

January 1, 2015

Actuarial Valuation Report

**Massachusetts Port Authority
Retirement System**

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President



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June 30, 2015

Massachusetts Port Authority Employees' Retirement Board
One Harborside Drive, Suite 200S
East Boston, MA 02128-2909

Dear Members of the Board:

Stone Consulting, Inc. has performed a January 1, 2015 actuarial valuation of the Massachusetts Port Authority Employees' Retirement System (MPAERS). This valuation and report was prepared using generally accepted actuarial principles and practices. To the best of our knowledge, this report is complete and accurate, and the assumptions used were chosen by the Retirement Board in conjunction with Stone Consulting Inc.'s recommendations. We believe the assumptions represent a reasonable estimate of anticipated experience of the system.

As part of performing the valuation, Stone Consulting, Inc. was furnished member data by the administrative staff of the MPAERS. Although examined for general reasonableness, the data was not audited by the actuary. In addition, the administrative staff furnished financial statements that were not audited by the actuary or by the plan's auditors.

The funding objective of the plan is to provide for the current cost of benefits (i.e., normal cost) as a level percentage of payroll over time and this objective is currently being realized. The employer contribution rate is determined by adding the normal cost plus a level dollar amortization of the frozen entry age liability. The normal cost is expected to remain at a level percentage of payroll. While the statute which created the MPAERS did not anticipate the effect of assumption or plan changes on the funding schedule, we have amortized over 20 years these effects, consistent with generally recognized actuarial practice.

MPAERS experienced investment losses in calendar 2014 as compared to the assumed valuation interest rate. The return on the market value of assets was 6.3%. The return on the actuarial value of assets was 8.9% versus the prior year valuation's interest assumption of 7.625%. The Massachusetts Port Authority (Authority)'s FY 2016 (July 1, 2015 through June 30, 2016) contribution of \$10,845,396 is \$300,923 less than the Authority's FY 2015 contribution and \$774,604 less than the expected contribution based upon last year's actuarial valuation. The decrease is mainly due to salary gains and to the recognition of prior year asset gains which resulted in an actuarial asset return greater than the assumed 7.625%. These gains were somewhat offset by the contribution increase related to the change in the assumed interest assumption from 7.625% to 7.50%. The change in interest rate was based on expectations of future experience. The salary increase assumption remained at 4.50%.

Stone Consulting, Inc. has prepared and included as part of this report all of the supporting schedules in the Actuarial Section of the Comprehensive Annual Financial Report (CAFR). An actuarial valuation of the MPAERS is performed annually. This satisfies the requirements under Chapter 32 of the Massachusetts General Laws.

We are pleased to present the results of this valuation. If the MPAERS Board has any questions on the content of this report, we would be glad to respond. Please note that this report is meant to be used in its entirety. Use of excerpts of this report may result in a misleading or inaccurate understanding of the results.

The undersigned is a consultant for Stone Consulting, Inc. and a member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,
STONE CONSULTING, INC.
Actuaries for the Plan



Lawrence B. Stone
Member, American Academy of Actuaries

SECTION I : RESULTS SUMMARY
Management Summary

Funding			
▪ Contribution for Fiscal 2016		\$10,845,396	
▪ Contribution for Fiscal 2015		\$11,146,319	
Assets			
▪ Market Value at January 1, 2015		\$537,695,582	
▪ Market Value at January 1, 2014		\$509,994,139	
▪ Growth in Market Value			5.4%
▪ Actuarial Value at January 1, 2015 (15% corridor)		\$520,740,990	
▪ Actuarial Value at January 1, 2014 (15% corridor)		\$479,181,222	
▪ Growth in Actuarial Asset Value			8.7%
Members			
▪ Actives	1,191		(2.6%)
▪ Retired, Disabled and Beneficiaries	718		(4.7%)
▪ Terminated Vested	71		(16.4%)
▪ Inactives	74		(7.2%)
Payroll of Active Members			
▪ Total	\$95,475,718		(4.9%)
▪ Average	\$80,164		(2.3%)
Present Value of Future Benefits			
▪ Actives	\$417,058,299		(5.7%)
▪ Retirees, Terminated Vested, Inactives, 3(8)(c)	<u>284,482,067</u>		(8.8%)
▪ Total	\$701,540,366		(6.9%)
Funding Ratio Using Entry Age Normal Actuarial Cost Method			
▪ Actuarial Accrued Liability	\$572,373,676		
▪ Market Value of Assets	\$537,695,582		
▪ Funded Ratio using Market Value as of January 1, 2015		93.9%	
▪ Funded Ratio using Market Value as of January 1, 2014		95.1%	
▪ Funded Ratio using Actuarial Value as of January 1, 2015		91.0%	
▪ Funded Ratio using Actuarial Value as of January 1, 2014		89.4%	

Percentages in brackets reflect change since the January 1, 2014 Valuation.

Funding Schedule

The funding schedule is based on the Frozen Entry Age Actuarial Cost Method, consistent with the requirements of Section 2 of Chapter 487 of the Acts of 1978. The funding schedule is composed of the normal cost, the amortization of the initial unfunded liability, and the amortization of the liability associated with plan changes such as early retirement incentives, actuarial assumption changes, and asset valuation method changes.

The actuarial gain in actuarial value of assets in 2014 contributed to the decrease in the contribution compared to Fiscal 2015. Valuing assets using an asset smoothing method delays complete recognition of gains and losses. The market value of assets investment return was 6.3%, and, the actuarial value investment return was 8.9%. There were over \$30 million in unrecognized actuarial asset gains as of the prior valuation and \$8.6 million of that was recognized this year along with \$1.3 million of the recognized portion of this year's loss of \$6.6 million. The details of the asset-smoothing method are shown later in the report.

The breakdown of the funding schedule appropriation is as follows:

Net Employer Normal Cost including interest	\$ 8,089,767
Amortization including interest	2,755,628
Sum of Net Normal Cost and Amortization	<u>10,845,396</u>
Employer Contribution (Not less than zero)	\$10,845,396

The details of the calculation of the normal cost and the amortization are shown in later sections of the report.

Valuation Assumptions and Methodology

The main economic actuarial assumptions used in this valuation have changed from those used in the January 1, 2014 valuation. Note that a change was made to the interest rate assumption.

- **Interest Rate:** The interest rate assumption is 7.50% (7.625% prior year). The interest rate is used to project earnings on assets and to discount the value of future liabilities to the present day. It is a long-term assumption and is meant to reflect our best estimate of future experience.
- **Salary Assumption:** The salary increase assumption is 4.50% (same as prior year).
- **Pension Adjustment Base and Pension Adjustment:** We have assumed that the Board would annually grant a 3% pension adjustment to retirees for the first \$13,000 of benefits.
- **Asset-Smoothing Methodology:** The Massport Retirement Board uses an asset-smoothing methodology as part of the actuarial valuation. This methodology has been used to lower the potential volatility of retirement contributions by smoothing investment gains and losses. We have recognized asset gains and losses in excess of the interest rate assumption over a period of 5 years. The result of this smoothing is called the actuarial value of assets and is used in calculating the valuation results. The actuarial value of assets must be between 85% and 115% of the market value of assets. This ensures that the actuarial value of assets is valued within reasonable bounds of market value. The above range is referred to as a 15% corridor.
- **Mortality Table:** The mortality table is the RP 2000 Table (Sex-Distinct) projected with Scale BB and Generational Mortality.
- **Vacation Buyback Effect:** As of January 1, 2002 an assumption regarding vacation buybacks was added. This assumption provides for a 1.25% base salary increase to account for employees “selling” back to Massport unused vacation time. We believe that the 1.25% assumption is a reasonable expectation of future behavior. Continued monitoring of this assumption is warranted.
- **Calculation of 3(8)(c) Liability:** The calculation assumes no COLA increases on 3(8)(c) payments.
- **Other Assumptions:** Withdrawal, disability and retirement rates are the same as the January 1, 2014 valuation.
- **Contribution Timing:** Contributions into the plan are assumed to be made as of July 1.

The main actuarial assumptions used in the valuation are summarized on the following page. The change in the interest rate assumption to 7.50% (from 7.625%) increased the Present Value of Future Benefits by \$12.4 million and increased the FY2016 funding amount by \$1.1 million.

<u>Assumption</u>	<u>January 1, 2015 Valuation</u>
Interest Rate	7.50%
Salary Increase	4.50%
Pension Adjustment Base	\$13,000
Pension Adjustment	3.00% on the lesser of the Retirement Allowance and the Pension Adjustment Base
Retirement	
<u>Hired prior to April 2, 2012</u>	
Group 1	Age 50-70 and 10 years of service
Group 2	Age 50-65 and 10 years of service
Group 4	Age 50-65 and 10 years of service
<u>Hired after April 1, 2012</u>	
Group 1	Age 60-70 and 10 years of service
Group 2	Age 55-65 and 10 years of service
Group 4	Age 50-65 and 10 years of service
Administrative Expense	Estimated budgeted amount: \$1,560,000

Assets

We were furnished with a copy of a draft of the System's annual financial report by the Board's administrative staff from the KPMG Financial Report. The draft financial report was not audited by Stone Consulting, Inc. or the System's auditors. The market value of assets was \$537,695,582 as of December 31, 2014. Assets were invested 56% in equities and pooled domestic and international equity funds, 31% in fixed income, cash, payables, receivables and interest accrued, 8% in real estate funds, with the remaining 5% in alternative investments.

The following is a breakdown of the market value of assets by category:

a.	Cash	\$	1,059,747.00
b.	Equities		17,752,035.00
c.	Pooled Domestic Equities Funds		146,127,701.00
d.	Pooled International Equities Funds		136,074,435.00
e.	Pooled Domestic Fixed Income Funds		163,240,311.00
f.	Pooled Alternative Investments Funds		28,607,216.00
g.	Pooled Real Estate Funds		<u>44,299,096.00</u>
h.	Subtotal	\$	537,160,541.00
i.	Interest Due and Accrued	\$	18,288.00
j.	Accounts Receivable		1,509,976.00
k.	Accounts Payable		<u>(993,223.00)</u>
l.	Subtotal	\$	(535,041.00)
m.	Market Value of Assets [(h) + (l)]	\$	537,695,582.00

The actuarial value of assets as of December 31, 2014 is \$520,740,990. The actuarial value of assets reflects the use of an asset-smoothing technique. The difference between the actual return and the expected investment return is phased in equally over five years. Applying asset-smoothing is intended to minimize the effect of short-term fluctuations in the market value of assets. To ensure that the actuarial value of assets is not too dissimilar from the market value of assets, we employ a 15% corridor. The actuarial value of assets must be within 15% of the market value of assets. The corridor did not affect the actuarial value of assets this year. The rate of return on the actuarial value of assets was 8.9% during 2014.

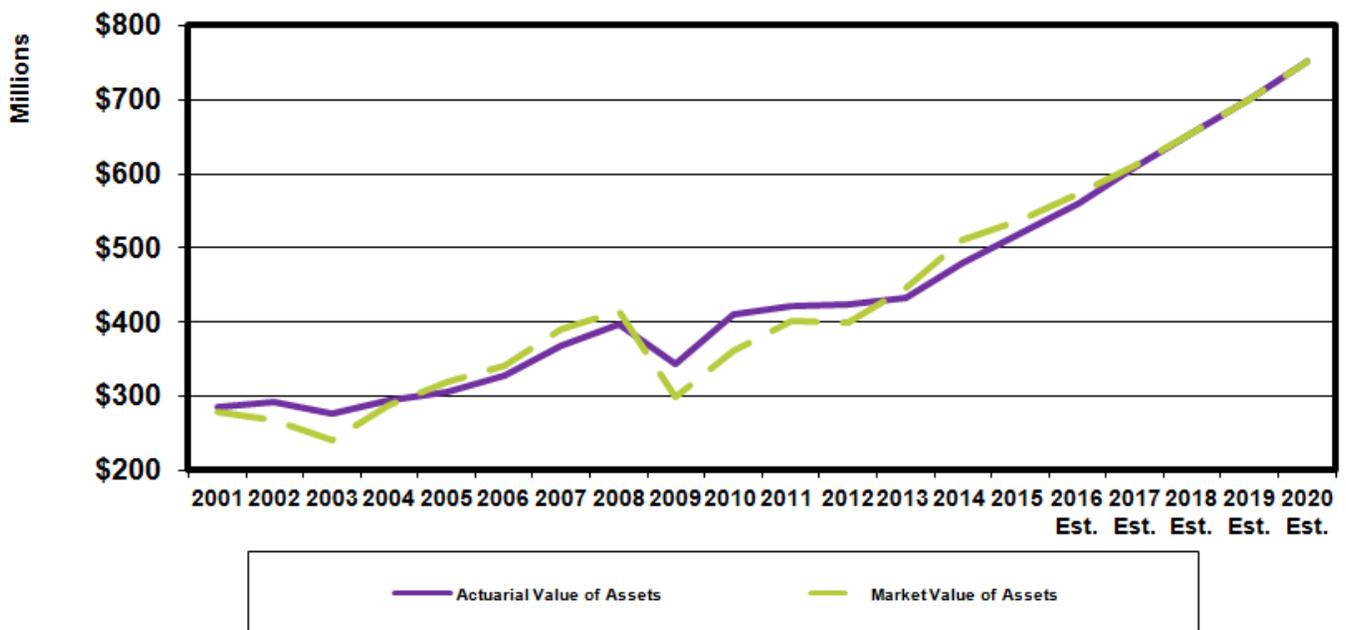
The actuarial value of assets is \$17.0 million less than the market value of assets. Under the current method, this difference will be recognized over the next 4 years. Based on the investments returning 7.50% in calendar 2015, we anticipate that next year's actuarial value of assets will be \$13.1 million lower than

■ Massachusetts Port Authority
Actuarial Valuation as of January 1, 2015

market value. If the market value of assets method was used the contribution would be \$9.0 million for Fiscal 2016, a decrease of \$1.8 million compared to the contribution using the smoothed value of assets.

The chart below shows the effect of the asset smoothing. We have compared the actuarial value of assets to the market value of assets from 2001 to the present with estimated values for 2016 through 2020. As the chart illustrates, the asset smoothing method has been successful in lowering the volatility of the assets used for the actuarial valuation.

The calculation of the actuarial value of assets is shown in the Summary of Valuation Results in Section II of the report.



Analysis of Valuation Results

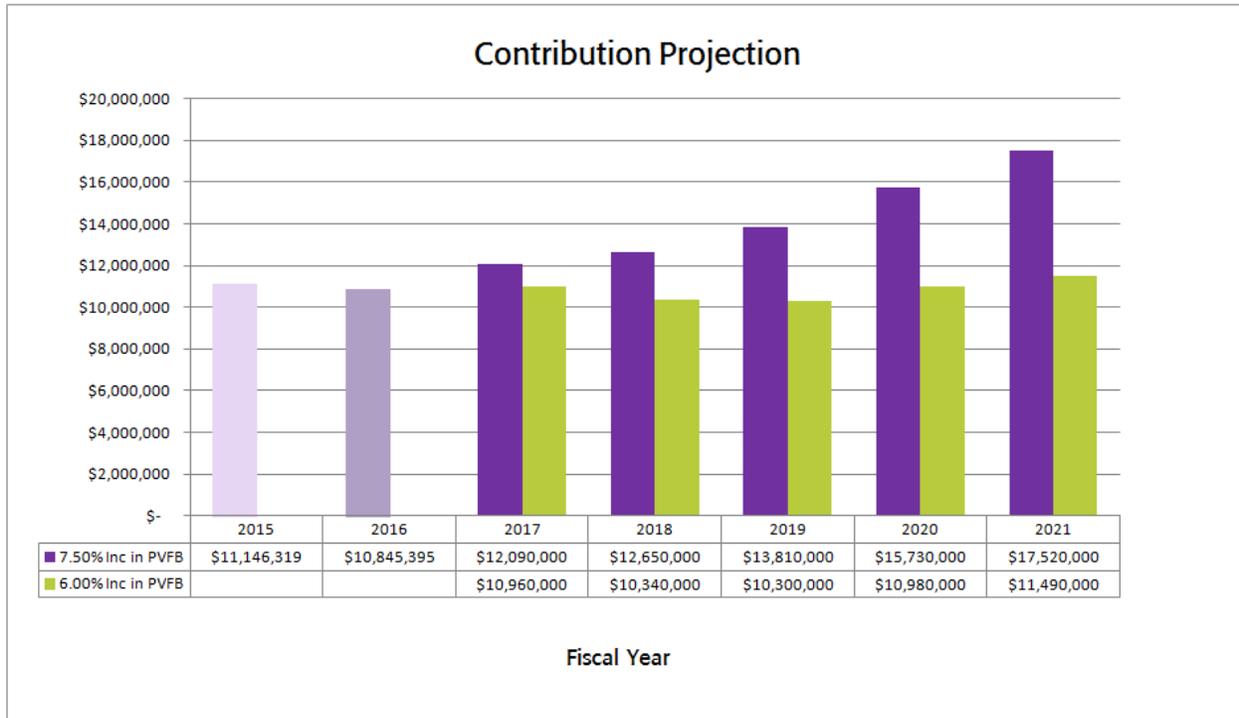
The Frozen Entry Age Actuarial Cost Method does not explicitly recognize actuarial gains or losses. Actuarial gains or losses are spread over the future working lifetime of active members as part of the normal cost. Therefore, an actuarial loss would increase the normal cost while an actuarial gain would lower the normal cost. For informational purposes, we have calculated an actuarial gain for 2014 of \$15.4 million. The major component of the actuarial gain was an actuarial asset gain of \$6.4 million and a \$2.9 million liability gain mostly due to lower than expected salary increases. The asset gain is calculated by comparing the actual values to the expected results based on the January 1, 2014 values and projecting those values respectively by the prior valuation's assumption of a 7.625% asset return. Though not explicitly calculated, other sources of gains would be from the mortality, disability and withdrawal decrement experience different from what was assumed.

The normal cost development for 2015 is shown on page 13. A comparison of normal costs from 2012 to 2015 is shown on page 14. The present value of future normal costs has decreased by \$10.5 million from 2013. The decrease in the present value of future normal costs is mainly due to the higher than expected increase in the actuarial value of assets. The gross normal cost rate decreased from 16.87% of pay in 2014 to 15.61% of pay in 2015. The net normal cost is adjusted with interest from January 1 to July 1. Anticipated administrative expenses of the System are added to the adjusted net normal cost. The administrative expenses exclude custodial and investment manager expenses as these are reflected in the interest assumption that is net of these fees. Administrative fees decreased from \$1,606,000 to \$1,560,000, mainly due to the prior year's administrative cost including a software implementation.

The employer retirement contribution is composed of two parts: the adjusted net normal cost with administrative expenses and an amortization of any changes in the liability (measured using the entry age actuarial funding method) due to changes in assumptions or methodologies or benefit provisions. These changes are amortized over 20 years to be consistent with the Massachusetts Port Authority Employees' Retirement System's enabling legislation. There were changes in 2015 that are required to be amortized due to changes in assumptions.

Future changes in benefits, unfavorable investment experience, and significant demographic changes could impact the net normal cost and the contribution level. To illustrate this point we have calculated projections using two scenarios with the present value of future benefits increasing by either 6% or 7.5%. These estimate that the contribution level for 2017 will increase within a range of \$100,000 to \$1.2 million from the 2016 contribution of \$10.8 million and then increase between \$(600,000) to \$600,000 in 2018, increase between \$0 to \$1.2 million in 2019, and increase between \$700,000 to \$1.9 million in 2020. As demonstrated here the contribution amounts can be volatile since the gains and losses, even after using asset smoothing, can be a large percentage of the current funding level.

The chart on the following page illustrates the contribution projection discussed above as well as the Fiscal 2015 and Fiscal 2016 contributions.



The Frozen Entry Age Actuarial Cost Method has been used in this valuation as required under the enabling legislation. This funding method does not separately value past service liabilities so we are unable to show how well funded the plan is in comparison to liabilities in a meaningful way. A common measure used to illustrate plan funding is the funding ratio. The funding ratio compares the assets to the actuarial accrued liability. We have calculated a funding ratio of 91.0% using the Entry Age Normal Actuarial Cost Method (EAN). If the market value of assets was used the funding ratio would be 93.9%. The EAN method is used by almost all Chapter 32 Retirement Systems and has been shown for illustration purposes only. This shows that the plan is relatively well-funded compared to other Massachusetts public sector retirement systems.

SECTION II : ACTUARIAL VALUATION RESULTS
Summary of Valuation Results

MEMBER DATA	January 1, 2014	January 1, 2015
1. Active Members		
a. Number	1,161	1,191
b. Annual Compensation	\$ 90,979,477	\$ 95,475,718
c. Average Annual Compensation	78,363	80,164
d. Average Attained Age	48.2	47.9
e. Average Past Service	14.6	14.2
2. Retired Members and Beneficiaries		
a. Number	686	718
b. Total Annual Retirement Allowance including COLA	\$ 23,904,001	\$ 25,678,308
c. Average Annual Retirement Allowance including COLA	\$ 34,845	\$ 35,764
d. Average Age	68.8	69.1
3. Terminated Vested Members		
a. Number	61	71
b. Deferred Benefit Amount	\$ 1,643,313	\$ 2,086,987
4. Inactives		
a. Number	69	74
b. Annuity Savings Fund Balance	\$ 2,083,607	\$ 1,991,182
ACTUARIAL COMPONENTS		
1. Present Value of Future Benefits		
a. Active Members	\$ 394,645,435	\$ 417,058,299
b. Inactive Members	2,083,607	1,991,182
c. Retired Members, Terminated Vesteds, and Beneficiaries	265,314,637	288,411,638
d. 3(8)(c)	(6,015,380)	(5,920,753)
e. Total	\$ 656,028,299	\$ 701,540,366
2. Actuarial Value of Assets		
a. Market Value as of December 31	\$509,994,139	\$537,695,582
b. 2014 Excess Return	31,842,376	(6,621,782)
c. 2013 Excess Return	21,838,808	31,842,376
d. 2012 Excess Return	(27,944,657)	21,838,808
e. 2011 Excess Return	17,067,969	(27,944,657)
f. Actuarial Value of Assets (a)-(.8)(b)-(.6)(c)-(.4)(d)-(.2)(e) (w/o corridor)	\$ 479,181,222	\$ 520,740,990
g. Actuarial Value of Assets within 15% corridor of Market Value	\$ 479,181,222	\$ 520,740,990

■ Massachusetts Port Authority
Actuarial Valuation as of January 1, 2015

Summary of Valuation Results (Continued)

	January 1, 2014	January 1, 2015
3. Frozen Entry Age Actuarial Liability		
a. Previous Valuation Frozen Liability		
(i) 2003 Valuation Assumption Change	(9,834,862)	(9,143,780)
(ii) Base due to 2003 Valuation Assumption Changes/ERI 2003	2,991,085	2,807,765
(iii) Assumption Change 2004 Valuation	(1,016,954)	(954,626)
(iv) Assumption Change 2006 Valuation for 3(8)(c)	(310,601)	(295,793)
(v) Assumption Change 2008 Valuation	(3,488,357)	(3,356,084)
(vi) Method Change 2008 Valuation	4,177,719	4,019,307
(vii) Assumption Change 2009 Valuation	(5,216,252)	(5,038,729)
(viii) Assumption Change 2010 Valuation	11,109,193	10,768,670
(ix) Assumption Change 2011 Valuation	731,537	711,280
(x) Assumption Change 2012 Valuation	14,341,301	13,981,555
(xi) Assumption Change 2013 Valuation	11,044,883	10,793,318
(xii) Total	\$24,528,692	\$24,292,883
b. Normal Cost for Prior Year	9,596,956	8,865,523
c. Employer Contribution (Adjusted to January 1)	11,553,864	10,822,431
d. Interest	1,721,099	1,703,118
e. January 1 Frozen Liability prior to additional bases	\$24,292,883	\$24,039,093
f. Assumption change 2015 valuation	N/A	7,863,929
g. Total	\$24,292,883	\$31,903,022
4. Amortization of Bases as of January 1, 2015		
a. Assumption Change: \$(8,400,003) and 8 years remaining	\$(1,338,899)	\$(1,334,053)
b. ERI 2003: \$2,610,467 and 9 years remaining	382,244	380,684
c. Assum. Chg 2004 Valuation: \$(887,546) and 9 years remaining	(129,961)	(129,431)
d. Assum. Chg 2006 Valuation: \$(279,856) and 11 years remaining	(35,764)	(35,587)
e. Assum. Chg 2008 Valuation: \$(3,213,726) and 13 years remaining	(370,044)	(367,902)
f. Method Chg 2008 Valuation: \$3,848,816 and 13 years remaining	443,171	440,606
g. Assum. Chg 2009 Valuation: \$(4,847,670) and 14 years remaining	(534,506)	(531,203)
h. Assum. Chg 2010 Valuation: \$10,402,182 and 15 years remaining	1,103,460	1,096,218
i. Assum. Chg 2011 Valuation: \$689,478 and 16 years remaining	70,650	70,161
j. Assum., Ben Chg 2012 Val: \$13,594,379 and 17 years remaining	1,350,309	1,340,469
k. Assum Change 2013 Val: \$10,522,572 and 18 years remaining	1,016,248	1,008,493
l. Assum Change 2015 Val: \$7,863,929 and 20 years remaining	N/A	717,572
m. Total	\$1,956,908	\$2,656,027
5. Contribution		
a. Net Normal Cost (Including Admin Expense, Without Interest)	\$8,839,044	\$7,853,752
b. Amortization	1,956,908	2,656,027
c. Interest Adjustment for 1/1 to 7/1	350,367	335,617
d. Total (Not less than zero)	\$11,146,319	\$10,845,396

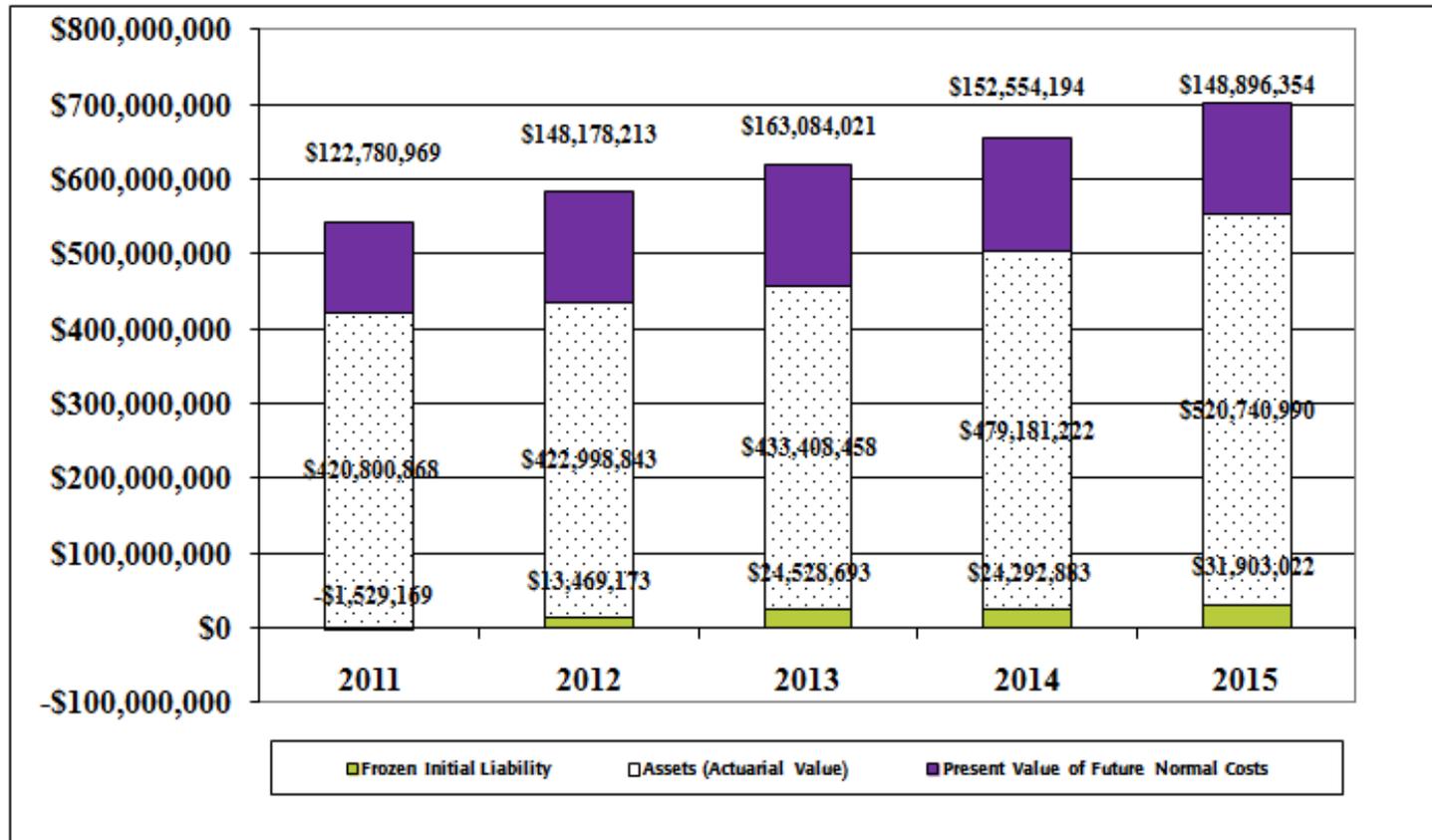
Development of Normal Cost

	January 1, 2015
1. Present Value of Future Benefits	\$ 701,540,366
2. Frozen Initial Liability	31,903,022
3. Assets (Actuarial Value)	\$ 520,740,990
4. Present Value of Future Normal Costs (1 -2 -3)	\$ 148,896,354
5. Present Value of Future Salaries	\$ 953,958,482
6. Normal Cost Percentage (4 / 5)	15.61%
7. Pay (excluding Employees at Retirement Age)	\$ 99,190,353
8. Gross Normal Cost (6 x 7)	\$ 15,481,893
9. Anticipated Employee Contributions	9,188,141
10. Net Normal Cost (8 – 9)	\$ 6,293,752
11. Interest Adjustment (1/1 to 7/1)	236,016
12. Interest Adjustment for Contribution Timing	0
13. Administrative Expense Assumption	\$ 1,560,000
14. Normal Cost (With Adjustments) (12 + 13)	\$ 8,089,767

Comparison of 2012, 2013, 2014 and 2015 Normal Cost

	1/1/2012	1/1/2013	1/1/2014	1/1/2015
Present Value of Future Benefits	\$584,646,229	\$621,021,172	\$656,028,299	\$701,540,366
Frozen Initial Liability	\$13,469,173	\$24,528,693	\$24,292,883	\$31,903,022
Assets (Actuarial Value) [Uses a 15% corridor]	\$422,998,843	\$433,408,458	\$479,181,222	\$520,740,990
Present Value of Future Normal Costs	\$148,178,213	\$163,084,021	\$152,554,194	\$148,896,354
Present Value of Future Salaries	\$842,539,153	\$866,156,943	\$904,207,040	\$953,958,428
Normal Cost Percentage	17.59%	18.83%	16.87%	15.61%
Pay (excluding Employees at Retirement age)	\$87,476,195	\$90,041,646	\$94,339,891	\$99,190,353
Gross Normal Cost	\$15,384,527	\$16,953,456	\$15,916,649	\$15,481,893
Anticipated Employee Contributions	\$7,980,292	\$8,247,500	\$8,683,605	\$9,188,141
Net Normal Cost	\$7,404,235	\$8,705,956	\$7,233,044	\$6,293,752
Interest Adjustment (1/1 to 7/1)	\$282,286	\$331,915	\$275,760	\$236,016
Interest Adjustment for Contribution Timing	\$0	\$0	\$0	\$0
Administrative Expense Assumption	\$931,000	\$891,000	\$1,606,000	\$1,560,000
Normal Cost (With Adjustments)	\$8,617,521	\$9,928,871	\$9,114,804	\$8,089,767

Breakdown of Present Value of Future Benefits



Derivation of Experience Gain or (Loss)

1. Normal Cost Rate Last Year	16.87%
2. Normal Cost Rate This Year	15.61%
3. Increase (Decrease) in Normal Cost Rate (2-1)	(1.26)%
4. Actuarial Present Value of Future Salaries	\$953,958,428
5. Increase (Decrease) in Actuarial Present Value of Future Normal Cost (3 x 4)	\$(12,019,876)
6. Increase due to Change in Assumptions, Benefits and Methods	\$3,338,854
7. Net Actuarial Gain/(Loss) [6-5]	\$15,358,731

Calculation of Valuation Assets as of January 1, 2015

5-YEAR PHASE-IN OF ASSET GAINS AND LOSSES

1. Market value of assets including receivable/payable as of January 1, 2015 \$537,695,582
2. Phase-in of asset gains and losses

	Plan Year (1)	Original Amt (2)	Pct Unrecognized (3)	Amt Unrecognized (2) x (3)
a.	2014	\$(6,621,782) *	80%	\$5,297,426
b.	2013	\$31,842,376	60%	19,105,426
c.	2012	21,838,808	40%	8,735,523
d.	2011	(27,944,657)	20%	(5,588,931)
e.	2010	17,067,969	0%	0
f.	Total			\$16,954,592

3. Valuation assets without corridor as of January 1, 2015: (1. - 2.f.) \$520,740,990
4. Corridor Check
 - a. 85% of Market Value \$457,041,245
 - b. 115% of Market Value \$618,349,919
5. Greater of 3. And 4.a. \$520,740,990
6. Valuation assets with corridor as of January 1, 2015: Lesser of 5. And 4.b. \$520,740,990
7. Calculation of return on valuation assets
 - a. Valuation assets as of January 1, 2014 \$479,181,222
 - b. ER contribs + EE contribs - Ben Pymts - Expenses (4,396,222)
 - c. Actual return on valuation assets \$45,955,990
 6. - (7.a. + 7.b.)
 - d. Weighted value of valuation assets \$518,542,879
 - e. Return on valuation assets: 7.c. / 7.d. 8.9%

*Equal to current year market value of \$537,695,582 minus: the prior year market value of \$509,994,139 plus Employer and Employee contributions of \$20,774,198 less benefit payments and expenses of \$25,170,420 plus expected investment earnings of \$38,719,447.

Analysis of Financial Experience

The Frozen Entry Age Actuarial Cost Method does not explicitly recognize actuarial gains or losses. Actuarial gains and losses are spread over the future working lifetime of the active members as part of the normal cost. Therefore, an actuarial loss would increase the normal cost as a percentage of payroll while an actuarial gain would lower the normal cost as a percentage of payroll.

Gross Normal Cost as a Percentage of Payroll (prior to Employee Contributions and Expenses)

	1/1/2014	1/1/2015
Prior Year's Gross Normal Cost (1/1/2013, 1/1/2014)	18.83%	16.87%
Increases/(Decreases) due to:		
▪ Liability experience	(.63)	(.94)
▪ Investment experience	(1.33)*	(.67)*
▪ Changes in benefits, assumptions and methods	(.00)	(.35)
Total	(1.96)	(1.26)
Current Valuation	16.87%	15.61%

*Includes prior years' investment experience which was recognized this year.

Disclosure Information

This disclosure information is based on GASB Statement 25 prior to the issuance of GASB Statement 67. The Retirement Board has requested this be included in the valuation report. Information with regards to GASB Statements 67 and 68 can be found in a separate report issued by Stone Consulting, Inc. as well as the MPAERS's Financial report and the Massachusetts Port Authority's Financial Statement.

The most recent actuarial valuation of the System was prepared by Stone Consulting, Inc. as of January 1, 2015.

The normal cost for employees on that date was	\$9,188,141	9.26% of expected payroll
The normal cost for the employer was	\$7,853,752	7.92% of expected payroll
The actuarial accrued liability for active members was*	N/A	
The actuarial accrued liability for retired members was*	N/A	
Total actuarial accrued liability*	\$552,644,012	
System assets as of that date	\$520,740,990	
[Market value of assets]	[\$537,695,582]	
Unfunded actuarial accrued liability*	\$31,903,022	

*Frozen entry age. Per Q&A – 88 of the GASB Implementation Guide requires you to illustrate the funding progress using the frozen initial unfunded amounts. The actuarial liability shown is the frozen initial unfunded amount plus the assets. The funding method does not explicitly calculate an actuarial accrued liability and therefore it can not be broken down by active and retired members.

The ratio of system's valuation assets to total actuarial liability was 94.2%

The principal actuarial assumptions used in the valuation are as follows:

Investment Return: 7.50% per annum

Rate of Salary Increase: 4.50% per annum

Disclosure Information (Continued)

SCHEDULE OF FUNDING PROGRESS

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
1/1/2015	\$520,740,990	\$552,644,012	\$31,903,022	94.2%	\$95,475,718	33.4%
1/1/2014	\$479,181,222	\$503,474,105	\$24,292,883	95.2%	\$90,979,477	26.7%
1/1/2013	\$433,408,458	\$457,937,151	\$24,528,693	94.6%	\$86,729,766	28.3%
1/1/2012	\$422,998,843	\$436,468,016	\$13,469,173	96.9%	\$84,044,762	16.0%
1/1/2011	\$420,800,868	\$419,271,699	(\$1,529,169)	100.4%	\$82,540,581	(1.9%)
1/1/2010	\$410,469,122	\$407,856,780	(\$2,612,342)	100.6%	\$86,438,149	(3.0%)
1/1/2009	\$342,952,767	\$327,828,633	(\$15,124,134)	104.6%	\$85,943,871	(17.6%)
1/1/2008	\$396,929,832	\$387,223,231	(\$9,706,601)	102.5%	\$81,119,712	(12.0%)
1/1/2007	\$368,345,560	\$357,507,095	(\$10,838,465)	103.0%	\$76,834,550	(14.1%)
1/1/2006	\$327,713,971	\$317,033,081	(\$10,680,890)	103.4%	\$73,513,857	(14.5%)

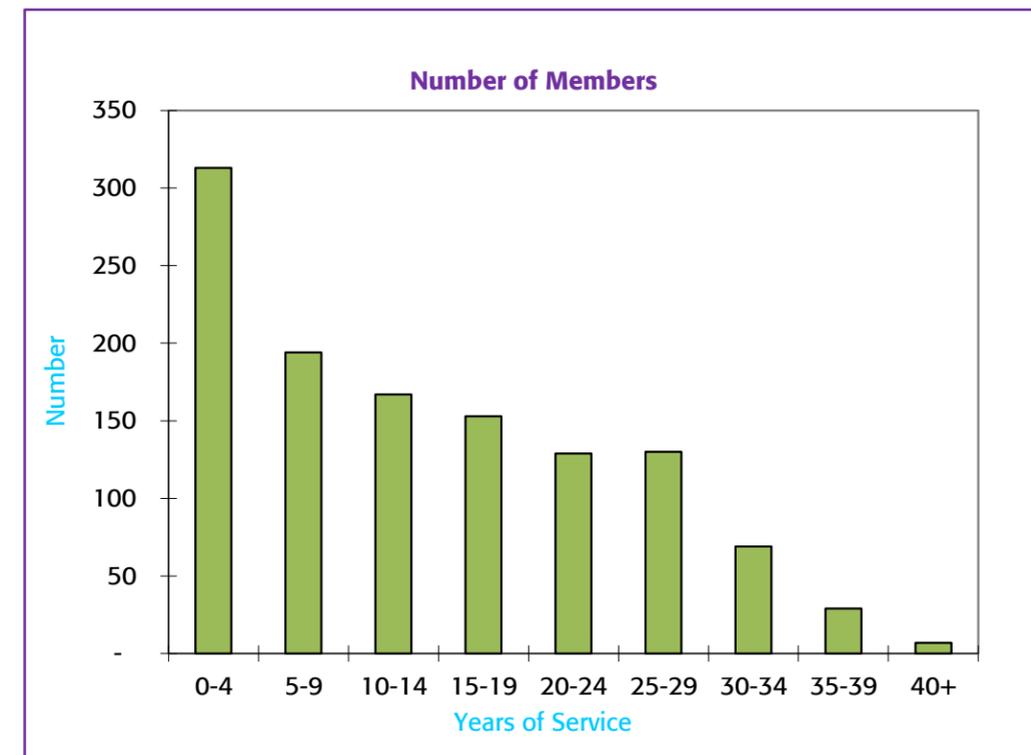
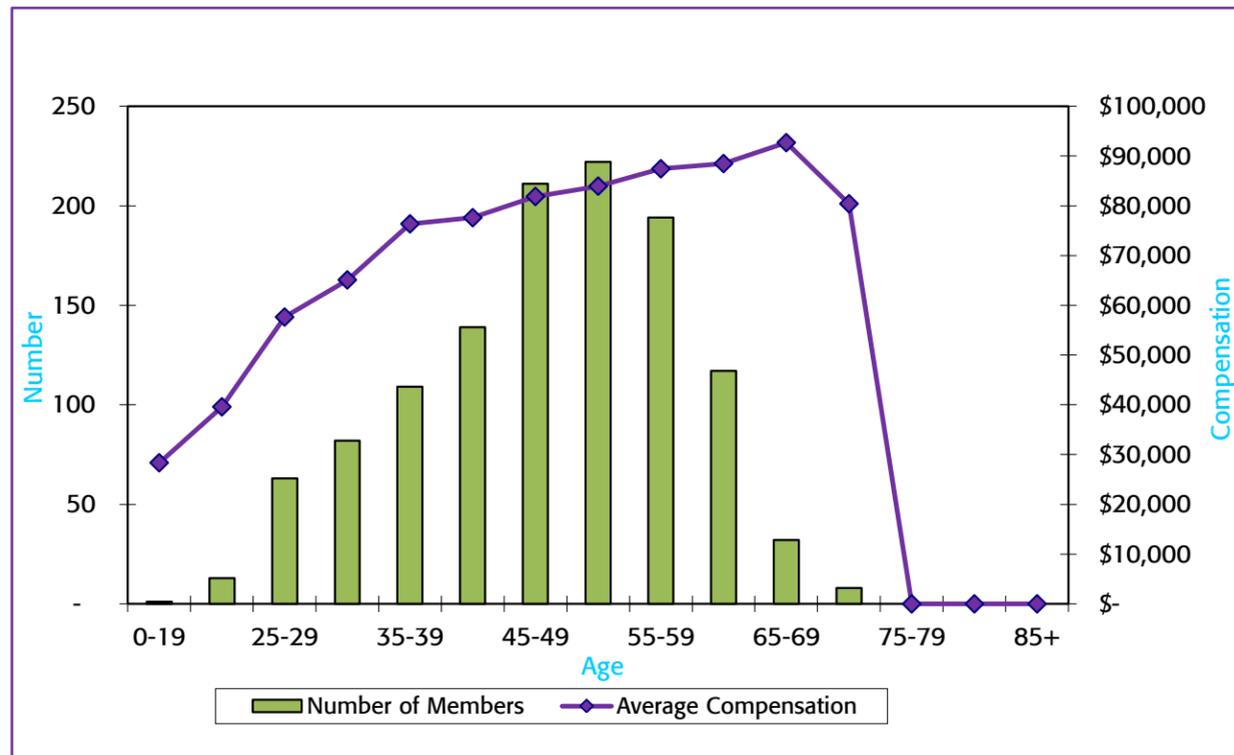
Notes to Schedule

Valuation Date: 1/1/2015
 Actuarial Cost Method: Frozen Entry Age
 Amortization Method: Level. Closed amortization
 Remaining Amortization Period: Multiple bases with remaining periods ranging from 8 years to 20 years.
 Asset Valuation Method: 5 year asset smoothing with a 15% corridor
 Actuarial Assumptions: Investment Rate of Return 7.50% per annum
 Projected Salary Increases 4.50% per annum

Distribution of Plan Members as of January 1, 2015

Active Members

AGE	0-4 Years	5-9 Years	10-14 Years	15-19 Years	20-24 Years	25-29 Years	30-34 Years	35-39 Years	40 + Years	Total	Total Compensation	Average Compensation
0-19	1	-	-	-	-	-	-	-	-	1	\$ 28,360	\$ 28,360
20-24	13	-	-	-	-	-	-	-	-	13	514,770	39,598
25-29	60	3	-	-	-	-	-	-	-	63	3,631,966	57,650
30-34	58	18	6	-	-	-	-	-	-	82	5,339,507	65,116
35-39	39	34	22	12	2	-	-	-	-	109	8,325,182	76,378
40-44	41	27	27	26	17	1	-	-	-	139	10,789,297	77,621
45-49	36	40	39	34	38	21	3	-	-	211	17,277,271	81,883
50-54	25	31	33	30	32	54	16	1	-	222	18,639,329	83,961
55-59	22	20	23	31	16	25	36	18	3	194	16,965,839	87,453
60-64	13	15	12	13	17	24	10	9	4	117	10,354,169	88,497
65-69	5	5	5	3	4	5	4	1	-	32	2,966,642	92,708
70-74	-	1	-	4	3	-	-	-	-	8	643,386	80,423
75-79	-	-	-	-	-	-	-	-	-	-	-	-
80-84	-	-	-	-	-	-	-	-	-	-	-	-
85+	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	313	194	167	153	129	130	69	29	7	1,191	\$ 95,475,718	\$ 80,164

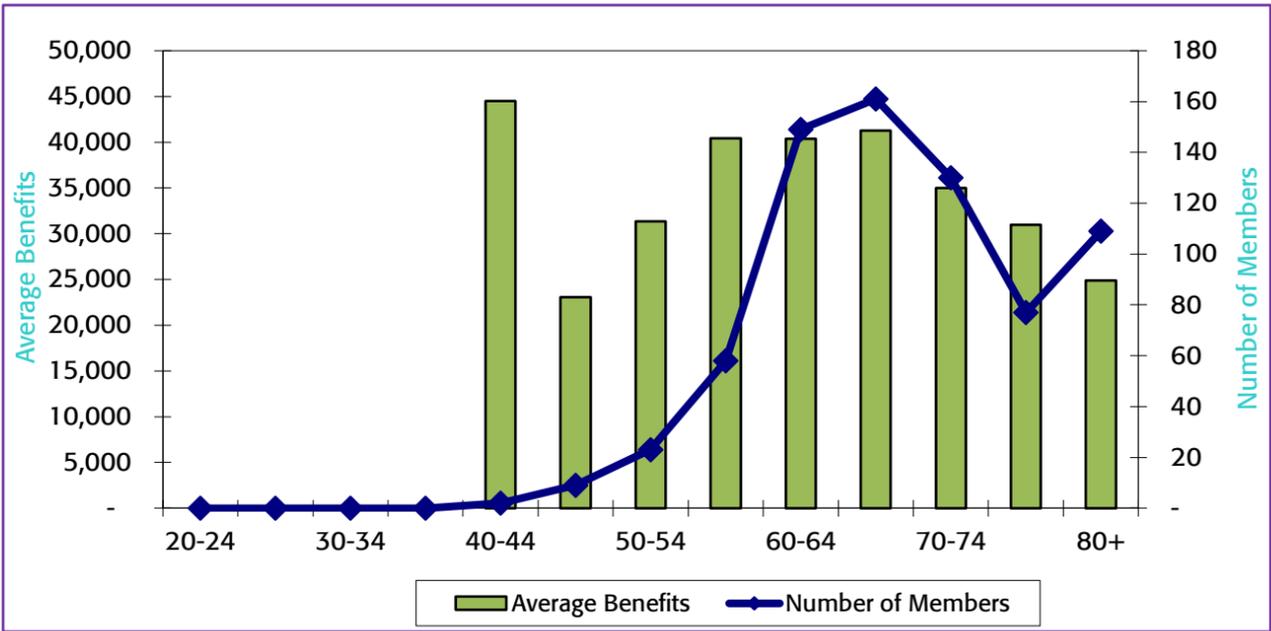


Distribution of Plan Members as of January 1, 2015
Retired Members

Retired Members and Beneficiaries			
Age	Number	Average Benefit	Total Benefit
20-24	-	-	-
25-29	-	-	-
30-34	-	-	-
35-39	-	-	-
40-44	1	30,780	30,780
45-49	7	13,900	97,301
50-54	13	26,896	349,648
55-59	50	38,215	1,910,734
60-64	138	40,718	5,619,053
65-69	150	41,698	6,254,740
70-74	124	34,634	4,294,564
75-79	74	30,529	2,259,147
80+	104	24,320	2,529,321
TOTAL	661	\$ 35,318	\$ 23,345,287

Disabled Members			
Age	Number	Average Benefit	Total Benefit
20-24	-	-	-
25-29	-	-	-
30-34	-	-	-
35-39	-	-	-
40-44	1	58,186	58,186
45-49	2	55,151	110,302
50-54	10	37,082	370,822
55-59	8	54,356	434,850
60-64	11	36,424	400,669
65-69	11	35,592	391,508
70-74	6	42,963	257,781
75-79	3	42,142	126,427
80+	5	36,495	182,475
TOTAL	57	\$ 40,930	\$ 2,333,021

Total			
Age	Number	Average Benefit	Total Benefit
20-24	-	-	-
25-29	-	-	-
30-34	-	-	-
35-39	-	-	-
40-44	2	44,483	88,965
45-49	9	23,067	207,603
50-54	23	31,325	720,469
55-59	58	40,441	2,345,584
60-64	149	40,401	6,019,722
65-69	161	41,281	6,646,248
70-74	130	35,018	4,552,345
75-79	77	30,981	2,385,574
80+	109	24,879	2,711,796
TOTAL	718	\$ 35,764	\$ 25,678,308



Schedule of Active Member Valuation Data

Valuation Date	Number	Annual Payroll	Annual Average Pay	Increase In Average Pay
1/1/2015	1,191	\$95,475,718	\$80,164	2.3%
1/1/2014	1,161	\$90,979,477	\$78,363	2.1%
1/1/2013	1,130	\$86,729,766	\$76,752	2.2%
1/1/2012	1,119	\$84,044,762	\$75,107	-0.9%
1/1/2011	1,089	\$82,540,581	\$75,795	-0.3%
1/1/2010	1,137	\$86,438,149	\$76,023	5.4%
1/1/2009	1,192	\$85,943,871	\$72,101	4.8%
1/1/2008	1,179	\$81,119,712	\$68,804	4.9%
1/1/2007	1,171	\$76,834,550	\$65,614	2.9%
1/1/2006	1,153	\$73,513,857	\$63,759	1.0%

Schedule of Retirees and Beneficiaries Added to and Removed from Rolls

Valuation Date	Added to Rolls		Removed from Rolls		Rolls: End of Year		% Increase in Annual Allowances	Average Annual Allowances
	No.	Annual Allowances	No.	Annual Allowances	No.	Annual Allowances		
1/1/2015	51	\$2,070,732	19	\$586,503	718	\$25,678,308	7.4%	\$35,764
1/1/2014	45	\$1,763,845	14	\$361,877	686	\$23,904,002	7.6%	\$34,845
1/1/2013	33	\$1,323,487	16	\$494,358	655	\$22,208,579	5.7%	\$33,906
1/1/2012	63	\$2,811,187	12	\$211,424	630	\$21,017,707	15.3%	\$33,361
1/1/2011	62	\$2,378,822	14	\$285,287	579	\$18,221,175	14.0%	\$31,470
1/1/2010	47	\$1,818,156	16	\$375,718	531	\$15,988,782	11.4%	\$30,111
1/1/2009	32	\$1,155,914	10	\$224,595	500	\$14,353,083	8.1%	\$28,706
1/1/2008	27	\$824,341	18	\$382,324	478	\$13,280,270	5.3%	\$27,783
1/1/2007	28	\$987,060	15	\$296,050	469	\$12,610,485	6.6%	\$26,888
1/1/2006	32	\$893,817	13	\$188,968	456	\$11,826,631	7.2%	\$25,936

Notes:

Additional changes to annual retirement allowances can be due to various factors including:

1. Cost of living increases under Massachusetts General Laws Chapter 103
2. Retroactive benefit changes due to changes in popup provision
3. Post-retirement COLA under Massachusetts General Laws Chapter 32, Sections 90A, 90C and 90D
4. Suspension of benefits
5. Changes in worker's compensation offsets
6. Data corrections
7. Change in dependents' allowance due to dependents exceeding age limit.

Solvency Test

Valuation Date	Actuarial Accrued Liability (AAL)			Actuarial Value of Assets	Portion of AAL Covered by Assets		
	Active Member Contributions (1)	Retirees and Beneficiaries (2)	Active/Inactive Members (Employer Financed) (3)		(1)	(2)	(3)
1/1/2015	\$97,096,332	\$270,897,577	\$184,650,103	\$520,740,990	100%	100%	82.7%
1/1/2014	\$94,361,394	\$249,709,368	\$159,403,343	\$479,181,222	100%	100%	84.8%
1/1/2013	\$90,907,523	\$233,425,040	\$133,604,588	\$433,408,458	100%	100%	81.6%
1/1/2012	\$86,830,067	\$217,864,260	\$131,773,689	\$422,998,843	100%	100%	89.8%
1/1/2011	\$85,699,175	\$183,305,136	\$150,267,388	\$420,800,868	100%	100%	100%
1/1/2010	\$84,304,971	\$160,449,116	\$163,102,693	\$410,469,122	100%	100%	100%
1/1/2009	\$80,117,710	\$142,776,737	\$104,934,186	\$342,952,767	100%	100%	100%
1/1/2008	\$74,880,180	\$134,030,120	\$178,312,931	\$396,929,832	100%	100%	100%
1/1/2007	\$70,249,521	\$126,629,107	\$160,628,467	\$368,345,560	100%	100%	100%
1/1/2006	\$66,247,407	\$122,959,489	\$127,826,185	\$327,713,971	100%	100%	100%

Notes:

- Under the Frozen Entry Age cost method actuarial accrued liability is not directly calculated. Actuarial accrued liability, as determined here, is that portion of the present value of future benefits that will not be paid by future employer normal costs.
- January 1, 2009 numbers reflect a change in assumptions. Mortality is based on the RP 2000 Table with projection for 9 years, an interest rate of 8% (from 7.75%) and salary rate of 4.75% (from 5%).
- January 1, 2010 numbers reflect a change in assumptions. Mortality is based on the RP 2000 Table with projection for 10 years, an interest rate of 7.75% (from 8.00%).
- January 1, 2011 numbers reflect a change in assumptions. Mortality is based on the RP 2000 Table with projection for 11 years.
- January 1, 2012 numbers reflect a change in assumptions. Mortality is based on the RP 2000 Table with projection for 22 years (from 11 year projection), an interest rate of 7.625% (from 7.75%) and salary rate of 4.50% (from 4.75%).
- January 1, 2013 numbers reflect a change in assumptions. Mortality is based on the RP 2000 Table (Sex-distinct) projected with Scale BB and Generational Mortality (from 22 year projection) and a change to retirement, disability and withdrawal assumptions.
- January 1, 2015 numbers reflect a change in assumptions. The interest rate was changed to 7.50% (from 7.625%).

Actuarial Methods and Assumptions

The assumptions used for the actuarial valuation are recommended by the actuary and adopted by the Retirement Board on an annual basis. In addition, Massachusetts State Law specifies the actuarial cost method to be used.

ACTUARIAL METHODS

- | | |
|---------------------------|--|
| 1. Actuarial Cost Method | The Frozen Entry Age Actuarial Cost Method has been used in this valuation. Under this method, the present value of all future benefits is determined for each individual participant as of each valuation date. The unfunded frozen actuarial liability represents the unfunded portion of the initial actuarial accrued liability as adjusted for plan changes and changes in assumptions. The annual normal cost is then determined as the amount necessary to fund, as a level percentage of pay of the participants included in the valuation, the excess of the present value of future benefits over the sum of the assets and the unfunded actuarial accrued liability. Actuarial gains and losses are not directly recognized under this method, but are spread over future years as a portion of the annual normal cost. |
| 2. Asset Valuation Method | The Asset Valuation Method is the market value of assets (adjusted by payables and receivables) adjusted to phase in investment gains or losses above or below the expected rate of investment return. A five-year rolling period is used. The phase-in is 20% for year one, 40% for year two, 60% for year three, 80% for year four and 100% for year five. The actuarial value of assets must be within a corridor of 85% to 115% of the adjusted market value of assets. |

ACTUARIAL ASSUMPTIONS

- | | |
|---------------------------|---|
| 1. Investment Return Rate | 7.50% per year (Prior valuation 7.625%) |
| 2. Mortality | <ul style="list-style-type: none">■ Healthy – RP2000 Table (sex-distinct) projected with Scale BB and Generational Mortality. Post-retirement the RP2000 healthy annuitant Table (sex-distinct) projected with Scale BB and Generational Mortality. |

Actuarial Methods and Assumptions (Continued)

Mortality (cont'd)

- Disabled - RP2000 healthy annuitant Table (sex-distinct) and Generational Mortality set-forward 2 years was used. Mortality for accidental disability is assumed to be 50% from the same cause as the disability.

3a. Rates of Retirement

Group 1 and 2 employees are assumed to retire at the following rates upon attainment of 10 years of service.

Rates of Retirement
(Employees Hired pre- April 2, 2012)

Age	Group 1	Group 2	Group 4
50	1%	1%	5%
51	1	1	5
52	1	1	5
53	3	3	5
54	3	3	5
55	4	3	35
56	4	3	15
57	5	5	15
58	4	4	15
59	6	6	15
60	13	13	15
61	13	13	15
62	11	11	15
63	12	15	15
64	13	15	15
65	30	100	100
66	30	N/A	N/A
67	30	N/A	N/A
68	30	N/A	N/A
69	30	N/A	N/A
70	100	N/A	N/A

Actuarial Methods and Assumptions (Continued)

3b. Rates of Retirement

Employees Hired after April 1, 2012

Rates of Retirement

Age	Group 1	Group 2*	Group 4
50	-	-	3%
51	-	-	3
52	-	-	5
53	-	-	5
54	-	-	5
55	-	8%	5
56	-	4	5
57	-	5	35
58	-	4	15
59	-	8	15
60	20%	10	15
61	13	10	15
62	11	16	15
63	13	16	15
64	13	16	15
65	15	100	100
66	15	N/A	N/A
67	30	N/A	N/A
68	30	N/A	N/A
69	30	N/A	N/A
70	100	N/A	N/A

Actuarial Methods and Assumptions (Continued)

4. **Withdrawal Prior to Retirement** The rates shown at the following sample ages illustrate the withdrawal assumption.

Rate of Withdrawal

Age	Groups 1 and 2*	Group 4*
25	2.0%	0.5%
30	2.0	0.5
35	2.0	0.5
40	1.5	0.4
45	1.5	0.1
50	1.0	N/A
55	1.0	N/A

*Groups 1, 2 and 4 are assigned based on employee class, as described in the Summary of Principal Plan Provisions, Section 1.

5. **Disability Prior to Retirement** The rates shown at the following sample ages illustrate the assumption regarding the incidence of disability:

Rate of Disability

Age	Group 1*	Group 2*	Group 4*
25	.01%	.07%	.20%
30	.01	.08	.40
35	.05	.12	.70
40	.08	.17	1.00
45	.10	.24	1.00
50	.14	.43	.90
55	.17	.55	.90
60	.20	.55	.80

Disability is assumed to be 45% ordinary and 55% accidental for Groups 1 and 2 and 10% ordinary and 90% accidental for Group 4.

*Groups 1, 2 and 4 are assigned based on employee class, as described in the Summary of Principal Plan Principal Plan Provisions, Section 1

Actuarial Methods and Assumptions (Continued)

6.	Salary Increases	4.50% per year.
7.	Regular Interest Rate Credited to Annuity Savings Account	2% per year.
8.	Family Composition	Members are assumed to be married with two dependent children - one male and one female both age 15; age difference between member and spouse assumed to be three years (the male being the older).
9.	Pension Adjustments	For purposes of the valuation, it is assumed that the Massachusetts Port Authority Employees' Retirement Board will fund 3% annual pension adjustment (cost-of-living increases).
10.	Pension Adjustment Base Increase	The pension adjustment base (cost-of-living base) is assumed to be \$13,000.
11.	Expenses	Budgeted amount for the fiscal year, excluding investment management fees and custodial fee, is added to the Normal Cost.
12.	Credited Service	An active member's credited service is attributed to Massachusetts Port Authority employment.
13.	Vacation Buybacks	A load of 1.25% on the liabilities and normal cost associated with active members' superannuation benefits. This is roughly equivalent to 25 additional hours being bought back each year in the final three-years of service prior to retirement compared to the years prior to the final three-years of service.
14.	Valuation Date	January 1, 2015.

Actuarial Methods and Assumptions (Continued)

15. Recent Changes
- As of January 1, 2015 the interest rate changed to 7.50% (from 7.625%).
- As of January 1, 2013 the mortality assumption was changed to the RP2000 Generational Table and the retirement, disability and withdrawal assumptions were changed based on an experience study.
- As of January 1, 2012 the mortality assumption was changed to the RP 2000 Table projected forward 22 years with Scale AA, interest rate changed to 7.625% (from 7.75%) and salary rate to 4.50% (from 4.75%). Vacation buyback factor was increased from 1.00% to 1.25%.
- As of January 1, 2011 the mortality assumption was changed to the RP 2000 Table projected forward 11 years with Scale AA.
- As of January 1, 2010 the mortality assumption was changed to the RP 2000 Table projected forward 10 years with Scale AA, interest rate changed to 7.75% (from 8.00%).
- As of January 1, 2009 the mortality assumption was changed to the RP 2000 Table projected forward 9 years with Scale AA, interest rate changed to 8% (from 7.75%), salary rate to 4.75% (from 5%), contribution timing changed to the beginning of the fiscal year from monthly.
- As of the January 1, 2008 valuation the retirement age assumption was extended to age 70 for Group 1 employees, disabled mortality changed to a 2 year set forward and the asset valuation method was changed to 5 year smoothing.
- As of the January 1, 2006 valuation the calculation of the 3(8)(c) liabilities did not reflect further COLA increases.
- As of the January 1, 2004 valuation, the retirement assumption for group 4 members was changed from retirement at age 58 and 10 years of service to retirement rates between ages 50 and 65.

Actuarial Methods and Assumptions (Continued)

15. Recent Changes
- As of the January 1, 2003 valuation, the asset valuation method was changed to use a 15% corridor instead of a 10% corridor. Also, the pension adjustment base increase assumption was changed from 3% to 0%, the interest assumption from 8% to 7.75% and the salary assumption from 5.5% to 5%.
- As of January 1, 2002 an assumption regarding vacation buybacks was added. As of January 1, 2001 mortality has been changed from GAM94 to RP2000 to better reflect male mortality.
- As of January 1, 2000, mortality was changed from GAM83 to reflect longer life expectancies. The retirement age assumption was also changed. Prior to the January 1, 2000 valuation, employees of Groups 1 and 2 were assumed to retire at the later of age 63 and 10 years of service. Employees of Group 4 were assumed to retire at the later of age 56 and 10 years of service.
16. Date of Adoption
- All assumptions and methods were adopted by the MPAERS Board on April 30, 2015 for use in the January 1, 2015 actuarial valuation and thereafter.
17. Contribution Timing
- Contributions are assumed to be made at the beginning of the fiscal year, July 1.

Summary of Principal Plan Provisions

1. Participant Participation is mandatory for all full-time employees whose employment commences before age 65. There are three classes of members in the retirement system:

Group 1: general employees

Group 2: employees in specified hazardous occupations (e.g., guards)

Group 4: firefighters and electricians

2. Member Contributions Member contributions vary depending upon date hired as follows:

Date of Hire	Member Contribution Rate
Prior to 1975	5% of Pay
1975 - 1983	7% of Pay
1984 - June 30, 1996	8% of Pay
After June 30, 1996	9% of Pay

Chapter 697 provision requires members hired after 1978 to contribute an additional 2% of pay over \$30,000.

3. Pay

a. Pay Gross regular compensation excluding bonuses, overtime, severance pay, unused sick pay, and other similar compensation.

b. Average Pay The average of pay during the three consecutive years that produce the highest average or, if greater, during the last three years (whether or not consecutive) preceding retirement.

4. Credited Service Period during which an employee contributes to the retirement system plus certain periods of military service and “purchased” service.

Summary of Principal Plan Provisions (Continued)

5. Service Retirement

a. Eligibility

1) Attainment of age 55 and completion of ten years of credited service or at any age with completion of 20 years of service. If hired prior to 1978 or a member of Group 4, the completion of ten years of service is not required.

2) Hired after April 1, 2012 and Group 1 – Age 60 and Completion of 10 years of credited service. Group 2 – Age 55 and completion of 10 years of service. Group 4 – Age 55.

b. Retirement Allowance

Determined as the product of the member’s benefit percentage, average pay and credited service, where the benefit percentage is shown below (maximum allowance of 80% of average pay):

Benefit Percentage	Group 1	Group 2	Group 4
2.5%	65+	60+	55+
2.4	64	59	54
2.3	63	58	53
2.2	62	57	52
2.1	61	56	51
2.0	60	55	50
1.9	59	N/A	49
1.8	58	N/A	48
1.7	57	N/A	47
1.6	56	N/A	46
1.5	55	N/A	45
Hired after April 1, 2012			
2.5%	67+	62+	57+
2.35	66	61	56
2.20	65	60	55
2.05	64	59	54
1.90	63	58	53
1.75	62	57	52
1.60	61	56	51
1.45	60	55	50

In addition, veterans receive an additional \$15 per year for each year of credited service up to 20 years

Summary of Principal Plan Provisions (Continued)

6. Deferred Vested Retirement

- | | |
|-------------------------|---|
| a. Eligibility | Completion of ten years of credited service. |
| b. Retirement Allowance | Determined in the same manner as "Service Retirement" section above with the member eligible to start collecting a benefit at age 55, (or age 57 for post-April 1, 2012 hires) or defer until later at his or her discretion. |

If a member chooses, his or her contributions with interest may be withdrawn. The amount of interest he or she will receive depends on length of service and whether or not the termination of employment was voluntary.

7. Ordinary Disability Retirement

- | | |
|-------------------------|---|
| a. Eligibility | Non-job related disability after completion of ten years of credited service. |
| b. Retirement Allowance | Determined in the same manner as "Service Retirement" section and calculated as if the member had attained age 55 (or age 57 for those hired after April 1, 2012), if younger. Veterans receive 50% of pay (during final year) plus an annuity based on accumulated member contributions with interest. |

8. Accidental Disability Retirement

- | | |
|-------------------------|--|
| a. Eligibility | Disabled as a result of an accident in the performance of duties. No age or service requirement. |
| b. Retirement Allowance | 72% of pay plus an annuity based on accumulated member contributions with interest. Also, a dependent's allowance per year for each child. Total allowance not to exceed 100% of pay (75% for members hired after 1987). |

Summary of Principal Plan Provisions (Continued)

9.	Non-Occupational Death	
a.	Eligibility	Dies while in active service, but not due to occupational injury.
b.	Retirement Allowance	Benefit as if Option C had been elected (see below) and member had attained age 55 (or age 57 for those hired after April 1, 2012) if younger. Minimum monthly benefits provided as follows: spouse - \$500, first child - \$120, each additional child - \$90
10.	Occupational Death	
a.	Eligibility	Dies as a result of an occupational injury.
b.	Retirement Allowance	72% of pay plus refund of annuity savings fund balance. In the case of an accidental disability retiree who dies of the same cause, the beneficiary receives 72% of the last 12 months salary or the current pension amount, whichever is greater.
11.	Cost-of-Living Increases	Applied to the first \$13,000 of annual benefit. Funded by the Authority.
12.	Optional Forms of Payment	
a.	Option A	Allowance payable monthly for the life of the member.
b.	Option B	Allowance payable monthly for the life of the member with a guarantee of any remaining member contributions with interest.
c.	Option C	Allowance payable monthly for the life of the member with 66-2/3% continuing to the member's beneficiary upon the member's death. If the beneficiary pre-deceases the member, the allowance amount "pops-up" to the non-reduced amount (Option A).

Glossary of Terms

1. **Present Value of Future Benefits** - Represents the dollar value today of all benefits expected to be earned by current members if all actuarial assumptions are exactly realized.
2. **Actuarial Cost Method** - The procedure used to allocate the Present Value of Future Benefits to past and future periods of employee service.
3. **Actuarial Assumptions** - Estimates are made as to the occurrence of certain events that determine the level of benefits to be provided and how long they will be provided. The more important actuarial assumptions include the investment return on assets, salary increases and the rates of turnover, disability, retirement and mortality.
4. **Unfunded Frozen Actuarial Liability** - The liability set under the Entry Age Actuarial Cost Method at plan inception, adjusted at each valuation to reflect the addition of interest and the amortization of liability since the previous valuation. The amount is adjusted by any increases or decreases in the actuarial liability (determined under the Entry Age Method) due to changes in benefits or actuarial assumptions after plan inception.
5. **Normal Cost** - That portion of the Present Value of Future Benefits that is attributable to benefits to be earned in the coming year. Under the Frozen Entry Age Method, the Normal Cost is the portion of the Unfunded Present Value of Future Benefits which is not attributable to the Unfunded Frozen Actuarial Liability. This amount is then funded as a level percentage of pay.
6. **Actuarial Value of Assets** - Value of the funds set aside through Authority and member contributions to provide for benefits, as measured by the actuary for valuation purposes.
7. **Unfunded Present Value of Future Benefits** - That portion of the present value of Future Benefits, not covered by the Actuarial Value of Assets.
8. **PERAC** - Public Employee Retirement Administration Commission, a division of the State government which has regulatory authority over the administration of the retirement system.
9. **GASB** - Government Accounting Standards Board, which issues guidance for disclosure of retirement system liabilities.