2015 ANNUAL REPORT

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2015 COMMISSION MEMBERS

CHAIRMAN

Philip Y. Brown, Esq.
Chairman

VICE CHAIRMAN

The Honorable Suzanne M. Bump
Auditor of the Commonwealth
Kathleen M. Fallon
Practice Area Director, Public Consulting Group

Kate Fitzpatrick
Town Manager, Town of Needham

James M. Machado
Sergeant, Fall River Police Department

Robert B. McCarthy
President Emeritus of the Professional Fire Fighters of Massachusetts

Jennifer F. Sullivan
Assistant Secretary for Capital Finance, Administration & Finance
PERAC MISSION STATEMENT

The Public Employee Retirement Administration Commission (PERAC) was created for and is dedicated to the oversight, guidance, monitoring, and regulation of the Massachusetts Public Pension Systems. The professional, prudent, and efficient administration of these systems is the public trust of PERAC and each of the 104 public pension systems for the mutual benefit of the public employees, public employers, and citizens of Massachusetts. The stewardship of the Trust Funds for the sole purpose of providing the benefits guaranteed to the public employees qualifying under the plans is the fulfillment of the obligation of the people of the Commonwealth to those who have dedicated their professional careers to the service of the people of the Commonwealth.
The Public Employee Retirement Administration Commission is pleased to release this 2015 Annual Report reviewing the status of the Massachusetts’ public pension plans.

Since the publication of our last Annual Report we have had some changes in the composition of the Commission. Commissioners Liz Fontaine, the investment appointee of the Governor, John Langan, the gubernatorial representative and Gerry McDonough, the State Auditor’s designee have all moved on and we will miss their service and wise counsel. Their seats are now respectively occupied by Kathleen Fallon, Jennifer F. Sullivan, and Timothy Dooling.

We were very fortunate to have Liz, John, and Gerry’s services. Liz applied her vast knowledge of finance to the decisions of the Commission and made a lasting contribution to its success. Beyond this Liz displayed good humor, congeniality and a sunny disposition in her dealings with other Commissioners, staff and the public pension community. In addition, her rigorous analytical thought was appreciated by all of us on the Commission. John brought his skills as a labor negotiator to the difficult issues confronted by the Commission. In addition, his calm demeanor and reasoned approach contributed to ensuring that, in spite of disagreements on issues, the Commission's deliberations took place in a cooperative and friendly manner. As he continues his public service, these attributes will ensure that the citizens of Massachusetts are well served. Gerry’s decision to retire from public service and return to the practice of law is the Commonwealth’s loss and the private legal bar’s gain. During his tenure Gerry was a strong advocate for employees, particularly those in more modest positions. His extensive knowledge of Chapter 32, broad experience in government and eloquent arguments brought light to many of the difficult matters faced by the Commission in dealing with the complexities of our pension law. We will miss his advocacy and his wisdom but have no doubt he will achieve further success in his renewed career in the private practice of law.

These three individuals, as well as those who have served on the Commission in the past and those presently serving, exemplify the best in committed citizens willing to give of themselves for the betterment of the Commonwealth.

The Commission is very fortunate, however, to have three extremely talented, bright and capable people join us. Commissioner Kathleen Fallon is Practice Area Director responsible for the Human Resources Practice for Public Consulting Group. She also has an extensive background in working for the state and her state service includes working as an aide to Representative Ellen Story and in the Fiscal Affairs Division of the Executive Office of Administration and Finance. She already has made an impact on the Commission with her thoughtful questions and insights.

Commissioner Timothy Dooling is the Deputy Auditor and General Counsel in the Office of the State Auditor. Commissioner Dooling has a long record of service in government having been General Counsel and Deputy Director of Career Services in the Executive Office of Labor and Workforce Development, chief legal counsel and acting executive director of the Parole Board, assistant general Counsel for the Suffolk County Sherriff’s Department and an assistant district attorney in Essex.
County. His experience, expertise, and proven good judgment will be an asset to the Commission.

Jennifer Sullivan, Assistant Secretary for Capital Finance, Administration & Finance comes to the Commission with an impressive background of both public and private service. She began her career as an analyst with Administration and Finance before attending law school at the University of Michigan. After law school, her career alternated between the public and private sector as she worked for national law firms, including Ropes & Gray LLP and Edwards Wildman Palmer, and was Counsel to the Massachusetts Senate Committee on Ways and Means. Already, she has impressed her colleagues with her intellect and focus.

Both Commissioner McCarthy and Commissioner Machado bring extremely valuable institutional knowledge to the meetings along with their thoughtful questions.

The investment performance of the systems detailed in this Report generally tracked that of pension plans throughout the nation. Although in 2015 Massachusetts’ returns ranged from – 3.33% to 4.45%, most systems achieved returns between 1.03% and 1.75%. In spite of the lower returns driven by market conditions, long range performance with very few exceptions exceeded 7.50% and, for more than a quarter of the systems was above 9.00%.

The last year has seen a continued focus on the state of public pension systems across the nation. It needs to be stressed once again that Massachusetts has taken a markedly different approach than many other jurisdictions. Our legislature has wisely put into place a statutory structure that calls for close oversight of public pension systems and the Commonwealth as well as its cities, towns and municipalities are diligent in funding the pension system. Structural reforms enacted several years ago should begin to impact our fiscal condition as the demographics of the work force change. Governance reforms have led to Board members having a more detailed knowledge of their role and incorporated enhanced transparency and best practices into management. In addition, aggressive action by the PERAC Actuary in revising investment assumptions and updating mortality tables to trend with industry practices, while in the near term seeming to exacerbate funding problems will, in the long run, lead to a sound and sustainable pension system.

As always, the Commission and staff will use our best efforts to assist the retirement boards in safeguarding the interests of system members and beneficiaries.

Sincerely,

Philip Y. Brown
Chairman
The Commission and staff are pleased to release this Annual Report on the Massachusetts Public Retirement Systems for 2015, a year in which despite flat capital markets progress was made in adjusting to governance reforms, increasing transparency and updating actuarial assumptions. In the latter area retirement boards have adopted more conservative investment assumptions, updated mortality tables and addressed new accounting standards and, as a result, stand well positioned for meeting the fiscal challenges ahead.

As we went to press with the 2014 Annual Report the threat of weakened statutory provisions related to board governance, transparency and best practices was embodied in outside sections contained in the FY 2015 Budget adopted by the Legislature. It was my belief at the time and it remains my belief that these proposed changes were animated by the fact that undue influence on board decisions has been reduced by Chapter 176.

One of those recommendations which would have effectively eliminated the need for due diligence in the majority of private equity and real estate procurements was fortunately vetoed by Governor Baker “...because it authorizes the state's many retirement systems to engage in follow-on investments without the protection afforded by up-to-date due diligence”. That veto was not overridden and the reforms, at least in regard to this issue, remain intact. However, the other measure that extended the period in which a search must be undertaken from five to seven years is now law. Unfortunately that action limits competition for retirement board business.

There is no question that a segment of the pension community is frustrated by the reform of the Massachusetts marketplace. We will remain vigilant and strongly urge all of those who have the best interests of members, retirees and taxpayers in mind to join us in resisting efforts to further weaken reform.

COMMISSION/STAFF CHANGES

Chairman Brown has reviewed the comings and goings of Commission members over the course of the last year. On behalf of the staff I would like to express our thanks to, and our admiration for, former Commissioners Gerry McDonough, John Langan and Liz Fontaine. Each of these individuals through their good nature, enthusiasm and expertise inspired us to our best efforts and contributed to PERAC being a pleasant place to work.

Similarly, in the relatively short time that Commissioners Kathleen Fallon, Jennifer Sullivan and Timothy Dooling have served, we all sense their dedication, interest and good will. In combination with "old hands" Chairman Brown and Commissioners Robert McCarthy, James Machado, and Kate Fitzpatrick, the Commission is well positioned for continued success.

Staff changes also took place during the year. Caryn Shea joined PERAC in the role of Chief Auditor in the wake of Harry Chadwick’s decision to return to Western Massachusetts as a Field Auditor. Caryn has extensive auditing experience and worked her way up from Field Auditor to Quality Assurance Manager in the Office of the State Auditor. In addition she is familiar to the public pension community having served on the Shrewsbury Retirement Board since 1996. Scott Henderson was appointed as Deputy Chief Auditor. It is hard to believe but Scott, a favorite of Board administrators, has been with PERAC for nearly twenty years, first, in the Actuarial Unit and, more recently, in the Audit Unit. Scott assumes the position vacated by the retirement of Jim Tivnan.
Vacant positions in the Audit Unit were also filled with the hiring of Amy Chow, George Nsia, and Kevin McCarthy. Amy is an attorney with previous experience as an investigator for the MCAD as well as in financial accounting. She is in the process of becoming a CPA. George holds a Master’s Degree in Financial Economics and has over seventeen years of Accounting and Auditing experience. Most recently George worked as a staff auditor with a private sector audit firm. Kevin has served as the Chief Financial Officer of the City of Boston Credit Union, University Credit Union and Tremont Credit Union. He is a CPA with over twenty five years of experience in public accounting and private industry.

Another excellent addition to PERAC staff is Samantha MacMillan, Actuarial Analyst. Samantha is a graduate of Nichols College with a degree in Mathematics and is taking the actuarial examinations in order to become an Enrolled Actuary.

**FEE REPORT**

PERAC published the first in the nation compilation of the fees paid by the pension systems to investment vendors. The report consisted of the Schedule 7 filed by each Board as part of its Annual Statement of Financial Condition. According to these submissions (some of which were incomplete) local systems paid $150,635,711.00 to investment service providers in 2014. The Report also stressed that Schedule 7 fees represented one source of cost to Boards but that other compensation in the form of “carried interest” paid to general partners, “deferred load” payments in the mutual fund context, catch up fees and other costs such as Legal Expenses and Fiduciary Insurance impact the return on investment.

The level of cost in and of itself is neither a positive or negative but must be assessed in the context of returns as performance may justify cost.

We intend to make publication of this data an annual event.

It should also be emphasized that retirement boards must conduct their own analysis of the fees paid or expected to be paid in connection with investment activities. Over the last few years our analysis has found that service providers often are unclear about not only the costs to the system but also the manner in which payment is made. Some arrangements include a payment directly from the Board as well as a reduction of the value of the Board account. The latter, at least in one instance, has been misleadingly identified as a “rebate”.

PERAC published the first in the nation compilation of the fees paid by the pension systems to investment vendors.
PERAC held its Eleventh Emerging Issues Forum at the College of the Holy Cross in September 2015. Over 260 people participated and board members attending received three educational credits. The keynote address by Treasurer Deborah Goldberg underscored her commitment to the public pension community. The Treasurer was well received as she mingled with attendees following her remarks.

Glenn Doggett of the Chartered Financial Analyst (CFA) Institute kicked off the presentations with a discussion entitled “Alignment Principles from Trustee to Manager”. Mr. Doggett stressed the importance of ethics and subscribing to a code of standards as Board members but also the duty of the Board to insist that investment vendors follow those standards. Evan Tylenda of the Sustainability Accounting Standards Board (SASB) addressed the topic of “Sustainable Investing: Investing for the Greater Good”.

Following that session a panel discussion of OPEB chaired by PERAC Commissioner and Needham Town Manager Kate Fitzpatrick took place. Scott McIntire of Melanson Heath used his presentation "The Auditor’s Experience: The Real Impact of Governmental Accounting Standards Board (GASB) 74 & 75" to highlight changes resulting from those pronouncements and how Boards should deal with these issues. Daniel Rhodes of the Segal Company provided the attendees with an actuary’s perspective with “How Working With The Actuary Can Help Municipalities Make Progress Toward Funding OPEB”. His remarks noted that GASB 74 & 75 do not address funding which is a local policy decision. He reviewed funding examples and the world before and after GASB’s action. Paul Todisco of PRIM explained the operation of the State Retirees Benefits Trust and the investing options available to Boards in managing funds set aside for future costs. Following lunch a session on Media/Crisis Relations, “How to React and Respond!” with Joe Shortsleeve of the Liberty Group and Ashley McCown of Solomon, McCown & Company outlined the do’s and don’ts of media relations particularly when the topic is bad news. The examples provided and the insights offered made this a highlight of the day. The Forum concluded with PERAC Communications Director Natacha Dunker and a sneak preview of PERAC’s new website. Natacha’s hands on instruction was well received and ensured a warm reception for the new website.

A word must be said about the participation of the board members and others at the Forum. In particular Board Member Kenneth Hartwell of Andover made a lasting impact on PERAC Commissioners, staff, Board members and presenters. His brief questions and extensive commentary stood out and made for an unforgettable event.
WEB SITE/COMMUNICATIONS

As referenced at the Emerging Issues Forum, last fall we completed the transition to the new website now located at the Mass.gov portal. The new website makes information easier to locate, uses up-to-date technology, and enables us to continuously update its content. One of the most gratifying aspects of working this through was the enthusiastic response of retirement board members and staff to our request for comments as to how best to organize the site. That input is reflected in the final product.

It is hoped that as we go forward the website will be a platform for the dissemination of new and current information. With that in mind if you have suggestions or comments, please contact the Communications Unit at nadunker@per.state.ma.us.

Following close behind the upgrade of our Website, during this past year the Commission embarked on an ambitious IT overhaul of its current systems. Through a competitive process the Commission selected a Massachusetts firm, Collaborative Consulting to achieve our goal of improving the system’s capabilities and creating more efficient business processes for both PERAC and our Stakeholders though the use of self-service portals, electronic signatures and a centralized database. Although the timetable for completion has not been finalized as we go to print, we firmly believe that following a reasonable learning curve period a dramatic simplification of our interaction with board administrators, board members, and vendors will be achieved.

REGULATIONS

The long process of revising PERAC regulations pertaining to disability and retirement board elections was completed with the publication of the regulations in the Code of Massachusetts Regulations on March 11, 2016. Because of the unique nature of the PERAC regulation process it took more than eighteen months between the commencement of that process and the publication.

Disability changes focused on the clarification of medical panel reports and attendance at those panels. Also, the disability regulations make it clear that all voting members of a board must sign each disability transmittal sent to PERAC. Failure to do so will result in remand. In the area of 91A filings PERAC may now waive the annual filing of earnings for a retiree on disability for twenty or more years who has not reported any earnings for ten years.

Election changes pertained to clarifying the voting rights of inactive members, definitions, and eligibility to serve among other issues.

CONCLUSION

Although investment returns in 2015 again generally mirrored the markets and the experience of the retirement boards around the country, returns for 2015 were well below the actuarial assumptions. However long term returns remained in general above assumptions and as assumptions are being reduced we are better positioned for the future.

Unfortunately, as noted above, we do not operate in a vacuum. Action or inaction by unrelated pension funds can generate criticism of all public pension funds. Trends elsewhere are misinterpreted and applied to the unique circumstances of Massachusetts. Nonetheless we must re dedicate ourselves to meeting the challenges ahead and ensuring that the interests of system members and their beneficiaries as well as the taxpayers are paramount. It is that goal which unites us all, the regulator and the regulated, as we move forward.

Sincerely,

Joeoph E. Connarton
Executive Director
INTRODUCTION

The Board Profile section of the PERAC Annual Report provides a detailed assessment of some of the important indicators relative to the financial health of the retirement systems. The information provided in this report can enable board members to provide factual comment and advice to policymakers as various proposals relative to the retirement law are assessed. Through this and other studies, the Commission seeks to provide objective, comprehensive, and accurate data for use by all interested parties.

A WORD ON PORTFOLIO VALUATIONS

In assessing investment performance, PERAC relies on the retirement boards to submit accurate and complete information about investment activity. PERAC numbers might differ from those provided to a board by its consultant because PERAC measures all assets, including monies not committed to investment management.

Asset allocation is presented in graph form. The way a board allocates its assets among the various investment classes available to it has long been recognized as the prime determining factor in the generation of returns. Allocation information reported by the investment consultants advising the retirement boards or PRIM forms the basis of these graphs. PERAC has not independently confirmed the accuracy of this data.

ACTUARIAL

As always, actuarial information details the fiscal condition of the systems, which can play a direct role in state and local budgets. The funded ratio indicates the extent to which assets cover system liabilities. When the system will pay off its unfunded liability and what type of funding technique is being used are also noted. PERAC has consistently urged boards to conduct actuarial valuations in order to provide an up-to-date assessment of the fiscal condition of the system.

The Funding Schedule item reflects the amortization schedule for the Unfunded Actuarial Liability (UAL). For example, 1.5% increasing with a year fully funded of 2030 means the UAL is being amortized on a 1.5% annually increasing basis to FY30.

A number of systems utilize phase-in schedules in which payments increase more rapidly over the first few years of the schedule than later in the schedule. We reflect those schedules using the ultimate amortization schedule and note there is a phase-in. For example, “4.0% Increasing Phase-in”
with a year fully funded of 2035 means the total appropriation increases by a certain percent per year for a period of time and then the remaining unfunded liability is amortized on a 4.0% annual increasing basis until FY35. Seventeen systems currently use a phase-in approach and both the percentage increase and number of years before the amortization begins vary. Schedules described as “Total Increasing” mean the annual appropriation increases by the amount indicated, which may vary, for the entire schedule. Fifty-one systems have such a schedule. In total, about three-quarter of systems utilize a phase-in and/or total increasing schedule.

PERAC approved 40 revised funding schedules and completed 24 actuarial valuations in 2015. The valuations complemented the 24 valuations performed by private actuaries. The Actuarial Unit also completed the annual actuarial valuation of the Commonwealth’s pension liability. Throughout the year, PERAC responded to legislative and gubernatorial requests for analysis of legislation and made presentations at several forums.

The Massachusetts Investment Return Assumptions from 2003 to present is illustrated below.

**MEDICAL PANELS/POST RETIREMENT EARNINGS**

In addition to the information detailed in the Profiles, PERAC, as always, has been busy assisting the boards in other areas. In 2015, 648 medical panel requests were processed and 1,398 comprehensive medical evaluations were conducted. This led to the approval of 543 disability applications and 66 accidental death claims. 28 medical re-examinations of disability retirees took place.

Such medical evaluations and examination resulted in 2 members returning to work saving the systems $64,445.00.

PERAC is responsible for the post-retirement monitoring of disabled retirees. One aspect of that task is enforcing the earnings limits set forth in Chapter 32. In 2015, PERAC analyzed 15,887 earnings reports, 3,945 retirees reported earnings and 146 earned in excess of the statutory limits. An additional 84 retirees failed to comply with the reporting requirement. This resulted in the identification of $1,459,550.00 in excess earnings and $2,176,174.00 for non-compliance. In addition 36 retirees waived their allowance saving $556,935.00.

One members’ retirement benefit was modified under the Commission’s Modification Policy in 2015. This review to date has resulted in the modification of 15 member retirement allowances. Savings due to that action total $328,025.00 annually.

**AUDITS**

In 2015 PERAC published 22 audits of retirement systems. In addition, 6 follow-up audits were issued. In the last few years the Commission has awarded Certificates of Achievement to those systems found by our auditors to be operating in an exemplary fashion. In 2015 we issued 8 Certificates of Achievement. As always, PERAC audit staff conducted annual seminars on the preparation of the Annual Statement.
INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)

- **2015 Return**: 0%
- **2015 Market Value**: $0 M
- **2011-2015 (Annualized)**: 0%
- **1985-2015 (Annualized)**: 0%

COMPOSITE INVESTMENT PROFILE
- Commonwealth of Massachusetts
- Public Employee Retirement Systems and Pension Reserves Investment Trust

INVESTMENT

- **2015 Return**: .91%
- **2015 Market Value**: $72.7 B
- **2011-2015 (Annualized)**: 7.49%
- **1985-2015 (Annualized)**: 9.14%
**ACTUARIAL FUNDED RATIO (1987-2015)**

- **Funded Ratio**
- **Date of Last Valuation**
- **Actuary**
- **Assumed Rate of Return**
- **Funding Schedule**
- **Year Fully Funded**
- **Unfunded Liability**
- **Total Pension Appropriation (Fiscal 2016)**

**INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)**

- **2015 Return**
- **2015 Market Value**
- **2011-2015 (Annualized)**
- **1985-2015 (Annualized)**

**ASSET ALLOCATION (12/31/15)**

- **DOMESTIC EQUITY 50.9%**
- **CASH/OVERLAY 33.0%**
- **INT’L EQUITY 5.8%**
- **FIXED INCOME 10.3%**

**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

- **Number of Disability Retirees**
- **Number Who Reported Earnings**
- **Number of Excess Earners**
- **Total Amount of Refund Due**

**EARNED INCOME OF DISABILITY RETIrees (2014)**

- **2015 Return**
- **2015 Market Value**
- **2011-2015 (Annualized)**
- **1985-2015 (Annualized)**

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**Adams**

Town Hall
8 Park Street, 3rd Floor
Adams, MA 01220
Phone 413-743-5575
Fax 413-743-2815

**Board Members**
Bernard Pinsonnault (Chairperson), Mary Beverly, David Clark, Allen Mendel, Patricia Wol

**Board Administrator**
Cheryl J. DeMarsico
Board Meeting
Fourth Monday of each month at 4:00 pm

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**INVESTMENT RETURN HISTORY**

<table>
<thead>
<tr>
<th>Period</th>
<th>31 years 2015</th>
<th>30 years 2014</th>
<th>29 years 2013</th>
<th>10 years 2015</th>
<th>10 years 2014</th>
<th>10 years 2013</th>
<th>5 years 2015</th>
<th>5 years 2014</th>
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<tr>
<td></td>
<td>7.69%</td>
<td>8.08%</td>
<td>8.33%</td>
<td>4.04%</td>
<td>4.95%</td>
<td>5.63%</td>
<td>4.66%</td>
<td>7.27%</td>
<td>10.68%</td>
</tr>
</tbody>
</table>
### Actuarial

- **Funded Ratio:** 53.6%
- **Date of Last Valuation:** 01/14
- **Actuary:** Sherman Actuarial Services, LLC
- **Assumed Rate of Return:** 8.25%
- **Funding Schedule:** 4.0% Increasing
- **Year Fully Funded:** 2035
- **Unfunded Liability:** $37.6 M
- **Total Pension Appropriation (Fiscal 2016):** $3.5 M
- **Number of Members:**
  - **Active:** 252
  - **Retired:** 233
- **Total Payroll/Benefit:**
  - **Active:** $12.3 M
  - **Retired:** $4.6 M
- **Average Salary/Benefit:**
  - **Active:** $48,900
  - **Retired:** $19,900
- **Average Age:**
  - **Active:** NA
  - **Retired:** 73
- **Average Service:**
  - **Active:** NA
  - **Retired:** NA

### Asset Allocation (12/31/15)

- **Port. Comp. Strat.** 7.0%
- **Cash/Overlay** 0.9%
- **Total:** 100%
- **Global Equity** 42.3%
- **Fixed Income** 12.9%
- **Fixed VA/HY** 8.3%
- **Private Equity** 11.4%
- **Real Estate** 10.9%
- **Timber/Nat. Resources** 3.1%
- **Hedge Funds** 9.0%
- **Other** 0.0%

### Earned Income of Disability Retirees (2014)

- **Number of Disability Retirees:** 13
- **Number Who Reported Earnings:** 6
- **Number of Excess Earners:** 0
- **Total Amount of Refund Due:** $0

### Investment Return History

- **31 years 2015:** 7.92%
- **30 years 2014:** 8.15%
- **29 years 2013:** 8.15%
- **10 years 2015:** 5.47%
- **10 years 2014:** 6.09%
- **10 years 2013:** 6.33%
- **5 years 2015:** 7.46%
- **5 years 2014:** 9.97%
- **5 years 2013:** 11.84%

### Investment Return

- **2015 Return:** 1.12%
- **2015 Market Value:** $48.0 M
- **2011-2015 (Annualized):** 7.46%
- **1985-2015 (Annualized):** 7.92%
ACTUARIAL FUNDED RATIO (1987-2015)

INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)

10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)

INVESTMENT RETURN HISTORY

31 years 2015 8.29%
10 years 2015 5.06%
5 years 2015 7.59%

30 years 2014 8.53%
10 years 2014 5.61%
5 years 2014 10.08%

29 years 2013 8.54%
10 years 2013 5.42%
5 years 2013 11.96%

ASSET ALLOCATION (12/31/15)

PORT. COMP. STRAT. 1.0%
CASH/OVERLAY 0.9%
HEDGE FUNDS 9.0%
TIMBER/NAT. RESOURCES 3.1%
REAL ESTATE 10.9%
PRIVATE EQUITY 11.4%
FIXED VA/HY 8.3%
FIXED INCOME 12.9%
GLOBAL EQUITY 42.3%

EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees 33
- Number Who Reported Earnings 12
- Number of Excess Earners 0
- Total Amount of Refund Due 0

- 2015 Return 1.34%
- 2015 Market Value $115.6 M
- 2011-2015 (Annualized) 7.59%
- 1985-2015 (Annualized) 8.29%
**ACTUARIAL**

- Funded Ratio: 50.9%
- Date of Last Valuation: 01/15
- Actuary: Stone Consulting
- Assumed Rate of Return: 7.50%
- Funding Schedule: 5.5% Total Increasing
- Year Fully Funded: 2033
- Unfunded Liability: $125.3 M
- Total Pension Appropriation (Fiscal 2016): $10.5 M

**INVESTMENT RETURN HISTORY**

- 31 years 2015: 8.32%
- 30 years 2014: 8.56%
- 29 years 2013: 8.57%
- 10 years 2015: 4.45%
- 10 years 2014: 4.87%
- 10 years 2013: 5.22%
- 5 years 2015: 7.54%
- 5 years 2014: 9.92%
- 5 years 2013: 11.23%

**ASSET ALLOCATION (12/31/15)**

- **GLOBAL EQUITY** 39.6%
- **REAL ESTATE** 10.2%
- **PRIVATE EQUITY** 13.3%
- **HEDGE FUNDS** 8.5%
- **PRIVATE/REAL ESTATE** 7.8%
- **CASH/OVERLAY** 4.7%
- **PORT. COMP. STRATEGIES** 0.9%
- **TIMBER/NAT. RESOURCES** 2.9%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees: 78
- Number Who Reported Earnings: 17
- Number of Excess Earners: 1
- Total Amount of Refund Due: $4,277.05

**EARNED INCOME**

- 2015 Return: 1.39%
- 2015 Market Value: $132.9 M
- 2011-2015 (Annualized): 7.54%
- 1985-2015 (Annualized): 8.32%
ACTUARIAL FUNDED RATIO (1987-2015)

Investment Return (2011-2015, 5 Year and 31 Year Averages)

10-Year History of Appropriations (in Thousands)

Investment Return History

EARNED INCOME OF DISABILITY RETIREES (2014)
ACTUARIAL FUNDED RATIO (1987-2015)

INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)

10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)

INVESTMENT RETURN HISTORY

31 years 2015  7.39%
30 years 2014  7.60%
29 years 2013  7.58%
10 years 2015  5.41%
10 years 2014  6.00%
10 years 2013  6.32%
5 years 2015  7.62%
5 years 2014  10.12%
5 years 2013  11.79%

ASSET ALLOCATION (12/31/15)

CASH/OVERLAY 1.0%
PORT. COMP. STRATEGY 1.0%
HEDGE FUNDS 9.0%
TIMBER/NAT. RESOURCES 3.1%
REAL ESTATE 11.5%
PRIVATE EQUITY 11.3%
FIXED VA/HY 8.2%
FIXED INCOME 12.8%
GLOBAL EQUITY 42.1%

EARNED INCOME OF DISABILITY RETIREES (2014)

Number of Disability Retirees  328
Number Who Reported Earnings  120
Number of Excess Earners  3
Total Amount of Refund Due  $35,483.40

2015 Return  1.23%
2015 Market Value  $869.9 M
2011-2015 (Annualized)  7.62%
1985-2015 (Annualized)  7.39%
**ACTUARIAL**

- **Funded Ratio**: 51.2%
- **Date of Last Valuation**: 01/14
- **Actuary**: The Segal Company
- **Assumed Rate of Return**: 7.75%
- **Funding Schedule**: 6.97% Total Increasing
- **Year Fully Funded**: 2027
- **Unfunded Liability**: $73.7 M
- **Total Pension Appropriation (Fiscal 2016)**: $7.9 M

**ASSET ALLOCATION (12/31/15)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM/REAL ASSETS</td>
<td>7.0%</td>
</tr>
<tr>
<td>CASH/OVERLAY</td>
<td>1.4%</td>
</tr>
<tr>
<td>HEDGE FUNDS</td>
<td>8.8%</td>
</tr>
<tr>
<td>FIXED INCOME</td>
<td>19.4%</td>
</tr>
<tr>
<td>DOMESTIC EQUITY</td>
<td>32.4%</td>
</tr>
<tr>
<td>REAL ESTATE</td>
<td>11.6%</td>
</tr>
<tr>
<td>PRIVATE EQUITY</td>
<td>6.0%</td>
</tr>
<tr>
<td>ASSET ALLOC./BALANCED</td>
<td>2.3%</td>
</tr>
<tr>
<td>INT’L EQUITY</td>
<td>11.1%</td>
</tr>
</tbody>
</table>

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- **Number of Disability Retirees**: 38
- **Number Who Reported Earnings**: 12
- **Number of Excess Earners**: 0
- **Total Amount of Refund Due**: 50

**2015 Return**: 1.32%
**2015 Market Value**: $84.9 M
**2011-2015 (Annualized)**: 7.95%
**1985-2015 (Annualized)**: 9.35%
ACTUARIAL FUNDED RATIO (1987-2015)

INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)

10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)

INVESTMENT RETURN HISTORY

31 years 2015 8.95%
10 years 2015 5.90%
5 years 2015 7.50%

30 years 2014 9.22%
10 years 2014 7.04%
5 years 2014 9.97%

29 years 2013 9.25%
10 years 2013 7.61%
5 years 2013 11.85%

8.95%
9.22%
9.97%
11.85%

Funded Ratio
Date of Last Valuation
Actuary
Assumed Rate of Return
Funding Schedule
Year Fully Funded
Unfunded Liability
Total Pension Appropriation (Fiscal 2016)
Total Payroll/Benefit
Average Salary/Benefit
Average Age
Average Service

PERAC (2015-2016)
82.2%
01/15
PERAC
7.60%
4.7% Total Increasing
2025
$40.5 M
$8.5 M

ACTIVE
RETIRED
Number of Members
1,134
728
Total Payroll/Benefit
$42.3 M
$11.2 M
Average Salary/Benefit
$37,300
$15,400
Average Age
50
74
Average Service
11.6 years
NA

ASSET ALLOCATION (12/31/15)

<table>
<thead>
<tr>
<th>Port. Comp. Strat.</th>
<th>Cash/Overlay</th>
<th>Hedge Funds</th>
<th>Global Equity</th>
<th>Timber/Nat. Resources</th>
<th>Real Estate</th>
<th>Private Equity</th>
</tr>
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<tbody>
<tr>
<td>1.0%</td>
<td>0.9%</td>
<td>1.0%</td>
<td>42.3%</td>
<td>9.0%</td>
<td>10.9%</td>
<td>11.4%</td>
</tr>
<tr>
<td>TIMBER/NAT. RESOURCES 3.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REAL ESTATE 10.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRIVATE EQUITY 11.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIXED INCOME 12.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIXED VA/HY 8.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CASH/OVERLAY 0.9%</td>
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</tr>
</tbody>
</table>

EARNED INCOME OF DISABILITY RETIREEES (2014)

- Number of Disability Retirees: 26
- Number Who Reported Earnings: 5
- Number of Excess Earners: 0
- Total Amount of Refund Due: 0

- 2015 Return: 1.17%
- 2015 Market Value: $194.3 M
- 2011-2015 (Annually): 7.50%
- 1985-2015 (Annually): 8.95%
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FUNDDED RATIO (1987-2015)

INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)

10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)

INVESTMENT RETURN HISTORY

<table>
<thead>
<tr>
<th>31 years 2015</th>
<th>30 years 2014</th>
<th>29 years 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.50%</td>
<td>8.76%</td>
<td>8.78%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10 years 2015</th>
<th>10 years 2014</th>
<th>10 years 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.86%</td>
<td>5.38%</td>
<td>5.86%</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>5 years 2015</th>
<th>5 years 2014</th>
<th>5 years 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.70%</td>
<td>10.23%</td>
<td>12.11%</td>
</tr>
</tbody>
</table>

ASSET ALLOCATION (12/31/15)

EARNED INCOME OF DISABILITY RETIREES (2014)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.16%</td>
<td>$99.2 M</td>
<td>7.70%</td>
<td>8.50%</td>
</tr>
</tbody>
</table>

Investment Return (2011-2015, 5 Year and 31 Year Averages)

10-Year History of Appropriations (in Thousands)

INVESTMENT RETURN HISTORY

<table>
<thead>
<tr>
<th>Period</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 years 2015</td>
<td>8.61%</td>
</tr>
<tr>
<td>10 years 2015</td>
<td>5.99%</td>
</tr>
<tr>
<td>5 years 2015</td>
<td>7.55%</td>
</tr>
</tbody>
</table>

ErAEd INCOME OF DISABILITY RETIREES (2014)

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Disability Retirees</td>
<td>0</td>
</tr>
<tr>
<td>Number Who Reported Earnings</td>
<td>0</td>
</tr>
<tr>
<td>Number of Excess Earners</td>
<td>0</td>
</tr>
<tr>
<td>Total Amount of Refund Due</td>
<td>$0</td>
</tr>
</tbody>
</table>

2015 Return | 1.16%
2015 Market Value | $9.6 M
2011-2015 (Annualized) | 7.55%
1985-2015 (Annualized) | 8.61%
**ACTUARIAL INVESTMENT RETURN HISTORY**

- Funded Ratio: 70.2%
- Date of Last Valuation: 01/14
- Actuary: The Segal Company
- Assumed Rate of Return: 7.75%
- Funding Schedule: 7.75% Total Increasing
- Year Fully Funded: 2025
- Unfunded Liability: $1.7 B
- Total Pension Appropriation (Fiscal 2016): $218.8 M

**ACTIVE**
- Number of Members: 14,235
- Total Payroll/Benefit: $869.0 M
- Average Salary/Benefit: $61,000
- Average Age: 46
- Average Service: 14.7 years

**RETIRED**
- Number of Members: 9,925
- Total Payroll/Benefit: $299.1 M
- Average Salary/Benefit: $30,100
- Average Age: 74
- Average Service: NA

**INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)**

- 10-year History of Appropriations (in Millions)

**10-YEAR HISTORY OF APPROPRIATIONS (IN MILLIONS)**

- FY10: $0
- FY11: $150
- FY12: $200
- FY13: $225
- FY14: $250
- FY15: $250
- FY16: $250

**INVESTMENT RETURN HISTORY**

- 31 years 2015: 8.82%
- 10 years 2015: 5.96%
- 5 years 2015: 6.40%
- 30 years 2014: 9.17%
- 10 years 2014: 6.95%
- 5 years 2014: 9.39%
- 29 years 2013: 9.32%
- 10 years 2013: 7.65%
- 5 years 2013: 12.30%

**2015 Return**

- -1.13%

**2015 Market Value**

- $4.1 B

**2011-2015 (Annualized)**

- 6.40%

**1985-2015 (Annualized)**

- 8.82%

*See Notes on Boston (Teachers) board profile page.*
**Notes — Boston (City) & Boston Teachers**

In this report we have separated the results for Boston Teachers and non-teachers (City). The liability for Boston Teachers has always been the responsibility of the Commonwealth. In 2010, legislation was enacted that allocated assets to Boston Teachers and separate accounts have been maintained since that date. The actuarial information for the City now solely reflects liability that is the responsibility of the City. The Funded Ratio and History of Appropriations charts for the City reflect information available since this allocation. Please note the following when reviewing the charts on these pages:

- Boston Teachers’ assets prior to 2010 were estimated as approximately 30% of Boston (System) total assets.
- The information with respect to Disability Retirees on the City Board Profile page reflects the entire system, including Boston Teachers.
- The information with respect to Investment Return History for the City reflects actual returns for Boston (City) for 2011-2015 and total returns for the Boston System prior to 2011.

**Actuarial**

- Funded Ratio: 40.5%
- Date of Last Valuation: 01/15
- Actuary: PERAC
- Assumed Rate of Return: 7.75%
- Funding Schedule: Varies Total Increasing
- Year Fully Funded: 2036
- Unfunded Liability: $2.1 M
- Total Pension Appropriation (Fiscal 2016): $120.4 M
- Number of Members: 
  - ACTIVE: 6,145
  - RETIRED: 4,488
- Total Payroll/Benefit: 
  - ACTIVE: $506.0 M
  - RETIRED: $220.4 M
- Average Salary/Benefit: 
  - ACTIVE: $82,300
  - RETIRED: $49,100
- Average Age: 
  - ACTIVE: 43
  - RETIRED: 72
- Average Service: 
  - ACTIVE: 12.3 years
  - RETIRED: NA

**Asset Allocation (12/31/15)**

- **Global Equity**: 42.3%
- **Fixed Income**: 12.9%
- **Fixed VA/HY**: 8.3%
- **Real Estate**: 10.9%
- **Private Equity**: 11.4%
- **Hedge Funds**: 9.0%
- **Cash/Overlay**: 0.9%
- **Timber/Nat. Resources**: 3.1%
- **Port. Comp. Strat.**: 1.0%
- **CASH/OVERLAY**: 0.9%

**Investment Return (2011-2015, 5 Year Averages)**

- 2015 Return: 1.21%
- 2015 Market Value: $1.5 B
- 2011-2015 (Annualized): 7.48%
**Funded Ratio (1987-2015)**

- **Date of Last Valuation**: 01/14
- **Actuary**: KMS Actuaries
- **Assumed Rate of Return**: 7.75%
- **Funding Schedule**: 4.5% Increasing Phase-in
- **Year Fully Funded**: 2033
- **Unfunded Liability**: $82.9 M
- **Total Pension Appropriation (Fiscal 2016)**: $8.8 M

**INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)**

- **2015 Return**: -1.06%
- **2015 Market Value**: $167.2 M
- **2011-2015 (Annualized)**: 6.26%
- **1985-2015 (Annualized)**: 8.56%

**ASSET ALLOCATION (12/31/15)**

- **Cash/Overlay**: 0.2%
- **Domestic Equity**: 24.9%
- **International Equity**: 18.9%
- **Real Estate**: 6.8%
- **Private Equity**: 0.7%
- **Fixed Income**: 25.9%
- **Fixed Va/Hy**: 2.2%
- **Hedge Funds**: 5.0%

**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

**Board Members**
- Gerald J. Kenny, Jr. (Chairperson),
- Roy W. Bjorlin, Phyllis DiPalma,
- Peter J. Morin, Edward J. Spellman, Jr.

**Board Administrator**
- Jeanne Martineau

**Board Meeting**
- Fourth Wednesday of each month

**NUMBER OF DISABILITY RETIREES (2014)**

- **Number of Disability Retirees**: 59
- **Number Who Reported Earnings**: 13
- **Number of Excess Earners**: 0
- **Total Amount of Refund Due**: $0

**INVESTMENT RETURN HISTORY**

- **31 years 2015**: 8.56%
- **30 years 2014**: 8.89%
- **29 years 2013**: 9.00%
- **10 years 2015**: 5.81%
- **10 years 2014**: 6.57%
- **10 years 2013**: 7.25%
- **5 years 2015**: 6.26%
- **5 years 2014**: 8.81%
- **5 years 2013**: 11.68%
**ACTUARIAL**

- **Funded Ratio**: 61.4%
- **Date of Last Valuation**: 01/14
- **Actuary**: Sherman Actuarial Services, LLC
- **Assumed Rate of Return**: 8.00%
- **Funding Schedule**: 4.5% Increasing Phase-in
- **Year Fully Funded**: 2029
- **Unfunded Liability**: $324.2 M
- **Total Pension Appropriation (Fiscal 2016)**: $33.8 M

- **Number of Members**: 3,119
- **Total Payroll/Benefit**: $141.9 M
- **Average Salary/Benefit**: $45,500
- **Average Age**: 72
- **Average Service**: NA

**ASSET ALLOCATION (12/31/15)**

- **REAL ESTATE**: 2.7%
- **PRIVATE EQUITY**: 4.7%
- **DOMESTIC EQUITY**: 38.4%
- **HEDGE FUNDS**: 6.3%
- **DOMESTIC**: 22.1%
- **CASH/OVERLAY**: 1.8%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- **Number of Disability Retirees**: 233
- **Number Who Reported Earnings**: 68
- **Number of Excess Earners**: 4
- **Total Amount of Refund Due**: $32,835.97

- **2015 Return**: .40%
- **2015 Market Value**: $571.5 M
- **2011-2015 (Annualized)**: 7.38%
- **1985-2015 (Annualized)**: 8.83%
ACTUARIAL FUNDED RATIO (1987-2015)

INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)

10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)

INVESTMENT RETURN HISTORY

ASSET ALLOCATION (12/31/15)

EARNED INCOME OF DISABILITY RETIREES (2014)
**ACTUARIAL**

- Funded Ratio: 55.7%
- Date of Last Valuation: 01/14
- Actuary: The Segal Company
- Assumed Rate of Return: 7.60%
- Funding Schedule: 5.5% Total Increasing
- Year Fully Funded: 2030
- Unfunded Liability: $192.6 M
- Total Pension Appropriation (Fiscal 2016): $19.2 M

**ASSET ALLOCATION (12/31/15)**

- FIXED INCOME 16.3%
- PRIVATE EQUITY 5.4%
- REAL ESTATE 7.5%
- HEDGE FUNDS 7.3%

**INVESTMENT RETURN HISTORY**

<table>
<thead>
<tr>
<th></th>
<th>31 years 2015</th>
<th>30 years 2014</th>
<th>29 years 2013</th>
<th>10 years 2015</th>
<th>10 years 2014</th>
<th>5 years 2015</th>
<th>5 years 2014</th>
<th>5 years 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.59%</td>
<td>8.84%</td>
<td>8.90%</td>
<td>5.13%</td>
<td>5.78%</td>
<td>6.02%</td>
<td>8.52%</td>
<td>11.57%</td>
</tr>
</tbody>
</table>

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees: 150
- Number Who Reported Earnings: 37
- Number of Excess Earners: 1
- Total Amount of Refund Due: $1,787.81

- 2015 Return: 1.43%
- 2015 Market Value: $256.2 M
- 2011-2015 (Annualized): 6.02%
- 1985-2015 (Annualized): 8.59%
**ACTUARIAL**

- **Funded Ratio**: 79.1%
- **Date of Last Valuation**: 01/14
- **Actuary**: The Segal Company
- **Assumed Rate of Return**: 7.88%
- **Funding Schedule**: 5.85% Total Increasing
- **Year Fully Funded**: 2026
- **Unfunded Liability**: $250.2 M
- **Total Pension Appropriation (Fiscal 2016)**: $37.6 M

**INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)**

- **2015 Return**: -0.07%
- **2015 Market Value**: $1.1 B
- **2011-2015 (Annualized)**: 8.04%
- **1985-2015 (Annualized)**: 9.23%

**ASSET ALLOCATION (12/31/15)**

- **Domestic Equity**: 41.0%
- **International Equity**: 15.6%
- **Fixed Income**: 15.8%
- **Fixed VA/HY**: 5.0%
- **Private Equity**: 2.7%
- **Real Estate**: 10.4%
- **Hedge Funds**: 8.6%
- **Timber/Nat. Resources**: 0.7%
- **Cash Overlay**: 0.2%

**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

**INVESTMENT RETURN HISTORY**

- **31 years 2015**: 9.23%
- **30 years 2014**: 9.55%
- **29 years 2013**: 9.65%
- **10 years 2015**: 6.28%
- **10 years 2014**: 7.04%
- **10 years 2013**: 7.33%
- **5 years 2015**: 8.04%
- **5 years 2014**: 11.06%
- **5 years 2013**: 13.78%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- **Number of Disability Retirees**: 222
- **Number Who Reported Earnings**: 48
- **Number of Excess Earners**: 1
- **Total Amount of Refund Due**: $1,806.17

**Board Members**

Francis E. Murphy III (Chairperson),
Nadia Chamblin-Foster, Michael P. Gardner,
James H. Monagle, John W. Shinkwin

**Board Administrator**

Ellen K. Philbin

**Board Meeting**

First Monday of every month

---

**Board Members**

Francis E. Murphy III (Chairperson),
Nadia Chamblin-Foster, Michael P. Gardner,
James H. Monagle, John W. Shinkwin

**Board Administrator**

Ellen K. Philbin

**Board Meeting**

First Monday of every month
**ACTUARIAL**

- Funded Ratio: 58.9%
- Date of Last Valuation: 01/15
- Actuary: PERAC
- Assumed Rate of Return: 7.50%
- Funding Schedule: 5.7% Total Increasing
- Year Fully Funded: 2028
- Unfunded Liability: $82.1 M
- Total Pension Appropriation (Fiscal 2016): $10.4 M

**INVESTMENT RETURN HISTORY**

<table>
<thead>
<tr>
<th>Period</th>
<th>31 years 2015</th>
<th>30 years 2014</th>
<th>29 years 2013</th>
<th>10 years 2015</th>
<th>10 years 2014</th>
<th>5 years 2015</th>
<th>5 years 2014</th>
<th>5 years 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.87%</td>
<td>8.10%</td>
<td>8.10%</td>
<td>5.95%</td>
<td>6.90%</td>
<td>7.53%</td>
<td>10.01%</td>
<td>11.89%</td>
</tr>
</tbody>
</table>

**ASSET ALLOCATION (12/31/15)**

- Global Equity 42.3%
- Real Estate 10.9%
- Timber/Nat. Resources 3.1%
- Fixed Income 12.9%
- Fixed VA/HY 8.3%
- Private Equity 11.4%
- Hedge Funds 9.0%
- Cash/Overlay 0.9%
- Port. Comp. Strat. 1.0%
- CASH/OVERLAY 0.9%
- TIMBER/NAT. RESOURCES 3.1%
- REAL ESTATE 10.9%
- FIXED INCOME 12.9%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees: 77
- Number Who Reported Earnings: 17
- Number of Excess Earners: 0
- Total Amount of Refund Due: 0

- 2015 Return: 1.22%
- 2015 Market Value: $126.3 M
- 2011-2015 (Annualized): 7.53%
- 1985-2015 (Annualized): 7.87%
**ACTUARIAL FUNDED RATIO (1987-2015)**

- **Date of Last Valuation**: 01/15
- **Actuary**: Stone Consulting
- **Assumed Rate of Return**: 8.00%
- **Funding Schedule**: 2.5% Total Increasing
- **Year Fully Funded**: 2023
- **Unfunded Liability**: $90.2 M
- **Total Pension Appropriation (Fiscal 2016)**: $17.1 M

**INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)**

- **2015 Return**: .18%
- **2015 Market Value**: $252.4 M
- **2011-2015 (Annualized)**: 8.03%
- **1985-2015 (Annualized)**: 8.56%

**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

**ASSET ALLOCATION (12/31/15)**

- **DOMESTIC EQUITY 31.1%**
- **INT’L EQUITY 17.1%**
- **PRIVATE EQUITY 13.1%**
- **REAL ESTATE 12.2%**
- **FIXED INCOME 21.9%**
- **ASSET ALLOC./BALANCED 4.6%**

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- **Number of Disability Retirees**: 83
- **Number Who Reported Earnings**: 27
- **Number of Excess Earners**: 3
- **Total Amount of Refund Due**: $10,950.69

**INVESTMENT RETURN HISTORY**

- **31 years 2015**: 8.56%
- **10 years 2015**: 6.44%
- **5 years 2015**: 8.03%
- **30 years 2014**: 8.86%
- **10 years 2014**: 7.21%
- **5 years 2014**: 11.48%
- **29 years 2013**: 8.91%
- **10 years 2013**: 7.48%
- **5 years 2013**: 15.74%
**ACTUARIAL**

- **Funded Ratio**
- **Date of Last Valuation**
- **Actuary**
- **Assumed Rate of Return**
- **Funding Schedule**
- **Year Fully Funded**
- **Unfunded Liability**
- **Total Pension Appropriation (Fiscal 2016)**

**INVESTMENT RETURN HISTORY**

- **31 years 2015** 7.62%
- **30 years 2014** 7.83%
- **29 years 2013** 7.82%
- **10 years 2015** 5.01%
- **10 years 2014** 5.79%
- **10 years 2013** 6.39%
- **5 years 2015** 7.39%
- **5 years 2014** 9.75%
- **5 years 2013** 11.73%

**ASSET ALLOCATION (12/31/15)**

- **GLOBAL EQUITY 40.5%**
- **REAL ESTATE 15.1%**
- **PRIVATE EQUITY 11.0%**
- **FIXED VA/HY 7.7%**
- **FIXED INCOME 11.9%**
- **HEDGE FUNDS 8.4%**
- **CASH/OVERLAY 1.6%**
- **PORT. COMP. STRATEGY 0.9%**
- **TIMBER/NAT. RESOURCES 2.9%**

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- **Number of Disability Retirees** 11
- **Number Who Reported Earnings** 5
- **Number of Excess Earners** 0
- **Total Amount of Refund Due** 0

- **2015 Return** 1.52%
- **2015 Market Value** $40.1 M
- **2011-2015 (Annualized)** 7.39%
- **1985-2015 (Annualized)** 7.62%
**ACTUARIAL**

- Funded Ratio: 81.0%
- Date of Last Valuation: 01/15
- Actuary: Stone Consulting
- Assumed Rate of Return: 7.25%
- Funding Schedule: 2.0% Increasing
- Year Fully Funded: 2030
- Unfunded Liability: $29.7 M
- Total Pension Appropriation (Fiscal 2016): $4.5 M
- Number of Members: 513
- Total Payroll/Benefit: $29.3 M
- Average Salary/Benefit: $57,100
- Average Age: 50
- Average Service: 12.2 years

**ASSET ALLOCATION (12/31/15)**

- Global Equity: 50.7%
- Fixed Income: 25.7%
- Private Equity: 5.5%
- Real Estate: 9.1%
- Hedge Funds: 3.3%
- Cash/Overlay: 1.2%
- Timber/Nat. Resources: 1.1%
- Port. Comp. Strategy: 0.4%

**EARNED INCOME OF DISABILITY RETIREEE (2014)**

- Number of Disability Retirees: 24
- Number Who Reported Earnings: 7
- Number of Excess Earners: 0
- Total Amount of Refund Due: $0
- 2015 Return: .84%
- 2015 Market Value: $133.8 M
- 2011-2015 (Annualized): 8.17%
- 1985-2015 (Annualized): 8.57%
ACTUARIAL

- Funded Ratio: 55.5%
- Date of Last Valuation: 01/14
- Actuary: Stone Consulting
- Assumed Rate of Return: 8.00%
- Funding Schedule: 4.0% Increasing Phase-in
- Year Fully Funded: 2036
- Unfunded Liability: $72.2 M
- Total Pension Appropriation (Fiscal 2016): $5.8 M

ACTIVE

- Number of Members: 469
- Total Payroll/Benefit: $24.5 M
- Average Salary/Benefit: $52,200
- Average Age: 47
- Average Service: 12.4 years

RETIRED

- Number of Members: 397
- Total Payroll/Benefit: $9.7 M
- Average Salary/Benefit: $24,300
- Average Age: NA

ASSET ALLOCATION (12/31/15)

- CASH/OVERLAY 2.4%
- DOMESTIC EQUITY 36.9%
- FIXED INCOME 17.2%
- PRIVATE EQUITY 13.5%
- INT’L EQUITY 30.0%

EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees: 25
- Number Who Reported Earnings: 7
- Number of Excess Earners: 1
- Total Amount of Refund Due: $9,105.34

- 2015 Return: -1.49%
- 2015 Market Value: $95.8 M
- 2011-2015 (Annualized): 5.29%
- 1985-2015 (Annualized): 7.89%
### Funded Ratio (1987-2015)

- **2015 Return:** 0%
- **2015 Market Value:** $0 M
- **2011-2015 (Annualized):** 0%
- **1985-2015 (Annualized):** 0%

### Investment Return History

- **31 years 2015:** 9.47%
- **10 years 2015:** 5.99%
- **5 years 2015:** 7.62%
- **30 years 2014:** 9.76%
- **10 years 2014:** 7.14%
- **5 years 2014:** 10.17%
- **29 years 2013:** 9.82%
- **10 years 2013:** 7.74%
- **5 years 2013:** 12.06%

### Asset Allocation (12/31/15)

- **GLOBAL EQUITY:** 42.3%
- **REAL ESTATE:** 10.9%
- **TIMBER/NAT. RESOURCES:** 3.1%
- **HEDGE FUNDS:** 9.0%
- **PRIVATE EQUITY:** 11.4%
- **FIXED VA/HY:** 8.3%
- **FIXED INCOME:** 12.9%
- **CASH/OVERLAY:** 0.9%
- **PORT. COMP. STRAT.:** 1.0%

### Actuarial

- **Funded Ratio:** 80.2%
- **Date of Last Valuation:** 01/14
- **Actuary:** Sherman Actuarial Services, LLC
- **Assumed Rate of Return:** 8.00%
- **Funding Schedule:** 4.0% Increasing
- **Year Fully Funded:** 2024
- **Unfunded Liability:** $24.7 M
- **Total Pension Appropriation (Fiscal 2016):** $4.5 M

### Earned Income of Disability Retirees (2014)

- **Number of Disability Retirees:** 47
- **Number Who Reported Earnings:** 8
- **Number of Excess Earners:** 0
- **Total Amount of Refund Due:** $0

### Investment Return History

- **2015 Return:** 1.19%
- **2015 Market Value:** $109.3 M
- **2011-2015 (Annualized):** 7.62%
- **1985-2015 (Annualized):** 9.47%
ACTUARIAL FUNDED RATIO (1987-2015)

INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)

10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)

INVESTMENT RETURN HISTORY

EARNED INCOME OF DISABILITY RETIREES (2014)
**Easthampton**
199 Northampton Street, Front
Easthampton, MA 01027
Phone 413-203-1307
Fax 413-203-1308

**Board Members**
James P. Dunham (Chairperson),
Valerie J. Bernier, Donald C. Emerson,
Jane Sakiewicz, Cornelius E. Sullivan

**Board Administrator**
Tina Schneider

**Board Meeting**
Fourth Tuesday of each month

---

**ACTUARIAL**

- Funded Ratio
- Date of Last Valuation: 01/14
- Actuary: PERAC
- Assumed Rate of Return: 7.75%
- Funding Schedule: 5.0% Total Increasing
- Year Fully Funded: 2027
- Unfunded Liability: $16.8 M
- Total Pension Appropriation (Fiscal 2016): $2.6 M

- Number of Members: 223
- Total Payroll/Benefit: $9.3 M
- Average Salary/Benefit: $41,900
- Average Age: 48
- Average Service: 12.7 years

---

**ASSET ALLOCATION (12/31/15)**

- CASH/OVERLAY 0.9%
- PORT. COMP. STRAT. 1.0%
- TIMBER/NAT. RESOURCES 3.1%
- PRIVATE EQUITY 11.4%
- FIXED INCOME 12.9%
- GLOBAL EQUITY 42.3%
- FIXED VA/HY 8.3%

---

**INVESTMENT RETURN HISTORY**

<table>
<thead>
<tr>
<th>Period</th>
<th>31 years 2015</th>
<th>30 years 2014</th>
<th>29 years 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return</td>
<td>8.19%</td>
<td>8.43%</td>
<td>8.44%</td>
</tr>
<tr>
<td></td>
<td>5.92%</td>
<td>7.06%</td>
<td>7.68%</td>
</tr>
<tr>
<td></td>
<td>7.56%</td>
<td>10.06%</td>
<td>11.89%</td>
</tr>
</tbody>
</table>

---

**EARNED INCOME OF DISABILITY RETIREEES (2014)**

- Number of Disability Retirees: 18
- Number Who Reported Earnings: 6
- Number of Excess Earners: 0
- Total Amount of Refund Due: 0

- 2015 Return: 1.17%
- 2015 Market Value: $43.5 M
- 2011-2015 (Annualized): 7.56%
- 1985-2015 (Annualized): 8.19%
### Actuarial

- **Funded Ratio**: 48.4%
- **Date of Last Valuation**: 01/14
- **Actuary**: Stone Consulting, 8.00%
- **Assumed Rate of Return**: Varies Total Increasing, 2035
- **Funding Schedule**: $348.7 M
- **Year Fully Funded**: $28.4 M
- **Unfunded Liability**: 2015 Return: 1.75%
- **Total Pension Appropriation (Fiscal 2016)**: 2015 Market Value: $373.5 M
- **2011-2015 (Annualized)**: 7.84%
- **1985-2015 (Annualized)**: 8.70%

### Investment Return History

<table>
<thead>
<tr>
<th>Period</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>11-15</th>
<th>85-15</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015 Return</td>
<td>1.75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015 Market Value</td>
<td>$373.5 M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011-2015 (Annualized)</td>
<td>7.84%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1985-2015 (Annualized)</td>
<td>8.70%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Earnings Income of Disability Retirees (2014)

- **Number of Disability Retirees**: 116
- **Number Who Reported Earnings**: 37
- **Number of Excess Earners**: 3
- **Total Amount of Refund Due**: $10,851.88
- **2015 Return**: 1.75%
- **2015 Market Value**: $373.5 M
- **2011-2015 (Annualized)**: 7.84%
- **1985-2015 (Annualized)**: 8.70%
### ACTUARIAL

- **Funded Ratio**: 42.8%
- **Date of Last Valuation**: 01/14
- **Actuary**: PERAC
- **Assumed Rate of Return**: 7.75%
- **Funding Schedule**: 4.5% Total Increasing, 2029
- **Year Fully Funded**: $118.8 M
- **Unfunded Liability**: $13.6 M
- **Total Pension Appropriation (Fiscal 2016)**: $118.8 M
- **Number of Members**: 730
- **Total Payroll/Benefit**: $36.2 M
- **Average Salary/Benefit**: $49,500
- **Average Age**: 47
- **Average Service**: 11.0 years

### ASSET ALLOCATION (12/31/15)

- **GLOBAL EQUITY**: 42.3%
- **REAL ESTATE**: 10.9%
- **PRIVATE EQUITY**: 11.4%
- **HEDGE FUNDS**: 9.0%
- **PORT. COMP. STRAT.**: 1.0%
- **CASH/OVERLAY**: 0.9%
- **TIMBER/NAT. RESOURCES**: 3.1%
- **FIXED VA/HY**: 8.3%
- **FIXED INCOME**: 12.9%

### INVESTMENT RETURN HISTORY

<table>
<thead>
<tr>
<th>Time Period</th>
<th>31 years 2015</th>
<th>29 years 2013</th>
<th>10 years 2015</th>
<th>10 years 2013</th>
<th>5 years 2015</th>
<th>5 years 2013</th>
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</thead>
<tbody>
<tr>
<td>Return</td>
<td>8.37%</td>
<td>8.63%</td>
<td>6.96%</td>
<td>6.96%</td>
<td>6.63%</td>
<td>12.18%</td>
</tr>
</tbody>
</table>

### EARNED INCOME OF DISABILITY RETIREEES (2014)

- **Number of Disability Retirees**: 88
- **Number Who Reported Earnings**: 20
- **Number of Excess Earners**: 1
- **Total Amount of Refund Due**: $32,002.44

<table>
<thead>
<tr>
<th>Year</th>
<th>Return</th>
<th>Market Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>1.22%</td>
<td>$110.1 M</td>
</tr>
<tr>
<td>2011-15</td>
<td>7.63%</td>
<td></td>
</tr>
<tr>
<td>1985-2015</td>
<td>8.37%</td>
<td></td>
</tr>
</tbody>
</table>
**ACTUARIAL**

- Funded Ratio: 73.6%
- Date of Last Valuation: 01/14
- Actuary: PERAC
- Assumed Rate of Return: 7.75%
- Funding Schedule: 5.0% Total Increasing
- Year Fully Funded: 2025
- Unfunded Liability: $17.1 M
- Total Pension Appropriation (Fiscal 2016): $2.8 M

**ASSET ALLOCATION (12/31/15)**

- Global Equity: 42.3%
- Real Estate: 10.9%
- Fixed Income: 12.9%
- Timber/Nat. Resources: 3.1%
- Hedge Funds: 9.0%
- Port. Comp. Strat.: 1.0%
- Cash/Overlay: 0.9%
- Private Equity: 11.4%
- Fixed Va/Hy: 8.3%
- CASH/OVERLAY 0.9%

**PORTFOLIO PERFORMANCE**

- 31 years 2015: 9.26%
- 30 years 2014: 9.54%
- 29 years 2013: 9.58%
- 10 years 2015: 5.90%
- 10 years 2014: 7.05%
- 10 years 2013: 7.64%
- 5 years 2015: 7.59%
- 5 years 2014: 10.07%
- 5 years 2013: 11.93%

**ERAND INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees: 21
- Number Who Reported Earnings: 12
- Number of Excess Earners: 0
- Total Amount of Refund Due: $0

- 2015 Return: 1.17%
- 2015 Market Value: $50.9 M
- 2011-2015 (Annualized): 7.59%
**Funded Ratio (1987-2015)**

**Investment Return (2011-2015, 5 Year and 31 Year Averages)**

**10-Year History of Appropriations (in Thousands)**

**Asset Allocation (12/31/15)**

**Earned Income of Disability Retirees (2014)**

**Actuarial**

- Funded Ratio: 41.3%
- Date of Last Valuation: 01/15
- Actuary: PERAC
- Assumed Rate of Return: 7.75%
- Funding Schedule: 6.3% Total Increasing
- Year Fully Funded: 2035
- Unfunded Liability: $336.8 M
- Total Pension Appropriation (Fiscal 2016): $25.5 M

- Number of Members: ACTIVE 1,586, RETIRE 1,570
- Total Payroll/Benefit: ACTIVE $73.8 M, RETIRE $35.7 M
- Average Salary/Benefit: ACTIVE $46,500, RETIRE $22,700
- Average Age: ACTIVE 47, RETIRE 73
- Average Service: ACTIVE 13.1 years, RETIRE NA

**Investment Return History**

- 31 years 2015: 8.30%
- 10 years 2015: 5.26%
- 5 years 2015: 7.56%
- 30 years 2014: 8.54%
- 10 years 2014: 5.84%
- 5 years 2014: 9.99%
- 29 years 2013: 8.56%
- 10 years 2013: 5.84%
- 5 years 2013: 11.67%

**Earned Income of Disability Retirees (2014)**

- Number of Disability Retirees: 212
- Number Who Reported Earnings: 56
- Number of Excess Earners: 3
- Total Amount of Refund Due: $17,920.86

- 2015 Return: 1.38%
- 2015 Market Value: $238.4 M
- 2011-2015 (Annualized): 7.56%
- 1985-2015 (Annualized): 8.30%
**Funded Ratio (1987-2015)**

- **2015 Return**: 0%
- **2015 Market Value**: $0 M
- **2011-2015 (Annualized)**: 0%
- **1985-2015 (Annualized)**: 0%

**Investment Return History**

- **31 years 2015**: 8.94%
- **30 years 2014**: 9.23%
- **29 years 2013**: 9.31%
- **10 years 2015**: 5.90%
- **10 years 2014**: 6.61%
- **10 years 2013**: 6.95%
- **5 years 2015**: 8.15%
- **5 years 2014**: 10.92%
- **5 years 2013**: 12.34%

**Asset Allocation (12/31/15)**

- **Hedge Funds**: 9.8%
- **Cash/Overlay**: 1.0%
- **Domestic Equity**: 39.0%
- **Real Estate**: 10.0%
- **Private Equity**: 5.3%
- **Fixed Income**: 19.9%
- **Int’l Equity**: 15.0%

**Earned Income of Disability Retirees (2014)**

- **Number of Disability Retirees**: 39
- **Number Who Reported Earnings**: 16
- **Number of Excess Earners**: 0
- **Total Amount of Refund Due**: $0

- **2015 Return**: .69%
- **2015 Market Value**: $113.9 M
- **2011-2015 (Annualized)**: 8.15%
- **1985-2015 (Annualized)**: 8.94%
ACTUARIAL FUNDED RATIO (1987-2015)

INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)

10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)

INVESTMENT RETURN HISTORY

31 years 2015  30 years 2014  29 years 2013
7.54%  7.76%  7.75%
10 years 2015  10 years 2014  10 years 2013
5.11%  5.65%  5.62%
5 years 2015  5 years 2014  5 years 2013
7.33%  9.53%  10.84%

EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees  54
- Number Who Reported Earnings  5
- Number of Excess Earners  0
- Total Amount of Refund Due  0

- 2015 Return  1.09%
- 2015 Market Value  98.8 M
- 2011-2015 (Annualized)  7.33%
- 1985-2015 (Annualized)  7.54%
**ACTUARIAL**

- **Funded Ratio**: 67.4%
- **Date of Last Valuation**: 01/14
- **Actuary**: PERAC
- **Assumed Rate of Return**: 7.75%
- **Funding Schedule**: 5.0% Total Increasing
- **Year Fully Funded**: 2030
- **Unfunded Liability**: $110.4 M
- **Total Pension Appropriation (Fiscal 2016)**: $13.0 M

### INVESTMENT RETURN HISTORY

- **31 years 2015**: 9.23%
- **30 years 2014**: 9.51%
- **29 years 2013**: 9.55%
- **10 years 2015**: 5.92%
- **10 years 2014**: 7.08%
- **10 years 2013**: 7.68%
- **5 years 2015**: 7.56%
- **5 years 2014**: 10.07%
- **5 years 2013**: 11.90%

### ASSET ALLOCATION (12/31/15)

- **GLOBAL EQUITY**: 42.3%
- **HEDGE FUNDS**: 9.0%
- **PORT. COMP. STRAT.**: 1.0%
- **CASH/OVERLAY**: 0.9%
- **FIXED INCOME**: 12.9%
- **PRIVATE EQUITY**: 11.4%
- **REAL ESTATE**: 10.9%
- **TIMBER/NAT. RESOURCES**: 3.1%

### EARNED INCOME OF DISABILITY RETIREES (2014)

- **Number of Disability Retirees**: 67
- **Number Who Reported Earnings**: 19
- **Number of Excess Earners**: 0
- **Total Amount of Refund Due**: $0

- **2015 Return**: 1.13%
- **2015 Market Value**: $257.7 M
- **2011-2015 (Annualized)**: 7.56%
- **1985-2015 (Annualized)**: 9.23%
ACTUARIAL

- Funded Ratio
- Date of Last Valuation
- Actuary
- Assumed Rate of Return
- Funding Schedule
- Year Fully Funded
- Unfunded Liability
- Total Pension Appropriation (Fiscal 2016)

ACTIVE
- Number of Members
- Total Payroll/Benefit
- Average Salary/Benefit
- Average Age
- Average Service

RETIRED
- Number of Members
- Total Payroll/Benefit
- Average Salary/Benefit

ASSET ALLOCATION (12/31/15)

- Domestic Equity 34.9%
- Real Estate 15.7%
- International Equity 16.1%
- Fixed Income 21.0%
- Private Equity 5.4%
- Hedge Funds 5.0%
- Timber/Nat. Resources 1.5%
- Cash/Overlay 0.4%

EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees
- Number Who Reported Earnings
- Number of Excess Earners
- Total Amount of Refund Due

- 2015 Return
- 2015 Market Value
- 2011-2015 (Annualized)
- 1985-2015 (Annualized)
ACTUARIAL FUNDED RATIO (1987-2015)
INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)
10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)
Funded Ratio  57.0%
Date of Last Valuation  01/15
Actuary  Stone Consulting
Assumed Rate of Return  7.88%
Funding Schedule  4.5% Total Increasing
Year Fully Funded  2031
Unfunded Liability  $35.5 M
Total Pension Appropriation (Fiscal 2016)  $3.4 M
Number of Members  268
Total Payroll/Benefit  $11.4 M
Average Salary/Benefit  $42,400
Average Age  48
Average Service  12.9 years
EARNED INCOME OF DISABILITY RETIREES (2014)
Number of Disability Retirees  23
Number Who Reported Earnings  4
Number of Excess Earners  0
Total Amount of Refund Due  $0
2015 Return  1.15%
2015 Market Value  $46.3 M
2011-2015 (Annualized)  7.55%
1985-2015 (Annualized)  9.35%

### Actuarial

- **Funded Ratio**: 44.6%
- **Date of Last Valuation**: 01/14
- **Actuary**: The Segal Company
- **Assumed Rate of Return**: 7.75%
- **Funding Schedule**: 6.15% Total Increasing
- **Year Fully Funded**: 2034
- **Unfunded Liability**: $97.5 M
- **Total Pension Appropriation (Fiscal 2016)**: $7.9 M
- **Number of Members**
  - **ACTIVE**: 517
  - **RETIRED**: 454
- **Total Payroll/Benefit**
  - **ACTIVE**: $26.6 M
  - **RETIRED**: $10.4 M
- **Average Salary/Benefit**
  - **ACTIVE**: $51,500
  - **RETIRED**: $22,900
- **Average Age**
  - **ACTIVE**: NA
  - **RETIRED**: NA
- **Average Service**
  - **ACTIVE**: 12.9 years
  - **RETIRED**: NA

### Asset Allocation (12/31/15)

<table>
<thead>
<tr>
<th>Port. Comp. Strat.</th>
<th>Cash/Overlay</th>
<th>Hedge Funds</th>
<th>Global Equity</th>
<th>Real Estate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0%</td>
<td>0.9%</td>
<td>9.0%</td>
<td>42.3%</td>
<td>10.9%</td>
</tr>
<tr>
<td>Timber/Nat. Resources</td>
<td>3.1%</td>
<td>11.4%</td>
<td>NA</td>
<td>10.9%</td>
</tr>
<tr>
<td>Private Equity</td>
<td>11.4%</td>
<td>8.3%</td>
<td>NA</td>
<td>10.9%</td>
</tr>
<tr>
<td>Fixed Income</td>
<td>12.9%</td>
<td>8.3%</td>
<td>NA</td>
<td>10.9%</td>
</tr>
<tr>
<td>Fixed VA/Hy</td>
<td>8.3%</td>
<td>8.3%</td>
<td>NA</td>
<td>10.9%</td>
</tr>
<tr>
<td>Cash/Overlay</td>
<td>0.9%</td>
<td>0.9%</td>
<td>NA</td>
<td>10.9%</td>
</tr>
</tbody>
</table>

### Earned Income of Disability Retirees (2014)

- **Number of Disability Retirees**: 43
- **Number Who Reported Earnings**: 14
- **Number of Excess Earners**: 0
- **Total Amount of Refund Due**: $0
- **2015 Return**: 1.19%
- **2015 Market Value**: $86.9 M
- **2011-2015 (Annualized)**: 7.57%
- **1985-2015 (Annualized)**: 8.79%
### Actuarial Funded Ratio (1987-2015)

- **Funded Ratio**: 85.0%
- **Date of Last Valuation**: 01/15
- **Actuary**: PERAC
- **Assumed Rate of Return**: 7.00%
- **Year Fully Funded**: 2034
- **Unfunded Liability**: $2.5 M
- **Total Pension Appropriation (Fiscal 2016)**: $262,000

### Investment Return History

- **2015 Return**: 7.46%
- **2015 Market Value**: $14.9 M
- **2011-2015 (Annualized)**: 7.31%
- **1985-2015 (Annualized)**: 7.46%

### Asset Allocation (12/31/15)

- **Fixed Income**: 39.7%
- **Domestic Equity**: 56.4%
- **Int’l Equity**: 3.9%

### Earned Income of Disability Retirees (2014)

- **Number of Disability Retirees**: 0
- **Number Who Reported Earnings**: 0
- **Number of Excess Earners**: 0
- **Total Amount of Refund Due**: $0

### Earnings History

<table>
<thead>
<tr>
<th>Period</th>
<th>31 years 2015</th>
<th>30 years 2014</th>
<th>29 years 2013</th>
<th>10 years 2015</th>
<th>10 years 2014</th>
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**Address:**

Greater Lawrence

240 Charles Street
North Andover, MA 01845
Phone 978-689-9464
Fax 978-685-7790

**Board Members**

Laurie A. Elliott (Chairperson),
Michael J. Gagnon, James C. O’Leary,
Joseph R. Quartarone, Ann L. Rader

**Board Administrator**

Vincent R. Malgeri

**Board Meeting**

Last Wednesday of the month at 5:00 pm
### Actuarial

- **Funded Ratio**
  - 56.2%
- **Date of Last Valuation**
  - 01/15
- **Actuary**
  - PERAC
- **Assumed Rate of Return**
  - 7.60%
- **Funding Schedule**
  - 6.3% Total Increasing
  - 2036
- **Year Fully Funded**
  - $44.3 M
- **Unfunded Liability**
  - $3.7 M
- **Total Pension Appropriation (Fiscal 2016)**

- **Number of Members**
  - 427
- **Total Payroll/Benefit**
  - $16.1 M
- **Average Salary/Benefit**
  - $37,600
- **Average Age**
  - 47
- **Average Service**
  - 9.6 years

### Asset Allocation (12/31/15)

- **Global Equity** 42.3%
- **Private Equity** 11.4%
- **Fixed VA/HY** 8.3%
- **Fixed Income** 12.9%
- **Cash/Overlay** 0.9%
- **Hedge Funds** 9.0%
- **Port. Comp. Strat.** 1.0%
- **Timber/Nat. Resources** 3.1%
- **Real Estate** 10.9%

### Earnings Income of Disability Retirees (2014)

- **Number of Disability Retirees**
  - 16
- **Number Who Reported Earnings**
  - 8
- **Number of Excess Earners**
  - 1
- **Total Amount of Refund Due**
  - $17,235.75

- **2015 Return**
  - 1.33%
- **2015 Market Value**
  - $58.3 M
- **2011-2015 (Annualized)**
  - 7.74%
- **1985-2015 (Annualized)**
  - 8.42%
ACTUARIAL

- Funded Ratio: 47.2%
- Date of Last Valuation: 01/14
- Actuary: The Segal Company
- Assumed Rate of Return: 7.88%
- Funding Schedule: Varies Total Increasing
- Year Fully Funded: 2036
- Unfunded Liability: $298.6 M
- Total Pension Appropriation (Fiscal 2016): $23.1 M

- Number of Members: 2,553
- Total Payroll/Benefit: $100.1 M
- Average Salary/Benefit: $39,200
- Average Age: 49
- Average Service: 12.4 years

ASSET ALLOCATION (12/31/15)

- Global Equity: 40.3%
- Cash/Overlay: 4.4%
- Hedge Funds: 8.6%
- Private Equity: 12.1%
- Real Estate: 10.7%
- Fixed Income: 12.2%
- Private Credit: 7.9%
- Timber/Nat. Resources: 2.9%
- Port. Comp. Strategies: 0.9%
- Total: 100%

EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees: 104
- Number Who Reported Earnings: 31
- Number of Excess Earners: 5
- Total Amount of Refund Due: $34,918.83

- 2015 Return: 1.55%
- 2015 Market Value: $299.0 M
- 2011-2015 (Annualized): 7.57%
- 1985-2015 (Annualized): 8.54%
INVESTMENT RETURN HISTORY

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<td>Return</td>
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EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees: 74
- Number Who Reported Earnings: 30
- Number of Excess Earners: 2
- Total Amount of Refund Due: $21,062.22

- 2015 Return: .32%
- 2015 Market Value: $255.8 M
- 2011-2015 (Annualized): 6.48%
- 1985-2015 (Annualized): 8.19%

INVESTMENT RETURN HISTORY

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<th>10 years 2015</th>
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ASSET ALLOCATION (12/31/15)

- DOMESTIC EQUITY: 19.7%
- INT’L EQUITY: 18.1%
- REAL ESTATE: 12.2%
- FIXED INCOME: 21.4%
- CASH/OVERLAY: 5.5%
- HEDGE FUNDS: 10.6%
- PRIVATE DEBT: 2.7%
- COMMODITIES/REAL ASSETS: 6.5%

ACTUARIAL

- Funded Ratio: 56.6%
- Date of Last Valuation: 01/14
- Actuary: Stone Consulting
- Assumed Rate of Return: 7.88%
- Funding Schedule: 4.0% Increasing Phase-in
- Year Fully Funded: 2034
- Unfunded Liability: $180.9 M
- Total Pension Appropriation (Fiscal 2016): $19.0 M

- Number of Members (ACTIVE): 1,899
- Total Payroll/Benefit (ACTIVE): $73.4 M
- Average Salary/Benefit (ACTIVE): $38,700
- Average Age (ACTIVE): 49
- Average Service (ACTIVE): 11.7 years

- Number of Members (RETIRED): 1,140
- Total Payroll/Benefit (RETIRED): $21.0 M
- Average Salary/Benefit (RETIRED): $18,500
- Average Age (RETIRED): NA

- Number of Disability Retirees: 74
- Number Who Reported Earnings: 30
- Number of Excess Earners: 2
- Total Amount of Refund Due: $21,062.22

- 2015 Return: .32%
- 2015 Market Value: $255.8 M
- 2011-2015 (Annualized): 6.48%
- 1985-2015 (Annualized): 8.19%
### Actuarial Funded Ratio (1987-2016)

- **Funded Ratio:** 52.0%
- **Date of Last Valuation:** 01/16
- **Actuary:** Stone Consulting
- **Assumed Rate of Return:** 7.50%
- **Funding Schedule:** 4.0% Increasing
- **Year Fully Funded:** 2032
- **Unfunded Liability:** $167.4 M
- **Total Pension Appropriation (Fiscal 2016):** $15.8 M

### Investment Return History

- **31 years 2015:** 9.88%
- **10 years 2015:** 6.15%
- **5 years 2015:** 6.93%
- **30 years 2014:** 10.27%
- **10 years 2014:** 7.13%
- **5 years 2014:** 10.18%
- **29 years 2013:** 10.35%
- **10 years 2013:** 7.53%
- **5 years 2013:** 12.47%

### Asset Allocation (12/31/15)

- **Domestic Equity:** 30.8%
- **International Equity:** 17.7%
- **Real Estate:** 10.6%
- **Private Equity:** 4.3%
- **Fixed Income:** 15.6%
- **Hedge Funds:** 10.7%
- **Cash/Overlay:** 3.7%
- **Timber/Nat. Resources:** 6.6%

### 10-Year History of Appropriations (in Thousands)

- FY07: $0, FY08: $2,000, FY09: $4,000, FY10: $6,000, FY11: $8,000, FY12: $10,000, FY13: $12,000, FY14: $14,000, FY15: $16,000, FY16: $18,000

### Earned Income of Disability Retirees (2014)

- **Number of Disability Retirees:** 84
- **Number Who Reported Earnings:** 19
- **Number of Excess Earners:** 0
- **Total Amount of Refund Due:** $0

- **2015 Return:** -1.30%
- **2015 Market Value:** $171.4 M
- **2011-2015 (Annualized):** 6.93%
- **1985-2015 (Annualized):** 9.88%
**ACTUARIAL**

- **Funded Ratio**: 58.1%
- **Date of Last Valuation**: 01/14
- **Actuary**: The Segal Company
- **Assumed Rate of Return**: 7.75%
- **Funding Schedule**: 2.75% Increasing
- **Year Fully Funded**: 2032
- **Unfunded Liability**: $153.1 M
- **Total Pension Appropriation (Fiscal 2016)**: $17.1 M

**ASSET ALLOCATION (12/31/15)**

- **DOMESTIC EQUITY**: 31.2%
- **FIXED INCOME**: 11.9%
- **PRIVATE EQUITY**: 17.1%
- **DOMESTIC REAL ESTATE**: 10.9%
- **REAL ESTATE**: 10.9%
- **REAL ESTATE**: 10.9%
- **CASH/OVERLAY**: 5.2%
- **HEDGE FUNDS**: 0.9%
- **COMMODITIES/REAL ASSETS**: 1.0%

**INVESTMENT RETURN HISTORY**

- **31 years 2015**: 9.37%
- **10 years 2015**: 6.51%
- **5 years 2015**: 9.23%

- **30 years 2014**: 9.57%
- **10 years 2014**: 6.78%
- **5 years 2014**: 11.94%

- **29 years 2013**: 9.64%
- **10 years 2013**: 6.96%
- **5 years 2013**: 15.83%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- **Number of Disability Retirees**: 70
- **Number Who Reported Earnings**: 16
- **Number of Excess Earners**: 2
- **Total Amount of Refund Due**: $1,388.70

- **2015 Return**: 3.59%
- **2015 Market Value**: $238.0 M
- **2011-2015 (Annualized)**: 9.23%
- **1985-2015 (Annualized)**: 9.37%
ACTUARIAL

- Funded Ratio 54.0%
- Date of Last Valuation 01/14
- Actuary Odyssey Advisors
- Assumed Rate of Return 7.75%
- Funding Schedule 3.8% Increasing
- Year Fully Funded 2031
- Unfunded Liability $29.7 M
- Total Pension Appropriation (Fiscal 2016) $3.5 M

- Number of Members ACTIVE 178 RETIRED 130
- Total Payroll/Benefit ACTIVE $9.3 M RETIRED $3.4 M
- Average Salary/Benefit ACTIVE $52,200 RETIRED $26,400
- Average Age ACTIVE 52 RETIRED NA
- Average Service ACTIVE 12.9 years RETIRED NA

ASSET ALLOCATION (12/31/15)

- PORT. COMP. STRAT. 1.0%
- CASH/OVERLAY 0.9%
- HEDGE FUNDS 9.0%
- TIMBER/NAT. RESOURCES 3.1%
- REAL ESTATE 10.9%
- PRIVATE EQUITY 11.4%
- FIXED VA/HY 8.3%
- FIXED INCOME 12.9%
- GLOBAL EQUITY 42.3%

EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees 24
- Number Who Report Earnings 10
- Number of Excess Earners 0
- Total Amount of Refund Due 50

- 2015 Return 1.32%
- 2015 Market Value $38.4 M
- 2011-2015 (Annualized) 7.54%
- 1985-2015 (Annualized) 7.82%
**ACTUARIAL**

- **Funded Ratio**: 44.6%
- **Date of Last Valuation**: 01/14
- **Actuary**: Stone Consulting
- **Assumed Rate of Return**: 7.75%
- **3.42% Increasing**: 2038
- **Year Fully Funded**: $210.2 M
- **Unfunded Liability**: $18.4 M
- **Total Pension Appropriation (Fiscal 2016)**: $210.2 M
- **Number of Members**: 1,519
- **Total Payroll/Benefit**: $67.8 M
- **Average Salary/Benefit**: $44,600
- **Average Age**: 46
- **Average Service**: 10.8 years

**ASSET ALLOCATION (12/31/15)**

- **PORT. COMP. STRAT. 1.0%**
- **CASH/OVERLAY 0.9%**
- **HEDGE FUNDS 9.0%**
- **GLOBAL EQUITY 42.3%**
- **TIMBER/NAT. RESOURCES 3.1%**
- **REAL ESTATE 10.9%**
- **PRIVATE EQUITY 11.4%**
- **FIXED INCOME 12.9%**
- **FIXED VA/HY 8.3%**
- **CASH/OVERLAY 0.9%**

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- **Number of Disability Retirees**: 109
- **Number Who Reported Earnings**: 21
- **Number of Excess Earners**: 1
- **Total Amount of Refund Due**: $1,261.56
- **2015 Return**: 1.16%
- **2015 Market Value**: $183.0 M
- **2011-2015 (Annualized)**: 7.52%
- **1985-2015 (Annualized)**: 7.70%
**ACTUARIAL**

- Funded Ratio: 79.2%
- Date of Last Valuation: 01/14
- Actuary: Stone Consulting
- Assumed Rate of Return: 5.50%
- Funding Schedule: Level
- Year Fully Funded: 2022
- Unfunded Liability: $37.7 M
- Total Pension Appropriation (Fiscal 2016): $8.8 M

**ASSET ALLOCATION (12/31/15)**

- Global Equity: 65.8%
- Cash/Overlay: 0.8%
- Private Equity: 6.7%
- Fixed Va/Ry: 4.9%
- Fixed Income: 7.6%
- Real Estate: 6.4%
- Timber/Nat. Resources: 1.8%
- Hedge Funds: 5.4%
- Port. Comp. Strategy: 0.6%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees: 28
- Number Who Reported Earnings: 13
- Number of Excess Earners: 0
- Total Amount of Refund Due: 50

**INVESTMENT RETURN HISTORY**

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<td>10.63%</td>
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### Actuarial

- **Funded Ratio:** 82.3%
- **Date of Last Valuation:** 01/14
- **Actuary:** Sherman Actuarial Services, LLC
- **Assumed Rate of Return:** 7.75%
- **Funding Schedule:** 4.0% Increasing Phase-in
- **Year Fully Funded:** 2025
- **Unfunded Liability:** $28.0 M
- **Total Pension Appropriation (Fiscal 2016):** $5.3 M

#### Participation Summary

- **Number of Members:** 646
- **Total Payroll/Benefit:** $32.9 M
- **Average Salary/Benefit:** $50,900
- **Average Age:** NA
- **Average Service:** NA

#### Asset Allocation (12/31/15)

- **Private Debt:** 7.4%
- **Cash/Overlay:** 4.7%
- **Domestic Equity:** 41.7%
- **International Equity:** 16.6%
- **Hedge Funds:** 10.1%
- **Real Estate:** 1%
- **Fixed VA/HY:** 4.0%
- **Fixed Income:** 2.6%

### Investment Return History

- **31 years 2015:** 8.69%
- **30 years 2014:** 8.97%
- **29 years 2013:** 9.04%
- **10 years 2015:** 5.18%
- **10 years 2014:** 6.16%
- **10 years 2013:** 6.74%
- **5 years 2015:** 5.75%
- **5 years 2014:** 8.57%
- **5 years 2013:** 12.04%

### Earned Income of Disability Retirees (2014)

- **Number of Disability Retirees:** 19
- **Number Who Reported Earnings:** 10
- **Number of Excess Earners:** 0
- **Total Amount of Refund Due:** $0

#### Investment Return of Disability Retirees

- **2015 Return:** .58%
- **2015 Market Value:** $136.8 M
- **2011-2015 (Annualized):** 5.75%
- **1985-2015 (Annualized):** 8.69%

INVESTMENT RETURN HISTORY

5 years 2015 | 10 years 2015 | 30 years 2014 | 31 years 2015
---|---|---|---
7.42% | 5.73% | 9.32% | 9.04%

10 years 2013 | 10 years 2014 | 29 years 2013 | 29 years 2013
---|---|---|---
6.83% | 7.27% | 9.36% | 9.36%

---|---|---|---
1.03% | $310.9 M | 7.42% | 9.04%

Number of Disability Retirees | Number Who Reported Earnings | Number of Excess Earners | Total Amount of Refund Due
---|---|---|---
158 | 43 | 2 | $40,412.08

EARNED INCOME OF DISABILITY RETIREES (2014)
**ACTUARIAL**

- Funded Ratio: 45.5%
- Date of Last Valuation: 01/15
- Actuary: PERAC
- Assumed Rate of Return: 7.60%
- Funding Schedule: Varies Total Increasing
- Year Fully Funded: 2034
- Unfunded Liability: $320.8 M
- Total Pension Appropriation (Fiscal 2016): $29.6 M

**ASSET ALLOCATION (12/31/15)**

- PORT. COMP. STRATEGY 0.9%
- fixed va/hy 7.7%
- HEDGE FUNDS 8.5%
- CASH/OVERLAY 1.6%
- GLOBAL EQUITY 39.6%
- REAL ESTATE 15.2%
- TIMBER/NAT. RESOURCES 2.9%
- PRIVATE EQUITY 11.5%
- FIXED INCOME 12.0%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees: 148
- Number Who Reported Earnings: 37
- Number of Excess Earners: 1
- Total Amount of Refund Due: $3,643.04

**INVESTMENT RETURN HISTORY**

- 31 years 2015: 7.94%
- 30 years 2014: 8.15%
- 29 years 2013: 8.14%
- 10 years 2015: 4.98%
- 10 years 2014: 5.74%
- 10 years 2013: 6.15%
- 5 years 2015: 7.94%
- 5 years 2014: 10.07%
- 5 years 2013: 10.56%

**INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)**

- 2015 Return: 1.75%
- 2015 Market Value: $281.4 M
- 2011-2015 (Annualized): 7.94%
- 1985-2015 (Annualized): 7.94%
**ACTUARIAL FUNDED RATIO (1987-2015)**

**INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)**

**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

**INVESTMENT RETURN HISTORY**

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<td>8.29%</td>
<td>11.18%</td>
<td>12.03%</td>
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**ASSET ALLOCATION (12/31/15)**

- **REAL ESTATE 1.3%**
- **CASH/OVERLAY 2.7%**
- **DOMESTIC EQUITY 54.4%**
- **INT’L EQUITY 4.7%**
- **FIXED INCOME 36.9%**

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- **Number of Disability Retirees**: 83
- **Number Who Reported Earnings**: 31
- **Number of Excess Earners**: 0
- **Total Amount of Refund Due**: $0

- **2015 Return**: -1.10%
- **2015 Market Value**: $222.2 M
- **2011-2015 (Annualized)**: 8.29%
- **1985-2015 (Annualized)**: 9.70%
### ACTUARIAL

- Funded Ratio: 67.0%
- Date of Last Valuation: 01/14
- Actuary: PERAC
- Assumed Rate of Return: 7.75%
- Funding Schedule: 8.0% Total Increasing
- Year Fully Funded: 2036
- Unfunded Liability: $40.3 M
- Total Pension Appropriation (Fiscal 2016): $3.0 M

### ASSET ALLOCATION (12/31/15)

- **GLOBAL EQUITY**: 42.3%
- **HEDGE FUNDS**: 9.0%
- **PORT. COMP. STRAT.**: 1.0%
- **CASH/OVERLAY**: 0.9%
- **REAL ESTATE**: 10.9%
- **FIXED INCOME**: 12.9%
- **PRIVATE EQUITY**: 11.4%
- **TIMBER/NAT. RESOURCES**: 3.1%

### INVESTMENT RETURN HISTORY

- **31 years 2015**: 9.17%
- **10 years 2015**: 5.95%
- **5 years 2015**: 7.58%
- **30 years 2014**: 9.45%
- **10 years 2014**: 7.10%
- **5 years 2014**: 10.11%
- **29 years 2013**: 9.49%
- **10 years 2013**: 7.70%
- **5 years 2013**: 11.98%

### EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees: 18
- Number Who Reported Earnings: 7
- Number of Excess Earners: 0
- Total Amount of Refund Due: $0

- **2015 Return**: 1.17%
- **2015 Market Value**: $87.0 M
- **2011-2015 (Annualized)**: 7.58%
- **1985-2015 (Annualized)**: 9.17%
ACTUARIAL FUNDED RATIO (1987-2015)

INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)

10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)

ASSET ALLOCATION (12/31/15)

EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees: 28
- Number Who Reported Earnings: 10
- Number of Excess Earners: 0
- Total Amount of Refund Due: $0

- 2015 Return: -.56%
- 2015 Market Value: $143.0 M
- 2011-2015 (Annualized): 6.47%
- 1985-2015 (Annualized): 8.30%
**Funded Ratio (1987-2015)**

- **Date of Last Valuation:** 01/15
- **Actuary:** Stone Consulting
- **Assumed Rate of Return:** 7.75%
- **Level:** 2022
- **Funding Schedule:**
  - **Year Fully Funded:** 2022
- **Unfunded Liability:** $30.7 M
- **Total Pension Appropriation (Fiscal 2016):** $6.1 M

**Investment Return History**

- **31 years 2015:** 7.29%
- **30 years 2014:** 7.63%
- **29 years 2013:** 7.73%
- **10 years 2015:** 4.63%
- **10 years 2014:** 5.41%
- **10 years 2013:** 6.05%
- **5 years 2015:** 5.57%
- **5 years 2014:** 8.62%
- **5 years 2013:** 11.25%

**10-Year History of Appropriations (in Thousands)**

**ASSET ALLOCATION (12/31/15)**

- **REAL ESTATE 11.0%**
- **DOMESTIC EQUITY 26.0%**
- **INT’L EQUITY 19.7%**
- **FIXED INCOME 23.1%**
- **CASH/OVERLAY 0.1%**
- **PRIVATE EQUITY 6.7%**
- **COMMODITIES/REAL ASSETS/OTHER 3.1%**
- **FIXED VA/HY 10.3%**

**Earned Income of Disability Retirees (2014)**

- **Number of Disability Retirees:** 0
- **Number Who Reported Earnings:** 0
- **Number of Excess Earners:** 0
- **Total Amount of Refund Due:** $0

**2015 Return:** -2.30%
**2015 Market Value:** $114.4 M
**2011-2015 (Annualized):** 5.57%
**1985-2015 (Annualized):** 7.29%
ACTUARIAL FUNDED RATIO (1987-2015)

INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)

10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)

INVESTMENT RETURN HISTORY

31 years 2015 30 years 2014 29 years 2013
8.93% 9.25% 9.34%
10 years 2015 10 years 2014 10 years 2013
5.91% 6.83% 7.31%
5 years 2015 5 years 2014 5 years 2013
7.00% 9.65% 12.82%

As of 12/31/15

EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees: 48
- Number Who Reported Earnings: 14
- Number of Excess Earmers: 0
- Total Amount of Refund Due: $0

- 2015 Return: -.42%
- 2015 Market Value: $525.6 M
- 2011-2015 (Annualized): 7.00%
- 1985-2015 (Annualized): 8.93%

REAL ESTATE 9.4%
CASH/OVERLAY 0.3%
DOMESTIC EQUITY 26.7%
PRIVATE EQUITY 5.7%
INT’L EQUITY 24.8%
FIXED INCOME 31.3%
**ACTUARIAL FUNDED RATIO (1987-2015)**

**INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)**

**10-YEAR HISTORY OF APPROPRIATIONS (IN MILLIONS)**

**INVESTMENT RETURN HISTORY**

<table>
<thead>
<tr>
<th>Time Period</th>
<th>31 years 2015</th>
<th>30 years 2014</th>
<th>29 years 2013</th>
<th>10 years 2015</th>
<th>10 years 2014</th>
<th>5 years 2015</th>
<th>5 years 2014</th>
<th>5 years 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return (%)</td>
<td>9.41%</td>
<td>9.70%</td>
<td>9.75%</td>
<td>5.96%</td>
<td>7.12%</td>
<td>7.62%</td>
<td>10.16%</td>
<td>12.05%</td>
</tr>
</tbody>
</table>

**ASSET ALLOCATION (12/31/15)**

- **GLOBAL EQUITY** 42.3%
- **HEDGE FUNDS** 9.0%
- **PORT. COMP. STRAT.** 1.0%
- **CASH/OVERLAY** 0.9%
- **REAL ESTATE** 10.9%
- **PRIVATE EQUITY** 11.4%
- **FIXED INCOME** 12.9%
- **FIXED VA/HY** 8.3%
- **TIMBER/NAT. RESOURCES** 3.1%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees: 601
- Number Who Reported Earnings: 125
- Number of Excess Earners: 3
- Total Amount of Refund Due: $40,664.68

- **2015 Return** 1.17%
- **2015 Market Value** $24.3 B
- **2011-2015 (Annualized)** 7.62%
- **1985-2015 (Annualized)** 9.41%
**ACTUARIAL**

- **Funded Ratio**
- **Date of Last Valuation**
- **Actuary**
- **Assumed Rate of Return**
- **Funding Schedule**
- **Year Fully Funded**
- **Unfunded Liability**
- **Total Pension Appropriation (Fiscal 2016)**

| Number of Members | 1,090 | 476 |
| Total Payroll/Benefit | $85.5 M | $14.6 M |
| Average Salary/Benefit | $78,500 | $30,600 |
| Average Age | 52 | 70 |
| Average Service | 18.2 years | NA |

**INVESTMENT RETURN (2011-2015, 5 YEAR AND 30 YEAR AVERAGES)**

- **2015 Return**
- **2015 Market Value**
- **2011-2015 (Annualized)**
- **1986-2015 (Annualized)**

| 30 years | 8.13% |
| 10 years | 6.67% |
| 5 years | 7.41% |

| 29 years | 8.38% |
| 10 years | 7.43% |
| 5 years | 9.92% |

| 28 years | 8.51% |
| 10 years | 8.01% |
| 5 years | 13.38% |

**ASSET ALLOCATION (12/31/15)**

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Equity</td>
<td>20.8%</td>
</tr>
<tr>
<td>Fixed Income</td>
<td>21.8%</td>
</tr>
<tr>
<td>Hedge Funds</td>
<td>8.7%</td>
</tr>
<tr>
<td>Private Equity</td>
<td>8.9%</td>
</tr>
<tr>
<td>Int’l Equity</td>
<td>15.4%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>8.1%</td>
</tr>
<tr>
<td>Cash/Overlay</td>
<td>1.0%</td>
</tr>
<tr>
<td>Asset Alloc./Balanced</td>
<td>15.3%</td>
</tr>
</tbody>
</table>

**EARNED INCOME OF DISABILITY RETIREES (2014)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Disability Retirees</td>
<td>57</td>
</tr>
<tr>
<td>Number Who Reported Earnings</td>
<td>14</td>
</tr>
<tr>
<td>Number of Excess Earners</td>
<td>1</td>
</tr>
<tr>
<td>Total Amount of Refund Due</td>
<td>$4,829.28</td>
</tr>
<tr>
<td>2015 Return</td>
<td>1.07%</td>
</tr>
<tr>
<td>2015 Market Value</td>
<td>$444.8 M</td>
</tr>
<tr>
<td>2011-2015 (Annualized)</td>
<td>7.41%</td>
</tr>
<tr>
<td>1986-2015 (Annualized)</td>
<td>8.13%</td>
</tr>
</tbody>
</table>
ACTUARIAL FUNDED RATIO (1987-2015)

INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)

10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)

ASSET ALLOCATION (12/31/15)

EARNED INCOME OF DISABILITY RETIREES (2014)
ACTUARIAL

- Funded Ratio: 61.0%
- Date of Last Valuation: 01/14
- Actuary: Sherman Actuarial Services, LLC
- Assumed Rate of Return: 7.50%
- Funding Schedule: 4.0% Increasing Phase-in
- Year Fully Funded: 2036
- Unfunded Liability: $104.8 M
- Total Pension Appropriation (Fiscal 2016): $10.5 M

ASSET ALLOCATION (12/31/15)

- Fixed Income: 19.7%
- Domestic Equity: 14.4%
- Int’l Equity: 11.1%
- Real Estate: 6.2%
- Hedge Funds: 8.5%
- Cash/Overlay: 3.0%
- Private Equity: 6.4%
- Fixed VA/HY: 3.2%
- Asset Allocation/Balanced: 27.5%

EARNED INCOME OF DISABILITY RETIREEES (2014)

- Number of Disability Retirees: 92
- Number Who Reported Earnings: 17
- Number of Excess Earners: 2
- Total Amount of Refund Due: $28,830.02

- 2015 Return: .46%
- 2015 Market Value: $174.3 M
- 2011-2015 (Annualized): 6.20%
- 1985-2015 (Annualized): 8.80%
**Melrose**

City Hall  
562 Main Street  
Melrose, MA 02176  
Phone 781-979-4151  
Fax 781-979-4206  

**Board Members**  
Patrick D. Dello Russo (Chairperson),  
Scott Colborne, Michael Lindstrom,  
Michael L. Lyle, Richard E. Pitts  

**Board Director**  
Adam Travinski  
**Board Meeting**  
Usually the last Wednesday of each month  

---

**ACTUARIAL**

- Funded Ratio  
  54.6%  
- Date of Last Valuation  
  01/15  
- Actuary  
  Stone Consulting  
  7.88%  
  3.93% Increasing  
- Assumed Rate of Return  
- Funding Schedule  
- Year Fully Funded  
- Unfunded Liability  
  $59.4 M  
- Total Pension Appropriation (Fiscal 2016)  
  $5.7 M  

**ASSET ALLOCATION (12/31/15)**

- CASH/OVERLAY 5.9%  
- REAL ESTATE 11.2%  
- FIXED INCOME 12.0%  
- GLOBAL EQUITY 39.4%  
- TIMBER/NAT. RESOURCES 2.9%  
- HEDGE FUNDS 8.4%  
- PORT. STRAT. COMPLETION 0.9%  

**INVESTMENT RETURN HISTORY**

- **31 years 2015**  
  8.32%  
- **10 years 2015**  
  5.29%  
- **5 years 2015**  
  7.23%  

**INVESTMENT RETURN (2011-2015) 5 YEAR AND 31 YEAR AVERAGES**

<table>
<thead>
<tr>
<th>Year</th>
<th>2015 Return</th>
<th>2015 Market Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-2015 (Annualized)</td>
<td>7.23%</td>
<td>$72.8 M</td>
</tr>
<tr>
<td>1985-2015 (Annualized)</td>
<td>8.32%</td>
<td></td>
</tr>
</tbody>
</table>

**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Appropriation</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY07</td>
<td>$5,000</td>
</tr>
<tr>
<td>FY08</td>
<td>$5,000</td>
</tr>
<tr>
<td>FY09</td>
<td>$5,000</td>
</tr>
<tr>
<td>FY10</td>
<td>$5,000</td>
</tr>
<tr>
<td>FY11</td>
<td>$5,000</td>
</tr>
<tr>
<td>FY12</td>
<td>$5,000</td>
</tr>
<tr>
<td>FY13</td>
<td>$5,000</td>
</tr>
<tr>
<td>FY14</td>
<td>$5,000</td>
</tr>
<tr>
<td>FY15</td>
<td>$5,000</td>
</tr>
<tr>
<td>FY16</td>
<td>$5,000</td>
</tr>
</tbody>
</table>

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees  
  33  
- Number Who Reported Earnings  
  11  
- Number of Excess Earners  
  2  
- Total Amount of Refund Due  
  $2,026.20  

- **2015 Return**  
  .78%  
- **2015 Market Value**  
  $72.8 M  

---

Investment Return (2011-2015, 5 Year and 31 Year Averages)

10-Year History of Appropriations (in Thousands)

Asset Allocation (12/31/15)

Earned Income of Disability Retirees (2014)

- Funded Ratio: 46.6%
- Date of Last Valuation: 01/14
- Actuary: PERAC
- Assumed Rate of Return: 7.75%
- Funding Schedule: Varies Total Increasing
- Year Fully Funded: 2032
- Unfunded Liability: $112.5 M
- Total Pension Appropriation (Fiscal 2016)

- Number of Members: 616
- Total Payroll/Benefit: $32.3 M
- Average Salary/Benefit: $52,400
- Average Age: 47
- Average Service: 14.1 years

- Number of Disability Retirees: 48
- Number Who Reported Earnings: 16
- Number of Excess Earners: 0
- Total Amount of Refund Due: $0

- 2015 Return: 2.27%
- 2015 Market Value: $118.6 M
- 2011-2015 (Annualized): 8.22%
- 1985-2015 (Annualized): 7.91%
**Middlesex County**

P.O. Box 160  
25 Linnell Circle  
Billerica, MA 01865  
Phone 978-439-3000 or 1-800-258-3805  
Fax 978-439-3050

**Board Members**
Thomas F. Gibson, Esq. (Chairperson),  
John Brown, Brian P. Curtin, Robert W. Healy

**Board Administrator**
Lisa Maloney

**Board Meeting**
Varies

---

**ACTUARIAL**

- Funded Ratio 44.0%
- Date of Last Valuation 01/14
- Actuary The Segal Company
- Assumed Rate of Return 7.88%
- Funding Schedule 4.0% Increasing Phase-in 2035
- Year Fully Funded $1.2 B
- Total Pension Appropriation (Fiscal 2016) $100.7 M

<table>
<thead>
<tr>
<th></th>
<th>ACTIVE</th>
<th>RETIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Members</td>
<td>9,082</td>
<td>5,077</td>
</tr>
<tr>
<td>Total Payroll/Benefit</td>
<td>$415.8 M</td>
<td>$114.8 M</td>
</tr>
<tr>
<td>Average Salary/Benefit</td>
<td>$45,800</td>
<td>$22,600</td>
</tr>
<tr>
<td>Average Age</td>
<td>48</td>
<td>NA</td>
</tr>
<tr>
<td>Average Service</td>
<td>11.7 years</td>
<td>NA</td>
</tr>
</tbody>
</table>

**ASSET ALLOCATION (12/31/15)**

- Fixed Income 12.1%
- Global Equity 40.0%
- Fixed Va/Hy 7.8%
- Private Equity 11.3%
- Timber/Nat. Resources 2.9%
- Hedge Funds 8.6%
- Cash/Overlay 5.2%
- Port. Comp. Strategy 0.9%

**INVESTMENT RETURN HISTORY**

<table>
<thead>
<tr>
<th>31 years 2015</th>
<th>30 years 2014</th>
<th>29 years 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.34%</td>
<td>8.58%</td>
<td>8.60%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10 years 2015</th>
<th>10 years 2014</th>
<th>10 years 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.64%</td>
<td>6.28%</td>
<td>6.58%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5 years 2015</th>
<th>5 years 2014</th>
<th>5 years 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.49%</td>
<td>9.85%</td>
<td>10.82%</td>
</tr>
</tbody>
</table>

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees 367
- Number Who Reported Earnings 128
- Number of Excess Earmers 6
- Total Amount of Refund Due $68,538.12

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.18%</td>
<td>$1.1 B</td>
<td>7.49%</td>
<td>8.34%</td>
</tr>
</tbody>
</table>
**ACTUARIAL FUNDED RATIO (1987-2015)**

**INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)**

**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

**INVESTMENT RETURN HISTORY**

<table>
<thead>
<tr>
<th>31 years 2015</th>
<th>30 years 2014</th>
<th>29 years 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.13%</td>
<td>8.37%</td>
<td>8.37%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10 years 2015</th>
<th>10 years 2014</th>
<th>10 years 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.43%</td>
<td>5.27%</td>
<td>5.61%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5 years 2015</th>
<th>5 years 2014</th>
<th>5 years 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.41%</td>
<td>9.82%</td>
<td>11.56%</td>
</tr>
</tbody>
</table>

**ASSET ALLOCATION (12/31/15)**

<table>
<thead>
<tr>
<th>PORT. COMP. STRAT.</th>
<th>1.0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASH/OVERLAY</td>
<td>0.9%</td>
</tr>
<tr>
<td>HEDGE FUNDS</td>
<td>9.0%</td>
</tr>
<tr>
<td>TIMBER/NAT. RESOURCES</td>
<td>3.1%</td>
</tr>
<tr>
<td>REAL ESTATE</td>
<td>10.9%</td>
</tr>
<tr>
<td>PRIVATE EQUITY</td>
<td>11.4%</td>
</tr>
<tr>
<td>FIXED VA/HY</td>
<td>8.3%</td>
</tr>
<tr>
<td>FIXED INCOME</td>
<td>12.9%</td>
</tr>
<tr>
<td>GLOBAL EQUITY</td>
<td>42.3%</td>
</tr>
</tbody>
</table>

**EARNED INCOME OF DISABILITY RETIREES (2014)**

| Number of Disability Retirees | 22 |
| Number Who Reported Earnings  | 12 |
| Number of Excess Earners     | 1  |
| Total Amount of Refund Due    | $10,533.37 |

| 2015 Return | 1.12% |
| 2015 Market Value | $73.9 M |
| 2011-2015 (Annualized) | 7.41% |
| 1985-2015 (Annualized) | 8.13% |
**ACTUARIAL**

- Funded Ratio: 76.6%
- Date of Last Valuation: 01/15
- Actuary: PERAC
- Assumed Rate of Return: 7.75%
- Funding Schedule: 6.0% Total Increasing
- Year Fully Funded: 2025
- Unfunded Liability: $31.8 M
- Total Pension Appropriation (Fiscal 2016): $5.3 M

**INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)**

- 2015 Return: 1.18%
- 2015 Market Value: $108.7 M
- 2011-2015 (Annualized): 7.58%
- 1985-2015 (Annualized): 9.33%

**ASSET ALLOCATION (12/31/15)**

- GLOBAL EQUITY 42.3%
- FIXED INCOME 12.9%
- PRIVATE EQUITY 11.4%
- FIXED VA/HY 8.3%
- REAL ESTATE 10.9%
- PORT. COMP. STRAT. 1.0%
- HEDGE FUNDS 9.0%
- TIMBER/NAT. RESOURCES 3.1%
- CASH/OVERLAY 0.9%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees: 34
- Number Who Reported Earnings: 6
- Number of Excess Earners: 0
- Total Amount of Refund Due: 0

- 2015 Return: 1.18%
- 2015 Market Value: $108.7 M
- 2011-2015 (Annualized): 7.58%
- 1985-2015 (Annualized): 9.33%
**Actuarial Funded Ratio (1987-2015)**

- Funded Ratio: 73.6%
- Date of Last Valuation: 01/14
- Actuary: PERAC
- Assumed Rate of Return: 7.75%
- Funding Schedule: 2.5% Total Increasing
- Year Fully Funded: 2030
- Unfunded Liability: $10.9 M
- Total Pension Appropriation (Fiscal 2016): $1.7 M

**Investment Return History**

- Number of Disability Retirees: 13
- Number Who Reported Earnings: 2
- Number of Excess Earners: 0
- Total Amount of Refund Due: $0

**2015 Return**

- 31 years 2015: 9.07%
- 30 years 2014: 9.34%
- 29 years 2013: 9.38%
- 10 years 2015: 5.91%
- 10 years 2014: 7.06%
- 10 years 2013: 7.67%
- 5 years 2015: 7.56%
- 5 years 2014: 10.07%
- 5 years 2013: 11.90%

**Earned Income of Disability Retirees (2014)**

- 2015 Return: 1.16%
- 2015 Market Value: $34.5 M
- 2011-2015 (Annualized): 7.56%
- 1985-2015 (Annualized): 9.07%

**Asset Allocation (12/31/15)**

- Fixed Income: 12.9%
- Private Equity: 11.4%
- Real Estate: 10.9%
- Timber/Nat. Resources: 3.1%
- Hedge Funds: 9.0%
- Cash/Overlay: 0.9%
- Port. Comp. Strat.: 1.0%
- Global Equity: 42.3%

**10-Year History of Appropriations (in Thousands)**

- 2016 Appropriation: $10.9 M
- 2015 Appropriation: $1.7 M
- 195 Members: $6.4 M
- 194 Members: $33,000
- 119 Members: $17,600
- 72 Members: $17,600

**Investment Return (2011-2015, 5 Year and 31 Year Averages)**

- 2015 Return: 1.16%
- 2015 Market Value: $34.5 M
- 2011-2015 (Annualized): 7.56%
- 1985-2015 (Annualized): 9.07%

**Active and Retired Members**

- Active: 195
- Retired: 121

**Investment Return History**

- 31 years 2015: 9.07%
- 30 years 2014: 9.34%
- 29 years 2013: 9.38%
- 10 years 2015: 5.91%
- 10 years 2014: 7.06%
- 10 years 2013: 7.67%
- 5 years 2015: 7.56%
- 5 years 2014: 10.07%
- 5 years 2013: 11.90%
ACTUARIAL FUNDED RATIO (1987-2015)

INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)

10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)

INVESTMENT RETURN HISTORY

31 years 2015 8.02%
30 years 2014 8.28%
29 years 2013 8.28%
10 years 2015 5.26%
10 years 2014 5.74%
10 years 2013 5.67%
5 years 2015 8.23%
5 years 2014 10.96%
5 years 2013 13.09%

ASSET ALLOCATION (12/31/15)

EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees: 19
- Number Who Reported Earnings: 7
- Number of Excess Earners: 0
- Total Amount of Refund Due: $0

- 2015 Return: .76%
- 2015 Market Value: $112.5 M
- 2011-2015 (Annualized): 8.23%
- 1985-2015 (Annualized): 8.02%
**ACTUARIAL FUNDED RATIO (1987-2015)**

Funded Ratio: 68.6%
Date of Last Valuation: 01/15
Actuary: The Segal Company
Assumed Rate of Return: 7.75%
Funding Schedule: 4.5% Increasing Phase-in

**INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)**

2015 Return: 1.17%
2015 Market Value: $134.5 M
2011-2015 (Annualized): 7.45%
1985-2015 (Annualized): 9.60%

**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

**ASSET ALLOCATION (12/31/15)**

- **CASH/OVERLAY**: 0.9%
- **GLOBAL EQUITY**: 42.3%
- **HEDGE FUNDS**: 9.0%
- **PORT. COMP. STRAT.**: 1.0%
- **TIMBER/NAT. RESOURCES**: 3.1%
- **REAL ESTATE**: 10.9%
- **PRIVATE EQUITY**: 11.4%
- **FIXED INCOME**: 12.9%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees: 24
- Number Who Reported Earnings: 5
- Number of Excess Earners: 0
- Total Amount of Refund Due: $0

- **2015 Return**: 1.17%
- **2015 Market Value**: $134.5 M
- **2011-2015 (Annualized)**: 7.45%
- **1985-2015 (Annualized)**: 9.60%
### ACTUARIAL

- **Funded Ratio:** 42.5%
- **Date of Last Valuation:** 01/14
- **Actuary:** Sherman Actuarial Services, LLC
- **Assumed Rate of Return:** 7.75%
- **Funding Schedule:** 4.0% Increasing
- **Year Fully Funded:** 2036
- **Unfunded Liability:** $348.8 M
- **Total Pension Appropriation (Fiscal 2016):** $29.8 M

### ASSET ALLOCATION (12/31/15)

- **CASH/OVERLAY:** 0.7%
- **DOMESTIC EQUITY:** 35.9%
- **REAL ESTATE:** 10.1%
- **PRIVATE EQUITY:** 4.0%
- **FIXED INCOME:** 15.6%
- **INT’L EQUITY:** 21.4%

### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)

- **FY07:** $5,700
- **FY08:** $9,200
- **FY09:** $8,000
- **FY10:** $7,500
- **FY11:** $10,300
- **FY12:** $21,000
- **FY13:** $28,000
- **FY14:** $28,000
- **FY15:** $28,000
- **FY16:** $25,000

### INVESTMENT RETURN HISTORY

<table>
<thead>
<tr>
<th>Period</th>
<th>Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 years</td>
<td>7.94%</td>
</tr>
<tr>
<td>10 years</td>
<td>5.75%</td>
</tr>
<tr>
<td>5 years</td>
<td>6.89%</td>
</tr>
</tbody>
</table>

### INVESTMENT RETURN

<table>
<thead>
<tr>
<th>Period</th>
<th>Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>-0.46%</td>
</tr>
<tr>
<td>2014</td>
<td>6.89%</td>
</tr>
<tr>
<td>2013</td>
<td>7.94%</td>
</tr>
<tr>
<td>2012</td>
<td>12.38%</td>
</tr>
<tr>
<td>2011</td>
<td>9.75%</td>
</tr>
<tr>
<td>2010</td>
<td>6.86%</td>
</tr>
<tr>
<td>2009</td>
<td>8.23%</td>
</tr>
<tr>
<td>2008</td>
<td>8.29%</td>
</tr>
</tbody>
</table>

### EARNED INCOME OF DISABILITY RETIREES (2014)

- **Number of Disability Retirees:** 278
- **Number Who Reported Earnings:** 75
- **Number of Excess Earners:** 6
- **Total Amount of Refund Due:** $46,790.11

### EARNED INCOME

- **2015 Return:** -0.46%
- **2015 Market Value:** $275.4 M
- **2011-2015 (Annualized):** 6.89%
- **1985-2015 (Annualized):** 7.94%
ACTUARIAL

- **Funded Ratio**: 60.8%
- **Date of Last Valuation**: 01/14
- **Actuary**: PERAC
- **Assumed Rate of Return**: 7.75%
- **Funding Schedule**: 4.0% Total Increasing
- **Year Fully Funded**: 2032
- **Unfunded Liability**: $38.0 M
- **Total Pension Appropriation (Fiscal 2016)**: $4.3 M

**ACTIVE**

- **Number of Members**: 364
- **Total Payroll/Benefit**: $15.6 M
- **Average Salary/Benefit**: $42,700
- **Average Age**: 48
- **Average Service**: 11.1 years

**RETIRED**

- **Number of Members**: 224
- **Total Payroll/Benefit**: $5.5 M
- **Average Salary/Benefit**: $24,600
- **Average Age**: 73
- **Average Service**: NA

ASSET ALLOCATION (12/31/15)

- **GLOBAL EQUITY**: 42.3%
- **CASH/OVERLAY**: 0.9%
- **HEDGE FUNDS**: 9.0%
- **PORT. COMP. STRAT.**: 1.0%
- **PRIVATE EQUITY**: 11.4%
- **FIXED INCOME**: 12.9%
- **FIXED VA/HY**: 8.3%
- **REAL ESTATE**: 10.9%
- **TIMBER/NAT. RESOURCES**: 3.1%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- **Number of Disability Retirees**: 25
- **Number Who Reported Earnings**: 9
- **Number of Excess Earners**: 0
- **Total Amount of Refund Due**: $0

- **2015 Return**: 1.19%
- **2015 Market Value**: $67.0 M
- **2011-2015 (Annualized)**: 7.49%
- **1985-2015 (Annualized)**: 8.15%
**ACTUARIAL FUNDED RATIO (1987-2015)**

**INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)**

**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

**INVESTMENT RETURN HISTORY**

<table>
<thead>
<tr>
<th>Period</th>
<th>31 years 2015</th>
<th>30 years 2014</th>
<th>29 years 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.55%</td>
<td>8.80%</td>
<td>8.82%</td>
</tr>
<tr>
<td><strong>10 years</strong></td>
<td>5.44%</td>
<td>6.00%</td>
<td>6.43%</td>
</tr>
<tr>
<td></td>
<td>7.57%</td>
<td>9.90%</td>
<td>11.45%</td>
</tr>
</tbody>
</table>

**ASSET ALLOCATION (12/31/15)**

- CASH/OVERLAY 0.9%
- PORT. COMP. STRAT. 1.0%
- HEDGE FUNDS 9.0%
- GLOBAL EQUITY 42.3%
- TIMBER/NAT. RESOURCES 3.1%
- REAL ESTATE 10.9%
- PRIVATE EQUITY 11.4%
- FIXED INCOME 12.9%
- FIXED VA/HY 8.3%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees: 143
- Number Who Reported Earnings: 38
- Number of Excess Earners: 1
- Total Amount of Refund Due: $40,265.52

**2015 Return**: 1.19%
**2015 Market Value**: $289.3 M
**2011-2015 (Annualized)**: 7.57%
**1985-2015 (Annualized)**: 8.55%
**ACTUARIAL**

- **Funded Ratio:** 55.8%
- **Date of Last Valuation:** 01/14
- **Actuary:** Sherman Actuarial Services, LLC
- **Assumed Rate of Return:** 8.25%
- **Funding Schedule:** 4.0% Increasing Phase-in
- **Year Fully Funded:** 2031
- **Unfunded Liability:** $550.9 M
- **Total Pension Appropriation (Fiscal 2016):** $54.2 M
- **Number of Members:** 5,153
- **Total Payroll/Benefit:** $266.7 M
- **Average Salary/Benefit:** $47,900
- **Average Age:** 73
- **Average Service:** NA

**ASSET ALLOCATION (12/31/15)**

- **HEDGE FUNDS 7.3%**
- **CASH/OVERLAY 2.6%**
- **DOMESTIC EQUITY 35.3%**
- **PRIVATE EQUITY 9.5%**
- **FIXED INCOME 22.9%**
- **INT’L EQUITY 12.8%**

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- **Number of Disability Retirees:** 297
- **Number Who Reported Earnings:** 90
- **Number of Excess Earners:** 1
- **Total Amount of Refund Due:** $1,721.05
- **2015 Return:** -.84%
- **2015 Market Value:** $761.8 M
- **2011-2015 (Annualized):** 7.11%
- **1985-2015 (Annualized):** 8.52%
ACTUARIAL FUNDED RATIO (1987-2015)
INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)  
10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)  

INVESTMENT RETURN HISTORY

<table>
<thead>
<tr>
<th>Years</th>
<th>30 year 2014</th>
<th>10 year 2014</th>
<th>5 year 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>9.98%</td>
<td>8.74%</td>
<td>11.82%</td>
</tr>
<tr>
<td>2014</td>
<td>9.62%</td>
<td>8.93%</td>
<td>11.82%</td>
</tr>
</tbody>
</table>

ASSET ALLOCATION (12/31/15)

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>REAL ESTATE</td>
<td>1.3%</td>
</tr>
<tr>
<td>HEDGE FUNDS</td>
<td>1.8%</td>
</tr>
<tr>
<td>CASH/OVERLAY</td>
<td>5.2%</td>
</tr>
<tr>
<td>DOMESTIC EQUITY</td>
<td>53.8%</td>
</tr>
<tr>
<td>INT’L EQUITY</td>
<td>5.0%</td>
</tr>
<tr>
<td>FIXED INCOME</td>
<td>32.2%</td>
</tr>
</tbody>
</table>

EARNED INCOME OF DISABILITY RETIREEES (2014)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Disability Retirees</td>
<td>29</td>
</tr>
<tr>
<td>Number Who Reported Earnings</td>
<td>13</td>
</tr>
<tr>
<td>Number of Excess Earners</td>
<td>1</td>
</tr>
<tr>
<td>Total Amount of Refund Due</td>
<td>$7,188.65</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015 Return</td>
<td>-0.75%</td>
</tr>
<tr>
<td>2015 Market Value</td>
<td>$54.9 M</td>
</tr>
<tr>
<td>2011-2015 (Annualized)</td>
<td>8.93%</td>
</tr>
<tr>
<td>1985-2015 (Annualized)</td>
<td>9.62%</td>
</tr>
</tbody>
</table>
**Funded Ratio (1987-2015)**

![Graph showing the funded ratio from 1987 to 2015.]

**Investment Return (2011-2015, 5 Year and 31 Year Averages)**

<table>
<thead>
<tr>
<th>Year</th>
<th>5 Year Average</th>
<th>31 Year Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>2.39%</td>
<td></td>
</tr>
</tbody>
</table>

**10-Year History of Appropriations (in Thousands)**

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Appropriations</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY07</td>
<td></td>
</tr>
<tr>
<td>FY08</td>
<td></td>
</tr>
<tr>
<td>FY09</td>
<td></td>
</tr>
<tr>
<td>FY10</td>
<td></td>
</tr>
<tr>
<td>FY11</td>
<td></td>
</tr>
<tr>
<td>FY12</td>
<td></td>
</tr>
<tr>
<td>FY13</td>
<td></td>
</tr>
<tr>
<td>FY14</td>
<td></td>
</tr>
<tr>
<td>FY15</td>
<td></td>
</tr>
<tr>
<td>FY16</td>
<td></td>
</tr>
</tbody>
</table>

**Asset Allocation (12/31/15)**

- **Domestic Equity**: 50.2%
- **Fixed Income**: 20.2%
- **Timber/Natural Resources**: 5.5%
- **Real Estate**: 10.0%
- **Cash/Overlay**: 1.8%
- **International Equity**: 12.1%

**Earned Income of Disability Retirees (2014)**

- Number of Disability Retirees: 21
- Number Who Reported Earnings: 9
- Number of Excess Earners: 1
- Total Amount of Refund Due: $8,352.36

**Perac Annual Report 2015 | 81**
ACTUARIAL

- Funded Ratio: 64.6%
- Date of Last Valuation: 01/14
- Actuary: Stone Consulting
- Assumed Rate of Return: 8.00%
- Funding Schedule: 4.0% Increasing
- Year Fully Funded: 2038
- Unfunded Liability: $14.2 M
- Total Pension Appropriation (Fiscal 2016): $1.5 M

- Number of Members: 204
- Total Payroll/Benefit: $8.2 M
- Average Salary/Benefit: $40,300
- Average Age: 47
- Average Service: 9.9 years

ASSET ALLOCATION (12/31/15)

- Global Equity: 42.3%
- Real Estate: 10.9%
- Private Equity: 11.4%
- Fixed Income: 12.9%
- Fixed Va/Hy: 8.3%
- Hedge Funds: 9.0%
- Cash/Overlay: 0.9%
- Timber/Nat. Resources: 3.1%
- Port. Comp. Strat.: 1.0%

EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees: 9
- Number Who Reported Earnings: 4
- Number of Excess Earners: 0
- Total Amount of Refund Due: $0

- 2015 Return: 1.17%
- 2015 Market Value: $29.0 M
- 2011-2015 (Annualized): 7.61%
- 1985-2015 (Annualized): 9.29%
Norwood
566 Washington Street
Norwood, MA 02062
Phone 781-762-1240, Ext. 157
Fax 781-278-3024

Board Members
Ted Mulvehill, Jr., (Chairperson),
Eileen Hickey, Thomas J. McQuaid,
Thomas O’Toole, Thomas A. Rorrie

Board Administrator
Debra A. Wilkes
Board Meeting
Third Thursday of each month

---

**ACTUARIAL**

- Funded Ratio: 77.0%
- Date of Last Valuation: 01/14
- Actuary: Sherman Actuarial Services, LLC
- Assumed Rate of Return: 8.25%
- Funding Schedule: 4.5% Increasing Phase-in 2030
- Unfunded Liability: $38.4 M
- Total Pension Appropriation (Fiscal 2016): $4.2 M

**INVESTMENT RETURN HISTORY**

- 31 years 2015: 8.99%
- 10 years 2015: 6.28%
- 5 years 2015: 6.85%
- 30 years 2014: 9.28%
- 10 years 2014: 7.08%
- 5 years 2014: 8.97%
- 29 years 2013: 9.40%
- 10 years 2013: 7.51%
- 5 years 2013: 12.40%

**ASSET ALLOCATION (12/31/15)**

- CASH/OVERLAY: 0.4%
- DOMESTIC EQUITY: 36.4%
- REAL ESTATE: 10.9%
- INT'L EQUITY: 21.9%
- FIXED INCOME: 13.1%
- FIXED VA/HY: 8.8%
- HEDGE FUNDS: 7.4%

**Earned Income of Disability Retirees (2014)**

- Number of Disability Retirees: 39
- Number Who Reported Earnings: 14
- Number of Excess Earners: 1
- Total Amount of Refund Due: $3,648.31

- 2015 Return: .60%
- 2015 Market Value: $134.8 M
- 2011-2015 (Annualized): 6.85%
- 1985-2015 (Annualized): 8.99%
**ACTUARIAL**

- **Funded Ratio**: 49.6%
- **Date of Last Valuation**: 01/14
- **Actuary**: Sherman Actuarial Services, LLC
- **Assumed Rate of Return**: 8.25%
- **Funding Schedule**: 4.0% Increasing
- **Year Fully Funded**: 2036
- **Unfunded Liability**: $122.5 M
- **Total Pension Appropriation (Fiscal 2016)**: $110.0 M
- **Number of Members**: 796
- **Total Payroll/Benefit**: $40.1 M
- **Average Salary/Benefit**: $50,400
- **Average Age**: NA
- **Average Service**: NA

**ASSET ALLOCATION (12/31/15)**

- **GLOBAL EQUITY**: 42.3%
- **REAL ESTATE**: 10.9%
- **PRIVATE EQUITY**: 11.4%
- **HEDGE FUNDS**: 9.0%
- **PORT. COMP. STRAT.**: 1.0%
- **CASH/OVERLAY**: 0.9%
- **FIXED INCOME**: 12.9%
- **FIXED VA/HY**: 8.3%
- **TIMBER/NAT. RESOURCES**: 3.1%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- **Number of Disability Retirees**: 53
- **Number Who Reported Earnings**: 15
- **Number of Excess Earners**: 0
- **Total Amount of Refund Due**: $0

- **2015 Return**: 1.18%
- **2015 Market Value**: $126.8 M
- **2011-2015 (Annualized)**: 7.59%
- **1985-2015 (Annualized)**: 8.56%
ACTUARIAL

- Funded Ratio: 46.2%
- Date of Last Valuation: 01/15
- Actuary: PERAC
- Assumed Rate of Return: 7.75%
- Funding Schedule: 5.1% Total Increasing to 2035
- Year Fully Funded: $129.7 M
- Unfunded Liability: $11.5 M
- Total Pension Appropriation (Fiscal 2016): 927

ACTIVE
- Number of Members: 927
- Total Payroll/Benefit: $34.7 M
- Average Salary/Benefit: $37,500
- Average Age: 49
- Average Service: 12.3 years

RETIRED
- Number of Members: 758
- Total Payroll/Benefit: $14.6 M
- Average Salary/Benefit: $19,200

ASSET ALLOCATION (12/31/15)

- Global Equity: 39.7%
- Fixed Income: 12.1%
- Private Equity: 11.7%
- Hedge Funds: 8.5%
- Real Estate: 10.5%
- Timber/Nat. Resources: 2.9%
- Cash/Overlay: 5.9%
- Port. Comp. Strategy: 0.9%

EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees: 77
- Number Who Reported Earnings: 21
- Number of Excess Earners: 0
- Total Amount of Refund Due: 0

- 2015 Return: 1.39%
- 2015 Market Value: $116.3 M
- 2011-2015 (Annualized): 7.71%
- 1985-2015 (Annualized): 8.12%
ACTUARIAL

- Funded Ratio 49.2%
- Date of Last Valuation 01/15
- Actuary PERAC
- Assumed Rate of Return 7.50%
- Funding Schedule 8.0% Total Increasing
- Year Fully Funded 2034
- Unfunded Liability $142.3 M
- Total Pension Appropriation (Fiscal 2016) $10.7 M

ASSET ALLOC./BALANCED 9.9%
CASH/OVERLAY 0.7%
DOMESTIC EQUITY 30.5%
REAL ESTATE 10.0%
PRIVATE EQUITY 6.3%
FIXED VA/HY 6.2%
FIXED INCOME 11.0%
INT’L EQUITY 20.2%

INVESTMENT RETURN HISTORY

<table>
<thead>
<tr>
<th></th>
<th>31 years 2015</th>
<th>30 years 2014</th>
<th>29 years 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.77%</td>
<td>8.97%</td>
<td>9.07%</td>
</tr>
<tr>
<td>10 years</td>
<td>6.26%</td>
<td>6.78%</td>
<td>7.33%</td>
</tr>
<tr>
<td>5 years</td>
<td>8.42%</td>
<td>10.33%</td>
<td>13.56%</td>
</tr>
</tbody>
</table>

EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees 69
- Number Who Reported Earnings 25
- Number of Excess Earners 1
- Total Amount of Refund Due $390.50

- 2015 Return 2.96%
- 2015 Market Value $145.8 M
- 2011-2015 (Annualized) 8.42%
- 1985-2015 (Annualized) 8.77%
Plymouth County

10 Cordage Park Circle
Suite 234
Plymouth, MA 02360
Phone 508-830-1803
Fax 508-830-1875

Board Members
Thomas J. O’Brien (Chairperson),
Mary Beth Carter, James E. Harrington,
Joseph F. McDonough, Esq.,
John F. Sciara

Board Administrator
David J. Sullivan
Board Meeting
Usually the last Tuesday of each month

ACTUARIAL

- Funded Ratio
- Date of Last Valuation
- Actuary
- Assumed Rate of Return
- Funding Schedule
- Year Fully Funded
- Unfunded Liability
- Total Pension Appropriation (Fiscal 2016)

Funded Ratio: 58.3%
Date of Last Valuation: 01/15
Actuary: Sherman Actuarial Services, LLC
Assumed Rate of Return: 8.00%
Funding Schedule: 4.0% Increasing
Year Fully Funded: 2031
Unfunded Liability: $590.6 M
Total Pension Appropriation (Fiscal 2016): $64.1 M

INVESTMENT RETURN HISTORY

- 31 years 2015
  9.05%
- 10 years 2015
  5.58%
- 5 years 2015
  7.02%
- 30 years 2014
  9.35%
- 10 years 2014
  6.40%
- 5 years 2014
  10.03%
- 29 years 2013
  9.50%
- 10 years 2013
  7.14%
- 5 years 2013
  13.09%

REAL ESTATE 12.9%
FIXED INCOME 22.4%
DOMESTIC EQUITY 37.6%
INT’L EQUITY 13.8%
COMM./REAL ASSETS/OTHER 2.0%
HEDGE FUNDS 3.3%
CASH/OVERLAY 3.5%
PRIVATE EQUITY 4.5%

EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees: 309
- Number Who Reported Earnings: 95
- Number of Excess Earners: 4
- Total Amount of Refund Due: $87,767.03

- 2015 Return: .54%
- 2015 Market Value: $832.6 M
- 2011-2015 (Annualized): 7.02%
- 1985-2015 (Annualized): 9.05%
### Actuarial

- **Funded Ratio**: 46.7%
- **Date of Last Valuation**: 01/14
- **Actuary**: Stone Consulting
- **Assumed Rate of Return**: 8.00%
- **Funding Schedule**: 5.4% Total Increasing
- **Year Fully Funded**: 2036
- **Unfunded Liability**: $337.6 M
- **Total Pension Appropriation (Fiscal 2016)**: $24.7 M

### Investment Return History

- **31 years 2015**: 8.09%
- **10 years 2015**: 4.94%
- **5 years 2015**: 5.97%

### Asset Allocation (12/31/15)

- **Fixed Income**: 15.0%
- **Domestic Equity**: 24.3%
- **Int'l Equity**: 26.2%
- **Private Equity**: 6.3%
- **Real Estate**: 9.1%
- **Commodities/Real Assets/Other**: 3.5%
- **Cash/Overlay**: 1.0%
- **Asset Alloc/Balanced**: 1.2%
- **Hedge Funds**: 2.1%

### Earned Income of Disability Retirees (2014)

- **Number of Disability Retirees**: 135
- **Number Who Reported Earnings**: 31
- **Number of Excess Earners**: 1
- **Total Amount of Refund Due**: $2,645.67

- **2015 Return**: -0.79%
- **2015 Market Value**: $283.3 M
- **2011-2015 (Annualized)**: 5.97%
- **1985-2015 (Annualized)**: 8.09%
**ACTUARIAL**

- **Funded Ratio**: 73.0%
- **Date of Last Valuation**: 01/15
- **Actuary**: KMS Actuaries
- **Assumed Rate of Return**: 7.65%
- **Funding Schedule**: 4.5% Total Increasing
- **Year Fully Funded**: 2029
- **Unfunded Liability**: $43.0 M
- **Total Pension Appropriation (Fiscal 2016)**: $5.2 M

**ASSET ALLOCATION (12/31/15)**

- **CASH/OVERLAY**: 0.9%
- **GLOBAL EQUITY**: 42.3%
- **HEDGE FUNDS**: 9.0%
- **PORT. COMP. STRAT.**: 1.0%
- **TIMBER/NAT. RESOURCES**: 3.1%
- **REAL ESTATE**: 10.9%
- **PRIVATE EQUITY**: 11.4%
- **FIXED INCOME**: 12.9%
- **FIXED VA/HY**: 8.3%
- **PRIVATE DEBT**: 7.6%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees: 33
- Number Who Reported Earnings: 9
- Number of Excess Earners: 1
- Total Amount of Refund Due: $7,462.61

**INVESTMENT RETURN HISTORY**

- **31 years 2015**: 9.22%
- **10 years 2015**: 5.99%
- **5 years 2015**: 7.63%

- **30 years 2014**: 9.50%
- **10 years 2014**: 7.14%
- **5 years 2014**: 10.14%

- **29 years 2013**: 9.54%
- **10 years 2013**: 7.73%
- **5 years 2013**: 12.02%

**INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)**

- **2015 Return**: 1.24%
- **2015 Market Value**: $118.0 M
- **2011-2015 (Annualized)**: 7.63%
- **1985-2015 (Annualized)**: 9.22%

**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

- **2015 Appropriation**: 333
- **2014 Appropriation**: 333
- **2013 Appropriation**: 333
- **2012 Appropriation**: 333
- **2011 Appropriation**: 333
- **2010 Appropriation**: 333
- **2009 Appropriation**: 333
- **2008 Appropriation**: 333
- **2007 Appropriation**: 333

**ASSET ALLOCATION (12/31/15)**

- **CASH/OVERLAY**: 0.9%
- **GLOBAL EQUITY**: 42.3%
- **HEDGE FUNDS**: 9.0%
- **PORT. COMP. STRAT.**: 1.0%
- **TIMBER/NAT. RESOURCES**: 3.1%
- **REAL ESTATE**: 10.9%
- **PRIVATE EQUITY**: 11.4%
- **FIXED INCOME**: 12.9%
- **FIXED VA/HY**: 8.3%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees: 33
- Number Who Reported Earnings: 9
- Number of Excess Earners: 1
- Total Amount of Refund Due: $7,462.61

- **2015 Return**: 1.24%
- **2015 Market Value**: $118.0 M
- **2011-2015 (Annualized)**: 7.63%
- **1985-2015 (Annualized)**: 9.22%
**Funded Ratio (1987-2015)**

- 1985-2015 (Annualized): 8.30%
- 10 years 2015: 8.30%
- 5 years 2015: 8.30%

**Investment Return History**

- 10 years 2015: 8.30%
- 5 years 2015: 8.30%

**Asset Allocation (12/31/15)**

- Global Equity: 42.3%
- Fixed Income: 12.9%
- Private Equity: 11.4%
- Real Estate: 10.9%
- Timber/Natural Resources: 3.1%
- Hedge Funds: 9.0%
- Cash/Overlay: 0.9%
- Port. Comp. Strat.: 1.0%

**Earned Income of Disability Retirees (2014)**

- Number of Disability Retirees: 88
- Number Who Reported Earnings: 33
- Number of Excess Earners: 1
- Total Amount of Refund Due: $1,871.16

**Board Members**

- Laurie Giardella (Chairperson),
- James Caramello, Gennaro Cataldo,
- John Henry, Sean Manion

**Board Administrator**

- Sandor Zapolin

**Board Meeting**

- Varies
**ACTUARIAL**

- **Funded Ratio**: 50.7%
- **Date of Last Valuation**: 01/14
- **Actuary**: The Segal Company
- **Assumed Rate of Return**: 7.75%
- **Funding Schedule**: 4.5% Increasing
- **Year Fully Funded**: 2031
- **Unfunded Liability**: $117.1 M
- **Total Pension Appropriation (Fiscal 2016)**: $12.5 M

<table>
<thead>
<tr>
<th>Number of Members</th>
<th>ACTIVE</th>
<th>RETIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>827</td>
<td>571</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Payroll/Benefit</th>
<th>$38.7 M</th>
<th>$12.9 M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Salary/Benefit</td>
<td>$46,800</td>
<td>$22,600</td>
</tr>
<tr>
<td>Average Age</td>
<td>49</td>
<td>75</td>
</tr>
<tr>
<td>Average Service</td>
<td>12.6 years</td>
<td>NA</td>
</tr>
</tbody>
</table>

**ASSET ALLOCATION (12/31/15)**

- **CASH/OVERLAY 2.6%**
- **PORT. COMP. STRATEGY 1.0%**
- **HEDGE FUNDS 8.9%**
- **TIMBER/NAT. RESOURCES 3.0%**
- **REAL ESTATE 10.7%**
- **PRIVATE EQUITY 11.3%**
- **FIXED VA/HY 8.2%**
- **FIXED INCOME 12.7%**
- **GLOBAL EQUITY 41.6%**

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- **Number of Disability Retirees**: 52
- **Number Who Reported Earnings**: 13
- **Number of Excess Earners**: 0
- **Total Amount of Refund Due**: $0

<table>
<thead>
<tr>
<th>2015 Return</th>
<th>.82%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015 Market Value</td>
<td>$138.5 M</td>
</tr>
<tr>
<td>2011-2015 (Annualized)</td>
<td>7.19%</td>
</tr>
<tr>
<td>1985-2015 (Annualized)</td>
<td>8.03%</td>
</tr>
</tbody>
</table>
### Actuarial

- **Funded Ratio**: 69.5%
- **Date of Last Valuation**: 01/15
- **Actuary**: PERAC
- **Assumed Rate of Return**: 7.60%
- **Funding Schedule**: 2.0% Increasing Phase-in to 2028
- **Year Fully Funded**: 2028
- **Unfunded Liability**: $35.4 M
- **Total Pension Appropriation (Fiscal 2016)**: $5.7 M

#### Investment Return (2011-2015, 5 Year and 31 Year Averages)

- **2015 Return**: 1.17%
- **2015 Market Value**: $81.0 M
- **2011-2015 (Annualized)**: 7.59%
- **1985-2015 (Annualized)**: 9.16%

#### Asset Allocation (12/31/15)

- **Global Equity**: 42.3%
- **Fixed Income**: 12.9%
- **Fixed VA/HY**: 8.3%
- **Private Equity**: 11.4%
- **Real Estate**: 10.9%
- **Timber/Natural Resources**: 3.1%
- **Hedge Funds**: 9.0%
- **PORT. COMP. STRAT.**: 1.0%
- **CASH/OVERLAY**: 0.9%

#### Earned Income of Disability Retirees (2014)

- **Number of Disability Retirees**: 24
- **Number Who Reported Earnings**: 8
- **Number of Excess Earners**: 0
- **Total Amount of Refund Due**: $0
ACTUARIAL

- Funded Ratio 72.1%
- Date of Last Valuation 01/14
- Actuary Sherman Actuarial Services, LLC
- Assumed Rate of Return 8.00%
- Funding Schedule 4.5% Increasing
- Year Fully Funded 2022
- Unfunded Liability $32.0 M
- Total Pension Appropriation (Fiscal 2016) $5.9 M

- Number of Members 572
- Total Payroll/Benefit $23.9 M
- Average Salary/Benefit $41,800
- Average Age 73
- Average Service NA

ASSET ALLOCATION (12/31/15)

- Timber/Nat. Resources 1.6%
- Hedge Funds 4.7%
- Private Equity 5.6%
- Int’l Equity 16.2%
- Real Estate 7.9%
- Cash/Overlay 1.5%
- Fixed Income 21.5%
- Domestic Equity 41.0%

EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees 22
- Number Who Reported Earnings 9
- Number of Excess Earners 1
- Total Amount of Refund Due $107.16

- 2015 Return .78%
- 2015 Market Value $98.1 M
- 2011-2015 (Annualized) 8.37%
- 1985-2015 (Annualized) 9.06%
**ACTUARIAL**

- Funded Ratio: 62.5%
- Date of Last Valuation: 01/15
- Actuary: Sherman Actuarial Services, LLC
- Assumed Rate of Return: 8.25%
- Funding Schedule: 4.0% Increasing
- Year Fully Funded: 2034
- Unfunded Liability: $139.1 M
- Total Pension Appropriation (Fiscal 2016): $14.2 M

**ASSET ALLOCATION (12/31/15)**

- Real Estate: 8.7%
- Cash/Overlay: 2.9%
- Fixed Income: 26.0%
- Int’l Equity: 5.1%
- Domestic Equity: 57.3%

**EARNED INCOME OF DISABILITY RETIREEs (2014)**

- Number of Disability Retirees: 104
- Number Who Reported Earnings: 26
- Number of Excess Earners: 1
- Total Amount of Refund Due: $1,266.12

**INVESTMENT RETURN HISTORY**

- 31 years 2015: 8.94%
- 10 years 2015: 7.07%
- 5 years 2015: 8.90%
- 30 years 2014: 9.21%
- 10 years 2014: 7.67%
- 5 years 2014: 11.55%
- 29 years 2013: 9.31%
- 10 years 2013: 8.44%
- 5 years 2013: 14.77%
**ACTUARIAL**

- Funded Ratio: 50.8%
- Date of Last Valuation: 01/14
- Actuary: PERAC
- Assumed Rate of Return: 7.75%
- Funding Schedule: 5.0% Total Increasing
- Year Fully Funded: 2034
- Unfunded Liability: $33.2 M
- Total Pension Appropriation (Fiscal 2016): $3.4 M

**ASSET ALLOCATION (12/31/15)**

- Global Equity: 42.3%
- Real Estate: 10.9%
- Timber/Nat. Resources: 3.1%
- Hedge Funds: 9.0%
- Private Equity: 11.4%
- Fixed Va/Hy: 8.3%
- Fixed Income: 12.9%
- Cash/Overlay: 0.9%
- Port. Comp. Strat.: 1.0%
- Cash/Overlay: 0.9%

**INVESTMENT RETURN HISTORY**

<table>
<thead>
<tr>
<th>Period</th>
<th>31 years 2015</th>
<th>30 years 2014</th>
<th>29 years 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.95%</td>
<td>8.17%</td>
<td>8.17%</td>
</tr>
<tr>
<td>10 years</td>
<td>4.25%</td>
<td>4.68%</td>
<td>4.90%</td>
</tr>
<tr>
<td>5 years</td>
<td>7.27%</td>
<td>9.35%</td>
<td>10.47%</td>
</tr>
</tbody>
</table>

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees: 14
- Number Who Reported Earnings: 4
- Number of Excess Earners: 0
- Total Amount of Refund Due: $0

- 2015 Return: 1.34%
- 2015 Market Value: $41.6 M
- 2011-2015 (Annualized): 7.27%
- 1985-2015 (Annualized): 7.95%
### Actuarial

- **Funded Ratio**: 27.0%
- **Date of Last Valuation**: 01/14
- **Actuary**: PERAC
- **Assumed Rate of Return**: 7.88%
- **Funding Schedule**: Varies Total Increasing
- **Year Fully Funded**: 2035
- **Unfunded Liability**: $731.0 M
- **Total Pension Appropriation (Fiscal 2016)**: $47.7 M

#### Investment Return (2011-2015, 5 Year and 31 Year Averages)

- **2015 Return**: 1.54%
- **2015 Market Value**: $287.4 M
- **2011-2015 (Annualized)**: 7.73%
- **1985-2015 (Annualized)**: 8.30%

#### Asset Allocation (12/31/15)

- **Global Equity**: 41.8%
- **Fixed Income**: 12.8%
- **Fixed VA/HY**: 8.2%
- **Private Equity**: 11.8%
- **Real Estate**: 10.8%
- **Timber/Nat. Resources**: 3.1%
- **Hedge Funds**: 9.0%
- **Port. Comp. Strategy**: 1.0%
- **Cash/Overlay**: 1.5%
- **TIAA**: 0.9%

#### Earned Income of Disability Retirees (2014)

- **Number of Disability Retirees**: 440
- **Number Who Reported Earnings**: 127
- **Number of Excess Earners**: 10
- **Total Amount of Refund Due**: $114,049.04

**PERAC Annual Report 2015 | 97**
**Funded Ratio (1987-2015)**

- 2015 Return: 0%
- 2015 Market Value: $0 M
- 2011-2015 (Annualized): 0%
- 1985-2015 (Annualized): 0%

**Investment Return History**

- 31 years 2015: 9.40%
- 10 years 2015: 5.97%
- 5 years 2015: 7.62%
- 30 years 2014: 9.69%
- 10 years 2014: 7.12%
- 5 years 2014: 10.16%
- 29 years 2013: 9.74%
- 10 years 2013: 7.72%
- 5 years 2013: 12.05%

**Asset Allocation (12/31/15)**

- **Cash/Overlay**: 0.9%
- **Global Equity**: 42.3%
- **Fixed Income**: 12.9%
- **Fixed VA/HY**: 8.3%
- **Private Equity**: 11.4%
- **Timber/Nat. Resources**: 3.1%
- **Real Estate**: 10.9%
- **Hedge Funds**: 9.0%
- **Port. Comp. Strat.**: 1.0%

**Earned Income of Disability Retirees (2014)**

- Number of Disability Retirees: 3306
- Number Who Reported Earnings: 890
- Number of Excess Earners: 30
- Total Amount of Refund Due: $301,462.12

- 2015 Return: 1.18%
- 2015 Market Value: $23.0 B
- 2011-2015 (Annualized): 7.62%
- 1985-2015 (Annualized): 9.40%
**Stoneham**

Town Hall  
35 Central Street  
Stoneham, MA 02180-2087  
Phone 781-279-2635  
Fax 781-438-6906

**Board Members**  
Janice T. Houghton (Chairperson),  
James J. McDermott, Jr., Donald Piatt,  
John Scullin, Kathleen Sullivan

**Board Administrator**  
Karen DeAngelis  
**Board Meeting**  
Last Tuesday of each month at 2:00 pm

---

**ACTUARIAL**

- Funded Ratio 64.5%
- Date of Last Valuation 01/14
- Actuary Stone Consulting 7.88%
- Assumed Rate of Return 7.85% Total Increasing 2023
- Funding Schedule $36.6 M
- Year Fully Funded $5.3 M
- Unfunded Liability 2015
- Total Pension Appropriation (Fiscal 2016)

**INVESTMENT RETURN HISTORY**

- Number of Disability Retirees 273
- Total Payroll/Benefit $12.8 M
- Average Salary/Benefit $47,000
- Average Age 50
- Average Service 12.9 years

---

**ASSET ALLOCATION (12/31/15)**

- **PORT. COMP. STRAT. 1.0%**
- **CASH/OVERLAY 0.9%**
- **HEDGE FUNDS 9.0%**
- **GLOBAL EQUITY 42.3%**
- **REAL ESTATE 10.9%**
- **FIXED INCOME 12.9%**
- **PRIVATE EQUITY 11.4%**
- **FIXED VA/HY 8.3%**
- **TIMBER/NAT. RESOURCES 3.1%**

---

**EARNED INCOME OF DISABILITY RETIREEES (2014)**

- Number of Disability Retirees 20
- Number Who Reported Earnings 6
- Number of Excess Earners 0
- Total Amount of Refund Due 50

- **2015 Return 1.18%**
- **2015 Market Value $73.7 M**
- **2011-2015 (Annualized) 7.57%**
- **1985-2015 (Annualized) 8.74%**
**ACTUARIAL**

- **Funded Ratio**: 48.2%
- **Date of Last Valuation**: 01/15
- **Actuary**: Stone Consulting
- **Assumed Rate of Return**: 8.00%
- **Funding Schedule**: 4.0% Increasing 2031
- **Year Fully Funded**: 2031
- **Unfunded Liability**: $45.6 M
- **Total Pension Appropriation (Fiscal 2016)**: $4.7 M

**INVESTMENT RETURN HISTORY**

- **31 years 2015**: 9.03%
- **30 years 2014**: 9.29%
- **29 years 2013**: 9.29%
- **10 years 2015**: 5.81%
- **10 years 2014**: 6.54%
- **10 years 2013**: 6.79%
- **5 years 2015**: 8.03%
- **5 years 2014**: 9.85%
- **5 years 2013**: 10.68%

**ASSET ALLOCATION (12/31/15)**

- **GLOBAL EQUITY**: 52.9%
- **HEDGE FUNDS**: 6.9%
- **CASH OVERLAY**: 2.2%
- **PORT. COMP. STRATEGY**: 0.8%
- **REAL ESTATE**: 9.4%
- **TIMBER/NAT. RESOURCES**: 2.3%
- **PRIVATE EQUITY**: 9.4%
- **FIXED INCOME**: 9.8%
- **PRIVATE VA/HY**: 6.3%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- **Number of Disability Retirees**: 18
- **Number Who Reported Earnings**: 4
- **Number of Excess Earners**: 0
- **Total Amount of Refund Due**: $0

- **2015 Return**: 1.50%
- **2015 Market Value**: $45.6 M
- **2011-2015 (Annualized)**: 8.03%
- **1985-2015 (Annualized)**: 9.03%
**ACTUARIAL**

- Funded Ratio: 65.6%
- Date of Last Valuation: 01/14
- Actuary: Sherman Actuarial Services, LLC
- Assumed Rate of Return: 8.00%
- Funding Schedule: 4.5% Increasing
- Year Fully Funded: 2030
- Unfunded Liability: $125.4 M
- Total Pension Appropriation (Fiscal 2016): $14.9 M

**INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)**

- 5 years 2015: 7.97%
- 5 years 2014: 10.80%
- 5 years 2013: 13.22%

**ASSET ALLOCATION (12/31/15)**

- INT'L EQUITY: 12.2%
- REAL ESTATE: 12.5%
- COMM./REAL ASSETS/OTHER: 1.9%
- DOMESTIC EQUITY: 46.0%
- CASH/OVERLAY: 2.5%
- PRIVATE EQUITY: 2.6%
- TIMBER/NAT. RESOURCES: 2.0%
- FIXED INCOME: 20.3%

**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

- FY07: $0
- FY08: $2,000
- FY09: $4,000
- FY10: $6,000
- FY11: $8,000
- FY12: $10,000
- FY13: $12,000
- FY14: $14,000
- FY15: $16,000

**INVESTMENT RETURN HISTORY**

- 31 years 2015: 9.59%
- 30 years 2014: 9.87%
- 29 years 2013: 9.95%
- 20 years 2015: 6.55%
- 10 years 2014: 6.98%
- 10 years 2013: 7.40%
- 5 years 2015: 7.97%
- 5 years 2014: 10.80%
- 5 years 2013: 13.22%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees: 79
- Number Who Reported Earnings: 16
- Number of Excess Earners: 0
- Total Amount of Refund Due: $0

- 2015 Return: 1.49%
- 2015 Market Value: $262.5 M
- 2011-2015 (Annualized): 7.97%
- 1985-2015 (Annualized): 9.59%
ACTUARIAL

- Funded Ratio: 63.5%
- Date of Last Valuation: 01/14
- Actuary: PERAC
- Assumed Rate of Return: 7.75%
- Funding Schedule: 4.0% Increasing Phase-in
- Year Fully Funded: 2035
- Unfunded Liability: $53.8 M
- Total Pension Appropriation (Fiscal 2016): $4.9 M

- Number of Members: 429
- Total Payroll/Benefit: $21.3 M
- Average Salary/Benefit: $49,600
- Average Age: 48
- Average Service: 12.4 years

EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees: 33
- Number Who Reported Earnings: 7
- Number of Excess Earners: 0
- Total Amount of Refund Due: $0

- 2015 Return: 1.31%
- 2015 Market Value: $102.8 M
- 2011-2015 (Annualized): 7.67%
- 1985-2015 (Annualized): 9.61%
ACTUARIAL

- Funded Ratio 55.9%
- Date of Last Valuation 01/15
- Actuary Sherman Actuarial Services, LLC
- Assumed Rate of Return 8.25%
- Funding Schedule Varies Total Increasing
- Year Fully Funded 2033
- Unfunded Liability $153.9 M
- Total Pension Appropriation (Fiscal 2016) $16.2 M

INVESTMENT RETURN HISTORY

- 31 years 2015 8.62%
- 30 years 2014 8.86%
- 29 years 2013 8.86%
- 10 years 2015 5.59%
- 10 years 2014 6.14%
- 10 years 2013 6.37%
- 5 years 2015 8.23%
- 5 years 2014 10.76%
- 5 years 2013 10.66%

ASSET ALLOCATION (12/31/15)

- PORT. COMP. STRATEGY 0.9%
- CASH/OVERLAY 2.1%
- TIMBER/NAT. RESOURCES 2.9%
- REAL ESTATE 12.9%
- FIXED INCOME 12.3%
- FIXED VA/HY 7.9%
- PRIVATE EQUITY 12.1%
- GLOBAL EQUITY 40.3%
- FIXED VA/HY 7.9%

EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees 79
- Number Who Reported Earnings 19
- Number of Excess Earners 0
- Total Amount of Refund Due 0

- 2015 Return 1.53%
- 2015 Market Value $202.5 M
- 2011-2015 (Annualized) 8.23%
- 1985-2015 (Annualized) 8.62%
**ACTUARIAL**

- **Funded Ratio**: 73.7%
- **Date of Last Valuation**: 01/15
- **Actuary**: Sherman Actuarial Services, LLC
- **Assumed Rate of Return**: 8.00%
- **Funding Schedule**: Varies Total Increasing
- **Year Fully Funded**: 2019
- **Unfunded Liability**: $47.0 M
- **Total Pension Appropriation (Fiscal 2016)**: $13.8 M

**INVESTMENT RETURN HISTORY**

- **31 years 2015**: 8.26%
- **10 years 2015**: 5.77%
- **5 years 2015**: 7.45%
- **30 years 2014**: 8.46%
- **10 years 2014**: 6.11%
- **5 years 2014**: 9.72%
- **29 years 2013**: 8.51%
- **10 years 2013**: 6.62%
- **5 years 2013**: 11.67%

**ASSET ALLOC./BALANCED 15.5%**

**DOMESTIC EQUITY 26.2%**

**CASH/OVERLAY 0.4%**

**HEDGE FUNDS 7.6%**

**REAL ESTATE 9.8%**

**PRIVATE EQUITY 3.5%**

**FIXED VA/HY 2.3%**

**FIXED INCOME 16.7%**

**DOMESTIC EQUITY 18.0%**

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- **Number of Disability Retirees**: 38
- **Number Who Reported Earnings**: 11
- **Number of Excess Earners**: 0
- **Total Amount of Refund Due**: 50

- **2015 Return**: 2.42%
- **2015 Market Value**: $140.3 M
- **2011-2015 (Annualized)**: 7.45%
- **1985-2015 (Annualized)**: 8.26%
### ACTUARIAL

- **Funded Ratio**: 50.7%
- **Date of Last Valuation**: 01/14
- **Actuary**: PERAC
- **Assumed Rate of Return**: 7.75%
- **Funding Schedule**: 6.0% Total Increasing
- **Year Funded**: 2029
- **Funding Schedule**: 2029
- **Total Pension Appropriation (Fiscal 2016)**: $25.9 M
- **Total Pension Appropriation (Fiscal 2016)**: $2.9 M
- **Number of Members**: 264
- **Total Payroll/Benefit**: $10.1 M
- **Average Salary/Benefit**: $38,200
- **Average Age**: 46
- **Average Service**: 10.8 years

### ASSET ALLOCATION (12/31/15)

- **Timber/Nat. Resources**: 7.8%
- **Cash/Overlay**: 0.9%
- **Domestic Equity**: 41.2%
- **Real Estate**: 10.7%
- **Private Equity**: 2.5%
- **Fixed Income**: 23.4%
- **Int’l Equity**: 13.5%

### EARNED INCOME OF DISABILITY RETIREES (2014)

- **Number of Disability Retirees**: 9
- **Number Who Reported Earnings**: 2
- **Number of Excess Earners**: 0
- **Total Amount of Refund Due**: $0
- **2015 Return**: .74%
- **2015 Market Value**: $29.9 M
- **2011-2015 (Annualized)**: 7.72%
- **1985-2015 (Annualized)**: 8.07%
**Funded Ratio (1987-2015)**

![Graph showing funded ratio from 1987 to 2015]

**Investment Return (2011-2015, 5 Year and 31 Year Averages)**

<table>
<thead>
<tr>
<th>Year</th>
<th>5 Year Average</th>
<th>31 Year Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>7.63%</td>
<td>9.92%</td>
</tr>
<tr>
<td>2014</td>
<td>9.22%</td>
<td>10.22%</td>
</tr>
<tr>
<td>2013</td>
<td>11.4%</td>
<td>10.29%</td>
</tr>
</tbody>
</table>

**10-Year History of Appropriations (in Thousands)**

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Appropriations</th>
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<tbody>
<tr>
<td>FY07</td>
<td>$0</td>
</tr>
<tr>
<td>FY08</td>
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<td>$3,000</td>
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<td>$4,000</td>
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<tr>
<td>FY15</td>
<td>$8,000</td>
</tr>
<tr>
<td>FY16</td>
<td>$9,000</td>
</tr>
</tbody>
</table>

**Asset Allocation (12/31/15)**

- Global Equity: 42.3%
- Fixed Income: 12.9%
- Fixed VA/HY: 8.3%
- Private Equity: 11.4%
- Timber/Nat. Resources: 3.1%
- Hedge Funds: 9.0%
- Port. Comp. Strat.: 1.0%
- Cash/Overlay: 0.9%
- Real Estate: 10.9%
- Timber/Nat. Resources: 3.1%
- Hedge Funds: 9.0%
- Port. Comp. Strat.: 1.0%
- Cash/Overlay: 0.9%
- Real Estate: 10.9%

**Earned Income of Disability Retirees (2014)**

- Number of Disability Retirees: 33
- Number Who Reported Earnings: 9
- Number of Excess Earners: 0
- Total Amount of Refund Due: $0

**2015 Return: 1.22%**

**2015 Market Value: $153.3 M**

- 2011-2015 (Annualized): 7.63%
- 1985-2015 (Annualized): 9.92%
**ACTUARIAL**

- Funded Ratio: 55.2%
- Date of Last Valuation: 01/14
- Actuary: Stone Consulting
- Assumed Rate of Return: 7.88%
- Funding Schedule: 4.0% Total Increasing
- Year Fully Funded: 2036
- Unfunded Liability: $69.5 M
- Total Pension Appropriation (Fiscal 2016): $6.2 M

- Number of Members: 569
- Total Payroll/Benefit: $23.8 M
- Average Salary/Benefit: $41,800
- Average Age: 48
- Average Service: 12.4 years

**ASSET ALLOCATION (12/31/15)**

- Domestic Equity: 53.8%
- Fixed Income: 33.5%
- Int’l Equity: 4.9%
- Cash/Overspy: 2.8%
- Real Estate: 1.7%
- Fixed VA/HY: 0.1%
- Timber/Nat. Resources: 3.2%

**INVESTMENT RETURN HISTORY**

- 31 years 2015: 8.21%
- 10 years 2015: 6.11%
- 5 years 2015: 8.88%

**ERNEVED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees: 34
- Number Who Reported Earnings: 11
- Number of Excess Earners: 2
- Total Amount of Refund Due: $58,746.13

- 2015 Return: -.54%
- 2015 Market Value: $99.4 M
- 2011-2015 (Annualized): 8.88%
- 1985-2015 (Annualized): 8.21%
ACTUARIAL FUNDED RATIO (1987-2015)

INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)

10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)

ASSET ALLOCATION (12/31/15)

EARNED INCOME OF DISABILITY RETIREES (2014)
**ACTUARIAL**

- Funded Ratio: 64.6%
- Date of Last Valuation: 01/14
- Actuary: Stone Consulting
- Assumed Rate of Return: 7.88%
- Funding Schedule: 3.1% Increasing
- Year Fully Funded: 2032
- Unfunded Liability: $90.5 M
- Total Pension Appropriation (Fiscal 2016): $9.8 M

**ASSET ALLOCATION (12/31/15)**

- Domestic Equity 38.9%
- Int’l Equity 17.8%
- Fixed Income 18.4%
- Private Equity 10.3%
- Commodities/Real Assets/Other 2.9%
- Cash/Overlay 1.0%
- Real Estate 10.7%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- Number of Disability Retirees: 80
- Number Who Reported Earnings: 20
- Number of Excess Earners: 1
- Total Amount of Refund Due: $1,159.44

- 2015 Return: .84%
- 2015 Market Value: $171.3 M
- 2011-2015 (Annualized): 7.45%
- 1985-2015 (Annualized): 9.81%
### Actuarial

- **Funded Ratio**: 78.3%
- **Date of Last Valuation**: 01/15
- **Actuary**: PERAC
- **Assumed Rate of Return**: 7.25%
- **Funding Schedule**: 5.5% Total Increasing
- **Year Fully Funded**: 2029
- **Unfunded Liability**: $27.9 M
- **Total Pension Appropriation (Fiscal 2016)**: $4.1 M
- **Number of Members**: 365
- **Total Payroll/Benefit**: $18.5 M
- **Average Salary/Benefit**: $50,800
- **Average Age**: 49
- **Average Service**: 13.4 years

### Asset Allocation (12/31/15)

- **Domestic Equity**: 33.8%
- **Domestic Fixed Income**: 37.3%
- **International Equity**: 19.8%
- **Hedge Funds**: 4.8%
- **Cash/Overlay**: 1.9%

### Investment Return History

- **31 years 2015**: 8.95%
- **10 years 2015**: 5.18%
- **5 years 2015**: 6.29%
- **30 years 2014**: 9.28%
- **10 years 2014**: 6.34%
- **5 years 2014**: 8.24%
- **29 years 2013**: 9.31%
- **10 years 2013**: 6.75%
- **5 years 2013**: 10.07%

### Earned Income of Disability Retirees (2014)

- **Number of Disability Retirees**: 22
- **Number Who Reported Earnings**: 4
- **Number of Excess Earners**: 0
- **Total Amount of Refund Due**: $0

- **2015 Return**: -.31%
- **2015 Market Value**: $102.1 M
- **2011-2015 (Annualized)**: 6.29%
- **1985-2015 (Annualized)**: 8.95%
**ACTUARIAL**

- Funded Ratio: 75.9%
- Date of Last Valuation: 01/15
- Actuary: PERAC
- Assumed Rate of Return: 7.50%
- Funding Schedule: 4.0% Total Increasing 2028
- Year Fully Funded: $16.8 M
- Unfunded Liability: $3.1 M
- Total Pension Appropriation (Fiscal 2016):
  - ACTIVE: $11.7 M
  - RETIRED: $3.6 M

### INVESTMENT RETURN

- **2015 Return**: 1.17%
- **2015 Market Value**: $55.4 M
- **2011-2015 (Annualized)**: 7.24%
- **1985-2015 (Annualized)**: 8.58%

### ASSET ALLOCATION (12/31/15)

- **GLOBAL EQUITY**: 42.3%
- **HEDGE FUNDS**: 1.0%
- **CASH/OVERLAY**: 0.9%
- **PORT. COMP. STRAT.**: 1.0%
- **TIMBER/NAT. RESOURCES**: 3.1%
- **REAL ESTATE**: 10.9%
- **PRIVATE EQUITY**: 11.4%
- **FIXED INCOME**: 12.9%
- **FIXED VA/HY**: 8.3%
- **CASH/OVERLAY**: 0.9%

### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)

- Total Appropriation: $257
- Total Payroll/Benefit: $11.7 M
- Average Salary/Benefit: $45,500
- Average Age: 49
- Average Service: 12.2 years

### EARNED INCOME OF DISABILITY RETIREES (2014)

- Number of Disability Retirees: 14
- Number Who Reported Earnings: 2
- Number of Excess Earners: 0
- Total Amount of Refund Due: $0

**INVESTMENT RETURN HISTORY**

- **31 years 2015**: 8.58%
- **30 years 2014**: 8.83%
- **29 years 2013**: 8.85%
- **10 years 2015**: 5.71%
- **10 years 2014**: 6.80%
- **10 years 2013**: 7.19%
- **5 years 2015**: 7.24%
- **5 years 2014**: 9.60%
- **5 years 2013**: 11.30%

**ASSET ALLOCATION (12/31/15)**

- **GLOBAL EQUITY**: 42.3%
- **HEDGE FUNDS**: 1.0%
- **CASH/OVERLAY**: 0.9%
- **PORT. COMP. STRAT.**: 1.0%
- **TIMBER/NAT. RESOURCES**: 3.1%
- **REAL ESTATE**: 10.9%
- **PRIVATE EQUITY**: 11.4%
- **FIXED INCOME**: 12.9%
- **FIXED VA/HY**: 8.3%
**ACTUARIAL**

- **Funded Ratio**: 64.6%
- **Date of Last Valuation**: 01/14
- **Actuary**: Buck Consultants
- **Assumed Rate of Return**: 8.00%
- **Funding Schedule**: 4.0% Increasing Phase-in
- **Year Fully Funded**: 2035
- **Unfunded Liability**: $63.6 M
- **Total Pension Appropriation (Fiscal 2016)**: $6.0 M

**ASSET ALLOCATION (12/31/15)**

- **Commodities/REAL ASSETS/OTHER**: 0.6%
- **Cash/Overlay**: 2.2%
- **Hedge Funds**: 7.8%
- **Real Estate**: 9.2%
- **Domestic Equity**: 33.8%
- **Private Equity**: 7.1%
- **Fixed Income**: 18.6%
- **Int’l Equity**: 20.7%

**EARNED INCOME OF DISABILITY RETIREES (2014)**

- **Number of Disability Retirees**: 26
- **Number Who Reported Earnings**: 9
- **Number of Excess Earners**: 1
- **Total Amount of Refund Due**: $467.95

**INVESTMENT RETURN HISTORY**

- **31 years 2015**: 9.29%
- **10 years 2015**: 6.43%
- **5 years 2015**: 7.71%

- **30 years 2014**: 9.63%
- **10 years 2014**: 7.24%
- **5 years 2014**: 10.67%

- **29 years 2013**: 9.72%
- **10 years 2013**: 7.71%
- **5 years 2013**: 13.69%
**ACTUARIAL FUNDED RATIO (1987-2015)**

<table>
<thead>
<tr>
<th>Date of Last Valuation</th>
<th>Actuary</th>
<th>Assumed Rate of Return</th>
<th>Funding Schedule</th>
<th>Year Fully Funded</th>
<th>Unfunded Liability</th>
<th>Total Pension Appropriation (Fiscal 2016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/15</td>
<td></td>
<td>7.63%</td>
<td>Total Increasing</td>
<td>2033</td>
<td>$407.8 M</td>
<td>$42.7 M</td>
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**INVESTMENT RETURN (2011-2015, 5 YEAR AND 31 YEAR AVERAGES)**

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<tr>
<td>11</td>
<td>-.71%</td>
<td>$798.8 M</td>
<td>6.06%</td>
<td>8.71%</td>
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<td>11-15</td>
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<td>45-15</td>
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**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

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<th>Fiscal Year</th>
<th>Appropriations (in Thousands)</th>
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<td>FY16</td>
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**INVESTMENT RETURN HISTORY**

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<th>Period</th>
<th>Return</th>
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<tr>
<td>31 years 2015</td>
<td>8.71%</td>
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<tr>
<td>10 years 2015</td>
<td>5.30%</td>
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<td>5 years 2015</td>
<td>6.06%</td>
</tr>
<tr>
<td>30 years 2014</td>
<td>9.03%</td>
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<tr>
<td>10 years 2014</td>
<td>6.38%</td>
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<td>5 years 2014</td>
<td>8.99%</td>
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<tr>
<td>29 years 2013</td>
<td>9.18%</td>
</tr>
<tr>
<td>10 years 2013</td>
<td>7.14%</td>
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<tr>
<td>5 years 2013</td>
<td>11.97%</td>
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**ASSET ALLOCATION (12/31/15)**

<table>
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<tr>
<th>Asset Class</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Fixed Income</td>
<td>7.0%</td>
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<tr>
<td>Fixed VA/HY</td>
<td>15.2%</td>
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<tr>
<td>Int’l Equity</td>
<td>20.8%</td>
</tr>
<tr>
<td>Domest Global Equity</td>
<td>23.5%</td>
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<tr>
<td>Private Equity</td>
<td>5.7%</td>
</tr>
<tr>
<td>Timber/Nat. Resources</td>
<td>2.0%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>14.6%</td>
</tr>
<tr>
<td>HEDGE FUNDS</td>
<td>2.4%</td>
</tr>
<tr>
<td>Cash/overlay</td>
<td>0.1%</td>
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<tr>
<td>Asset Alloc./Balanced</td>
<td>1.9%</td>
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<tr>
<td>Comm./real Assets/Other</td>
<td>1.9%</td>
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**EARNED INCOME OF DISABILITY RETIREES (2014)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Number of Disability Retirees</td>
<td>334</td>
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<tr>
<td>Number Who Reported Earnings</td>
<td>69</td>
</tr>
<tr>
<td>Number of Excess Earners</td>
<td>3</td>
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<tr>
<td>Total Amount of Refund Due</td>
<td>$13,644.67</td>
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**ACTUARIAL FUNDING RATIO (1987-2015)**

<table>
<thead>
<tr>
<th>Date of Last Valuation</th>
<th>Actuary</th>
<th>Assumed Rate of Return</th>
<th>Funding Schedule</th>
<th>Year Fully Funded</th>
<th>Unfunded Liability</th>
<th>Total Pension Appropriation (Fiscal 2016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/14</td>
<td>KMS Actuaries</td>
<td>8.00%</td>
<td>4.0% Increasing Phase-in</td>
<td>2035</td>
<td>$599.4 M</td>
<td>$43.3 M</td>
</tr>
</tbody>
</table>

**INVESTMENT RETURN HISTORY**

- **31 years 2015**: 8.09%
- **30 years 2014**: 8.34%
- **29 years 2013**: 8.33%
- **10 years 2015**: 5.03%
- **10 years 2014**: 5.49%
- **10 years 2013**: 5.59%
- **5 years 2015**: 7.37%
- **5 years 2014**: 9.67%
- **5 years 2013**: 10.57%

**ASSET ALLOCATION (12/31/15)**

- **GLOBAL EQUITY**: 40.9%
- **PRIVATE EQUITY**: 12.0%
- **REAL ESTATE**: 11.6%
- **TIMBER/NAT. RESOURCES**: 3.0%
- **HEDGE FUNDS**: 8.8%
- **PORT. COMP. STRATEGY**: 1.0%
- **CASH/OVERLAY**: 2.3%

**EARNED INCOME OF DISABILITY RETIREEES (2014)**

- **Number of Disability Retirees**: 232
- **Number Who Reported Earnings**: 77
- **Number of Excess Earners**: 3
- **Total Amount of Refund Due**: $20,762.27

- **2015 Return**: .92%
- **2015 Market Value**: $574.1 M
- **2011-2015 (Annualized)**: 7.37%
- **1985-2015 (Annualized)**: 8.09%
## INVESTMENT RETURN HISTORY

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>31 years</td>
<td>9.49%</td>
<td>9.78%</td>
<td>9.84%</td>
<td>10.05%</td>
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<tr>
<td>29 years</td>
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<td>9.21%</td>
<td>9.68%</td>
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<td>10 years</td>
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<td>5 years</td>
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<td>10.05%</td>
<td>11.90%</td>
<td>13.15%</td>
<td>15.00%</td>
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## ASSET ALLOCATION (12/31/14)

- **Global Equity**: 42.3%
- **Fixed Income**: 12.9%
- **Private Equity**: 11.4%
- **Real Estate**: 10.9%
- **Timber/Nat. Resources**: 3.1%
- **Hedge Funds**: 9.0%
- **Port. Comp. Strat.**: 1.0%
- **Cash/Overlay**: 0.9%

### Investment Return
- **2015 Return**: 1.14%
- **2015 Market Value**: $59.6 B
- **2011-2015 (Annualized)**: 7.53%
- **1985-2015 (Annualized)**: 9.49%

---

**Board Members**
Treasurer Deborah B. Goldberg (Chairperson),
Robert Brousseau, Ruth Ellen Fitch,
Michael J. Heffeman, Anthony E. Hubbard,
Theresa McGoldrick, Esq., Dennis Naughton,

**Board Administrator**
Michael G. Trotsky, CFA

**Board Meeting**
Every other month, day and date varies
<table>
<thead>
<tr>
<th>RETIREMENT BOARDS WITH 40–399 ACTIVE MEMBERS</th>
<th>DISABILITY PANEL REQUESTS</th>
<th>ACCIDENTAL DEATH APPROVALS</th>
<th>DISABILITY NURSE CME REVIEWS</th>
<th>PHYSICIAN CME/RTS REVIEWS</th>
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# Disability Retirement Statistics

(as of 12/31/15)

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<th>RETIREMENT BOARDS WITH 400–599 ACTIVE MEMBERS (CONT’D)</th>
<th>DISABILITY PANEL REQUESTS</th>
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## Disability Retirement Statistics
(as of 12/31/15)

### Accidentals and Death Approvals

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### Retirement Boards with 900-2,399 Active Members (Cont’d)

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### Retirement Boards with 2,400-10,000 Active Members

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### Retirement Boards with 20,500-90,000 Active Members

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### Total All Retirement Boards:

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### Restoration to Service Statistics
(Provided for those boards where a disability retiree has returned to work.)

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INVESTMENT VENDORS

- The following is a listing of the investment managers, custodians, and consultants that serve the Massachusetts public pension systems. The listing is based on information supplied by the retirement boards.

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<td>PRIT</td>
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<td>ANDOVER</td>
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PRIM

- Custodian: BNY Mellon
- Consultants: Arden Asset Management LLC, Callan Associates, Hamilton Lane, NEPC, Townsend

INVESTMENT VENDORS

- 1818 Fund
- 400 Capital Management
- Acadian Asset Management, LLC
- Access Capital
- Acorn Investments
- Advent International
- AEW Capital Management
- AFL-CIO Housing Investment Trust
- Alchemy Partners
- Alta Communications
- American Securities Capital Partners
- Anchorage Capital, LLC
- Angelo Gordon
- APAX Partners & Co.
- Apollo Management Co.
- Arden Asset Management
- Ashmore Investment Management, Ltd.
- Arrowgrass G.P. Limited
- Ascent Venture Partners
- Ashmore Investment Management, Ltd.
- Asia Pacific Trust
- Austin Ventures
- Avenue Capital Group
- Bailie Gifford
- Bain Capital
- Battery Ventures
- Belmont Capital Partners
- Berkshire Partners
- Blackrock Financial Management, Inc.
- Blackstone Capital Partners
- Blackstone Group
- Boston Ventures
- Breaxan Howard G.P. Limited
- Bridgepoint Capital Limited
- Brigade Capital G.P., LLC
- Campbell Group, LLC
- Canover
- Cantab Capital Partners, LP
- Canyon Johnson II
- Capital Resource Lenders
- Capula Management Limited
- Carlyle Group
- Carlyle Partners
- Castille
- Catalyst Investors
- Centerbridge
- Centerbridge Special Credit Partners
- CenterSquare Investment Management
- Charlesbank Capital Partners
- Charles River Ventures
- Charterhouse Group
- Chequers
- City of London Investment Management Co.
- Claren Road Capital, LLC
- Clifton Group
- Code, Hemnessey & Simmons
- Commonwealth Capital Ventures
- Community Capital Management
- Crescent Capital Group
- Crossroads Group
- CVC Capital
- Cypress Merchant Banking Partners
- Davidson Kempner Advisors, Inc.
- Denham Capital Management
- DivcoWest
- Dreihaus Capital Management, LLC
- Eaton Vance Institutional Funds
- El Dorado Ventures
- Elliot Capital Advisors, LP
- Equitable Capital Management Corporation
- Essex Woodlands Health Ventures
- Ethos Private Equity
- Exponent Private Equity Partners
- Fidelity Management Trust Company
- FIS Group, Inc.
- First Reserve Corporation
- Flagship Ventures
- Forest Investment Associates
- Frontier Capital Management
- Freeman Spogli Equity Partners
- GENSTAR Capital
- Gilde Buy Out Partners AG
- Glenview Capital G.P., LLC
- Goldman Sachs Investment Management
- Goes Capital
- GSO Capital Partners
- GTCR Golder Rauner
- Harbourvest Partners
- Harding Loevner
- Hellman & Friedman Capital Partners
- H.I.G. Capital Partners
- Highfields Associates, LLC
- Highland Capital Partners
- Hong Capital
- Huber Capital
- Index Ventures
- Insight Venture Partners
- Intech
- Intercontinental IV
- InterWest Partners
- Invesco Realty Advisors
- Investec Asset Management
- Jennison Associates
- Joseph Littlejohn & Levy Fund
- J.P. Morgan Investment Management
- Kelso & Company
- Kepha Partners
- Keystone Ventures
- King Street Capital Management
- Kohlberg Kravis Roberts and Co.
- KPS Capital Partners
- Landmark Equity Partners
- LaSalle Investment Management
- Loanios, Slayes & Company
- Madison Dearborn Capital Partners
- Marathon — London
- M/C Venture Partners
- Menlo Ventures
- MFA Partners APA-German European Ventures
- Mondrian Investment Partners Ltd.
- Montagu
- Montreux Equity Partners
- Mudrick Capital Management, LP
- Nash & Sellers
- Nautic Partners
- New Boston Urban Fund I
- New Enterprise Associates
- Nordic Capital
- Oaktree Capital Management
- Odyssey Investment Partners
- Olympus Partners
- Onex Capital Partners
- OZ Advisors, LP
- PacificAlternative Asset Management Co. (PAAMCO)
- Pacific Investment Management Co. (PIMCO)
- PIM Europe
- PanAgora Asset Management, Inc.
- Permira Ventures
- Pershing Square G.P., LLC
- Picket Asset Management, Inc.
- Polaris Venture Partners
- Providence Equity Partners
- Pzena Investment Management
- Quad-C Management
- Rembrandt Venture Partners
- Riverbridge Partners
- Rock Creek Group
- Russell Implementation Source
- SAIF Partners
- Samlyn Partners, LLC
- SCV Vitalife
- Shenkman Capital Management
- Sherbrooke Capital
- Sofinnova Ventures, Inc.
- Spark Capital
- Spectrum Equity Partners
- State Street Global Advisors
- Steadfast Capital Management LP
- Stone Harbor Investment Partners LP
- Summit Creek Advisors
- Summit Ventures
- SV Life Sciences Advisors
- TA Associates/Advent
- TA Realty
- Taconic Associates, LLC
- Technology Crossover Ventures
- Texas Pacific Group
- Thoma Bravo
- Thoma Cressey Partners
- Thomas H. Lee Equity Partners, LP
- Torquest Partners
- Towerbrook Capital Partners
- Trident Capital
- Trust Company of the West
- T. Rowe Price
- Union Square Ventures
- VantagePoint Partners
- Venture Capital Fund of New England
- Vesta Capital Partners
- Vista Equity Partners
- Voya Financial
- Wasatch Advisors Inc.
- Wayzata Investment Partners
- Welsh, Carson, Anderson & Stowe
- Weston Presidio Capital
- WestView Capital Partners
- Whitney & Company
- William Blair Mezzanine Capital Fund, LP
- Willis Stein
- Winton Capital Management
- Xenon Private Equity, LTD
- York Capital Management
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### PERAC DIRECTORY | UNITS AND STAFF MEMBERS

#### ADMINISTRATION
- **Joseph E. Connarton**  
  Executive Director
- **Joseph I. Martin**  
  Deputy Executive Director
- **John W. Parsons**  
  Deputy Director/General Counsel
- **Michael J. DeVito**  
  Director of Strategic Planning, Management & Public Affairs
- **Kim Boisvert**  
  Senior Executive Assistant
- **Sarah D. Grimes**  
  Staff Assistant
- **Katie Bozzi**  
  Accounts Payable Specialist
- **Ellen Furtado**  
  Administrative Assistant
- **Caroline J. Garcia**  
  Director of Administrative Services
- **Virginia Barrows**  
  Chief Financial Officer
- **Tracey Legaski**  
  Administrative Assistant
- **Kim Boisvert**  
  Senior Executive Assistant
- **Katie Bozzi**  
  Accounts Payable Specialist
- **Ellen Furtado**  
  Administrative Assistant

#### ACTUARIAL
- **James Lamenzo**  
  Actuary
- **John Boorack**  
  Senior Actuarial Associate
- **Kaitlyn Doucette**  
  Senior Actuarial Analyst
- **Timothy Larkin**  
  Actuarial Analyst
- **Sherry Brooks-Ross**  
  Benefit Calculation Specialist

#### AUDIT
- **Caryn M. Shea, CPA, CFS**  
  Chief Auditor
- **Scott Henderson**  
  Deputy Chief Auditor
- **Harry Chadwick**  
  Auditor
- **Amy Chow**  
  Auditor
- **Kevin P. McCarthy, CPA**  
  Auditor
- **George Nsia**  
  Auditor
- **Michael Pasternak**  
  Auditor

#### COMMUNICATIONS
- **Natacha A. Dunker**  
  Communications Director
- **Michael D. Litvack**  
  Webmaster/Graphic Design Specialist
- **Ben Polatin**  
  Communication Specialist
- **Karen McMahon**  
  Graphic Designer/Editor

#### DISABILITY
- **Kate Hogan**  
  Manager of Medical Services
- **Patrice Looby**  
  Nurse Case Manager
- **Jessica Kean**  
  Case Manager
- **Regina Manning**  
  Case Manager II
- **Erin Groesser**  
  Administrative Assistant
- **Mary Jane Carritte**  
  Clinical Case Manager

#### FRAUD PREVENTION
- **Sandra King**  
  Fraud Prevention Manager

#### INFORMATION SYSTEMS
- **Dan Boyle**  
  Director of Information Systems
- **K-Lone Steele**  
  Senior Systems Engineer
- **Irina M. Boukina**  
  Senior Programmer/Analyst
- **Charles Hoyt**  
  Senior Programmer/Analyst
- **Mona Mandal**  
  ECM Specialist
- **Anthony Tse**  
  Project Manager

#### INVESTMENT
- **Thomas J. O’Donnell**  
  Compliance Officer
- **Cheryl Johnson, CFA**  
  Compliance Analyst
- **Victoria Marcorelle**  
  Senior Investment Analyst
- **Veronica Colon**  
  Investment Analyst
- **Rose Morrison**  
  Administrative Assistant
- **Derek Moitoso**  
  Compliance Counsel

#### LEGAL
- **Judith Corrigan**  
  Deputy General Counsel/Managing Attorney
- **Kenneth Hill**  
  Senior Associate General Counsel
- **Patrick Charles**  
  Associate General Counsel
- **Doreen Duane**  
  Executive Assistant