

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	1	0.0000	0.0001	0.0002	-	-	N/A	N/A
20-24	-	202	0.0000	0.0001	0.0002	-	-	N/A	N/A
25-29	-	1,410	0.0000	0.0002	0.0002	-	-	N/A	N/A
30-34	-	2,452	0.0000	0.0003	0.0002	1	1	0%	0%
35-39	-	2,834	0.0000	0.0004	0.0003	1	1	0%	0%
40-44	3	3,816	0.0008	0.0006	0.0005	2	2	150%	150%
45-49	5	5,378	0.0009	0.0009	0.0008	5	4	100%	125%
50-54	11	6,784	0.0016	0.0014	0.0013	10	9	110%	122%
55-59	12	6,522	0.0018	0.0025	0.0019	16	13	75%	92%
60-64	13	4,207	0.0031	0.0045	0.0029	19	12	68%	108%
65-69	6	1,662	0.0036	0.0082	0.0046	13	7	46%	86%
70-74	5	408	0.0123	0.0141	0.0078	5	3	100%	167%
75 and over	-	1	0.0000	0.0237	0.0133	-	-	N/A	N/A
Totals	55	35,677				72	52	76%	106%

TEACHERS
MALE PRE-RETIREMENT MORTALITY (COMBINED ORDINARY AND DUTY)

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0002	0.0002	-	-	N/A	N/A
20-24	-	102	0.0000	0.0002	0.0004	-	-	N/A	N/A
25-29	-	892	0.0000	0.0002	0.0003	-	-	N/A	N/A
30-34	-	1,668	0.0000	0.0002	0.0004	-	1	N/A	0%
35-39	2	2,628	0.0008	0.0004	0.0004	1	1	200%	200%
40-44	2	3,536	0.0006	0.0005	0.0005	2	2	100%	100%
45-49	6	2,916	0.0021	0.0008	0.0009	2	3	300%	200%
50-54	4	2,149	0.0019	0.0012	0.0016	3	3	133%	133%
55-59	2	2,054	0.0010	0.0020	0.0026	4	5	50%	40%
60-64	6	1,634	0.0037	0.0037	0.0044	6	7	100%	86%
65-69	2	478	0.0042	0.0070	0.0076	3	3	67%	67%
70-74	-	81	0.0000	0.0119	0.0128	1	1	0%	0%
75 and over	-	-	N/A	0.0212	0.0214	-	-	N/A	N/A
Totals	24	18,138				22	26	109%	92%

TEACHERS
FEMALE PRE-RETIREMENT MORTALITY (COMBINED ORDINARY AND DUTY)

Age	Actual Deaths	Total Count	Actual Rate	Assumed Rate		Expected Deaths		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0001	0.0001	-	-	N/A	N/A
20-24	-	364	0.0000	0.0001	0.0001	-	-	N/A	N/A
25-29	1	3,688	0.0003	0.0001	0.0001	-	1	N/A	100%
30-34	2	6,579	0.0003	0.0002	0.0002	1	1	200%	200%
35-39	2	8,464	0.0002	0.0003	0.0002	2	2	100%	100%
40-44	2	9,469	0.0002	0.0004	0.0004	4	3	50%	67%
45-49	3	9,105	0.0003	0.0006	0.0006	6	6	50%	50%
50-54	8	8,424	0.0009	0.0010	0.0010	8	8	100%	100%
55-59	14	8,290	0.0017	0.0017	0.0015	14	12	100%	117%
60-64	9	5,603	0.0016	0.0030	0.0021	16	12	56%	75%
65-69	2	1,372	0.0015	0.0055	0.0034	7	4	29%	50%
70-74	-	182	0.0000	0.0094	0.0059	2	1	0%	0%
75 and over	1	3	0.3333	0.0158	0.0100	-	-	N/A	N/A
Totals	44	61,543				60	50	73%	88%

STATE EMPLOYEES
MALE ORDINARY DISABILITY EXPERIENCE

Age	Actual Disabilities	Total Count	Actual Rate	Assumed Rate		Expected Disabilities		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0002	0.0002	-	-	N/A	N/A
20-24	-	8	0.0000	0.0003	0.0003	-	-	N/A	N/A
25-29	-	418	0.0000	0.0003	0.0003	-	-	N/A	N/A
30-34	-	1,086	0.0000	0.0004	0.0004	-	-	N/A	N/A
35-39	2	1,708	0.0012	0.0006	0.0006	1	1	200%	200%
40-44	4	2,671	0.0015	0.0010	0.0010	3	3	133%	133%
45-49	7	4,065	0.0017	0.0016	0.0016	7	7	100%	100%
50-54	6	4,208	0.0014	0.0027	0.0027	11	11	55%	55%
55-59	13	3,538	0.0037	0.0041	0.0041	14	14	93%	93%
60-64	7	1,344	0.0052	0.0062	0.0062	8	8	88%	88%
65-69	1	45	0.0222	0.0093	0.0093	-	-	N/A	N/A
70-74	-	-	N/A	0.0125	0.0125	-	-	N/A	N/A
75 and over	-	-	N/A	0.0156	0.0156	-	-	N/A	N/A
Totals	40	19,091	0.002			44	44	91%	91%

STATE EMPLOYEES
FEMALE ORDINARY DISABILITY EXPERIENCE

Age	Actual Disabilities	Total Count	Actual Rate	Assumed Rate		Expected Disabilities		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0003	0.0002	-	-	N/A	N/A
20-24	-	8	0.0000	0.0004	0.0003	-	-	N/A	N/A
25-29	-	343	0.0000	0.0005	0.0004	-	-	N/A	N/A
30-34	-	1,322	0.0000	0.0006	0.0005	1	1	0%	0%
35-39	1	1,972	0.0005	0.0009	0.0007	2	1	50%	100%
40-44	4	3,057	0.0013	0.0014	0.0011	4	3	100%	133%
45-49	6	4,375	0.0014	0.0023	0.0018	10	8	60%	75%
50-54	14	5,266	0.0027	0.0039	0.0031	20	16	70%	88%
55-59	19	4,886	0.0039	0.0059	0.0047	28	23	68%	83%
60-64	6	1,495	0.0040	0.0089	0.0071	12	10	50%	60%
65-69	2	41	0.0488	0.0134	0.0107	-	-	N/A	N/A
70-74	1	3	0.3333	0.0179	0.0143	-	-	N/A	N/A
75 and over	-	-	N/A	0.0224	0.0179	-	-	N/A	N/A
Totals	53	22,768	0.002			77	62	69%	85%

TEACHERS
MALE ORDINARY DISABILITY EXPERIENCE

Age	Actual Retirement	Total Count	Actual Rate	Assumed Rate		Expected Retirement		Actual/Expected	
				Current	Proposed	Current (3) * (5)	Proposed (3) * (6)	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
20-24	-	-	N/A	0.0002	0.0002	-	-	N/A	N/A
25-29	-	223	0.0000	0.0003	0.0003	-	-	N/A	N/A
30-34	-	1,251	0.0000	0.0004	0.0004	-	-	N/A	N/A
35-39	1	2,382	0.0004	0.0005	0.0005	1	1	100%	100%
40-44	2	3,332	0.0006	0.0008	0.0008	3	3	67%	67%
45-49	1	2,784	0.0004	0.0014	0.0014	4	4	25%	25%
50-54	5	1,997	0.0025	0.0023	0.0023	5	5	100%	100%
55-59	5	1,730	0.0029	0.0035	0.0035	6	6	83%	83%
60-64	2	685	0.0029	0.0048	0.0048	2	2	100%	100%
65-69	-	44	0.0000	0.0000	0.0000	-	-	N/A	N/A
70-74	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
75 and over	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
Totals	16	14,428				21	21	76%	76%

TEACHERS
FEMALE ORDINARY DISABILITY EXPERIENCE

Age	Actual Retirement	Total Count	Actual Rate	Assumed Rate		Expected Retirement		Actual/Expected	
				Current	Proposed	Current (3) * (5)	Proposed (3) * (6)	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
20-24	-	-	N/A	0.0002	0.0001	-	-	N/A	N/A
25-29	-	1,088	0.0000	0.0002	0.0002	-	-	N/A	N/A
30-34	1	5,100	0.0002	0.0003	0.0003	2	1	50%	100%
35-39	1	7,665	0.0001	0.0004	0.0004	3	3	33%	33%
40-44	4	8,729	0.0005	0.0007	0.0006	6	5	67%	80%
45-49	5	8,485	0.0006	0.0012	0.0009	10	8	50%	63%
50-54	14	7,737	0.0018	0.0019	0.0015	15	12	93%	117%
55-59	14	7,201	0.0019	0.0029	0.0023	21	17	67%	82%
60-64	-	2,238	0.0000	0.0040	0.0032	7	6	0%	0%
65-69	-	68	0.0000	0.0000	0.0000	-	-	N/A	N/A
70-74	-	1	0.0000	0.0000	0.0000	-	-	N/A	N/A
75 and over	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
Totals	39	48,312				64	52	61%	75%

GENERAL EMPLOYEES
MALE ORDINARY DISABILITY EXPERIENCE

Age	Actual Retirement	Total Count	Actual Rate	Assumed Rate		Expected Retirement		Actual/Expected	
				Current	Proposed	Current (3) * (5)	Proposed (3) * (6)	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0004	0.0003	-	-	N/A	N/A
20-24	-	5	0.0000	0.0005	0.0004	-	-	N/A	N/A
25-29	-	148	0.0000	0.0006	0.0005	-	-	N/A	N/A
30-34	-	508	0.0000	0.0008	0.0006	-	-	N/A	N/A
35-39	-	587	0.0000	0.0012	0.0009	1	1	0%	0%
40-44	1	1,030	0.0010	0.0018	0.0014	2	1	50%	100%
45-49	3	1,862	0.0016	0.0030	0.0023	6	4	50%	75%
50-54	5	2,316	0.0022	0.0050	0.0039	12	9	42%	56%
55-59	6	1,816	0.0033	0.0076	0.0059	13	10	46%	60%
60-64	2	278	0.0072	0.0115	0.0089	3	2	67%	100%
65-69	-	19	0.0000	0.0174	0.0134	-	-	N/A	N/A
70-74	-	-	N/A	0.0232	0.0179	-	-	N/A	N/A
75 and over	-	-	N/A	0.0291	0.0224	-	-	N/A	N/A
Totals	17	8,569				37	27	46%	63%

GENERAL EMPLOYEES
FEMALE ORDINARY DISABILITY EXPERIENCE

Age	Actual Retirement	Total Count	Actual Rate	Assumed Rate		Expected Retirement		Actual/Expected	
				Current	Proposed	Current (3) * (5)	Proposed (3) * (6)	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0002	0.0002	-	-	N/A	N/A
20-24	-	2	0.0000	0.0002	0.0002	-	-	N/A	N/A
25-29	-	69	0.0000	0.0003	0.0002	-	-	N/A	N/A
30-34	-	279	0.0000	0.0004	0.0003	-	-	N/A	N/A
35-39	1	505	0.0020	0.0005	0.0004	-	-	N/A	N/A
40-44	-	1,060	0.0000	0.0008	0.0007	1	1	0%	0%
45-49	4	2,356	0.0017	0.0014	0.0012	3	3	133%	133%
50-54	9	3,905	0.0023	0.0023	0.0019	9	8	100%	113%
55-59	5	3,660	0.0014	0.0035	0.0029	12	10	42%	50%
60-64	1	359	0.0028	0.0053	0.0044	2	1	50%	100%
65-69	1	26	0.0385	0.0080	0.0067	-	-	N/A	N/A
70-74	-	-	N/A	0.0107	0.0089	-	-	N/A	N/A
75 and over	-	-	N/A	0.0134	0.0112	-	-	N/A	N/A
Totals	21	12,221				27	23	78%	91%

POLICE AND FIRE OFFICERS
ORDINARY DISABILITY EXPERIENCE

Age	Actual Retirement	Total Count	Actual Rate	Assumed Rate		Expected Retirement		Actual/Expected	
				Current	Proposed	Current (3) * (5)	Proposed (3) * (6)	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0002	0.0002	-	-	N/A	N/A
20-24	-	5	0.0000	0.0002	0.0002	-	-	N/A	N/A
25-29	-	293	0.0000	0.0003	0.0003	-	-	N/A	N/A
30-34	-	895	0.0000	0.0004	0.0004	-	-	N/A	N/A
35-39	1	1,394	0.0007	0.0005	0.0005	1	1	100%	100%
40-44	1	1,802	0.0006	0.0008	0.0008	1	1	100%	100%
45-49	1	1,267	0.0008	0.0014	0.0014	2	2	50%	50%
50-54	-	210	0.0000	0.0018	0.0018	-	-	N/A	N/A
55-59	1	3	0.3333	0.0018	0.0018	-	-	N/A	N/A
60-64	-	1	0.0000	0.0018	0.0018	-	-	N/A	N/A
65-69	-	-	N/A	0.0018	0.0018	-	-	N/A	N/A
70-74	-	-	N/A	0.0018	0.0018	-	-	N/A	N/A
75 and over	-	-	N/A	0.0018	0.0018	-	-	N/A	N/A
Totals	4	5,870				4	4	100%	100%

STATE EMPLOYEES
MALE DUTY DISABILITY EXPERIENCE

Age	Actual Disabilities	Total Count	Actual Rate	Assumed Rate		Expected Disabilities		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0001	0.0001	-	-	N/A	N/A
20-24	-	322	0.0000	0.0001	0.0001	-	-	N/A	N/A
25-29	-	1,596	0.0000	0.0002	0.0001	-	-	N/A	N/A
30-34	-	1,888	0.0000	0.0003	0.0002	-	-	N/A	N/A
35-39	1	2,299	0.0004	0.0004	0.0003	1	1	100%	100%
40-44	4	3,211	0.0012	0.0006	0.0004	2	1	200%	400%
45-49	5	4,773	0.0010	0.0009	0.0007	4	3	125%	167%
50-54	7	5,703	0.0012	0.0015	0.0012	9	7	78%	100%
55-59	4	5,440	0.0007	0.0023	0.0018	13	10	31%	40%
60-64	2	3,277	0.0006	0.0035	0.0027	11	8	18%	25%
65-69	-	853	0.0000	0.0053	0.0040	4	3	0%	0%
70-74	-	242	0.0000	0.0071	0.0054	2	1	0%	0%
75 and over	-	-	N/A	0.0089	0.0067	-	-	N/A	N/A
Totals	23	29,604				46	34	50%	68%

STATE EMPLOYEES
FEMALE DUTY DISABILITY EXPERIENCE

Age	Actual Disabilities	Total Count	Actual Rate	Assumed Rate		Expected Disabilities		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0001	0.0001	-	-	N/A	N/A
20-24	-	202	0.0000	0.0001	0.0001	-	-	N/A	N/A
25-29	1	1,410	0.0007	0.0001	0.0001	-	-	N/A	N/A
30-34	1	2,452	0.0004	0.0002	0.0002	-	-	N/A	N/A
35-39	2	2,834	0.0007	0.0003	0.0002	1	1	200%	200%
40-44	1	3,816	0.0003	0.0004	0.0003	2	1	50%	100%
45-49	5	5,378	0.0009	0.0007	0.0006	4	3	125%	167%
50-54	5	6,784	0.0007	0.0012	0.0009	8	6	63%	83%
55-59	7	6,522	0.0011	0.0018	0.0014	11	9	64%	78%
60-64	5	3,534	0.0014	0.0027	0.0021	9	7	56%	71%
65-69	1	953	0.0010	0.0040	0.0032	4	3	25%	33%
70-74	-	232	0.0000	0.0054	0.0043	1	1	0%	0%
75 and over	-	-	N/A	0.0067	0.0054	-	-	N/A	N/A
Totals	28	34,117				40	31	70%	90%

TEACHERS
MALE DUTY DISABILITY EXPERIENCE

Age	Actual Retirement	Total Count	Actual Rate	Assumed Rate		Expected Retirement		Actual/Expected	
				Current	Proposed	Current (3) * (5)	Proposed (3) * (6)	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
20-24	-	102	0.0000	0.0000	0.0000	-	-	N/A	N/A
25-29	-	892	0.0000	0.0000	0.0000	-	-	N/A	N/A
30-34	-	1,668	0.0000	0.0001	0.0000	-	-	N/A	N/A
35-39	-	2,628	0.0000	0.0001	0.0001	-	-	N/A	N/A
40-44	-	3,536	0.0000	0.0001	0.0001	-	-	N/A	N/A
45-49	1	2,916	0.0003	0.0002	0.0001	1	-	100%	N/A
50-54	-	2,149	0.0000	0.0003	0.0002	1	-	0%	N/A
55-59	-	2,054	0.0000	0.0005	0.0004	1	1	0%	0%
60-64	1	1,402	0.0007	0.0006	0.0005	1	1	100%	100%
65-69	-	276	0.0000	0.0000	0.0000	-	-	N/A	N/A
70-74	-	44	0.0000	0.0000	0.0000	-	-	N/A	N/A
75 and over	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
Totals	2	17,667				4	2	50%	100%

TEACHERS
FEMALE DUTY DISABILITY EXPERIENCE

Age	Actual Retirement	Total Count	Actual Rate	Assumed Rate		Expected Retirement		Actual/Expected	
				Current	Proposed	Current (3) * (5)	Proposed (3) * (6)	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
20-24	-	364	0.0000	0.0000	0.0000	-	-	N/A	N/A
25-29	-	3,688	0.0000	0.0000	0.0000	-	-	N/A	N/A
30-34	-	6,579	0.0000	0.0001	0.0000	-	-	N/A	N/A
35-39	-	8,464	0.0000	0.0001	0.0001	1	-	0%	N/A
40-44	-	9,469	0.0000	0.0001	0.0001	1	1	0%	0%
45-49	-	9,105	0.0000	0.0002	0.0001	2	1	0%	0%
50-54	-	8,424	0.0000	0.0003	0.0002	3	2	0%	0%
55-59	3	8,290	0.0004	0.0005	0.0004	4	3	75%	100%
60-64	-	4,932	0.0000	0.0006	0.0005	2	2	0%	0%
65-69	-	766	0.0000	0.0000	0.0000	-	-	N/A	N/A
70-74	-	101	0.0000	0.0000	0.0000	-	-	N/A	N/A
75 and over	-	1	0.0000	0.0000	0.0000	-	-	N/A	N/A
Totals	3	60,183				13	9	23%	33%

GENERAL EMPLOYEES
MALE DUTY DISABILITY EXPERIENCE

Age	Actual Retirement	Total Count	Actual Rate	Assumed Rate		Expected Retirement		Actual/Expected	
				Current	Proposed	Current (3) * (5)	Proposed (3) * (6)	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0001	0.0001	-	-	N/A	N/A
20-24	-	111	0.0000	0.0001	0.0001	-	-	N/A	N/A
25-29	-	437	0.0000	0.0002	0.0001	-	-	N/A	N/A
30-34	-	796	0.0000	0.0003	0.0002	-	-	N/A	N/A
35-39	1	828	0.0012	0.0004	0.0003	-	-	N/A	N/A
40-44	1	1,301	0.0008	0.0006	0.0004	1	1	100%	100%
45-49	1	2,246	0.0004	0.0009	0.0007	2	2	50%	50%
50-54	4	2,737	0.0015	0.0015	0.0012	4	3	100%	133%
55-59	4	2,639	0.0015	0.0023	0.0018	6	5	67%	80%
60-64	1	1,633	0.0006	0.0035	0.0027	5	4	20%	25%
65-69	-	416	0.0000	0.0053	0.0040	2	2	0%	0%
70-74	-	106	0.0000	0.0071	0.0054	1	1	0%	0%
75 and over	-	-	N/A	0.0089	0.0067	-	-	N/A	N/A
Totals	12	13,250				21	18	57%	67%

GENERAL EMPLOYEES
FEMALE DUTY DISABILITY EXPERIENCE

Age	Actual Retirement	Total Count	Actual Rate	Assumed Rate		Expected Retirement		Actual/Expected	
				Current	Proposed	Current (3) * (5)	Proposed (3) * (6)	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
20-24	-	58	0.0000	0.0001	0.0000	-	-	N/A	N/A
25-29	-	335	0.0000	0.0001	0.0000	-	-	N/A	N/A
30-34	-	574	0.0000	0.0001	0.0001	-	-	N/A	N/A
35-39	1	848	0.0012	0.0001	0.0001	-	-	N/A	N/A
40-44	-	1,609	0.0000	0.0002	0.0001	-	-	N/A	N/A
45-49	-	3,064	0.0000	0.0003	0.0002	1	1	0%	0%
50-54	2	4,607	0.0004	0.0005	0.0004	3	2	67%	100%
55-59	1	5,141	0.0002	0.0008	0.0006	4	3	25%	33%
60-64	-	2,967	0.0000	0.0012	0.0009	3	2	0%	0%
65-69	-	675	0.0000	0.0019	0.0013	1	1	0%	0%
70-74	-	164	0.0000	0.0025	0.0018	-	-	N/A	N/A
75 and over	-	-	N/A	0.0031	0.0022	-	-	N/A	N/A
Totals	4	20,042				12	9	33%	44%

POLICE AND FIRE OFFICERS
DUTY DISABILITY EXPERIENCE

Age	Actual Retirement	Total Count	Actual Rate	Assumed Rate		Expected Retirement		Actual/Expected	
				Current	Proposed	Current (3) * (5)	Proposed (3) * (6)	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0012	0.0012	-	-	N/A	N/A
20-24	-	122	0.0000	0.0014	0.0014	-	-	N/A	N/A
25-29	1	793	0.0013	0.0019	0.0019	2	2	50%	50%
30-34	2	1,166	0.0017	0.0025	0.0025	3	3	67%	67%
35-39	7	1,746	0.0040	0.0035	0.0035	6	6	117%	117%
40-44	10	2,206	0.0045	0.0055	0.0055	12	12	83%	83%
45-49	5	1,316	0.0038	0.0092	0.0092	12	12	42%	42%
50-54	8	218	0.0367	0.0121	0.0121	3	3	267%	267%
55-59	1	6	0.1667	0.0121	0.0121	-	-	N/A	N/A
60-64	1	2	0.5000	0.0121	0.0121	-	-	N/A	N/A
65-69	-	-	N/A	0.0121	0.0121	-	-	N/A	N/A
70-74	-	-	N/A	0.0121	0.0121	-	-	N/A	N/A
75 and over	-	-	N/A	0.0121	0.0121	-	-	N/A	N/A
Totals	35	7,575				38	38	92%	92%

STATE EMPLOYEES
SERVICE BASED WITHDRAWAL EXPERIENCE

				Assumed Rate		Expected Withdrawal		Actual/Expected	
Service	Actual Withdrawal	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	16,562	132,634	0.124869	0.160000	0.160000	21,221	21,221	78%	78%
2	28,588	274,967	0.103970	0.101160	0.101160	27,816	27,816	103%	103%
3	22,315	278,035	0.080260	0.080768	0.080768	22,456	22,456	99%	99%
4	23,263	280,073	0.083060	0.068839	0.068839	19,280	19,280	121%	121%
5	18,884	295,351	0.063939	0.060375	0.060375	17,832	17,832	106%	106%
6	16,921	311,630	0.054298	0.053810	0.053810	16,769	16,769	101%	101%
7	15,860	329,690	0.048104	0.048446	0.048446	15,972	15,972	99%	99%
8	15,338	348,719	0.043985	0.043911	0.043911	15,313	15,313	100%	100%
9	15,109	372,279	0.040585	0.039983	0.039983	14,885	14,885	102%	102%
10	14,280	393,339	0.036303	0.036518	0.036518	14,364	14,364	99%	99%
11	12,238	393,898	0.031068	0.033418	0.033418	13,163	13,163	93%	93%
12	13,545	389,855	0.034745	0.030614	0.030614	11,935	11,935	113%	113%
13	11,035	387,514	0.028475	0.028054	0.028054	10,871	10,871	102%	102%
14	11,271	406,056	0.027758	0.025699	0.025699	10,435	10,435	108%	108%
15	9,778	441,613	0.022143	0.023519	0.023519	10,386	10,386	94%	94%
16	10,313	452,664	0.022783	0.021489	0.021489	9,727	9,727	106%	106%
17	9,472	504,726	0.018766	0.019590	0.019590	9,888	9,888	96%	96%
18	9,940	553,299	0.017965	0.017807	0.017807	9,853	9,853	101%	101%
19	10,033	603,673	0.016620	0.016125	0.016125	9,734	9,734	103%	103%
20	10,180	690,657	0.014739	0.014535	0.014535	10,038	10,038	101%	101%
21	9,522	765,697	0.012436	0.013026	0.013026	9,974	9,974	95%	95%
22	9,971	814,819	0.012237	0.011590	0.011590	9,444	9,444	106%	106%
23	10,635	894,738	0.011886	0.010222	0.010222	9,146	9,146	116%	116%
24	13,109	908,758	0.014425	0.008914	0.008914	8,100	8,100	162%	162%
25	7,470	895,302	0.008344	0.007662	0.007662	6,859	6,859	109%	109%
Totals	345,632	12,119,988				335,462	335,462	103%	103%

TEACHERS
SERVICE BASED WITHDRAWAL EXPERIENCE

				Assumed Rate		Expected Withdrawal		Actual/Expected	
Service	Actual Withdrawal	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	14,848	55,722	0.266462	0.180000	0.150000	10,030	8,358	148%	178%
2	47,810	335,552	0.142482	0.120000	0.100000	40,266	33,555	119%	142%
3	34,889	365,783	0.095380	0.080000	0.075000	29,263	27,434	119%	127%
4	29,241	411,045	0.071138	0.064811	0.064811	26,640	26,640	110%	110%
5	26,774	478,842	0.055914	0.048163	0.048163	23,062	23,062	116%	116%
6	25,567	557,752	0.045840	0.038256	0.038256	21,337	21,337	120%	120%
7	22,962	664,964	0.034530	0.031695	0.031695	21,076	21,076	109%	109%
8	21,566	771,755	0.027944	0.027033	0.027033	20,863	20,863	103%	103%
9	21,397	866,425	0.024696	0.023553	0.023553	20,407	20,407	105%	105%
10	18,370	956,514	0.019205	0.020857	0.020857	19,950	19,950	92%	92%
11	25,739	1,033,399	0.024907	0.018708	0.018708	19,333	19,333	133%	133%
12	26,072	1,079,518	0.024151	0.016956	0.016956	18,304	18,304	142%	142%
13	18,172	1,099,095	0.016534	0.015500	0.015500	17,036	17,036	107%	107%
14	17,212	1,108,077	0.015533	0.014271	0.014271	15,813	15,813	109%	109%
15	17,805	1,118,185	0.015924	0.013220	0.013220	14,782	14,782	120%	120%
16	18,733	1,108,354	0.016901	0.012312	0.012312	13,646	13,646	137%	137%
17	14,105	1,145,522	0.012313	0.011518	0.011518	13,194	13,194	107%	107%
18	14,366	1,140,070	0.012601	0.010820	0.010820	12,336	12,335	116%	116%
19	13,159	1,142,133	0.011521	0.010200	0.010200	11,650	11,650	113%	113%
20	8,411	1,164,924	0.007220	0.009646	0.009646	11,237	11,237	75%	75%
21	9,475	1,150,878	0.008233	0.009149	0.009149	10,529	10,529	90%	90%
22	10,432	1,103,121	0.009457	0.008700	0.008700	9,597	9,597	109%	109%
23	8,718	1,073,681	0.008120	0.008292	0.008292	8,903	8,903	98%	98%
24	11,872	1,034,613	0.011475	0.007920	0.007920	8,194	8,194	145%	145%
25	8,007	997,149	0.008030	0.007580	0.007580	7,558	7,558	106%	106%
Totals	485,701	21,963,076				425,008	414,796	114%	117%

GENERAL EMPLOYEES
SERVICE BASED WITHDRAWAL EXPERIENCE

				Assumed Rate		Expected Withdrawal		Actual/Expected	
Service	Actual Withdrawal	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	7,381	49,925	0.147847	0.175000	0.175000	8,737	8,737	84%	84%
2	12,349	102,767	0.120168	0.118774	0.118774	12,206	12,206	101%	101%
3	10,882	110,039	0.098896	0.101396	0.101396	11,158	11,158	98%	98%
4	10,365	119,822	0.086506	0.086148	0.086148	10,322	10,322	100%	100%
5	9,683	135,125	0.071656	0.072887	0.072887	9,849	9,849	98%	98%
6	8,030	156,038	0.051459	0.061471	0.061471	9,592	9,592	84%	84%
7	8,373	179,220	0.046718	0.051757	0.051757	9,276	9,276	90%	90%
8	9,122	198,726	0.045902	0.043604	0.043604	8,665	8,665	105%	105%
9	7,601	213,870	0.035539	0.036868	0.036868	7,885	7,885	96%	96%
10	7,740	226,030	0.034245	0.031408	0.031408	7,099	7,099	109%	109%
11	7,717	237,414	0.032505	0.027082	0.027082	6,430	6,430	120%	120%
12	6,822	239,273	0.028512	0.023746	0.023746	5,682	5,682	120%	120%
13	5,378	239,526	0.022453	0.021259	0.021259	5,092	5,092	106%	106%
14	5,945	238,163	0.024964	0.019479	0.019479	4,639	4,639	128%	128%
15	4,387	230,725	0.019014	0.018263	0.018263	4,214	4,214	104%	104%
16	3,384	230,048	0.014709	0.017470	0.017470	4,019	4,019	84%	84%
17	4,180	235,469	0.017752	0.016956	0.016956	3,992	3,992	105%	105%
18	2,485	238,402	0.010423	0.016579	0.016579	3,952	3,952	63%	63%
19	3,275	237,003	0.013820	0.016198	0.016198	3,839	3,839	85%	85%
20	2,584	239,146	0.010804	0.015669	0.015669	3,747	3,747	69%	69%
21	3,154	235,061	0.013418	0.014851	0.014851	3,491	3,491	90%	90%
22	2,781	223,123	0.012466	0.013602	0.013602	3,035	3,035	92%	92%
23	2,480	207,698	0.011939	0.011778	0.011778	2,446	2,446	101%	101%
24	1,288	206,847	0.006225	0.009239	0.009239	1,911	1,911	67%	67%
25	2,085	193,713	0.010763	0.005841	0.005841	1,131	1,131	184%	184%
Totals	149,472	4,923,173				152,410	152,409	98%	98%

POLICE AND FIRE OFFICERS
SERVICE BASED WITHDRAWAL EXPERIENCE

				Assumed Rate		Expected Withdrawal		Actual/Expected	
Service	Actual Withdrawal	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	4,703	46,837	0.100412	0.100000	0.100000	4,684	4,684	100%	100%
2	4,632	98,515	0.045205	0.047300	0.047300	4,660	4,660	99%	99%
3	3,909	109,396	0.032717	0.036903	0.036903	4,037	4,037	97%	97%
4	4,598	115,674	0.032776	0.030821	0.030821	3,565	3,565	129%	129%
5	2,469	122,930	0.021166	0.026506	0.026506	3,258	3,258	76%	76%
6	4,225	126,461	0.033698	0.023158	0.023158	2,929	2,929	144%	144%
7	3,326	135,625	0.024151	0.020424	0.020424	2,770	2,770	120%	120%
8	3,428	146,029	0.023864	0.018111	0.018111	2,645	2,645	130%	130%
9	1,565	148,050	0.009000	0.016108	0.016108	2,385	2,385	66%	66%
10	863	148,775	0.004244	0.014342	0.014342	2,134	2,134	40%	40%
11	1,522	156,074	0.010414	0.012761	0.012761	1,992	1,992	76%	76%
12	2,483	155,189	0.015548	0.011332	0.011332	1,759	1,759	141%	141%
13	2,056	157,047	0.013817	0.010026	0.010026	1,575	1,575	131%	131%
14	1,147	157,999	0.006353	0.008826	0.008826	1,394	1,394	82%	82%
15	1,640	146,597	0.009696	0.007714	0.007714	1,131	1,131	145%	145%
16	1,611	161,336	0.010395	0.006679	0.006679	1,078	1,078	149%	149%
17	269	167,925	0.001668	0.005711	0.005711	959	959	28%	28%
18	195	174,313	0.001154	0.004802	0.004802	837	837	23%	23%
19	0	184,539	0.000000	0.003944	0.003944	728	728	0%	0%
20	364	182,442	0.002038	0.000000	0.000000	0	0	0%	0%
21	0	177,104	0.000000	0.000000	0.000000	0	0	0%	0%
22	0	152,913	0.000000	0.000000	0.000000	0	0	0%	0%
23	0	139,730	0.000000	0.000000	0.000000	0	0	0%	0%
24	0	122,547	0.000000	0.000000	0.000000	0	0	0%	0%
25	0	110,668	0.000000	0.000000	0.000000	0	0	0%	0%
Totals	45,004	3,544,716				44,520	44,520	101%	101%

Salary Scale Assumption
State Employees

Year	Average Long Service Increase	CPI	Productivity
2007	4.98%	2.69%	2.29%
2008	3.58%	5.02%	-1.44%
2009	2.86%	-1.43%	4.29%
2010	4.06%	1.05%	3.01%
2011	2.19%	3.56%	-1.37%
2012	5.08%	1.66%	3.42%
2013	0.70%	1.75%	-1.05%
2014	0.76%	2.07%	-1.31%
2015	3.36%	0.12%	3.24%
2016	2.19%	1.01%	1.19%
Average	2.97%	1.74%	1.23%
Proposed	3.25%	2.50%	0.75%

Years of Service	Average Pay Increase	Less Actual Inflation and Productivity Components	Actual Step-Rate/Promotional Component	Proposed Step-Rate/Promotional Component
2	4.51%	(2.97%)	1.54%	2.00%
3	6.12%	(2.97%)	3.16%	3.00%
4	5.57%	(2.97%)	2.60%	2.75%
5	5.77%	(2.97%)	2.80%	2.75%
6	5.81%	(2.97%)	2.85%	2.50%
7	4.13%	(2.97%)	1.16%	1.25%
8	3.72%	(2.97%)	0.75%	1.00%
9	3.79%	(2.97%)	0.83%	1.00%
10	3.90%	(2.97%)	0.93%	1.00%
11	4.02%	(2.97%)	1.05%	1.00%
12	4.88%	(2.97%)	1.91%	2.00%
13	4.24%	(2.97%)	1.27%	1.25%
14	3.68%	(2.97%)	0.71%	1.00%
15	3.75%	(2.97%)	0.79%	1.00%
16	4.07%	(2.97%)	1.10%	1.00%
17	3.16%	(2.97%)	0.19%	0.50%
18	3.32%	(2.97%)	0.35%	0.50%
19	3.78%	(2.97%)	0.82%	0.50%
20	3.33%	(2.97%)	0.36%	0.50%
21	3.78%	(2.97%)	0.82%	0.50%
22	3.37%	(2.97%)	0.40%	0.25%
23	3.06%	(2.97%)	0.09%	0.25%
24	3.10%	(2.97%)	0.13%	0.25%
25+	2.97%	(2.97%)	0.00%	0.00%

Salary Scale Assumption
Teachers

Year	Average Long Service Increase	CPI	Productivity
2007	6.14%	2.69%	3.45%
2008	3.45%	5.02%	-1.57%
2009	2.79%	-1.43%	4.21%
2010	2.50%	1.05%	1.44%
2011	4.06%	3.56%	0.50%
2012	1.58%	1.66%	-0.08%
2013	-2.53%	1.75%	-4.29%
2014	1.93%	2.07%	-0.15%
2015	2.08%	0.12%	1.96%
2016	0.33%	1.01%	-0.67%
Average	2.23%	1.74%	0.49%
Proposed	3.00%	2.50%	0.50%

Years of Service	Average Pay Increase	Less Actual Inflation and Productivity Components	Actual Step-Rate/Promotional Component	Proposed Step-Rate/Promotional Component
2	11.15%	(2.21%)	8.94%	9.00%
3	8.28%	(2.21%)	6.08%	6.25%
4	7.86%	(2.21%)	5.66%	5.50%
5	7.39%	(2.21%)	5.19%	5.00%
6	7.42%	(2.21%)	5.21%	5.00%
7	6.63%	(2.21%)	4.43%	4.50%
8	6.37%	(2.21%)	4.16%	4.25%
9	6.40%	(2.21%)	4.19%	4.00%
10	6.79%	(2.21%)	4.58%	4.00%
11	2.21%	(2.21%)	0.00%	0.00%

Salary Scale Assumption
General Employees

Year	Average Long Service Increase	CPI	Productivity
2007	4.81%	2.69%	2.12%
2008	3.88%	5.02%	-1.14%
2009	3.54%	-1.43%	4.97%
2010	1.52%	1.05%	0.46%
2011	2.05%	3.56%	-1.51%
2012	1.50%	1.66%	-0.17%
2013	2.04%	1.75%	0.29%
2014	1.61%	2.07%	-0.46%
2015	2.58%	0.12%	2.46%
2016	2.44%	1.00%	1.44%
Average	3.07%	1.74%	0.86%
Proposed	3.25%	2.50%	0.75%

Years of Service	Average Pay Increase	Less Actual Inflation and Productivity Components	Actual Step-Rate/Promotional Component	Proposed Step-Rate/Promotional Component
2	2.52%	-2.59%	-0.08%	3.00%
3	5.15%	-2.59%	2.56%	2.75%
4	5.13%	-2.59%	2.54%	2.50%
5	4.42%	-2.59%	1.83%	2.25%
6	4.63%	-2.59%	2.04%	2.00%
7	3.63%	-2.59%	1.04%	1.25%
8	3.45%	-2.59%	0.86%	0.75%
9	3.39%	-2.59%	0.80%	0.50%
10	3.19%	-2.59%	0.60%	0.50%
11	3.02%	-2.59%	0.43%	0.25%
12	2.82%	-2.59%	0.23%	0.25%
13	2.36%	-2.59%	-0.23%	0.25%
14	2.63%	-2.59%	0.03%	0.25%
15	3.23%	-2.59%	0.64%	0.25%
16+	2.59%	-2.59%	0.00%	0.00%

Salary Scale Assumption
Police and Fire Fighters

Year	Average Long Service Increase	CPI	Productivity
2007	5.89%	2.69%	3.21%
2008	2.76%	5.02%	-2.26%
2009	3.33%	-1.43%	4.76%
2010	3.25%	1.05%	2.19%
2011	3.16%	3.56%	-0.40%
2012	5.70%	1.66%	4.03%
2013	2.50%	1.75%	0.74%
2014	3.05%	2.07%	0.97%
2015	2.32%	0.12%	2.19%
2016	6.33%	1.01%	2.19%
Average	5.07%	1.74%	2.08%
Proposed	4.00%	2.50%	1.50%

Years of Service	Average Pay Increase	Less Actual Inflation and Productivity Components	Actual Step-Rate/Promotional Component	Proposed Step-Rate/Promotional Component
2	15.09%	-3.82%	11.27%	9.00%
3	10.66%	-3.82%	6.84%	7.00%
4	7.82%	-3.82%	4.01%	4.00%
5	5.71%	-3.82%	1.89%	2.50%
6	6.52%	-3.82%	2.70%	3.00%
7	3.48%	-3.82%	-0.34%	0.50%
8	3.96%	-3.82%	0.14%	0.50%
9	3.82%	-3.82%	0.00%	0.00%

Employees' Retirement Board of Rhode Island
Governance Subcommittee
Wednesday, April 12, 2017, 9:00 a.m.
2nd Floor Conference Room, 50 Service Ave

The Meeting of the Governance Subcommittee was called to order at 9:00 a.m. Wednesday, April 12, 2017, in the 2nd Floor Conference Room, 50 Service Avenue, Warwick, RI.

I. Roll Call of Members

The following members were present at roll call: John P. Maguire, Chairperson; Michael DiBiase; Brian M. Daniels and Patrick Marr for General Treasurer Seth Magaziner.

Also in attendance: Frank J. Karpinski, ERSRI Executive Director; Attorney Michael P. Robinson, Board Counsel and Gayle Mambro-Martin, Deputy Legal Counsel

Recognizing a quorum, Chairman Maguire called the meeting to order.

Roger P. Boudreau arrived at 9:02 a.m.

II. Approval of the Draft Minutes from the March 15, 2017 Governance Subcommittee Meeting

On a motion by Brian M. Daniels and seconded by Michael DiBiase, it was unanimously

VOTED: To approve the draft minutes of the March 15, 2017 meeting of the Governance Subcommittee.

III. Review of the Overview of Governance Subcommittee Duties

Director Karpinski provided the Subcommittee an overview of the duties and responsibilities incorporated within the charter approved by the Board. The Director said the Subcommittee combines the former Rules and Regulations, Legislative and Board Education Subcommittees. He said board education and evaluation, strategic planning, oversight of system staff, board governance and review of retirement laws comprise the Board Governance Subcommittees duties.

The Subcommittee discussed the Board's annual calendar as well as its yearly calendar to better focus on time sensitive matters and be cognizant of the standard types of meetings, e.g. review of disabilities, budget, actuarial valuations, etc. The Director said there is currently a high-level meeting calendar for the rest of year, but the Subcommittee said it will seek to meet again to finalize the current year calendar and build the 2018 calendar year.

The Subcommittee then discussed a review of retirement laws where regulations are needed. Attorney Mambro-Martin said there are draft policies that are ready for subcommittee review and promulgation and internal policies were applicable that could also be considered for promulgation. She recommended a review of post-retirement employment policies given that there are increasingly more requests being presented to ERSRI.

Director Karpinski said the Subcommittee should prioritize draft regulations to consider and then present matters to the full Board for approval and formal promulgation.

IV. Strategic Plan Discussion

Director Karpinski referred the Subcommittee to the draft 2017 Strategic Plan. He noted that the Treasurer initiated a Treasury wide plan and ERSRI to develop short and long-term goals. The Director noted that the most significant piece of the strategic plan is the data validation project which when completed, will provide better customer service, web site usefulness and quicker benefit processing.

The Subcommittee discussed the draft plans and Chairman Maguire felt some of the target dates to conduct and finalize the strategic plan development may need to be reviewed. Director Karpinski said the target dates can be adjusted with the Subcommittee's review. Mr. DiBiase noted that strategic planning is generally focused on strategic objectives and felt the Board should be engaged in its process. Director Karpinski said the May offsite training will have a facilitator to engage the Board to fine tune the draft plan and ultimately the full Board will approve it. He also noted that the plan is a living document and can be adjusted should the Subcommittee and Board feel adjustments are required. The Subcommittee also discussed the vision statement and made adjustments.

V. Executive Director Evaluation Discussion

Mr. Maguire referred the Subcommittee to the example Director evaluations provided and after discussion, asked if Director Karpinski could obtain examples from additional systems to compare. The Director said he will do a national survey through the National Association of State Retirement Administrators (NASRA).

The Subcommittee then discussed what level the Executive Director has in the staff and manager hiring process. Director Karpinski said he can recommend but does not have direct authority to hire, terminate or appoint staff. The Subcommittee said it will need to take that into consideration when developing the evaluation. Mr. Daniels said for the nonunion employees there should be a certain percentage tied into their job to be in line with the strategic plan execution.

VI. Adjournment

There being no other business to come before the committee, on a motion by Brian M. Daniels and seconded by Patrick Marr, the meeting adjourned at 9:53 a.m.

Respectfully submitted,

Frank J. Karpinski
Executive Director

April 12, 2017

Employees' Retirement Board of Rhode Island
Member Services Subcommittee
Wednesday, April 12, 2017, 11:00 a.m.
2nd Floor Conference Room, 50 Service Ave

The Meeting of the Member Services Subcommittee was called to order at 11:22 a.m. Wednesday, April 12, 2017, in the 2nd Floor Conference Room, 50 Service Avenue, Warwick, RI.

I. Roll Call of Members

The following members were present at roll call: Marcia B. Reback, Chairperson; Roger P. Boudreau, Mark A. Carruolo and Bea Lanzi for General Treasurer Seth Magaziner.

Also in attendance: Frank J. Karpinski, ERSRI Executive Director; Attorney Michael P. Robinson, Board Counsel, Kate Brock, Director of Member Services and General Treasurer Seth Magaziner

Recognizing a quorum, Chairperson Reback called the meeting to order.

II. Selection of Vice Chairperson

On a motion by Mark A. Carruolo and seconded by Bea Lanzi, it was unanimously

VOTED: To select Roger P. Boudreau as the Vice Chairman of the Member Services Subcommittee.

III. Review and Finalize Draft Member Services Committee Charter for Board Approval

Treasurer Magaziner addressed the Subcommittee and stressed that improving member services is the top priority within the organization for the next 2 years to ultimately be able to provide better services and more counseling to members. He thanked the Subcommittee for their commitment to member services.

Director Karpinski noted items on the draft *Member Services Charter* that required input from the Subcommittee. The Subcommittee discussed the items and then on a motion by Roger P. Boudreau and seconded by Bea Lanzi, it was unanimously

VOTED: To perform a self-evaluation of the Member Services Subcommittee every two years.

On a motion by Roger P. Boudreau and seconded by Mark A. Carruolo, it was unanimously

VOTED: To approve the Member Services Subcommittee Charter as amended and recommend its adoption to the full Board.

IV. Overview of ERSRI's Member Services Operations

Director of Member Services Kate Brock provided an overview to the Subcommittee of the ERSRI Member Services department which included department staffing, an

overview of department responsibilities, blocking issues to improving customer service, a discussion of data and how it impacts operations and how ERSRI has been correcting it, member account validation, benefit structure complexity, and additional near term customer service improvements.

Mr. Carruolo queried about the quality of the data and if the contact person at the agencies providing contributions and days worked are familiar with what data is required. Director Karpinski affirmed that there is a communicative relationship between the retirement counselors and the human resources/payroll departments, however turnover at the agencies is problematic. Ms. Brock told the Subcommittee that one of the requested FTE's approved by the Board earlier would review, at time of receipt, data that is being posted in the system to help mitigate processing issues in the future.

Chairperson Reback told Director Karpinski that it would be beneficial if the IT Department could familiarize the Subcommittee on the data collection process. Director Karpinski said that he would have the IT wage and contribution department provide a presentation to the Subcommittee on the process.

Chairperson Reback then requested that, given the time, Ms. Brocks presentation relating to member communications be tabled to the next meeting along with a discussion of establishing the Subcommittees priorities from the charter.

V. Adjournment

There being no other business to come before the committee, on a motion by Roger P. Boudreau and seconded by Mark A. Carruolo, the meeting adjourned at 12:35 p.m.

Respectfully submitted,

Frank J. Karpinski
Executive Director

Employees' Retirement System of Rhode Island

Report of Contributions
Period Ending: 5/5/17

Organization	Frequency	Last Posted Pay Period End Date	Employee Contributions	Employer Contributions	Wages	Total	Payment for Period Ending	Check Amount	Periods Past Due	Estimated Amount Past Due As Of 5/5/17
1671 International Charter School	BIWK	4/28/2017	$3,116.03	$10,462.34	$79,380.61	$ 13,578.37	3/17/2017	$ 14,189.44	1	$ 13,578.37
2100 R.I. Airport Corporation	BIWK	4/29/2017	$2,423.73	$6,107.11	$24,100.69	$ 8,530.84	3/18/2017	$ 8,530.84	0	$ -
1471 Smithfield School Dept.	BIWK	3/18/2017	$35,739.37	$92,437.78	$701,346.17	$ 128,177.15	3/18/2017	$ 133,106.62	0	$ -
1401 Northern Rhode Island Collaborative	BIWK	4/30/2017	$5,267.27	$12,359.65	$93,775.90	$ 17,626.92	3/19/2017	$ 17,884.90	0	$ -
1441 Providence School Dept.	BIWK	4/16/2017	$292,034.46	$736,773.20	$5,590,081.56	$ 1,028,807.66	3/19/2017	$ 1,108,497.98	0	$ -
1448 Providence 12 Month Bi-Weekly	BIWK	4/16/2017	$24,209.92	$57,375.54	$435,323.07	$ 81,585.46	3/19/2017	$ 88,389.71	0	$ -
1771 Sheila C Nowell Leadership Academy	BIWK	4/16/2017	$1,101.34	$3,693.38	$28,022.48	$ 4,794.72	3/19/2017	$ 5,195.10	0	$ -
1541 Urban Collaborative Schools	BIWK	3/19/2017	$2,324.53	$5,114.32	$38,803.62	$ 7,438.85	3/19/2017	$ 7,438.85	0	$ -
1331 Narragansett School Dept.	BIWK	4/20/2017	$25,243.86	$62,796.37	$476,452.08	$ 88,040.23	3/23/2017	$ 90,337.56	0	$ -
1031 Burrillville School Dept.	BIWK	4/21/2017	$30,486.06	$67,986.47	$545,199.66	$ 98,472.53	3/24/2017	$ 103,496.18	0	$ -
1611 West Warwick School Dept.	BIWK	3/25/2017	$50,098.31	$124,016.39	$940,943.72	$ 174,114.70	3/25/2017	$ 185,291.54	0	$ -
1531 Tiverton School Dept.	BIWK	4/22/2017	$22,639.75	$64,715.24	$491,009.89	$ 87,354.99	3/25/2017	$ 89,345.01	0	$ -
1447 Providence Long Term Subs	WKLY	4/16/2017	$1,612.53	$5,588.32	$42,400.00	$ 7,200.85	3/26/2017	$ 9,860.25	0	$ -
1301 Lincoln School Dept.	BIWK	4/27/2017	$49,243.68	$123,728.43	$938,758.27	$ 172,972.11	3/30/2017	$ 180,513.44	0	$ -
1741 Trinity Academy	SMON	3/31/2017	$1,967.58	$6,509.18	$49,387.00	$ 8,476.76	3/31/2017	$ 9,185.92	0	$ -
1491 South Kingstown School Dept.	BIWK	4/28/2017	$54,965.46	$137,579.93	$1,043,853.69	$ 192,545.39	3/31/2017	$ 198,152.84	0	$ -
1701 Beacon Charter School Of Woonsocket	SMON	4/15/2017	$2,938.49	$10,327.92	$78,360.33	$ 13,266.41	3/31/2017	$ 13,912.26	0	$ -
1641 Highlander Charter School	SMON	3/31/2017	$4,068.09	$13,851.02	$105,091.12	$ 17,919.11	3/31/2017	$ 18,703.63	0	$ -
1281 Johnston School Dept.	BIWK	4/28/2017	$47,493.64	$116,665.81	$885,165.63	$ 164,159.45	3/31/2017	$ 172,486.26	0	$ -
1161 East Providence Schools	BIWK	4/28/2017	$44,458.54	$145,437.59	$1,103,474.30	$ 189,896.13	3/31/2017	$ 281,592.46	0	$ -
1681 The Compass School	SMON	4/30/2017	$1,588.76	$5,583.98	$42,366.99	$ 7,172.74	3/31/2017	$ 7,172.74	0	$ -
2300 Narragansett Bay Commission	BIWK	4/15/2017	$6,622.64	$44,750.85	$176,601.69	$ 51,373.49	4/1/2017	$ 67,022.70	0	$ -
1631 Woonsocket School Dept.	BIWK	4/19/2017	$46,389.34	$151,279.10	$1,147,796.75	$ 197,668.44	4/5/2017	$ 225,499.89	0	$ -
1191 Foster School Dist.	BIWK	4/21/2017	$3,376.80	$8,512.27	$64,584.91	$ 11,889.07	4/7/2017	$ 12,572.01	0	$ -
1181 Exeter/West Greenwich Reg. Schools	BIWK	4/21/2017	$15,424.15	$52,716.77	$399,977.00	$ 68,140.92	4/7/2017	$ 101,374.06	0	$ -
1311 Little Compton School Dept.	BIWK	4/7/2017	$3,705.95	$11,613.76	$93,134.12	$ 15,319.71	4/7/2017	$ 15,319.71	0	$ -
1321 Middletown Public Schools	BIWK	4/21/2017	$39,507.90	$88,382.95	$670,585.63	$ 127,890.85	4/7/2017	$ 132,774.12	0	$ -
1711 The Learning Community Charter School	BIWK	4/22/2017	$4,304.68	$14,020.03	$106,373.90	$ 18,324.71	4/8/2017	$ 20,271.54	0	$ -
1341 New Shoreham School Dist.	BIWK	4/22/2017	$3,816.63	$9,705.72	$77,832.55	$ 13,522.35	4/8/2017	$ 13,522.35	0	$ -
1271 Jamestown School Dept.	BIWK	4/8/2017	$6,896.38	$19,918.83	$151,128.84	$ 26,815.21	4/8/2017	$ 28,771.43	0	$ -
1461 Scituate School Dept.	BIWK	4/23/2017	$21,006.59	$55,159.40	$418,507.84	$ 76,165.99	4/9/2017	$ 77,805.38	0	$ -
1061 Central Falls Collaborative	BIWK	4/26/2017	$24,764.96	$83,094.44	$630,458.58	$ 107,859.40	4/12/2017	$ 141,468.78	0	$ -
1691 Blackstone Academy Charter School, Inc.	SMON	4/30/2017	$2,296.51	$8,071.30	$61,238.87	$ 10,367.81	4/13/2017	$ 10,367.81	0	$ -
1721 Segue Institute Of Learning	BIWK	4/30/2017	$1,682.45	$5,913.18	$44,865.00	$ 7,595.63	4/14/2017	$ 7,642.95	0	$ -
1571 Warwick School Dept.	BIWK	4/28/2017	$86,782.90	$292,125.15	$2,216,431.60	$ 378,908.05	4/14/2017	$ 548,279.28	0	$ -
1351 Newport School Dept.	BIWK	4/28/2017	$39,831.78	$97,910.24	$742,871.75	$ 137,742.02	4/14/2017	$ 147,954.19	0	$ -
1151 East Greenwich School Dept.	BIWK	4/28/2017	$31,419.46	$89,724.74	$719,524.49	$ 121,144.20	4/14/2017	$ 122,405.33	0	$ -
1371 North Kingstown School Dept.	BIWK	4/14/2017	$53,967.00	$145,612.33	$1,104,797.07	$ 199,579.33	4/14/2017	$ 205,853.55	0	$ -
1381 North Providence School Dept.	BIWK	4/14/2017	$28,592.75	$94,817.11	$719,400.32	$ 123,409.86	4/14/2017	$ 182,946.87	0	$ -
1421 Portsmouth School Dept.	BIWK	4/28/2017	$23,027.18	$79,551.91	$603,580.49	$ 102,579.09	4/14/2017	$ 127,797.98	0	$ -
1731 The Greene School	SMON	4/30/2017	$1,607.35	$5,057.45	$38,371.91	$ 6,664.80	4/15/2017	$ 7,522.50	0	$ -
1761 The Village Green Virtual Charter School	SMON	4/30/2017	$2,262.77	$5,434.10	$41,229.92	$ 7,696.87	4/15/2017	$ 9,266.66	0	$ -
1751 Ri Nurses Institute	SMON	4/15/2017	$2,348.72	$7,717.62	$58,555.39	$ 10,066.34	4/15/2017	$ 11,009.26	0	$ -
1591 West Bay Collaborative	BIWK	4/15/2017	$2,313.57	$7,061.68	$53,578.88	$ 9,375.25	4/15/2017	$ 9,375.25	0	$ -
1111 Cranston School Dept.	BIWK	4/29/2017	$171,923.99	$448,585.23	$3,403,529.13	$ 620,509.22	4/15/2017	$ 656,212.20	0	$ -
1121 Cumberland School Dept.	SMON	4/15/2017	$55,044.98	$153,447.78	$1,164,244.47	$ 208,492.76	4/15/2017	$ 215,794.26	0	$ -
1391 North Smithfield School Dept.	BIWK	4/29/2017	$21,139.90	$56,875.17	$456,095.37	$ 78,015.07	4/15/2017	$ 79,365.93	0	$ -
1781 South Side Elementary Charter School	BIWK	4/15/2017	$385.77	$1,355.85	$10,287.17	$ 1,741.62	4/15/2017	$ 1,741.62	0	$ -
2000 State	BIWK	4/15/2017	$661,704.32	$4,471,358.35	$17,644,349.23	$ 5,133,062.67	4/15/2017	$ 5,154,190.12	0	$ -