



November 1, 2022

Quincy Retirement Board
1212 Hancock Street
Suite 210A
Quincy, MA 02169

Dear Quincy Retirement Board:

Stone Consulting, Inc. has performed a January 1, 2022 actuarial valuation of the Quincy Retirement System. 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 represent a reasonable estimate of anticipated experience of the system unless otherwise noted in the text.

To reflect the addition of funds related to a Pension Obligation Bond to fund benefits for the City of Quincy, results were allocated between the City and the Quincy Housing Authority in order to develop separate funding schedules for the two employers. The resulting contributions were then combined to produce the funding schedule on page 6. The funding schedule was developed as follows:

- As a result of the proceeds of the Bond, the City of Quincy was fully funded as of January 1, 2022 (assets exceeded liabilities). With no unfunded liability to be amortized, the contribution for the City consists of the Net Normal Cost (including administrative expense), plus Net 3(8)(c) payments
- The existing funding schedule for the Quincy Retirement System, based on the January 1, 2020 valuation, was developed by setting the total contribution to increase by 7.50% annually through Fiscal Year 2024, with 5.40% increases thereafter. The funding schedule for the Housing Authority continued this approach, applying similar increases to the contribution paid by the Quincy Housing Authority for Fiscal Year 2023.

PERAC and GASB guidelines indicate that actuarial valuations should be conducted at least every other year. The Quincy Retirement Board conducted their prior actuarial valuation effective January 1, 2020.

Stone Consulting, Inc. is completely independent of the City of Quincy and the Quincy Retirement System. This includes any of its officers and key personnel. Neither we or anyone else closely associated with us has any relationship with the City of Quincy or the Quincy Retirement System that would impair our independence, other than this or related assignments.

■ Quincy Retirement Board
Actuarial Valuation as of January 1, 2022

We are pleased to present the results of this valuation. If the Retirement 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 inaccurate or misleading understanding of the results. The use of these results may not be appropriate for all circumstances.

I, Colin Edgar, am a consultant for Stone Consulting, Inc. I am a member of the American Academy of Actuaries and meet 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

Colin Edgar
Member, American Academy of Actuaries

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Introduction

This report presents the results of the actuarial valuation of the Quincy Retirement System. The valuation was performed at the request of the Retirement Board as of January 1, 2022 for the purpose of determining the contribution requirements for Fiscal Year 2024 and beyond. The contribution requirements are based on:

- The financial condition of the system as of December 31, 2021, based in formation from the Retirement system and their auditors, O'Connor and Drew;
- The benefit provisions of M.G.L. Chapter 32 and related statutes;
- The demographics of members in the system (i.e., active and inactive participants, retirees and beneficiaries as of January 1, 2022);
- Economic assumptions regarding salary increases and investment earnings; and
- Other actuarial assumptions (e.g., withdrawals, retirement, death, etc.)

Valuation Summary

Summary of Results and Experience

- Experience and Funding Schedule

The most significant element of the System's experience over the past two years was the addition of funds related to a Pension Obligation Bond for the City of Quincy. The proceeds of the bond are intended to fund benefits only for the City, resulting in a number of methodology changes which are discussed in detail as part of the development of the funding schedule.

The funding schedule for the Quincy Housing Authority finishes in FY2034, compared to the planned funding schedule from the 2020 valuation, which finished in FY2036. The City of Quincy is fully funded as of January 1, 2022.

The funding ratio (based on Actuarial Value of Assets) increased from 46% to 101%.

- Assumptions/methodology:

Changes to assumptions and plan provisions increased the liability by \$38.9 million, including an update of the mortality assumption and a reduction of the discount rate from 7.25% to 6.75%. Assumptions and valuation methodology are discussed in Appendix A, on page 11.

Summary of Changes to Assumptions and Plan Provisions

- The discount rate assumption is 6.75%
 - Previous valuation used 7.25%
 - Net effect of change in assumption increased the liability by \$41.4 million (5.0%)
 - Reflects anticipated future market performance

- The mortality assumption is based upon the RP-2014 adjusted to 2006, projected generationally using MP-2021
 - Prior valuation used the same table, projected using MP-2019.
 - Net effect of the change in mortality assumption decreased the liability by \$2.5 million (0.3%)

Summary of Experience

- Average annual return in calendar 2020 and 2021 – 13.97% vs. a 7.25% assumption.
 - \$52,915,875 net actuarial asset gain in calendar years 2020 and 2021

- Total compensation changed by 5.8% over the prior valuation
 - average annual compensation (compensation divided by number of active members) changed by 3.9%
 - Salary gain of \$8.5 million (less liability than expected when compared to salary projected from the prior valuation data with the prior assumption).

■ Quincy Retirement Board
Actuarial Valuation as of January 1, 2022

January 1, 2022 Actuarial Valuation Results

	January 1, 2022	January 1, 2020	Percentage Change
Funding			
Contribution for Fiscal 2024	\$10,680,015		-75.9%
Contribution for Fiscal 2024 based on current schedule		\$44,278,219	
Members			
■ Actives			
a. Number	1,575	1,546	1.9%
b. Annual Compensation	\$107,666,362	\$101,716,416	5.8%
c. Average Annual Compensation	\$68,360	\$65,793	3.9%
d. Average Attained Age	48.7	49.3	-1.2%
e. Average Past Service	12.0	12.4	-3.2%
■ Retired, Disabled and Beneficiaries			
a. Number	1,496	1,521	-1.6%
b. Total Benefits*	\$51,092,870	\$47,622,405	7.3%
c. Average Benefits*	\$34,153	\$31,310	9.1%
d. Average Age	74.5	75.0	-0.7%
■ Inactives			
a. Number	260	167	55.7%
■ Vested Terminated Members			
a. Number	26	21	23.8%
Normal Cost			
a. Total Normal Cost as of January 1, 2022	\$ 17,894,770	\$ 15,422,209	16.0%
b. Less Expected Members' Contributions	<u>10,192,581</u>	<u>9,567,914</u>	6.5%
c. Normal Cost to be funded by the Municipality	\$ 7,702,189	\$ 5,854,295	31.6%
d. Adjustment to July 1, 2023	466,722	354,747	31.6%
e. Administrative Expense Assumption	<u>638,452</u>	<u>586,377</u>	8.9%
f. Normal Cost Adjusted to July 1, 2023	\$ 8,807,364	\$ 6,795,419	29.6%
Actuarial Accrued Liability as of January 1, 2022			
a. Active Members	\$357,346,694	\$329,194,932	8.6%
b. Inactive Members	2,237,712	1,461,937	53.1%
c. Terminated Vested Members	2,869,189	2,498,635	14.8%
d. Retired Members and Beneficiaries	<u>504,826,443</u>	<u>455,265,554</u>	10.9%
e. Total	\$867,280,039	\$788,421,058	10.0%
Unfunded Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of January 1, 2022	\$867,280,039	\$788,421,058	10.0%
b. Less Actuarial Value of Assets as of January 1, 2022	<u>877,337,352</u>	<u>361,711,746</u>	142.6%
c. Unfunded Actuarial Accrued Liability as of January 1, 2022	\$ (10,057,314)	\$426,709,312	-102.4%
d. Adjustment to July 1, 2023	<u>2,472,007</u>	<u>19,233,665</u>	
e. Unfunded Actuarial Accrued Liability as of July 1, 2023	\$ (7,585,307)	\$445,942,977	

*Excluding State reimbursed COLA

NOTE: for all tables in this report, totals may not sum due to rounding.

Development of Funding Schedule

The appropriation for Fiscal 2024 is as follows:

Net Employer Normal Cost for Fiscal 2024 (including admin. expenses)	\$ 8,807,364
Net 3(8)(c) Payments	259,692
Amortization	<u>1,612,959</u>
Total Appropriation required for Fiscal 2024	\$ 10,680,015

- The funding schedule is presented on the following page. The schedule's length is eleven (11) years, a two-year reduction compared to the thirteen-year remainder of the 15-year schedule from the January 1, 2020 valuation.
- The maximum funding schedule length allowed by Section 22F of Chapter 32 of the Massachusetts General Laws is seventeen years to Fiscal 2040.

Allocation of Results to Employers

The funding contribution is composed of three components:

- Net Normal Cost, including administrative expense
- Amortization of the Unfunded Liability
- Net 3(8)(c) payments

Each component had to be allocated between the City and the Housing Authority in order to develop the funding schedule for each employer. These three components are discussed in greater detail in the pages following the funding schedule, including discussion of how each element was divided between the City and the Housing Authority.

QUINCY RETIREMENT SYSTEM

FUNDING SCHEDULE

Fiscal Year	Housing Authority					City of Quincy			Total Contribution
	Normal Cost	Unfunded Liability	Funding Amortization of UAAL	Net 3(8)(c) Payments	Schedule Contribution	Normal Cost	Net 3(8)(c) Payments	Schedule Contribution	
2024	258,162	15,434,011	1,612,959	8,432	1,879,553	8,549,202	251,260	8,800,463	10,680,015
2025	268,488	14,753,974	1,704,128	8,432	1,981,048	8,891,170	251,260	9,142,431	11,123,479
2026	279,228	13,930,710	1,800,365	8,432	2,088,025	9,246,817	251,260	9,498,077	11,586,102
2027	290,397	12,949,143	1,901,949	8,432	2,200,778	9,616,690	251,260	9,867,950	12,068,728
2028	302,013	11,792,879	2,009,176	8,432	2,319,620	10,001,357	251,260	10,252,618	12,572,238
2029	314,093	10,444,103	2,122,355	8,432	2,444,880	10,401,412	251,260	10,652,672	13,097,552
2030	326,657	8,883,466	2,241,814	8,432	2,576,903	10,817,468	251,260	11,068,728	13,645,632
2031	339,724	7,089,963	2,367,901	8,432	2,716,056	11,250,167	251,260	11,501,427	14,217,483
2032	353,312	5,040,801	2,500,979	8,432	2,862,723	11,700,173	251,260	11,951,434	14,814,157
2033	367,445	2,711,260	2,641,433	8,432	3,017,310	12,168,180	251,260	12,419,441	15,436,751
2034	382,143	74,540	74,540	8,432	465,115	12,654,908	251,260	12,906,168	13,371,283
2035	397,428	-	-	8,432	405,860	13,161,104	251,260	13,412,364	13,818,225

Components of the Funding Schedule

Net Normal Cost

	January 1, 2022	% of Payroll*
Gross Normal Cost (GNC)	\$ 17,894,770	16.6%
Employees Contribution	<u>10,192,581</u>	9.5%
Net Normal Cost (NNC)	\$ 7,702,189	7.2%
Adjusted to Beginning of Fiscal Year 2024	466,722	
Administrative Expense	<u>638,452</u>	0.6%
Adjusted Net Normal Cost With Admin. Expense	\$ 8,807,364	

- The gross normal cost (GNC) is the “price” of benefits accruing in the current year if the valuation assumptions are realized. For an individual, this is the value in benefits which they are earning with their current year of service.
- The GNC only relates to current actives; retirees are done earning their benefit and inactive are not earning any credited service. The GNC for the whole system is split into two parts: the portion which is paid for by the employees (Employee Contributions), and the portion which must be paid for by the Retirement System (Net Normal Cost, or NNC).
- The NNC is adjusted from January 1, 2022 to Fiscal 2024 by rolling it forward with a salary increase factor of 4.00%.
- Finally, administrative expense is added to the adjusted NNC. This is the amount seen in the funding schedule.

ALLOCATION OF RESULTS: Of the three elements used to calculate the Net Normal Cost in the funding schedule, the Gross Normal Cost and the Employees’ Contribution are determined by individual. The Gross Normal Cost and Employees’ Contributions for each employee are allocated to the employee each employee is associated with.

The third component is the administrative expense; this was allocated according to each employer’s share of active payroll, with City being assigned 95.2% of the total (\$607,757) and Housing being assigned the remaining 4.8% (\$30,695).

*Payroll paid in 2021 for employees as of January 1, 2022 is \$107,666,362. Payroll for new hires in 2021 was annualized.

■ Quincy Retirement Board
Actuarial Valuation as of January 1, 2022

Amortization of the Unfunded Actuarial Accrued Liability

		January 1, 2022	Percentage Change
Active Actuarial Accrued Liability		\$ 357,346,694	8.6%
Superannuation	\$ 327,094,759		
Death	\$ 7,342,251		
Disability	\$ 19,357,569		
Withdrawal	\$ 3,552,115		
Retiree, Inactive, Survivor and Beneficiary Actuarial Accrued Liability		\$ 509,933,345	11.0%
Retirees and Beneficiaries	\$ 414,715,664		
Disabled	\$ 90,110,779		
Vested	\$ 2,869,189		
Inactive	\$ 2,237,712		
Total Actuarial Accrued Liability (AAL)	\$ 867,280,039		10.0%
Actuarial Value of Assets (AVA)	\$ 877,337,352		142.6%
Unfunded Actuarial Accrued Liability	\$ (10,057,314)		-102.4%
Funded Ratio (AVA / AAL)			
2022 (6.75% interest rate):	101%		
2020 (7.25% interest rate):	46%		

- Actuarial Accrued Liability (AAL) is the “price” of benefits attributable to benefits earned in past years, or in other words, represents today’s value of all benefits earned by active and inactive members.
- The total AAL is \$867,280,039. This along with an actuarial value of assets of \$877,337,352 produces a funded status of 101%. This compares to a funded status of 46% for the 2020 valuation.
- The Unfunded AAL is the portion of the AAL which is not covered by the Plan assets. The UAAL for Quincy as of January 1, 2022 is \$(10,057,314).
- In developing the funding schedule, we used a fresh start approach in which the unfunded actuarial accrued liability (UAAL), other than the UAAL due to past early retirement incentives, is reamortized instead of maintaining the existing amortization amount and separately amortizing the actuarial gain or loss. This can result in a funding schedule in which the changes in contribution amounts from year to year are more consistent.

ALLOCATION OF RESULTS: Each employer’s share of the UAAL was determined by comparing their share of the AAL to their share of the assets. Like the Gross Normal Cost and Employees’ Contributions described on the previous page, the AAL is calculated by individual, and was allocated by member. The allocation of assets is described on the following page.

Net 3(8)(c) Payments

- 3(8)(c) payments are benefits which the Quincy Retirement System pays to or receives from other retirement boards for service that a retiree had with a different retirement system.
- The net 3(8)(c) payments are the difference between what the Quincy Retirement System paid out minus what was received by the System, calculated based on the December 31, 2021 PERAC annual statement.
 - This was adjusted from the amount in the PERAC annual statement by adding 3(8)(c) payments to other systems that were not reflected in the annual statement
- The amount of net 3(8)(c) payments is assumed to remain level in future years.

ALLOCATION OF RESULTS: The portion of total net 3(8)(c) payments assigned to each employer is based on their share of retiree payroll; this resulted in the City being assigned 96.8% of the total (\$251,260) and the Housing Authority being assigned the remaining 3.2% of the total (\$8,432).

Assets

- Assets are based on the PERAC annual statement for the Quincy Retirement System as of December 31, 2021.
- The asset allocation is approximately 26% fixed income, cash, receivables and payables and 74% equities, alternative investments, hedge funds and similar types of investments.

ALLOCATION OF RESULTS: The assets of the system fall into two categories – the proceeds of the Pension Obligation Bond, which are assigned entirely to the City, and the remainder of the assets, which are shared between the City and Housing Authority. The amount of the Bond proceeds as of December 31, 2021 based on the PERAC annual statement was \$445.0 million; the remaining \$473.6 million was allocated according to each employer's share of the Accrued Liability, resulting in 96.45% being assigned to the City and the remaining 3.55% being assigned to the Housing Authority. Deferred gains and losses (as shown on the following page) were allocated consistently with the shared portion of the assets.

The resulting Actuarial Value of Assets by employer is:

- City: \$862.0 million
- Housing: \$ 15.3 million

As noted previously, the AVA for the City exceeds the City's portion of the liability, making the City fully funded as of the valuation date.

Four-Year Asset Smoothing

1. Market value of assets including receivable/payable as of 01/01/2022 \$ 918,607,611

2. Phase-in of asset gains and losses

	Plan Year (1)	Original Amount (2)	Percent Unrecognized (3)	Amount Unrecognized (2) x (3)
a.	2021	\$29,384,620	75%	\$22,038,465
b.	2020	\$23,531,255	50%	\$11,765,628
c.	2019	\$29,864,665	25%	\$7,466,166
d.	2018	(\$37,842,876)	0%	\$0
e.	2017	\$35,580,661	0%	\$0
f.	Total	\$80,518,326		\$41,270,259

3. Valuation assets without corridor as of 01/01/2022 \$ 877,337,352
(1. - 2.f.)

4. Corridor Check

a. 90% of Market Value \$ 826,746,850
b. 110% of Market Value \$ 1,010,468,372

5. Valuation assets with corridor as of 01/01/2022 \$ 877,337,352
(3. within Corridor)

6. Calculation of return on valuation assets

a. Valuation assets as of 01/01/2020 \$ 361,711,746
b. ER contribs + EE contribs - Ben Pymts - Expenses \$ 436,987,580
c. Actual return on valuation assets \$ 44,154,968
5. - (6.a. + 6.b.)
d. Weighted value of valuation assets \$ 357,196,286
e. Return on valuation assets 22.02%
(6.c. / 6.d.)
f. Annualized return on valuation assets 10.46%

APPENDICES

Appendix A – Actuarial Methods and Assumptions

ACTUARIAL METHODS

Actuarial Cost Method

The Entry Age Normal Actuarial Cost Method has been used in this valuation. Under this method, the normal cost is the amount calculated as the level percentage of compensation necessary to fully fund the prospective benefits from each member's entry age to retirement age.

The actuarial accrued liability represents the theoretical accumulation of all prior years' normal costs for the plan members as if the program had always been in effect. The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over plan assets.

Asset Valuation Method

Market Value of Assets, adjusted for payables and receivables, adjusted to phase in investment gains compared to the expected market value and losses evenly over four years (shown on page 12). The asset valuation method adjusts the results to no less than 90% and no more than 110% of the market value of assets adjusted for payables and receivables.

Fiscal Year Adjustment

The actuarial results are adjusted by the valuation interest rate and salary scale to the beginning of Fiscal Year 2024. The unfunded actuarial accrued liability is rolled forward with normal cost and further adjusted by anticipated contributions and interest.

ACTUARIAL ASSUMPTIONS

Valuation Date

January 1, 2022.

Investment Return

6.75% per year net of investment expenses (prior assumption was 7.25%).

Regular Interest Rate Credited to Annuity Savings Account

2% per year.

Actuarial Methods and Assumptions (Continued)

Cost-of-Living Increases

A 3% COLA on the first \$15,000 of a member's retirement allowance is assumed to be granted every year.

Salary Increases

Select and 3.75% ultimate, with the following steps:

- Group 1 and 2: 3.0% steps in years 1-3, 4.0% step in year 10
- Fire: 19.1% in year 1, 16.03% in year 2, 5.0% in years 28-29
- Police: 21.0% in year 1, 4.73% in year 2, 5.0% in years 28-29

Total payroll is assumed to increase at 4.00% per year.

Credited Service

All service is assumed to be due to employment with the municipality.

Family Composition

Members assumed married with 2 dependent children – one male and one female both age 15; age difference between member and spouse assumed to be 3 years (the male being the older).

Administrative Expenses

Estimated budgeted amount of \$638,452 for the Fiscal Year 2024 is added to the Normal Cost. The administrative expense does not include investment manager and custodial fees. These fees are considered part of the interest rate assumption that is net of fees.

Net 3(8)(c)

Net 3(8)(c) payments are assumed to be the same level as the past calendar year for all future years.

Contribution Timing

Contributions are assumed to be made at the beginning of the fiscal year.

Actuarial Methods and Assumptions (Continued)

Withdrawal Prior to Retirement

The rates shown at the following sample ages illustrate the withdrawal assumption. Withdrawal rates are set to zero if the retirement rate at that age is nonzero.

Rate of Withdrawal

Service	Group 1 and 2	Group 4
0	15%	1.5%
1	12%	1.5%
2	10%	1.5%
3	9%	1.5%
4	8%	1.5%
5	7.6%	1.5%
10	5.4%	1.5%
15	3.3%	0.0%
20	2.0%	0.0%
25	1.0%	0.0%
30+	0.0%	0.0%

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 and 2	Group 4
20	0.01%	0.10%
25	0.02%	0.20%
30	0.03%	0.30%
35	0.06%	0.30%
40	0.10%	0.30%
45	0.15%	1.00%
50	0.19%	1.25%
55	0.24%	1.20%
60	0.28%	0.85%

In-Service Disability and Death

Both Disability and In-Service Death are assumed to be 50% ordinary and 50% accidental for Group 1 and 2, and 10% ordinary and 90% accidental for Group 4.

Actuarial Methods and Assumptions (Continued)

Rates of Retirement

The rates shown at the following ages illustrate the assumption regarding the incidence of retirement, once the member has achieved 10 years of service:

Age				Hired after 4/1/2012		
	Group 1 & 2 Male	Group 1 & 2 Female	Group 4	Group 1 & 2 Male	Group 1 & 2 Female	Group 4
50	1%	1.5%	2%	0%	0%	0%
51	1%	1.5%	2%	0%	0%	0%
52	1%	2.0%	2%	0%	0%	0%
53	1%	2.5%	2%	0%	0%	0%
54	2%	2.5%	7.5%	0%	0%	0%
55	2%	5.5%	15%	0%	0%	10%
56	2.5%	6.5%	10%	0%	0%	7%
57	2.5%	6.5%	10%	0%	0%	20%
58	5%	6.5%	10%	0%	0%	10%
59	6.5%	6.5%	15%	0%	0%	15%
60	12%	5%	20%	25%	30%	20%
61	20%	13%	20%	20%	13%	20%
62	30%	15%	25%	30%	15%	25%
63	25%	12.5%	25%	25%	12.5%	25%
64	22%	18%	30%	22%	18%	30%
65	40%	15%	100%	40%	15%	100%
66	25%	20%	N/A	25%	20%	N/A
67	25%	20%	N/A	25%	20%	N/A
68	30%	25%	N/A	30%	25%	N/A
69	30%	20%	N/A	30%	20%	N/A
70	100%	100%	N/A	100%	100%	N/A

Mortality

RP-2014 adjusted to 2006, projected generationally using MP-2021 (sex-distinct). Prior valuation used the same mortality table, projected using MP-2019. During employment the healthy employee mortality table is used. Post-employment the healthy annuitant table is used.

Mortality for disabled retirees follows the same table as non-disabled retirees, set forward 2 years. Death is assumed to be due to the same cause as the disability 40% of the time.

Appendix B – Summary of Principal 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., electricians)
- Group 4: police and firefighters

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

Members hired after 1978 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. For members hired after April 1, 2012, five-year averages will be used.

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 Provisions (Continued)

5. SERVICE RETIREMENT

a. Eligibility

Hired prior to April 2, 2012:

- 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.

Hired after April 1, 2012:

- 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

*Reduction is .125% for each year early instead of .15% per year for employees with over 30 years of service.

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

Summary of Principal Provisions (Continued)

6. DEFERRED VESTED RETIREMENT

a. Eligibility

Completion of 10 years of credited service (for elected and appointed members, 6 years in the event of involuntary termination).

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 10 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 Provisions(Continued)

9. NON-OCCUPATIONAL DEATH

a. Eligibility

Dies while in active service, but not due to occupational injury. 2 years of service.

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. Benefit Amount

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

An increase of up to 3% applied to the first \$15,000 of annual benefit. Funded by the Employer from Fiscal Year 1999. Percentage increase is voted on each year by the Retirement Board. Cost-of-living increases granted during Fiscal Year 1982 through Fiscal 1998 are reimbursed by the Commonwealth.

12. OPTIONAL FORMS OF PAYMENT

- Option A: Allowance payable monthly for the life of the member.
- Option B: Allowance payable monthly for the life of the member with a guarantee of remaining member contributions with interest.
- 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 predeceases the member, the allowance amount "pops up" to the non-reduced amount.

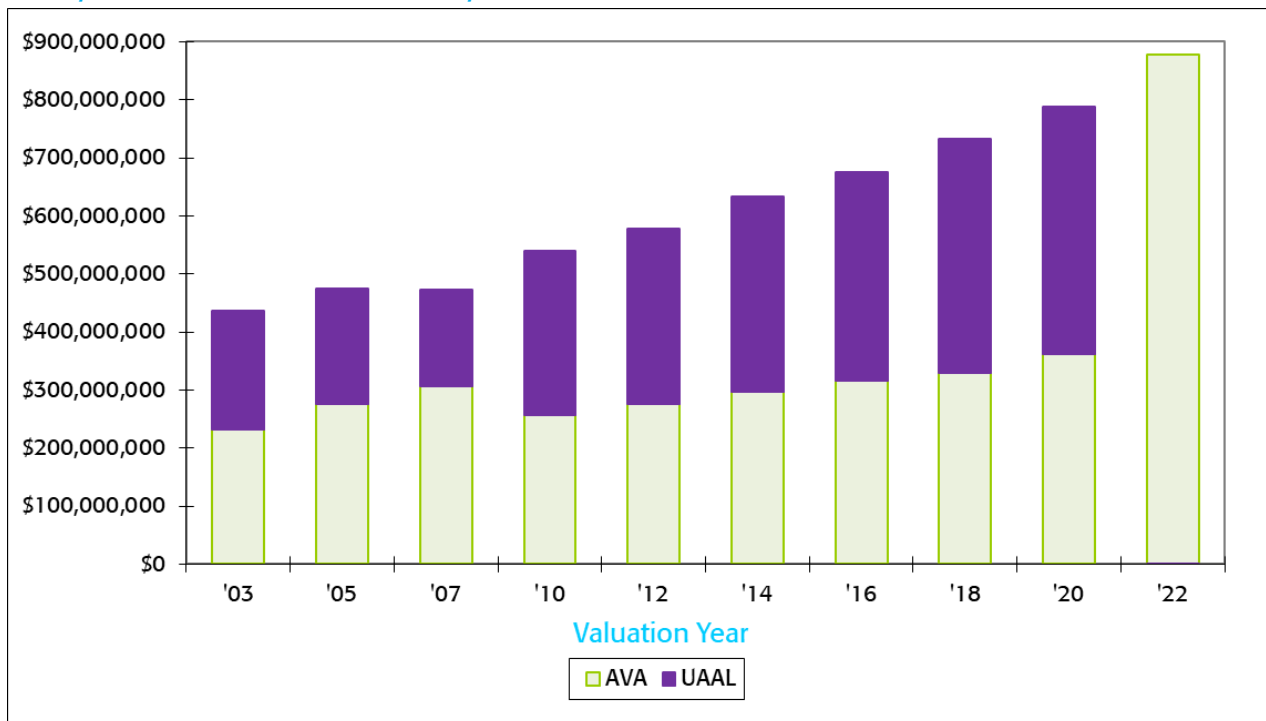
Appendix C – Charts of Selected Actuarial Statistics

History of Demographic Statistics

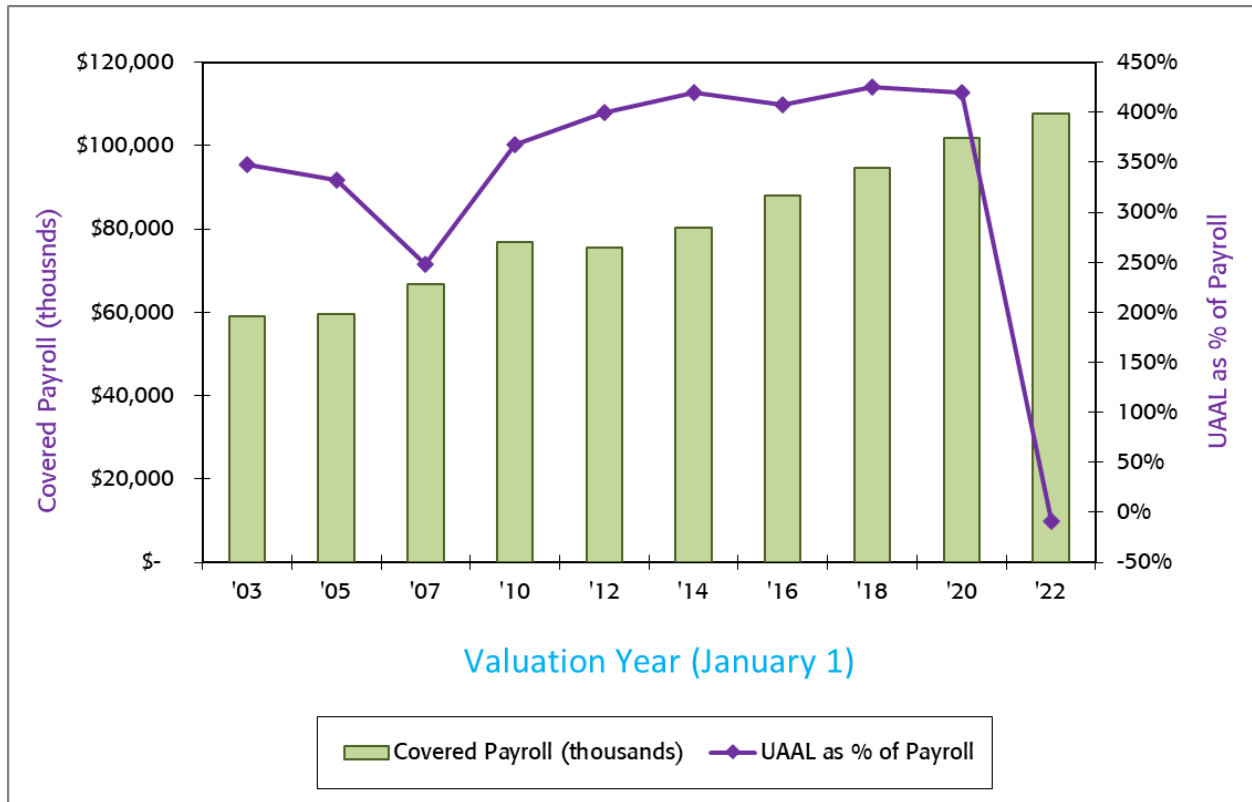
Valuation Year	Number	Average Age	Average Past Service	Average Ann'l Compensation
2022	1,575	48.7	12.0	\$68,360
2020	1,546	49.3	12.4	\$65,793
2018	1,494	49.3	12.6	\$63,415
2016	1,416	49.6	13.0	\$62,209
2014	1,356	49.7	13.4	\$59,242
2012	1,324	49.7	13.6	\$57,122
2010	1,419	49.1	12.5	\$54,185
2007	1,426	47.4	11.3	\$46,781
2005	1,339	47.0	11.4	\$44,431
2003	1,384	46.9	11.8	\$42,594
2001	1,459	47.8	12.8	\$38,948

- Both employee age and service have begun to decrease in recent years, following years of increases. This pattern has appeared in the experience of several systems in the Commonwealth. Average annual compensation has grown by 75.5% (2.7% annually) over the past twenty-one years.

History of Assets and Unfunded Liability



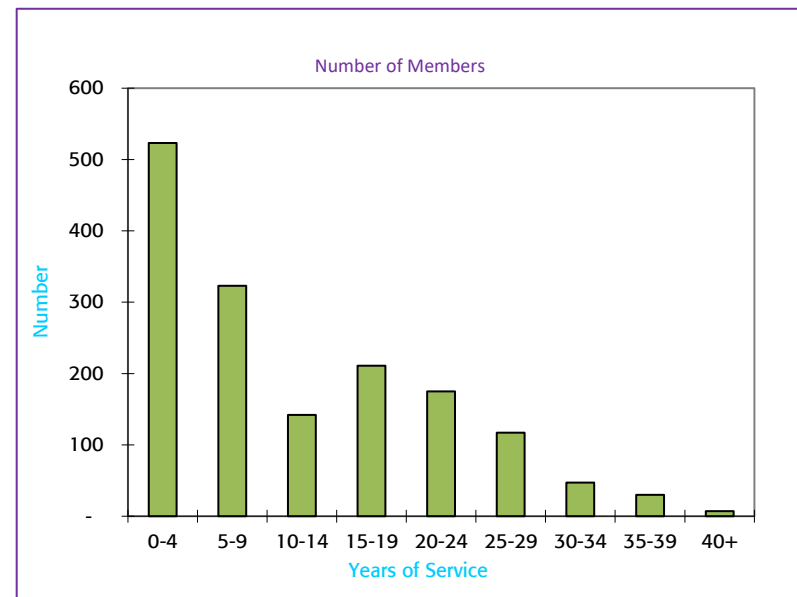
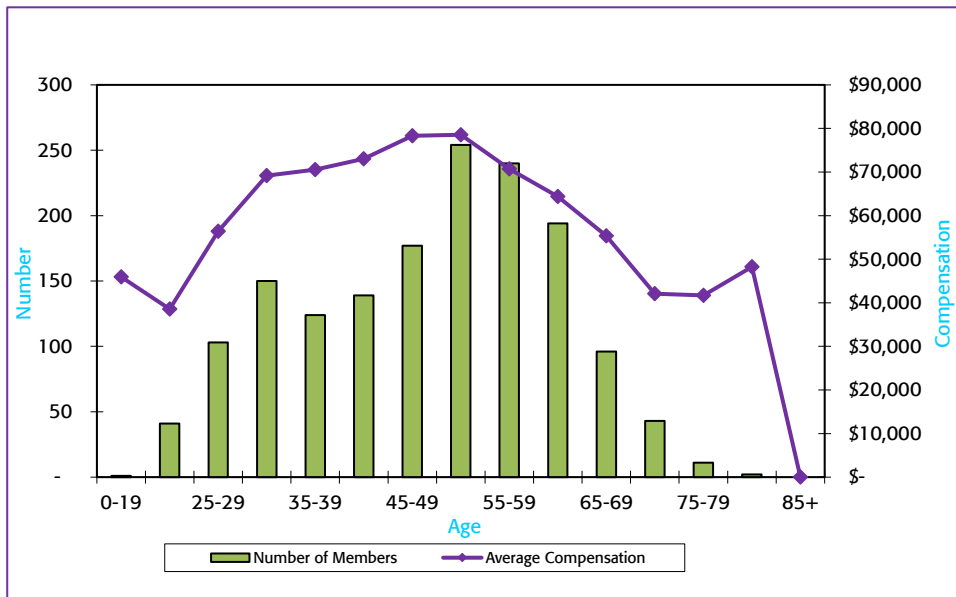
History of Unfunded Liability and Covered Payroll



Distribution of Plan Members as of January 1, 2022

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	\$ 45,945	\$ 45,945
20-24	41	-	-	-	-	-	-	-	-	41	\$ 1,580,905	\$ 38,559
25-29	99	4	-	-	-	-	-	-	-	103	\$ 5,807,894	\$ 56,387
30-34	87	53	10	-	-	-	-	-	-	150	\$ 10,379,096	\$ 69,194
35-39	46	47	23	8	-	-	-	-	-	124	\$ 8,749,794	\$ 70,563
40-44	38	42	14	35	9	1	-	-	-	139	\$ 10,152,041	\$ 73,036
45-49	36	31	18	46	37	9	-	-	-	177	\$ 13,865,446	\$ 78,336
50-54	54	44	21	39	49	43	4	-	-	254	\$ 19,953,548	\$ 78,557
55-59	60	40	19	30	22	36	23	9	1	240	\$ 16,966,854	\$ 70,695
60-64	39	35	19	25	30	15	14	16	1	194	\$ 12,487,298	\$ 64,368
65-69	17	18	13	23	12	7	1	4	1	96	\$ 5,313,336	\$ 55,347
70-74	5	7	4	3	13	5	3	1	2	43	\$ 1,809,002	\$ 42,070
75-79	-	2	1	2	3	1	1	-	1	11	\$ 458,649	\$ 41,695
80-84	-	-	-	-	-	-	1	-	1	2	\$ 96,555	\$ 48,278
85+	-	-	-	-	-	-	-	-	-	-	\$ -	\$ -
TOTAL	523	323	142	211	175	117	47	30	7	1,575	\$ 107,666,362	\$ 68,360



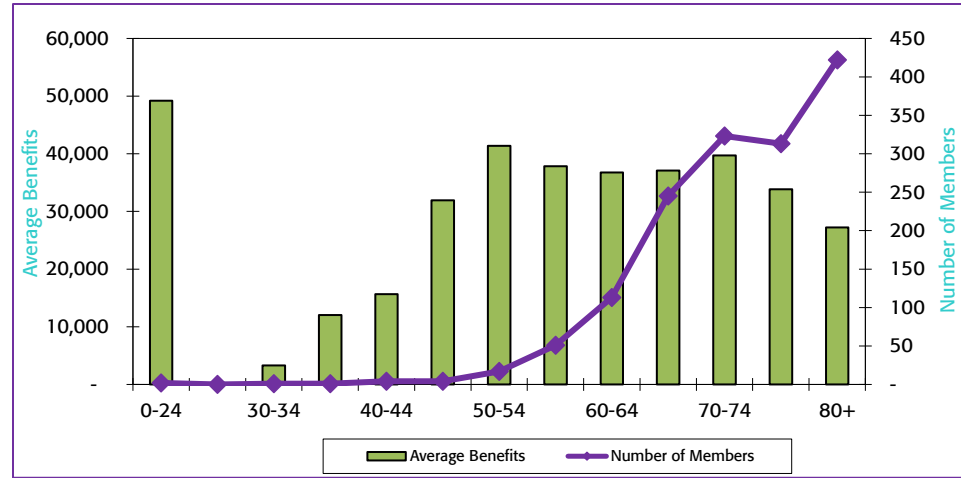
Distribution of Plan Members as of January 1, 2022

RETIRED MEMBERS

Retired Members and Beneficiaries			
Age	Number	Average Benefit	Total Benefit
0-24	2	49,201	98,402
25-29	-	-	-
30-34	1	3,309	3,309
35-39	1	12,018	12,018
40-44	3	8,272	24,817
45-49	2	11,704	23,407
50-54	7	27,426	191,982
55-59	37	35,553	1,315,459
60-64	94	33,638	3,162,017
65-69	214	33,708	7,213,497
70-74	291	38,187	11,112,478
75-79	288	33,256	9,577,739
80+	385	26,390	10,160,217
TOTAL	1,325	\$ 32,374	\$ 42,895,342

Disabled Members			
Age	Number	Average Benefit	Total Benefit
0-24	-	-	-
25-29	-	-	-
30-34	-	-	-
35-39	-	-	-
40-44	1	37,804	37,804
45-49	2	52,167	104,335
50-54	10	51,123	511,230
55-59	14	43,906	614,690
60-64	19	52,169	991,211
65-69	31	60,497	1,875,396
70-74	32	53,546	1,713,456
75-79	25	40,822	1,020,541
80+	37	35,915	1,328,866
TOTAL	171	\$ 47,939	\$ 8,197,528

Total			
Age	Number	Average Benefit	Total Benefit
0-24	2	49,201	98,402
25-29	-	-	-
30-34	1	3,309	3,309
35-39	1	12,018	12,018
40-44	4	15,655	62,621
45-49	4	31,936	127,742
50-54	17	41,365	703,212
55-59	51	37,846	1,930,149
60-64	113	36,754	4,153,228
65-69	245	37,098	9,088,892
70-74	323	39,709	12,825,934
75-79	313	33,860	10,598,279
80+	422	27,225	11,489,083
TOTAL	1,496	\$ 34,153	\$ 51,092,870



Benefits shown are net of State reimbursed COLA.

Appendix D – Glossary of Terms

- **Actuarial Accrued Liability**
The portion of the Present Value of Benefits that is attributable to past service.
- **Actuarial Value of Assets**
The value of assets based on the asset valuation method shown in the Actuarial Methods and Assumptions section of this report.
- **Actuarial Assumptions**
Estimates are made as to the occurrence of certain events that determine the level of benefits to be paid 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.
- **Actuarial Cost Method**
The procedure that is used to allocate the present value of benefits between the liability that is attributable to past service (Actuarial Accrued Liability) and that attributable to future service.
- **Funding Ratio**
The percentage of the accrued liability that is covered by the Actuarial Value of Assets.
- **GASB**
Government Accounting Standards Board (issues guidance for disclosure of retirement system liabilities).
- **Normal Cost**
The portion of the Present Value of Benefits that is attributable to benefits to be earned in the coming year.
- **PERAC**
Public Employee Retirement Administration Commission, a division of the State government which has regulatory authority over the administration of the retirement system.
- **Present Value of Benefits**
Represents the dollar value today of all benefits expected to be earned by current members if all actuarial assumptions are exactly realized.
- **PRIT**
Pension Reserves Investment Trust Fund is the state controlled and administered fund for the investment of assets for members of the retirement system.
- **Unfunded Actuarial Accrued Liability**
That portion of the Actuarial Accrued Liability not covered by System Assets.

Disclosures

- Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as:
 - plan experience differing from that anticipated by the economic or demographic assumptions,
 - changes in economic or demographic assumptions,
 - increases or decreases expected as part of natural operation of the methodology used for these measurements such as additional contribution requirements based on the plan's funded status,
 - changes in plan provisions or applicable law.

As part of the valuation, we have not performed an analysis of the potential range of future measurements.

- Stone Consulting, Inc. was furnished member data by the Quincy Retirement System's administrative staff. Although examined under broad parameters for 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. With the assistance of the staff of the Quincy Retirement Board, we were able to develop a database sufficient for valuation purposes.
- The investment return assumption is a long-term assumption and is based on capital market expectations by asset class, historical returns, and professional judgement.
- Historically, 9% to 10% has been the expected long-term rate of return for equities, and 5% to 6% has been the expected long-term rate of return for fixed income securities. Many economists and investment professionals are projecting lower returns for equities and fixed income securities. In light of these projections, as well as historical investment returns, the 6.75% interest rate assumption is within the reasonable assumption range. We encourage close monitoring for changes in investment performance against expectations.
- The salary increase assumption reflects prior experience including PERAC's 2002 local experience study, current expectations, and professional judgement.
- All assumptions and methodologies were selected by the Quincy Retirement Board in conjunction with guidance provided by Stone Consulting, Inc.
- Stone Consulting, Inc. used the Entry Age Normal actuarial funding method in this actuarial valuation. The use of the Entry Age Normal actuarial funding method is consistent with the requirements of Chapter 32 of the Massachusetts General Laws.
- The UAAL and funded ratio are measures of the plan's funded status. These measures reflect the plan's position as of January 1, 2022. We believe these measures, by themselves, are not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations or assessing the need for or the amount of future contributions. However, we believe these measures, in conjunction with the plan's funding schedule, are appropriate for assessing the amount of future contributions.

■ Quincy Retirement Board
Actuarial Valuation as of January 1, 2022

PERAC Information Disclosure

The most recent actuarial valuation of the System was prepared by Stone Consulting, Inc. as of January 1, 2022

The normal cost for employees on that date was:	\$10,192,581	9.5% of payroll
The normal cost for the employer was:	\$7,702,189	7.2% of payroll

The actuarial liability for active members was:	\$357,346,694
The actuarial liability for retired members was (includes inactives):	\$509,933,345
Total actuarial accrued liability:	\$867,280,039
System assets as of that date (\$918,607,611 Market Value):	\$877,337,352
Unfunded actuarial accrued liability:	\$(10,057,314)

The ratio of system's assets to total actuarial liability was:	101%
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As of that date the total covered employee payroll was:	\$107,666,362
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The principal actuarial assumptions used in the valuation are as follows:	
Investment Return:	6.75% per annum
Rate of Salary Increase:	Select and Ultimate (3.75% ultimate rate)

SCHEDULE OF FUNDING PROGRESS (Dollars in \$000's)

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)
1/1/2022	\$877,337	\$867,280	\$(10,057)	101%	\$107,666	-9%
1/1/2020	\$361,712	\$788,421	\$426,709	46%	\$101,716	420%
1/1/2018	\$330,037	\$733,469	\$403,432	45%	\$94,742	426%
1/1/2016	\$315,825	\$674,956	\$359,131	47%	\$88,087	408%
1/1/2014	\$296,239	\$633,798	\$337,558	47%	\$80,333	420%