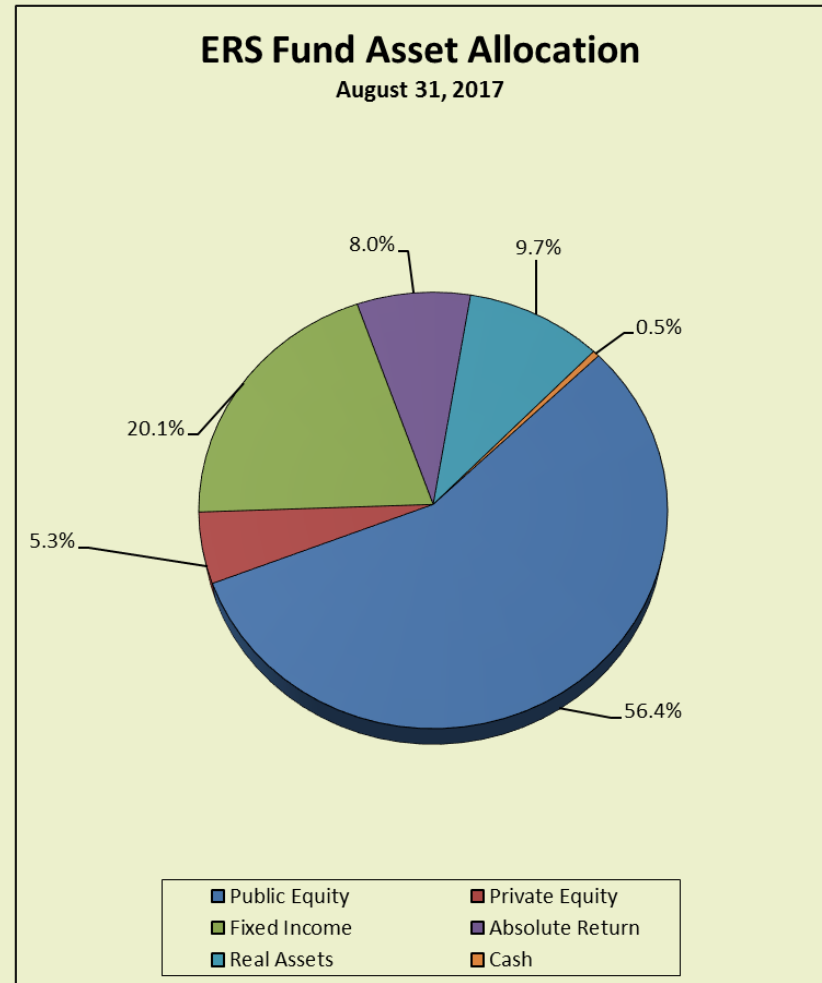

2018 Budget Presentation

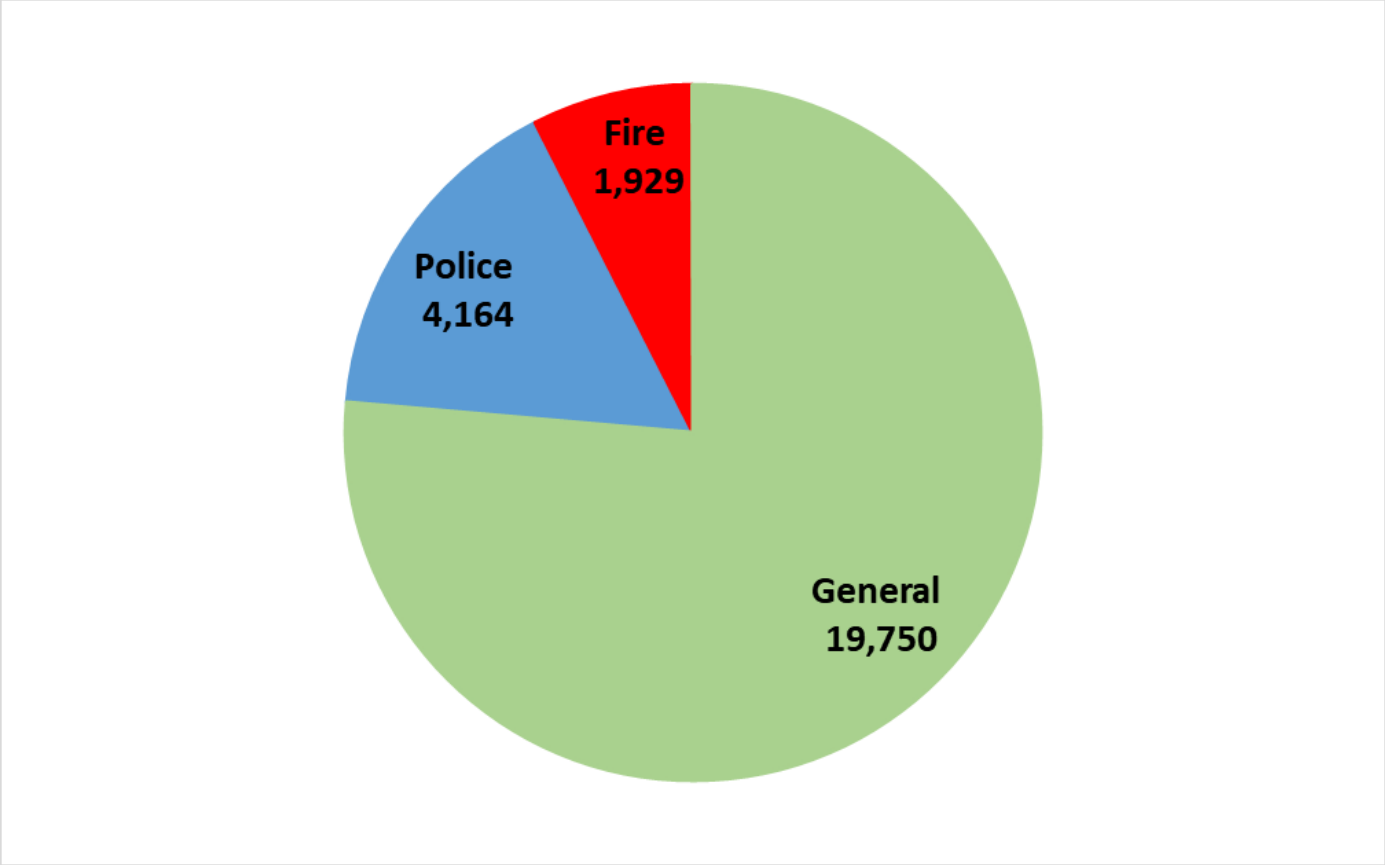
Employees' Retirement System
October 10, 2017

General Pension Statistics

- Fund Value: \$5.20 billion (as of Aug. 31, 2017)
- Membership Breakdown (per 2017 valuation):
 - Actives: 11,083
 - Deferred: 3,416
 - Retirees / Beneficiaries: 12,888
- Actuarial Funded Status: 96.1% (per 2017 actuarial valuation; 92.9% based on market value)
- Total Annual Pension Payroll: \$359.0 million (est. for 2017 based on actuals through pay pd 18 2017)
- Total Annual Pensionable Wages : \$544.4 million (est. for 2017 based on YTD actuals through pay pd.18)
- Total Annual Member Contributions: \$32.0 million (est. for 2017 based on YTD actuals through pay pd.18)



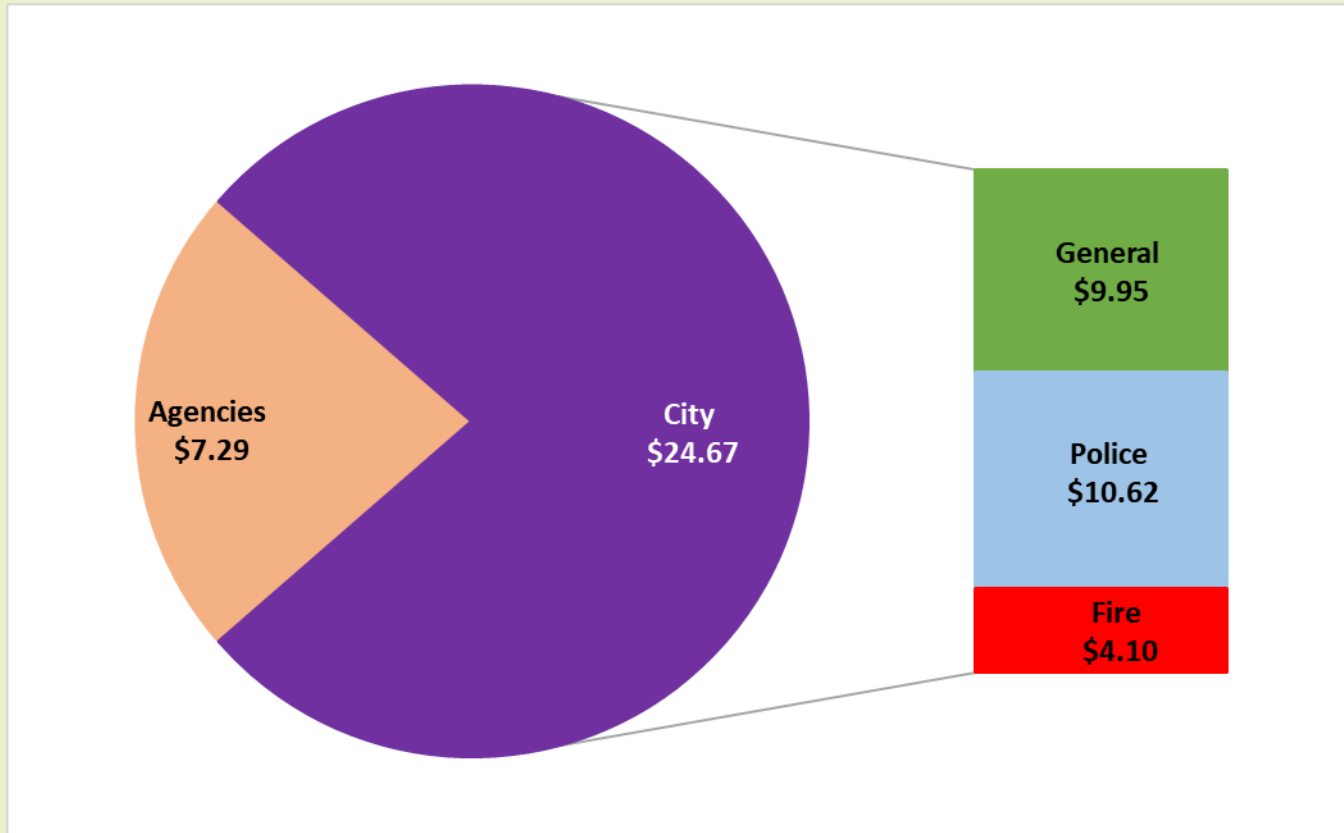
CMERS Participant Headcount (Active, Deferred and Retired) as of September 30, 2017



(chart does not include survivors/beneficiaries in payment)

Total Annual Member Contributions

(in millions)
(projected for 2017)



Total Contributions: \$31.96 million

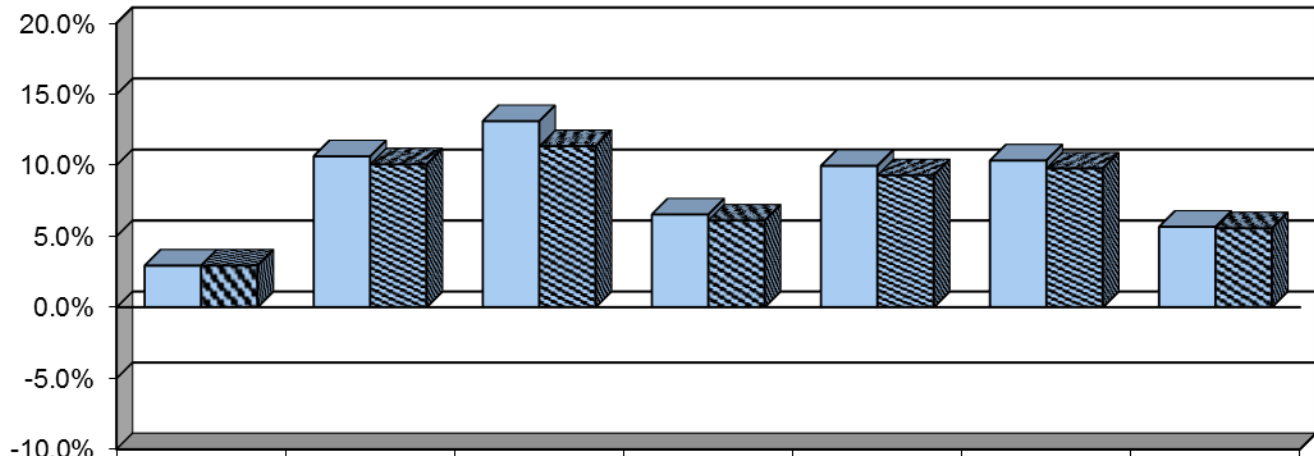
Annual Member Contributions

(projected for 2017)

Unit	Collected Through PP18-2017				Straight Line Projections for 2017			
	Payroll Size	Employer Paid	Employee Paid	Total	Payroll Size	Employer Paid	Employee Paid	Total
City - General	132,323,192	-	6,889,155	6,889,155	191,133,500	-	9,951,002	9,951,002
City - Police	105,027,232	-	7,351,921	7,351,921	151,706,002	-	10,619,441	10,619,441
City - Fire	40,543,163	-	2,837,648	2,837,648	58,562,346	-	4,098,825	4,098,825
City - Total	277,893,587	-	17,078,724	17,078,724	401,401,847	-	24,669,268	24,669,268
Agencies	99,011,858	105,381	4,938,587	5,043,968	143,017,128	152,218	7,133,514	7,285,732
Total	\$ 376,905,445	\$ 105,381	\$ 22,017,311	\$ 22,122,692	\$ 544,418,976	\$ 152,218	\$ 31,802,782	\$ 31,955,000

CMERS Investment Performance History Periods Ending August 31, 2017

August 31, 2017



	3 Mo.	YTD	1 Year	3 Years	5 Years	7 Years	10 Years
■ Total Fund Gross	2.9%	10.6%	13.1%	6.5%	10.0%	10.3%	5.7%
▨ Total Fund Benchmark	2.9%	10.1%	11.3%	6.1%	9.3%	9.8%	5.6%

■ Total Fund Gross

▨ Total Fund Benchmark

Performance vs Callan Public Fund Sponsor Database (Gross)



10th Percentile	3.57	14.82	6.37	10.09	6.29
25th Percentile	3.31	13.62	5.95	9.53	5.85
Median	3.04	12.42	5.30	8.78	5.44
75th Percentile	2.62	10.86	4.56	7.86	4.93
90th Percentile	2.23	9.59	3.73	6.82	4.19
Total Fund ●	3.64	14.33	5.80	10.04	5.25
Total Fund Reference Index ▲	3.18	12.13	5.50	9.41	5.29

Active Management versus Passive Analysis

22-Years

1/1/95 - 12/31/16

MERS' decision to hire some active managers versus hiring only passive managers

		Time Weighted Returns			Dollar Weighted Estimates (Net of fees)		
		Annualized MERS Asset Class		Annualized Index	Value of a Dollar Invested in		Active Management Impact
MERS Asset Class	Index	Gross	Net of fees	Net of fees	MERS Asset Class	Index	\$Millions
Domestic Equity	Russell 3000	10.01%	9.75%	9.61%	\$ 7.74	\$ 7.53	\$ 131.2
International Equity*	MSCI EAFE	6.91%	6.51%	4.00%	\$ 3.67	\$ 2.25	\$ 373.3
Global Equity **	MSCI World / ACWI	6.77%	6.40%	7.61%	\$ 1.52	\$ 1.64	\$ (31.3)
Fixed Income	Barclays Aggregate	7.11%	7.00%	5.77%	\$ 4.43	\$ 3.43	\$ 254.9
Estimate of Fund's benefit from its decision to hire active managers over past 22 years							\$ 728.1

Manager Fees for indices are assumed to be:

Russell 3000 Index - 2 basis points

MSCI EAFE Index - 5 basis points

MSCI World / ACWI Index - 5 basis points

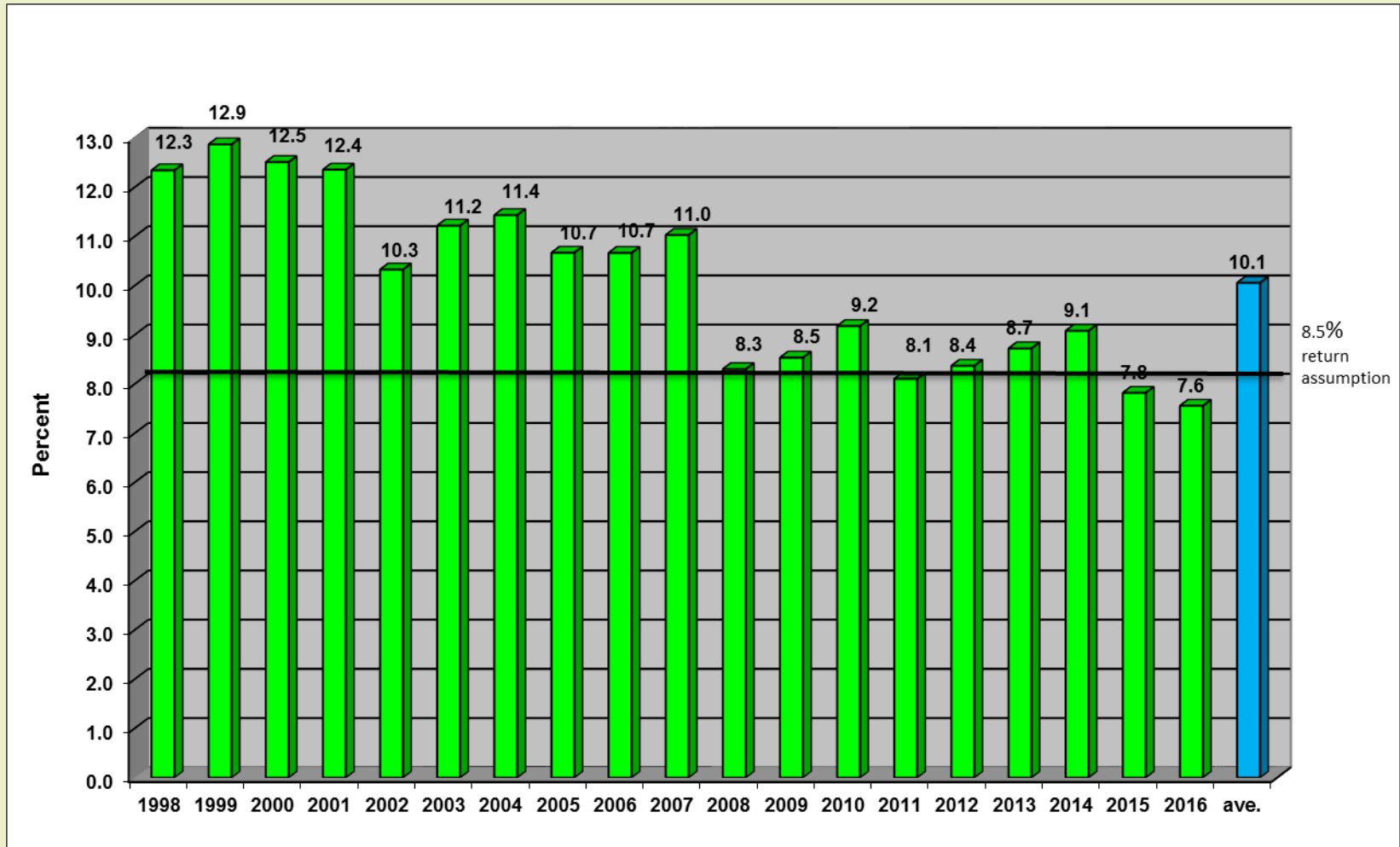
Barclays Aggregate Index - 2 basis points

Value estimates are based on monthly ERS asset class balances.

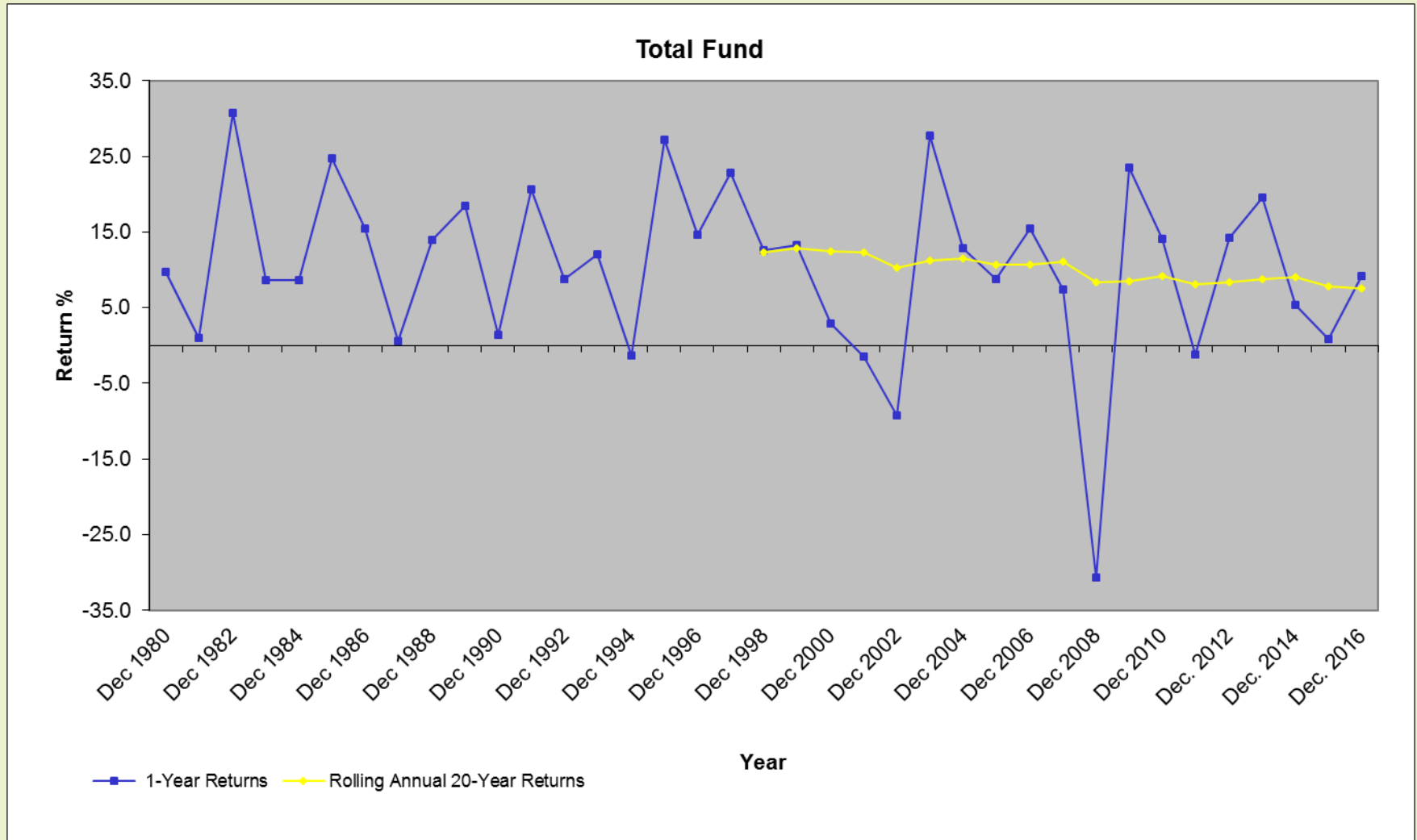
** Inception Date for International Equity Composite is May 1, 1996

** Inception Date for Global Equity Composite is April 1, 2010

ERS 20 Year Rolling Ave. Investment Returns 1979-2016



Rolling Fund Returns 1979 - 2016

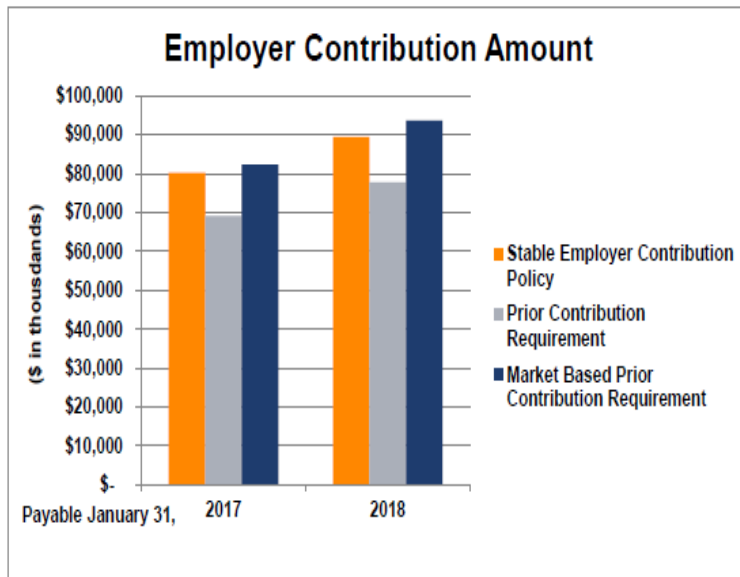


Stable Employer Contribution Policy

Group	Employer Rate based on:		
	Stable Employer Contribution Policy	Prior Contribution Requirement	Market Based Prior Contribution Requirement
General	8.48%	6.75%	8.46%
Policemen	22.63%	21.35%	25.06%
Firefighter	24.83%	20.87%	24.82%

- The Prior Contribution Requirement would have provided for a smaller contribution this year
- This is in line with our final projections, which show the Stable Employer Contribution Policy rates being higher in the future
- The Market Based Prior Contribution Requirement is an indicator of where the contribution rates would head if we were to reset the stable policy now. Based on this year's early indicator, a 2.4% increase for police, and the others are similar. The stable contribution rates in calendar year 2018 will be reevaluated as the result of the 5-year experience review to be performed in 2017, early indication suggests a double digit increase in contribution dollar amounts are likely.

Stable Employer Contribution Policy



- The results this year are similar to those from last year's valuation for the stable policy and prior contribution requirement.
- Note that the increase in the contribution requirement is largely due to the large pay increases.

Stable Employer Contribution Policy

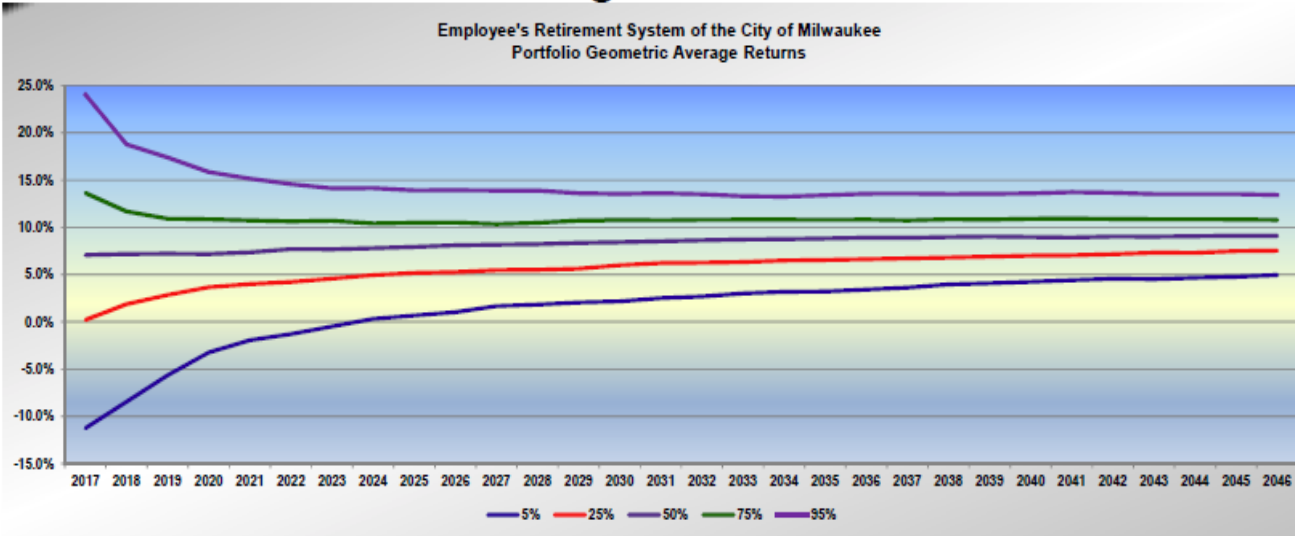
	General	Police	Fire
Stable Employer Contribution Policy	8.48%	22.63%	24.83%
Prior Contribution requirement			
2013	10.60%	25.87%	27.18%
2014	8.36%	22.60%	22.86%
2015	6.96%	19.93%	19.98%
2016	6.89%	20.81%	20.80%
2017	6.75%	21.35%	20.87%
Average	7.91%	22.11%	22.34%

When the rates are reset in late 2017, the funded ratio in 2017 will factor heavily in rate setting. The table here shows that for the last four out of five years the contribution rate has been higher under the stable rate than would have been under the previous policy.

Employees' Retirement System of the City of Milwaukee



Portfolio Geometric Average Return



Recommendation:

Could maintain current **8.5%** assumption.
Consider lower rate for conservatism – possibly **8.0%**.

Note that these gross rates of return do not reflect investment manager fees.

Portfolio Geometric Average Return															
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
95th percentile	24.0%	18.8%	17.4%	15.8%	15.1%	14.6%	14.1%	14.1%	13.9%	13.9%	13.9%	13.9%	13.6%	13.5%	13.6%
75th percentile	13.6%	11.7%	10.9%	10.8%	10.7%	10.6%	10.7%	10.4%	10.5%	10.5%	10.3%	10.5%	10.7%	10.8%	10.7%
50th percentile	7.1%	7.2%	7.2%	7.2%	7.3%	7.7%	7.7%	7.8%	7.9%	8.1%	8.2%	8.2%	8.4%	8.4%	8.5%
25th percentile	0.2%	1.9%	2.8%	3.7%	4.0%	4.2%	4.6%	4.9%	5.2%	5.3%	5.5%	5.5%	5.6%	6.0%	6.2%
5th percentile	-11.2%	-8.5%	-5.7%	-3.2%	-1.9%	-1.3%	-0.5%	0.3%	0.7%	1.0%	1.7%	1.8%	2.0%	2.2%	2.5%

	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046
95th percentile	13.5%	13.3%	13.2%	13.4%	13.5%	13.6%	13.5%	13.5%	13.6%	13.7%	13.6%	13.5%	13.5%	13.5%	13.4%
75th percentile	10.8%	10.8%	10.8%	10.8%	10.8%	10.7%	10.8%	10.8%	10.9%	10.9%	10.9%	10.8%	10.8%	10.8%	10.8%
50th percentile	8.6%	8.7%	8.7%	8.8%	8.9%	8.9%	9.0%	9.0%	9.0%	8.9%	9.0%	9.0%	9.0%	9.1%	9.1%
25th percentile	6.2%	6.3%	6.5%	6.5%	6.6%	6.7%	6.8%	6.9%	7.0%	7.0%	7.1%	7.3%	7.3%	7.5%	7.5%
5th percentile	2.7%	3.0%	3.2%	3.2%	3.4%	3.6%	4.0%	4.1%	4.2%	4.4%	4.5%	4.5%	4.7%	4.8%	4.9%

EST. 2018 COM Contribution - \$83.052 Million**

Group	Active Members	Covered Compensation	Employer Contributions Payable January 31, 2018
General City *	3,332	\$ 182,988,398	\$ 16,931,274
Water Department	311	17,534,574	1,622,412
School Board	4,174	122,400,905	11,325,326
Milwaukee Technical College	-	-	-
Sewerage Commission	216	17,177,813	1,589,403
Veolia	36	2,921,654	270,330
Wisconsin Center District	82	4,287,544	396,711
Housing Authority	179	10,608,347	981,553
Redevelopment Authority	9	788,869	72,991
Policemen	1,921	160,010,056	48,266,000
Firemen	744	62,183,635	17,855,000
TOTAL	11,004	\$ 580,901,795	\$ 99,311,000

9.25% of Covered Comp

30.16% of Covered Comp

28.71% of Covered Comp

* Includes Elected Officials

** Based on preliminary estimate by independent actuary at 8% discount rate and including proposed funding policy amendments to MCC-36. May be higher depending on assumptions adopted by ERS Board for 2018-2022.

Demographics by Gender and Race

Race	Female	Male	Total	% Race
ASIAN		2	2	4.9%
BLACK	15	0	15	36.6%
HISPANIC	1	2	3	7.3%
WHITE	11	10	21	51.2%
Total	27	14	41	100%
% Gender	65.8%	34.2%	100%	

Department Composition by Generation

Generation	Baby Boomer	Generation X	Millennial	Grand Total
# of Employees	13	23	5	41
% of Workforce	31.7%	56.1%	12.2%	100%

Department by EEO Category

EEO Category	# of Employees
NO EEO Reporting	0
Office/Clerical	6
Officials and Administrators	9
Paraprofessionals	6
Professionals	20
Grand Total	41

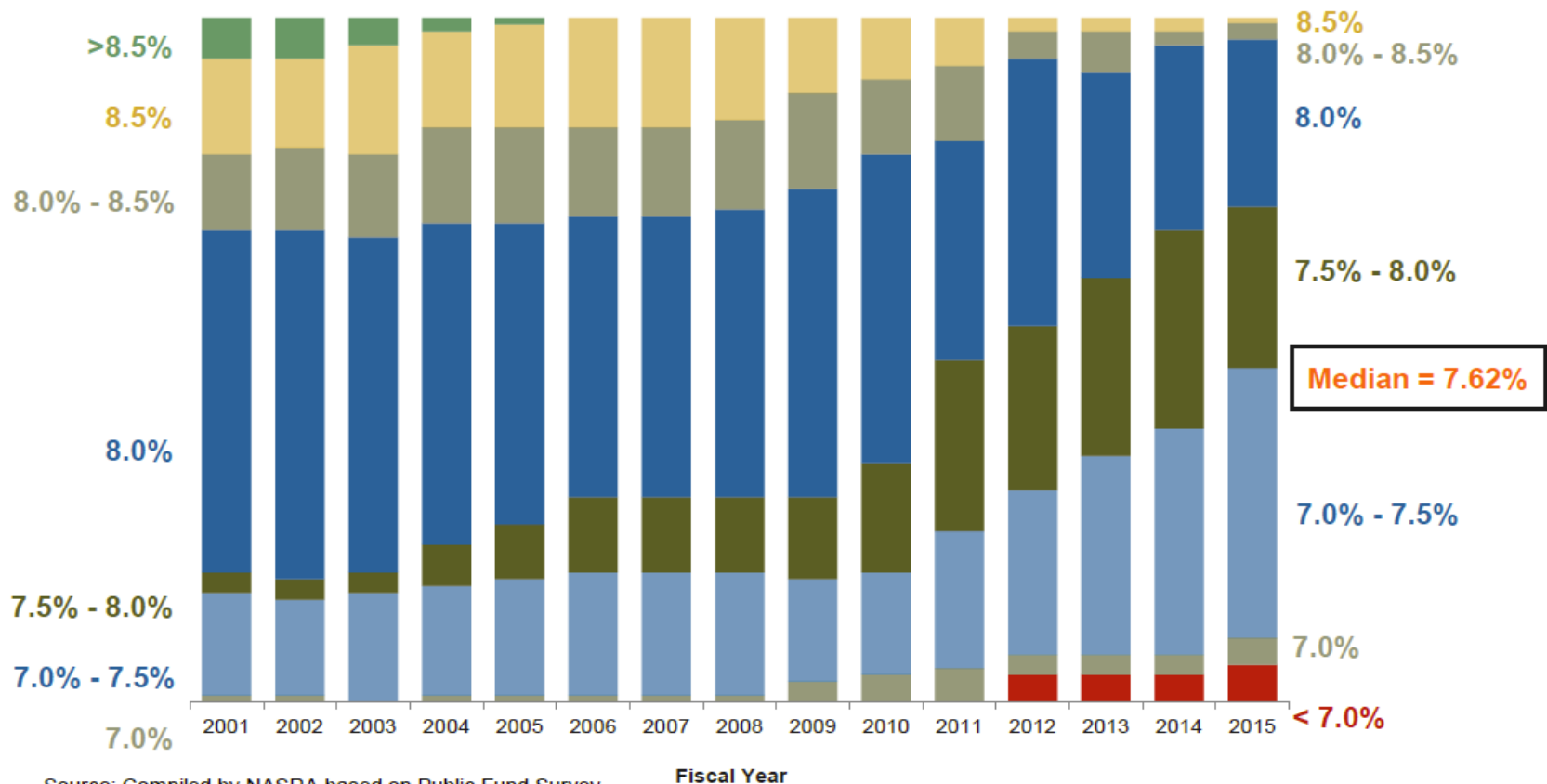
Average Years of Service	Average Age
11.8	50

Eligible for Service Retirement* by Year

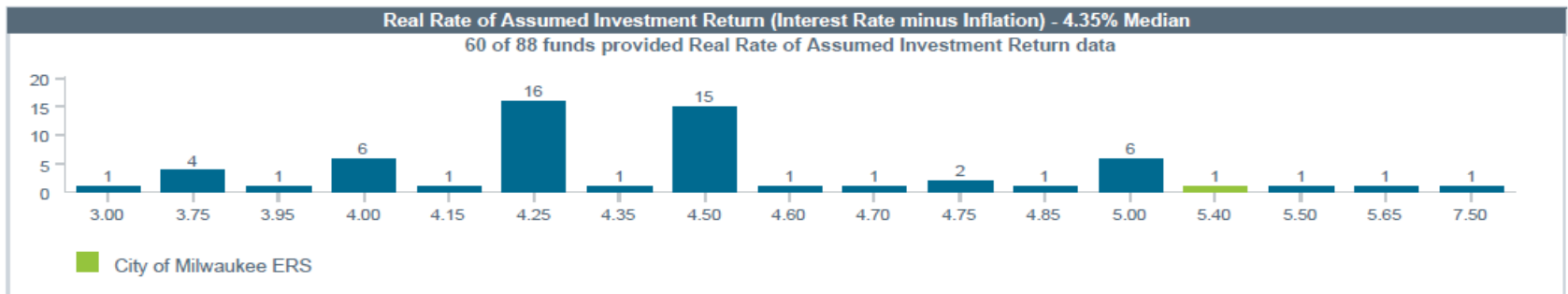
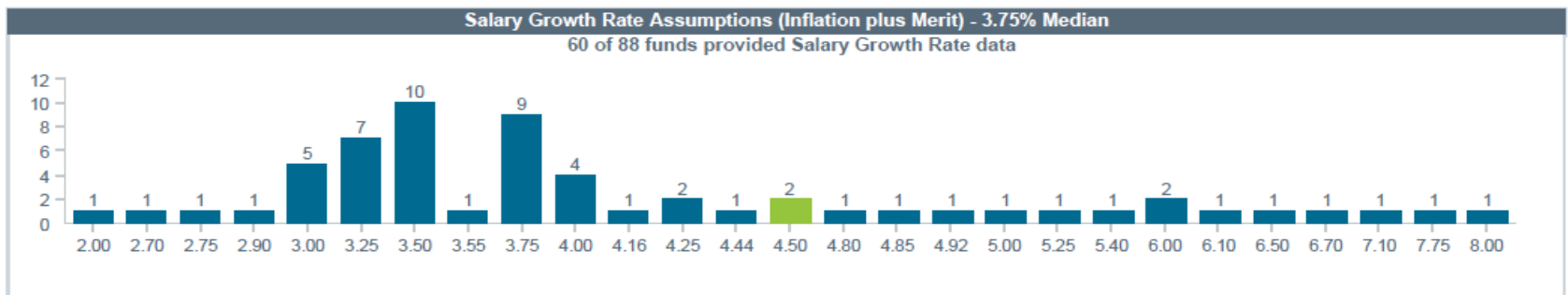
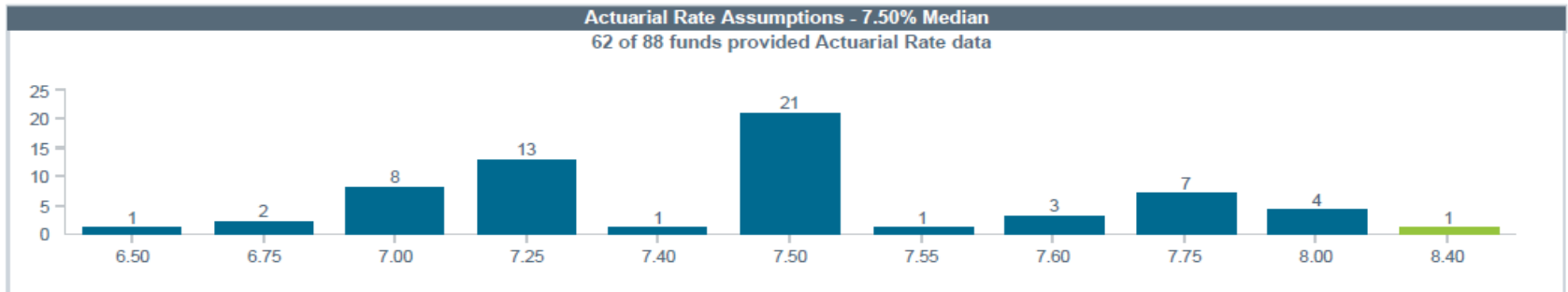
Year	Current	12/31/2017	12/31/2018	12/31/2019	12/31/2020	12/31/2021
% Eligible to Retire	22.0%	24.4%	26.8%	29.3%	34.1%	36.6%

Appendix

Public Fund Actuarial Discount Rates



- An industry consensus on low return expectations going forward has led to a steady decline in actuarial discount rates over the last few years.



Funds that did not provide data will not appear in the chart.



Fund Number: 105

As of December 31, 2016

Total Fund Fee Summary in Basis Points

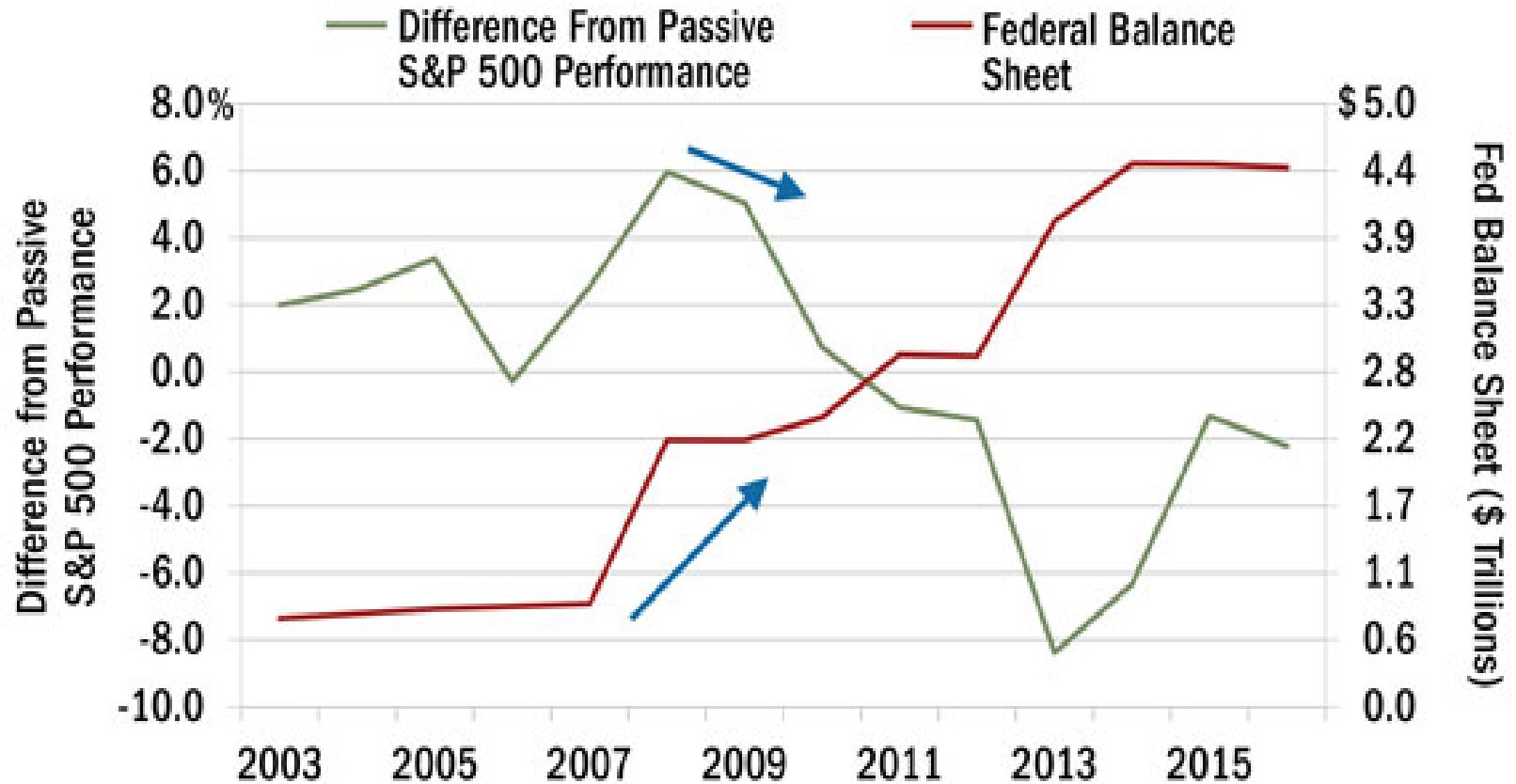
City of Milwaukee ERS vs. Average by Asset Range
55 of 71 funds provided fee data for this time period

Administrative Expenses	City of Milwaukee ERS	Under \$500 Million	\$500mm - \$1 Billion	\$1 - \$5 Billion	\$5 - \$10 Billion	\$10 - \$20 Billion	Over \$20 Billion
Internal Inv. Div. Staff	0.98	1.12	0.00	0.81	0.91	0.98	2.11
Actuary	0.31	2.75	0.96	0.49	0.36	0.17	0.11
Legal	0.21	0.78	0.96	0.67	0.40	0.21	0.20
Consultant	0.00	0.18	0.24	0.25	0.53	0.07	0.15
Audit	0.21	0.61	0.52	0.20	0.12	0.07	0.06
Other Professional	0.13	0.10	0.47	0.34	0.26	0.35	0.83
General Administrative	0.38	13.22	10.17	7.71	6.45	2.84	2.88
Total Administrative Expenses	2.23	18.76	13.33	10.46	9.02	4.69	6.34
Investment Expenses	City of Milwaukee ERS	Under \$500 Million	\$500mm - \$1 Billion	\$1 - \$5 Billion	\$5 - \$10 Billion	\$10 - \$20 Billion	Over \$20 Billion
Custodial	0.62	1.71	2.64	1.33	0.57	0.52	0.31
Investment Consulting	0.49	2.49	2.18	2.00	0.74	0.66	0.50
US Equity	8.75	4.18	8.01	7.51	6.51	3.87	2.24
International Equity	8.05	2.04	6.03	7.25	6.10	5.16	3.80
Global Equity	2.14	5.69	2.70	1.60	2.10	1.94	1.12
Fixed Income	3.52	3.97	6.25	5.79	4.72	3.65	3.68
Real Estate	15.35	5.37	7.78	7.83	8.51	5.48	5.46
Other Investment Management	0.08	0.00	0.00	1.08	1.08	0.90	0.81
Total Investment Expenses (ex. Alt Inv)	38.99	25.46	35.59	34.40	30.32	22.19	17.93
Alternative Investments	33.05	7.87	7.15	16.93	20.20	16.03	22.73
Total Investment Expenses	72.04	33.33	42.74	51.33	50.52	38.22	40.66
Total Expenses	74.27	52.09	56.07	61.79	59.54	42.91	47.00

Expressed in basis points on total fund assets. Funds that did not provide fee data will not appear in the table.



Swamped by Easy Money



Source: Evercore ISI and Standard & Poor's, 2003 to 2016

Table 1c Allocation of Total 2017 Contributions to Employee Groups for Combined Fund

Employer Contribution based on Stable Employer Contribution Policy

Group	Active Members	Covered Compensation	Employer Rate**	Dollar Amount Payable***								
				January 1, 2017	June 1, 2017	July 1, 2017	August 1, 2017	September 1, 2017	October 1, 2017	November 1, 2017	December 1, 2017	January 31, 2018
General City*	3,332	\$ 182,988,398	8.48%	\$ 15,517,416	\$ 16,038,523	\$ 16,144,826	\$ 16,251,833	\$ 16,359,550	\$ 16,467,980	\$ 16,577,129	\$ 16,687,002	\$ 16,908,937
Water Department	311	17,534,574	8.48%	1,486,932	1,536,866	1,547,052	1,557,306	1,567,628	1,578,018	1,588,477	1,599,006	1,620,272
School Board****	4,174	122,400,905	8.48%	10,379,597	10,728,165	10,799,271	10,870,848	10,942,900	11,015,429	11,088,439	11,161,933	11,310,385
Milwaukee Technical College	-	-	8.48%	-	-	-	-	-	-	-	-	-
Sewerage Commission	216	17,177,813	8.48%	1,456,679	1,505,597	1,515,576	1,525,621	1,535,733	1,545,912	1,556,158	1,566,472	1,587,306
Veolia	36	2,921,654	8.48%	247,756	256,076	257,774	259,482	261,202	262,933	264,676	266,430	269,974
Wisconsin Center District	82	4,287,544	8.48%	363,584	375,794	378,284	380,792	383,315	385,856	388,414	390,988	396,188
Housing Authority	179	10,608,347	8.48%	899,588	929,798	935,961	942,164	948,409	954,695	961,022	967,392	980,258
Redevelopment Authority	9	788,869	8.48%	66,896	69,143	69,601	70,062	70,527	70,994	71,465	71,938	72,895
Policemen	1,921	160,010,056	22.63%	36,210,276	37,426,291	37,674,351	37,924,056	38,175,415	38,428,440	38,683,143	38,939,533	39,457,424
Firemen	744	62,183,635	24.83%	15,440,197	15,958,710	16,064,484	16,170,959	16,278,139	16,386,030	16,494,636	16,603,962	16,824,793
TOTAL	11,004	\$ 580,901,795		\$ 82,068,921	\$ 84,824,963	\$ 85,387,180	\$ 85,953,123	\$ 86,522,818	\$ 87,096,287	\$ 87,673,559	\$ 88,254,656	\$ 89,428,432

* Includes Elected Officials

** Rates apply to Covered Compensation as of the beginning of the year then credited with interest to payable date

*** Actual contribution requirement will be adjusted for the actual payment date of the contribution.

**** Breakdown of contributions for MPO by normal cost and past service portion as follows:

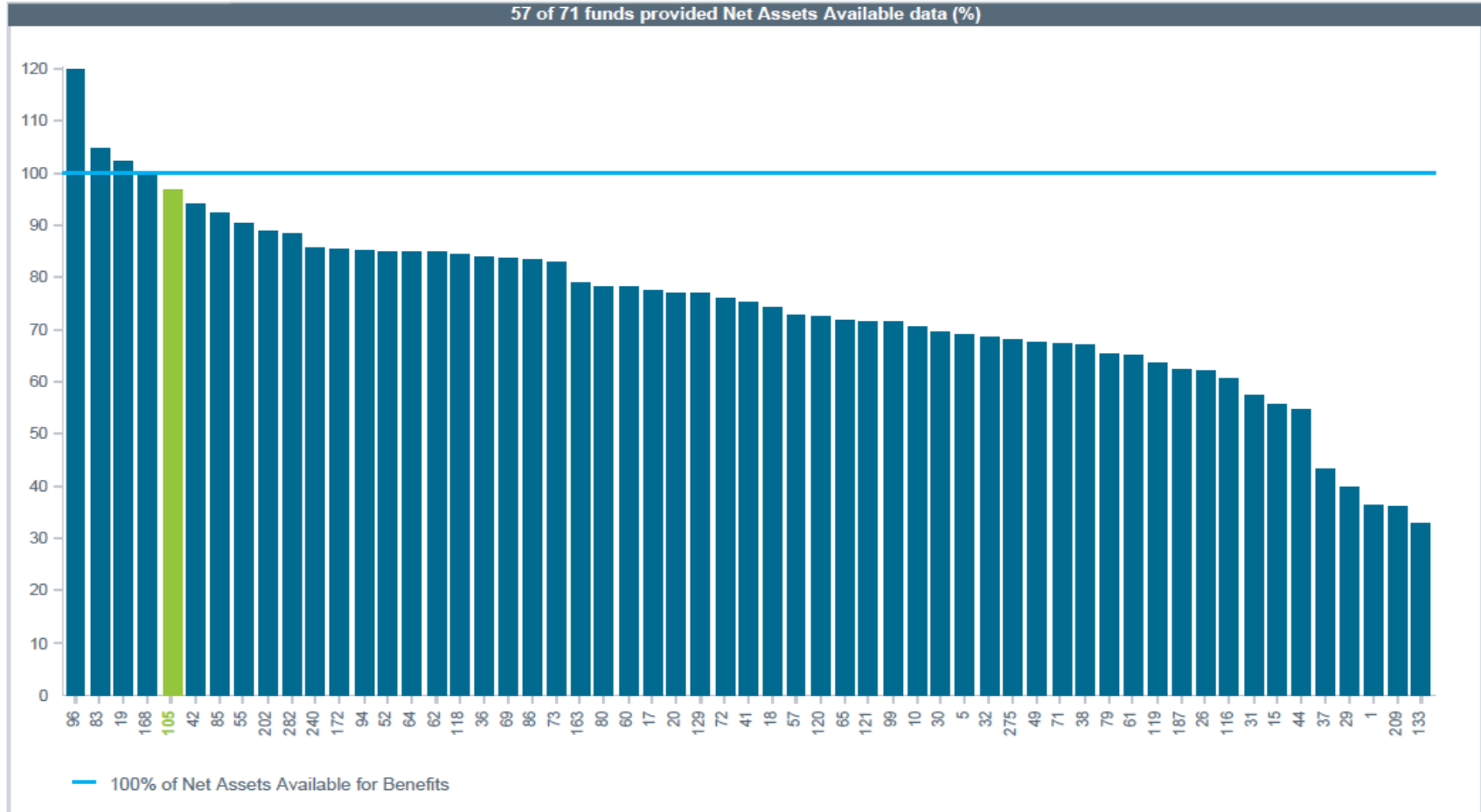
Payable at	January 1, 2017	June 1, 2017	July 1, 2017	August 1, 2017	September 1, 2017	October 1, 2017	November 1, 2017	December 1, 2017	January 31, 2018
Normal cost	3,467,035	3,583,465	3,607,216	3,631,124	3,655,191	3,679,418	3,703,805	3,728,354	3,777,940
Past service portion	6,912,562	7,144,700	7,192,055	7,239,724	7,287,709	7,336,011	7,384,634	7,433,579	7,532,445
Total	10,379,597	10,728,165	10,799,271	10,870,848	10,942,900	11,015,429	11,088,439	11,161,933	11,310,385

Fund Number: 105

As of December 31, 2016

Net Assets Available For Benefits

Expressed as a Percentage of the Pension Benefit Obligation

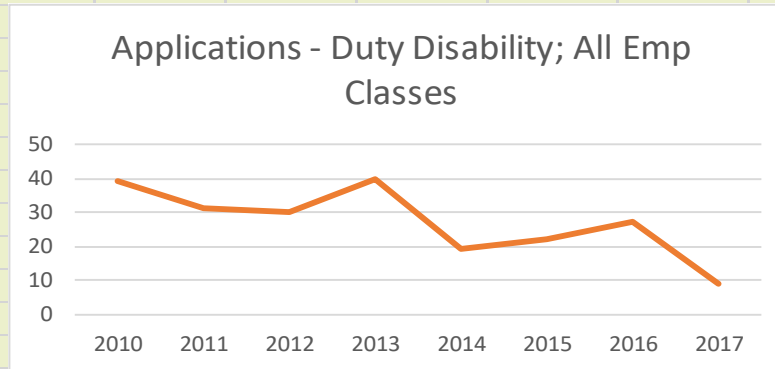


Funds that did not provide data will not appear in the chart.

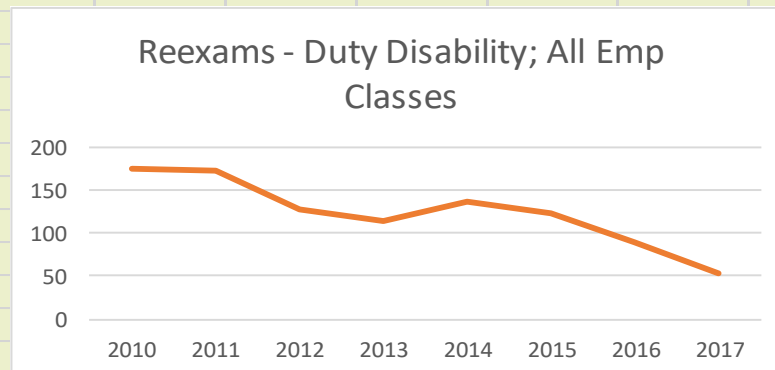


ERS Duty Disability Trend 2010-2017

Disability Type Employee Class	Duty Dis Only (All)			Applications	
Year	Approved	Cancelled	Denied	Pending	Total
2010	21	4	14		39
2011	15	3	13		31
2012	16	2	12		30
2013	13	8	19		40
2014	6	2	11		19
2015	10	4	7	1	22
2016	10	3	8	6	27
2017	1		1	7	9



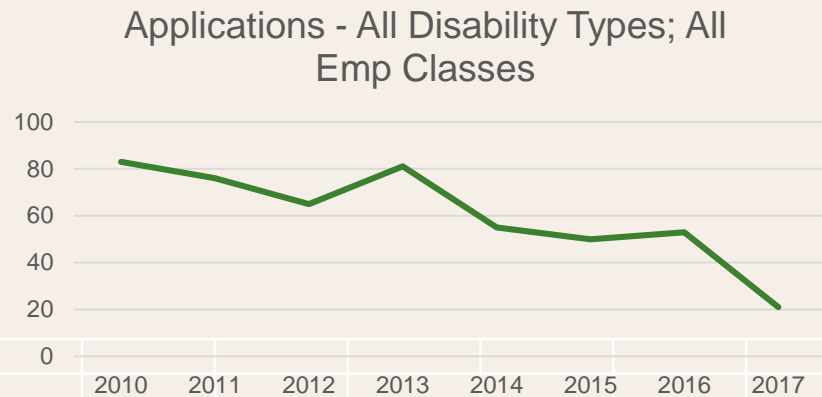
Disability Type Employee Class	Duty Dis Only (All)			Reexaminations	
Year	Approved	Cancelled	Denied	Pending	Total
2010	172	4			176
2011	169	4			173
2012	125	3			128
2013	111	3	1		115
2014	129	4	4		137
2015	119	2		2	123
2016	89				89
2017	28			26	54



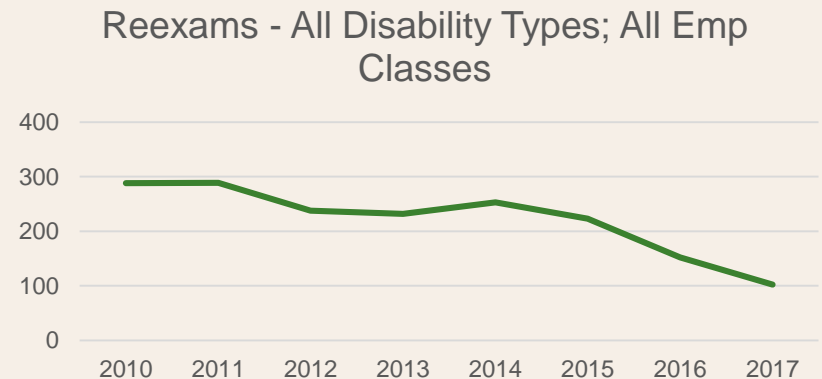
ERS Disability Trend

All Cases 2010-2017

Disability Type (All)		Applications			
Employee Class (All)					
Year	Approved	Cancelled	Denied	Pending	Total
2010	56	13	14		83
2011	55	8	13		76
2012	42	10	13		65
2013	48	12	21		81
2014	32	9	14		55
2015	18	14	16	2	50
2016	24	7	11	11	53
2017	6		1	14	21

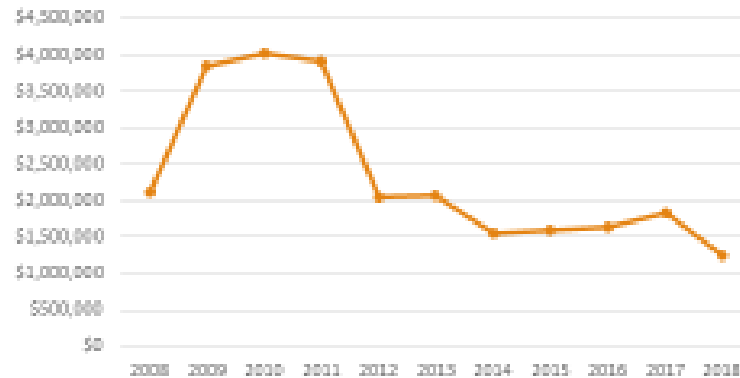


Disability Type (All)		Reexaminations			
Employee Class (All)					
Year	Approved	Cancelled	Denied	Pending	Total
2010	284	4			288
2011	285	4			289
2012	234	4			238
2013	227	4	1		232
2014	244	5	4		253
2015	205	7	2	9	223
2016	146	1		5	152
2017	48			54	102



Insourcing Impact 2008-Present

Systems Support



- As part of the 5 year IT Strategic plan, ERS began to consolidate IT resources in 2011
- In 2012 (5) IT contracts eliminated for 2 fulltime positions. Total savings of \$1,875,411.00
- In 2014 (1) contract eliminated, HP Maintenance reduction utilizing offshore developers brought on \$507,749 total savings
- *2018 Proposal to insource (4) contract positions for 3 FTE positions a total savings of 500K*

IT Insourcing Proposal

1 IT Insourcing Plan (Contract positions to FTE Positions)

Position	Vendor	2017 Annual Cost	Proposed Insourced Cost 2017 (*burden rate of 50%)	Pay Range	City Position Title	Y1 Savings	Y2 Savings	Y3 Savings	ROI over a 3 year period (2020)
Database Administrator	SSR	210,000	\$110,000	1HX	Systems Analyst Project Leader	\$100,000	\$108,400	\$117,136	\$325,536
Java Developer	Symphony	175,000	90,000	2LX	Systems Analyst Project Leader	85,000	\$92,000	\$99,280	\$276,280
Server Administrator	SSR	\$160,000	\$110,000	2LX	Systems Analyst Project Leader	\$56,400	\$63,056	\$69,978	\$189,434
Sr. Infrastructure Expert (no annual increases annual renewals at flat rate)	SSR	\$250,000	\$0	N/A	Eliminate current contract and shift duties to Enterprise Information Manager	\$250,000	\$250,000	\$250,000	\$750,000
						Y1 \$491,400	Y2 \$513,456	Y3 \$536,394	TOTAL NET SAVINGS (3Year) \$1,541,250