



# Federated Annual Fee Report - 2016

## Executive Summary

It is our pleasure to present the second annual Fee Report for the Federated City Employees' Retirement System ("Federated") covering calendar year 2016. Last year, staff released the first iteration for calendar year 2015 with a commitment to produce the report on an annual basis. The goal of the report is to provide insight into the management and incentive fees paid to investment managers along with the overall costs of operating the investment program. Pension plan fee data is generally underreported in the industry and only captures the portion of fees that are paid by invoice. This excludes often sizable embedded fees that are paid out of certain fund structures.

It is important to note that fees are a byproduct of asset allocation and portfolio construction, which are byproducts of the Board's objectives, investment beliefs, and risk tolerance. Each year, the Board typically reviews the asset allocation considering updated capital market assumptions and the expected returns and volatility of the portfolio associated with those assumptions. The current asset allocation as illustrated in Tables 1 and 2 is an expression of the Board's Investment Policy Statement that "Investments shall be diversified with the intent to minimize the risk of large investment losses".

Asset allocation is typically one of the largest determinants of investment management fees at the portfolio level. Asset allocations that introduce alternative asset classes (Private Equity, Private Debt, Real Estate, Hedge Funds, etc.) will have higher levels of investment manager fees, because these asset classes or strategies have higher fee structures than traditional asset classes. Building a Private Equity allocation at the same fee level as an active or passive long-only Global Equity allocation is simply not possible. In addition, asset class structuring can have significant impact on fees. The use of active management versus passive management, as well as alternative strategies within traditional asset classes will increase fees. Finally, when evaluating investment managers, Staff places a significant emphasis on fees, negotiating for lower fees, and analyzing that expected value or return is worth the expected cost.

This year, the report includes a comparison to last year's data, and highlights key changes to fee ratios and the drivers of those changes. Some are attributable to manager performance and others are due to investment manager line-up changes as outlined in the report.

**For calendar year 2016, management and incentive fees for the pension plan totaled \$21.3 million with a fee ratio of 1.07% compared to \$22.2 million and 1.10% for calendar year 2015. The health care trust totaled \$0.6 million with a fee ratio of 0.36%**

compared to \$0.3 million and 0.24% for 2015. Other investment-related costs (Staff, consultants, custodian bank, investment legal, etc.) for the pension plan were \$1.6 million with a fee ratio of 0.08% consistent with 2015, and the health care trust totaled \$0.2 million with a fee ratio of 0.12% compared to \$0.1 million and 0.12% for 2015.

Table 1

Pension Average Asset Allocation for 2016

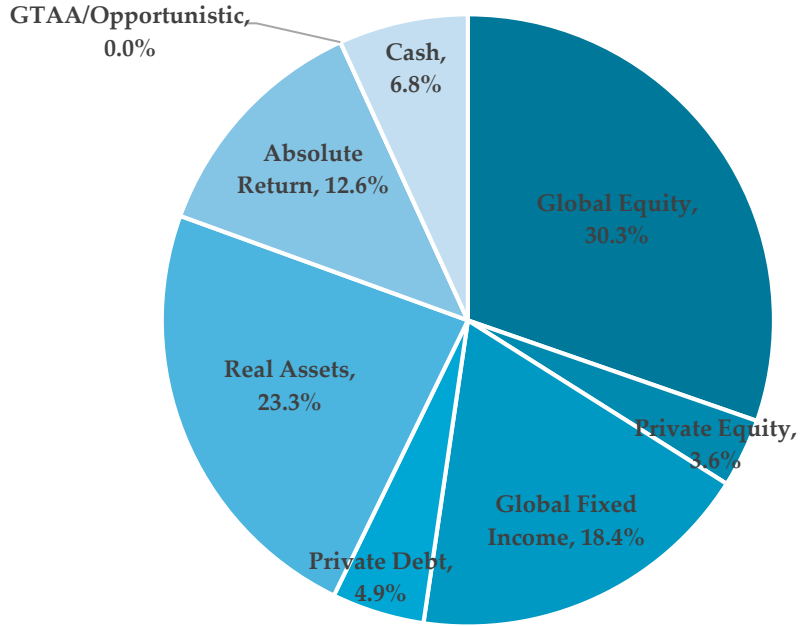
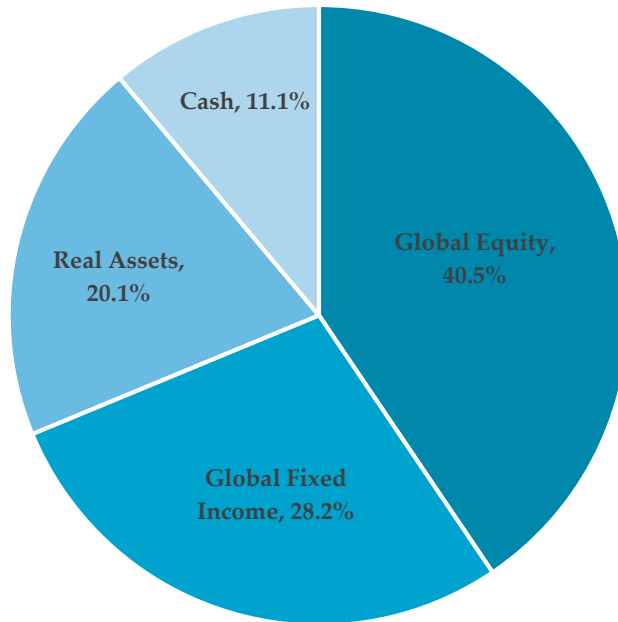


Table 2

Health Care Trust Average Asset Allocation for 2016



## Introduction

The fees in this report represent management fees, incentive fees, and other investment-related costs that were incurred during the calendar year. These amounts may include fees that were accrued for the year, but not paid out.

Management fees are fees charged by fund managers to invest and manage assets. Incentive fees are performance-based fees for exceeding a hurdle rate and are only applicable to certain fund structures. It's important to note that incentive fees are a form of shared economics that are only paid if the manager has produced positive returns or exceeded a predetermined hurdle rate. Incentive fees can be negative in the case of performance-based fee clawback provisions for underperformance. Both management and incentive fee amounts exclude fund operating expenses charged by investment managers for overhead not directly related to investment management. Trading expenses such as broker commissions are also excluded, as gross performance returns are reported after these expenses have been deducted. Other costs include salary and benefit compensation for investment staff (includes a 50% allocation for the CEO), cost of general consultant and Absolute Return consultant, custodian, and other third party vendors utilized by the investment program.

The fees in this report do not include indirect expenses and charges that may be paid to managers' affiliates, consultants or entities for services rendered to the managers, the funds or portfolio entities held by certain funds; nor is it intended to include all categories of fees, expenses and charges identified in the Institutional Limited Partners Association ("ILPA") fee reporting template.

## Data Sources

Staff compiled this fee report using the best available information for each fund manager in order to develop a comprehensive view of fees. Fee amounts were reviewed for reasonableness and reconciled to fee schedules. Fees for all managers active at any point during the year are included in this report, including those that were funded or terminated during the year.

For most separately managed accounts and public markets commingled funds, quarterly fee invoices from the fund managers were used as the data source. Mutual funds, short term investment funds (Cash), and certain public markets commingled funds that deduct fees directly from the funds were calculated by multiplying each fund's fee ratio

by the fund's average balances. The average balances were sourced from our custodian State Street.

The remaining manager fees were sourced from our managers directly. Absolute Return fees were provided by managers with independent quarterly re-calculations and reconciliations completed by our absolute return consultant Albourne. Private Equity fees were gathered by asking our managers to complete the ILPA fee reporting template or a similar template. The ILPA template is intended to unify and codify the presentation of fees, expenses, and carried interest information by fund managers to Limited Partners. The remaining manager fees in Global Fixed Income, Private Debt, and Real Assets were obtained by having the fund managers fill out a fee template designed by staff.

Within the Other Costs section, consultant, custodian, and other vendor costs were sourced from fee invoices sent by the vendors. Investment staff salary and benefits were allocated to each of the 4 San Jose plans by pro-rating the total cost by the average monthly balance of each plan. Similarly, investment-related legal costs incurred by Federated were allocated between the pension plan and health care trust by pro-rating the total cost by the average monthly balance of each plan.

The pension plan uses an Overlay fund that includes investments across multiple asset classes. Overlay fees were allocated on a notional basis to the respective asset classes that were overlaid during the year.

## Changes from 2015 Report

In an effort to provide the most informative and consistent data possible, several changes have been retroactively made to the 2015 report. The methodology changes are outlined below and updated values are represented in the 2015 columns of the Year-over-Year comparison tables.

Staff cost in 2015 only included cash compensation and was split evenly between the Federated and Police and Fire plans. The total cost has been updated to include both cash compensation and benefits and is now pro-rated to each of the 4 San Jose plans based on their average monthly balances.

In 2015, other third party vendors such as data vendors and investment oversight providers were excluded. These are now included in the Other Vendors column along with investment-related legal and research providers.

Finally, the multi-asset Overlay collateral account balances were captured under the Cash asset class in 2015. The Overlay notional balance of each asset class is now allocated to the respective asset class that the overlay provided economic exposure to.

## Total Portfolio Fee Summaries

The following tables present fees by both asset class and management type. Fees by management type are presented by segregating investments into four “fund-type” categories: passive, active, hedged, and private. Passive strategies are intended to generate a return that emulates a passive index. Active strategies include investment managers that attempt to outperform an index on a long only basis. Hedged strategies generally seek to achieve an absolute return (“alpha”) regardless of market direction (“beta”) by employing various strategies including long and short positions. Private strategies utilize a diverse set of approaches to invest in opportunities such as non-exchange listed companies, taking listed companies private, investing in the credit market by providing loans, and investing in non-exchange listed real estate.

## Year-over-Year Comparisons

The year-over-year comparison tables in this report present a time series of changes in average weights, fees, fee ratios, contribution to total plan fee ratios, and a year-over-year attribution. The year-over-year attribution uses the Brinson-Hood-Beebower methodology to decompose the change in contribution to total plan fee ratio into 1) impact due to weights and 2) impact due to fee ratios.

*Note: Some values on this report may not sum due to rounding. The dollar values displayed throughout the report are shown in thousands.*

Table 3

Pension Fees by Asset Class and Management Type

Asset Class	Mgmt Fees (\$000's)	Incent Fees (\$000's)	Mgmt and Incent Fees (\$000's)	Average Balance (\$000's)	Average Weight	Fee Ratio - Mgmt Fees	Fee Ratio - Incent Fees	Fee Ratio - Mgmt and Incent Fees	% of Total Plan Fee Ratio	Contrib to Total Plan Fee Ratio
Global Equity	4,300	200	4,500	603,000	30.3%	0.71%	0.03%	0.74%	21.1%	0.23%
Passive	300	-	300	256,600	12.9%	0.10%	0.00%	0.10%	1.2%	0.01%
Active	1,700	-	1,700	230,200	11.6%	0.75%	0.00%	0.75%	8.1%	0.09%
Hedged	2,300	200	2,500	116,100	5.8%	2.01%	0.15%	2.15%	11.8%	0.13%
Private Equity	1,400	500	1,900	72,300	3.6%	1.96%	0.64%	2.60%	8.8%	0.09%
Private	1,400	500	1,900	72,300	3.6%	1.96%	0.64%	2.60%	8.8%	0.09%
Global Fixed Income	1,300	600	1,900	364,900	18.4%	0.37%	0.16%	0.53%	9.2%	0.10%
Passive	200	-	200	213,600	10.7%	0.07%	0.00%	0.07%	0.7%	0.01%
Active	500	-	500	106,400	5.4%	0.50%	0.00%	0.50%	2.5%	0.03%
Hedged	700	600	1,300	44,900	2.3%	1.47%	1.34%	2.81%	5.9%	0.06%
Private Debt	1,200	-200	1,100	97,300	4.9%	1.28%	-0.17%	1.12%	5.1%	0.05%
Private	1,200	-200	1,100	97,300	4.9%	1.28%	-0.17%	1.12%	5.1%	0.05%
Real Assets	3,600	1,700	5,300	463,900	23.3%	0.77%	0.37%	1.14%	24.9%	0.27%
Passive	200	-	200	220,500	11.1%	0.08%	0.00%	0.08%	0.8%	0.01%
Active	300	-	300	79,500	4.0%	0.39%	0.00%	0.39%	1.5%	0.02%
Hedged	1,000	600	1,600	39,000	2.0%	2.68%	1.50%	4.18%	7.7%	0.08%
Private	2,000	1,100	3,200	124,800	6.3%	1.63%	0.91%	2.55%	15.0%	0.16%
Absolute Return	4,300	2,100	6,400	250,800	12.6%	1.72%	0.84%	2.56%	30.2%	0.32%
Hedged	4,300	2,100	6,400	250,800	12.6%	1.72%	0.84%	2.56%	30.2%	0.32%
Cash	150	-	150	136,000	6.8%	0.11%	0.00%	0.11%	0.7%	0.01%
Passive	150	-	150	136,000	6.8%	0.11%	0.00%	0.11%	0.7%	0.01%
<b>Total Plan</b>	<b>16,250</b>	<b>4,900</b>	<b>21,250</b>	<b>1,988,200</b>	<b>100.0%</b>	<b>0.82%</b>	<b>0.25%</b>	<b>1.07%</b>	<b>100.0%</b>	<b>1.07%</b>

The table above illustrates that management and incentive fees for the pension plan totaled \$21.3 million for 2016 which equated to a total plan fee ratio of 1.07%. The Absolute Return and Real Assets asset classes contributed the most to the total plan fee ratio at 0.32% and 0.27%, respectively. The Private Debt and Private Equity asset classes contributed the least to the total plan fee ratio at 0.05% and 0.09%, respectively.

Table 4

Pension Fees by Management Type

Type	Mgmt Fees (\$000's)	Incent Fees (\$000's)	Mgmt and Incent Fees (\$000's)	Average Balance (\$000's)	Average Weight	Fee Ratio - Mgmt Fees	Fee Ratio - Incent Fees	Fee Ratio - Mgmt and Incent Fees	% of Total Plan Fee Ratio	Contrib to Total Plan Fee Ratio
Passive	700	-	700	826,800	41.6%	0.08%	0.00%	0.08%	3.3%	0.04%
Active	2,500	-	2,500	416,100	20.9%	0.60%	0.00%	0.60%	11.8%	0.13%
Hedged	8,300	3,500	11,800	450,800	22.7%	1.84%	0.78%	2.62%	55.5%	0.59%
Private	4,600	1,400	6,200	294,400	14.8%	1.56%	0.48%	2.11%	29.2%	0.31%
<b>Total Plan</b>	<b>16,250</b>	<b>4,900</b>	<b>21,250</b>	<b>1,988,200</b>	<b>100.0%</b>	<b>0.82%</b>	<b>0.25%</b>	<b>1.07%</b>	<b>100.0%</b>	<b>1.07%</b>

Hedged strategies contributed the most to the total plan fee ratio at 0.59% and represented about 23% of average plan assets. Private strategies were the next largest contributor accounting for 0.31% of the total plan fee ratio and represented 15% of



average plan assets. Passive and active management strategies accounted for 0.04% and 0.13% of the total plan fee ratio and represented 42% and 21% of plan assets, respectively.

Table 5

Pension Other Investment Costs

Staff Salary and Benefits (\$000's)	Consultants (\$000's)	Custodian (\$000's)	Other Vendors (\$000's)	Total Other Costs (\$000's)	Other Costs Fee Ratio
600	430	360	170	1,560	0.08%

Other investment costs for the pension plan equated to a total fee ratio of 0.08%. As previously discussed, other costs include salary and benefits for investment staff, cost of general consultant and Absolute Return consultant, custodian, and other vendors including investment-related legal costs and research tools used by Staff.

Table 6

Health Care Fees by Asset Class and Management Type

Asset Class	Mgmt Fees (\$000's)	Incent Fees (\$000's)	Mgmt and Incent Fees (\$000's)	Average Balance (\$000's)	Average Weight	Fee Ratio - Mgmt Fees	Fee Ratio - Incent Fees	Fee Ratio - Mgmt and Incent Fees	% of Total Plan Fee Ratio	Contrib to Total Plan Fee Ratio
Global Equity	310	-	310	68,100	40.5%	0.45%	0.00%	0.45%	51.7%	0.18%
Passive	21	-	21	41,200	24.5%	0.05%	0.00%	0.05%	3.6%	0.01%
Active	288	-	288	26,900	16.0%	1.07%	0.00%	1.07%	48.2%	0.17%
Global Fixed Income	18	-	18	47,400	28.2%	0.04%	0.00%	0.04%	2.9%	0.01%
Passive	18	-	18	47,400	28.2%	0.04%	0.00%	0.04%	2.9%	0.01%
Real Assets	206	44	251	33,800	20.1%	0.61%	0.13%	0.74%	41.9%	0.15%
Passive	11	-	11	15,200	9.0%	0.08%	0.00%	0.08%	1.9%	0.01%
Active	28	-	28	7,200	4.3%	0.40%	0.00%	0.40%	4.7%	0.02%
Hedged	77	44	121	2,900	1.7%	2.64%	1.50%	4.14%	20.2%	0.07%
Private	89	-	90	8,500	5.1%	1.05%	0.01%	1.05%	15.0%	0.05%
Cash	21	-	21	18,700	11.1%	0.11%	0.00%	0.11%	3.4%	0.01%
Passive	21	-	21	18,700	11.1%	0.11%	0.00%	0.11%	3.4%	0.01%
Total Plan	555	44	600	168,000	100.0%	0.33%	0.03%	0.36%	100.0%	0.36%

The table above illustrates that management and incentive fees for the health care trust totaled \$600,000 for 2016 which equated to a total plan fee ratio of 0.36%. The Global Equity asset class contributed the most to the total plan fee ratio at 0.18%. The Global Fixed Income asset class contributed the least to the total plan fee ratio at 0.01%.

Table 7

Health Care Fees by Management Type

Type	Mgmt Fees (\$000's)	Incent Fees (\$000's)	Mgmt and Incent Fees (\$000's)	Average Balance (\$000's)	Average Weight	Fee Ratio - Mgmt Fees	Fee Ratio - Incent Fees	Fee Ratio - Mgmt and Incent Fees	% of Total Plan Fee Ratio	Contrib to Total Plan Fee Ratio
Passive	71	-	71	122,400	72.9%	0.06%	0.00%	0.06%	11.9%	0.04%
Active	317	-	317	34,000	20.2%	0.93%	0.00%	0.93%	52.9%	0.19%
Hedged	77	44	121	2,900	1.7%	2.66%	1.52%	4.17%	20.2%	0.07%
Private	89	-	90	8,500	5.1%	1.05%	0.00%	1.06%	15.0%	0.05%
<b>Total Plan</b>	<b>555</b>	<b>44</b>	<b>600</b>	<b>168,000</b>	<b>100.0%</b>	<b>0.33%</b>	<b>0.03%</b>	<b>0.36%</b>	<b>100.0%</b>	<b>0.36%</b>

For the total health care trust, active management strategies accounted for 0.19% of the total plan fee ratio and represented about 20% of average plan assets. Passive strategies contributed the least to the total plan fee ratio at 0.04% and represented 73% of plan assets.

Table 8

Health Care Other Investment Costs

Staff Salary and Benefits (\$000's)	Consultants (\$000's)	Custodian (\$000's)	Other Vendors (\$000's)	Total Other Costs (\$000's)	Other Costs Fee Ratio
51	26	117	15	209	0.12%

Other investment costs for the health care trust equated to a total fee ratio of 0.12%. As previously discussed, other costs include salary and benefits for investment staff, cost of general consultant, custodian, and other vendors including investment-related legal costs and research tools used by Staff.

Table 9

Pension Year-over-Year Comparison by Asset Class and Management Type

Asset Class	Average Weight			Management Fees			Incentive Fees			Management and Incentive Fees			Fee Ratio			Contrib to Total Plan Fee Ratio			YoY Attribution	
	2015	2016	Change	2015 (\$000's)	2016 (\$000's)	Change (\$000's)	2015 (\$000's)	2016 (\$000's)	Change (\$000's)	2015 (\$000's)	2016 (\$000's)	Change (\$000's)	2015	2016	Change	2015	2016	Change	Due to Weight	Due to Fee Ratio
Global Equity	32.9%	30.3%	-2.5%	5,000	4,300	-700	1,900	200	-1,700	6,900	4,500	-2,400	1.04%	0.74%	-0.30%	0.34%	0.23%	-0.12%	-0.03%	-0.09%
Passive	11.1%	12.9%	1.9%	300	300	-	-	-	-	300	300	-	0.13%	0.10%	-0.04%	0.01%	0.01%	0.00%	0.00%	0.00%
Active	15.9%	11.6%	-4.3%	2,500	1,700	-800	-	-	-	2,500	1,700	-800	0.78%	0.75%	-0.03%	0.12%	0.09%	-0.04%	-0.03%	0.00%
Hedged	5.9%	5.8%	-0.1%	2,200	2,300	100	1,900	200	-1,700	4,100	2,500	-1,600	3.43%	2.15%	-1.27%	0.20%	0.13%	-0.08%	0.00%	-0.07%
Private Equity	4.2%	3.6%	-0.6%	1,400	1,400	-	600	500	-100	2,000	1,900	-100	2.34%	2.60%	0.26%	0.10%	0.09%	0.00%	-0.01%	0.01%
Private	4.2%	3.6%	-0.6%	1,400	1,400	-	600	500	-100	2,000	1,900	-100	2.34%	2.60%	0.26%	0.10%	0.09%	0.00%	-0.01%	0.01%
Global Fixed Income	18.6%	18.4%	-0.3%	1,700	1,300	-400	100	600	500	1,800	1,900	100	0.48%	0.53%	0.05%	0.09%	0.10%	0.01%	0.00%	0.01%
Passive	12.5%	10.7%	-1.7%	100	200	100	-	-	-	100	200	100	0.04%	0.07%	0.03%	0.00%	0.01%	0.00%	0.00%	0.00%
Active	2.5%	5.4%	2.8%	300	500	200	-	-	-	300	500	200	0.58%	0.50%	-0.08%	0.01%	0.03%	0.01%	0.02%	0.00%
Hedged	3.6%	2.3%	-1.3%	1,300	700	-600	100	600	500	1,400	1,300	-100	1.93%	2.81%	0.87%	0.07%	0.06%	-0.01%	-0.03%	0.02%
Private Debt	5.4%	4.9%	-0.5%	1,400	1,200	-200	-	-200	-200	1,400	1,100	-300	1.29%	1.12%	-0.17%	0.07%	0.05%	-0.01%	-0.01%	-0.01%
Private	5.4%	4.9%	-0.5%	1,400	1,200	-200	-	-200	-200	1,400	1,100	-300	1.29%	1.12%	-0.17%	0.07%	0.05%	-0.01%	-0.01%	-0.01%
Real Assets	23.5%	23.3%	-0.2%	2,200	3,600	1,400	700	1,700	1,000	3,000	5,300	2,300	0.63%	1.14%	0.51%	0.15%	0.27%	0.12%	0.00%	0.12%
Passive	11.8%	11.1%	-0.7%	200	200	-	-	-	-	200	200	-	0.08%	0.08%	-0.01%	0.01%	0.01%	0.00%	0.00%	0.00%
Active	6.1%	4.0%	-2.1%	500	300	-200	-	-	-	500	300	-200	0.41%	0.39%	-0.02%	0.02%	0.02%	-0.01%	-0.01%	0.00%
Hedged	0.0%	2.0%	2.0%	-	1,000	1,000	-	600	600	-	1,600	1,600	0.00%	4.18%	4.18%	0.00%	0.08%	0.08%	0.00%	0.08%
Private	5.7%	6.3%	0.6%	1,600	2,000	400	700	1,100	400	2,300	3,200	900	2.00%	2.55%	0.55%	0.11%	0.16%	0.05%	0.01%	0.03%
Absolute Return	10.9%	12.6%	1.7%	4,300	4,300	-	2,700	2,100	-600	7,000	6,400	-600	3.18%	2.56%	-0.62%	0.35%	0.32%	-0.02%	0.05%	-0.08%
Hedged	10.9%	12.6%	1.7%	4,300	4,300	-	2,700	2,100	-600	7,000	6,400	-600	3.18%	2.56%	-0.62%	0.35%	0.32%	-0.02%	0.05%	-0.08%
Cash	4.4%	6.8%	2.4%	90	150	60	-	-	-	90	150	60	0.10%	0.11%	0.01%	0.00%	0.01%	0.00%	0.00%	0.00%
Passive	4.4%	6.8%	2.4%	90	150	60	-	-	-	90	150	60	0.10%	0.11%	0.01%	0.00%	0.01%	0.00%	0.00%	0.00%
Total Plan	100.0%	100.0%	0.0%	16,100	16,250	150	6,000	4,900	-1,100	22,200	21,250	-950	1.10%	1.07%	-0.03%	1.10%	1.07%	-0.03%	0.01%	-0.04%

Table 10

Pension Year-over-Year Comparison by Management Type

Type	Average Weight			Management Fees			Incentive Fees			Management and Incentive Fees			Fee Ratio			Contrib to Total Plan Fee Ratio			YoY Attribution	
	2015	2016	Change	2015 (\$000's)	2016 (\$000's)	Change (\$000's)	2015 (\$000's)	2016 (\$000's)	Change (\$000's)	2015 (\$000's)	2016 (\$000's)	Change (\$000's)	2015	2016	Change	2015	2016	Change	Due to Weight	Due to Fee Ratio
Passive	39.7%	41.6%	1.9%	700	700	-	-	-	-	700	700	-	0.09%	0.08%	0.00%	0.03%	0.04%	0.00%	0.00%	0.00%
Active	24.5%	20.9%	-3.5%	3,300	2,500	-800	-	-	-	3,300	2,500	-800	0.67%	0.60%	-0.07%	0.16%	0.13%	-0.04%	-0.02%	-0.01%
Hedged	20.5%	22.7%	2.2%	7,800	8,300	500	4,700	3,500	-1,200	12,500	11,800	-700	3.03%	2.62%	-0.41%	0.62%	0.59%	-0.03%	0.07%	-0.09%
Private	15.4%	14.8%	-0.5%	4,400	4,600	200	1,300	1,400	100	5,700	6,200	500	1.84%	2.11%	0.26%	0.28%	0.31%	0.03%	-0.01%	0.04%
<b>Total Plan</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>	<b>16,100</b>	<b>16,250</b>	<b>150</b>	<b>6,000</b>	<b>4,900</b>	<b>-1,100</b>	<b>22,200</b>	<b>21,250</b>	<b>-950</b>	<b>1.10%</b>	<b>1.07%</b>	<b>-0.03%</b>	<b>1.10%</b>	<b>1.07%</b>	<b>-0.03%</b>	<b>0.04%</b>	<b>-0.07%</b>

Table 11

Pension Year-over-Year Comparison of Other Costs

	Staff Salary and Benefits (\$000's)	Consultants (\$000's)	Custodian (\$000's)	Other Vendors (\$000's)	Total Other Costs (\$000's)	Other Costs Fee Ratio
2015	570	480	290	210	1,550	0.08%
2016	600	430	360	170	1,560	0.08%
Change	30	-50	70	-40	10	0.00%

Table 12

Health Care Year-over-Year Comparison by Asset Class and Management Type

Asset Class	Average Weight			Management Fees			Incentive Fees			Management and Incentive Fees			Fee Ratio			Contrib to Total Plan Fee Ratio			YoY Attribution	
	2015	2016	Change	2015 (\$000's)	2016 (\$000's)	Change (\$000's)	2015 (\$000's)	2016 (\$000's)	Change (\$000's)	2015 (\$000's)	2016 (\$000's)	Change (\$000's)	2015	2016	Change	2015	2016	Change	Due to Weight	Due to Fee Ratio
Global Equity	44.4%	40.5%	-3.8%	188	310	122	-	-	-	188	310	122	0.36%	0.45%	0.09%	0.16%	0.18%	0.02%	-0.01%	0.04%
Passive	27.6%	24.5%	-3.1%	15	21	6	-	-	-	15	21	6	0.05%	0.05%	0.01%	0.01%	0.01%	0.00%	0.00%	0.00%
Active	16.7%	16.0%	-0.8%	173	288	115	-	-	-	173	288	115	0.88%	1.07%	0.19%	0.15%	0.17%	0.02%	-0.01%	0.03%
Global Fixed Income	26.4%	28.2%	1.8%	11	18	7	-	-	-	11	18	7	0.04%	0.04%	0.00%	0.01%	0.01%	0.00%	0.00%	0.00%
Passive	26.4%	28.2%	1.8%	11	18	7	-	-	-	11	18	7	0.04%	0.04%	0.00%	0.01%	0.01%	0.00%	0.00%	0.00%
Real Assets	16.5%	20.1%	3.7%	70	206	136	-	44	44	70	251	181	0.36%	0.74%	0.38%	0.06%	0.15%	0.09%	0.01%	0.08%
Passive	5.2%	9.0%	3.8%	5	11	6	-	-	-	5	11	6	0.08%	0.08%	-0.01%	0.00%	0.01%	0.00%	0.00%	0.00%
Active	9.5%	4.3%	-5.2%	42	28	-14	-	-	-	42	28	-14	0.38%	0.40%	0.02%	0.04%	0.02%	-0.02%	-0.02%	0.00%
Hedged	0.0%	1.7%	1.7%	-	77	77	-	44	44	-	121	121	0.00%	4.14%	4.14%	0.00%	0.07%	0.07%	0.00%	0.07%
Private	1.7%	5.1%	3.4%	23	89	66	-	-	-	23	90	67	1.13%	1.05%	-0.08%	0.02%	0.05%	0.03%	0.04%	0.00%
Cash	12.8%	11.1%	-1.7%	15	21	6	-	-	-	15	21	6	0.10%	0.11%	0.01%	0.01%	0.01%	0.00%	0.00%	0.00%
Passive	12.8%	11.1%	-1.7%	15	21	6	-	-	-	15	21	6	0.10%	0.11%	0.01%	0.01%	0.01%	0.00%	0.00%	0.00%
Total Plan	100.0%	100.0%	0.0%	284	555	271	-	44	44	284	600	316	0.24%	0.36%	0.11%	0.24%	0.36%	0.11%	0.00%	0.12%

Table 13

Health Care Year-over-Year Comparison by Management Type

Type	Average Weight			Management Fees			Incentive Fees			Management and Incentive Fees			Fee Ratio			Contrib to Total Plan Fee Ratio			YoY Attribution	
	2015	2016	Change	2015 (\$000's)	2016 (\$000's)	Change (\$000's)	2015 (\$000's)	2016 (\$000's)	Change (\$000's)	2015 (\$000's)	2016 (\$000's)	Change (\$000's)	2015	2016	Change	2015	2016	Change	Due to Weight	Due to Fee Ratio
Passive	72.0%	72.9%	0.8%	46	71	25	-	-	-	46	71	25	0.05%	0.06%	0.00%	0.04%	0.04%	0.00%	0.00%	0.00%
Active	26.2%	20.2%	-6.0%	215	317	102	-	-	-	215	317	102	0.70%	0.93%	0.23%	0.18%	0.19%	0.01%	-0.04%	0.05%
Hedged	0.0%	1.7%	1.7%	-	77	77	-	44	44	-	121	121	0.00%	4.17%	4.17%	0.00%	0.07%	0.07%	0.00%	0.07%
Private	1.7%	5.1%	3.3%	23	89	66	-	-	-	23	90	67	1.13%	1.06%	-0.07%	0.02%	0.05%	0.03%	0.04%	0.00%
<b>Total Plan</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>	<b>284</b>	<b>555</b>	<b>271</b>	<b>-</b>	<b>44</b>	<b>44</b>	<b>284</b>	<b>600</b>	<b>316</b>	<b>0.24%</b>	<b>0.36%</b>	<b>0.11%</b>	<b>0.24%</b>	<b>0.36%</b>	<b>0.11%</b>	<b>0.00%</b>	<b>0.12%</b>

Table 14

Health Care Year-over-Year Comparison of Other Costs

	Staff Salary and Benefits (\$000's)	Consultants (\$000's)	Custodian (\$000's)	Other Vendors (\$000's)	Total Other Costs (\$000's)	Other Costs Fee Ratio
2015	33	21	70	11	135	0.12%
2016	51	26	117	15	209	0.12%
Change	18	5	47	4	74	0.01%

## Analysis of Pension Year-over-Year Changes by Asset Class

As presented in Table 9, the pension total plan fee ratio decreased by -3 bps from 1.10% in 2015 to 1.07% in 2016.

The largest asset class drivers of the decrease were Global Equity (-12 bps change in contribution) and Absolute Return (-2 bps) which were offset by an increase in Real Assets (+12 bps).

Average asset class weight changes contributed +1 bp to the year-over-year change in total plan fee ratio. The largest asset class weight changes came from a 2.5% decrease in Global Equity (-3 bps attribution due to weight), a 2.4% increase in Cash (no impact), and a 1.7% increase in Absolute Return (+5 bps).

Changes in fee ratios contributed -4 bps to the year-over-year change in total plan fee ratio. Global Equity (-9 bps attribution due to fee ratio) and Absolute Return (-8 bps) were the largest negatives, partially offset by an increase in Real Assets (+12 bps).

A summary of the key drivers in year-over-year changes to pension fee ratios from 2015 to 2016 for each asset class is below along with comparisons of performance net of fees.

The **Global Equity** fee ratio declined from 0.34% in 2015 to 0.23% in 2016 due to lower incentive fees to hedged long/short equity managers and lower weight in active managers. The Marketable Alternative Equity composite return declined from 3.3% in 2015 to 0.7% in 2016 leading to lower incentive fees and bringing the fee ratio for hedged Global Equity managers down from 3.43% in 2015 to 2.15% in 2016. Additionally, the active manager weight declined by 4.3% from 2015 to 2016. Global Equity asset class performance improved from -1.7% in 2015 to 6.1% in 2016.

**Private Equity** saw a slight increase from 2.34% in 2015 to 2.60% in 2016 as fees remained the same in dollar terms but average weight declined from 4.2% in 2015 to 3.6% in 2016. The performance of Private Equity declined on a time-weighted return basis from 7.6% in 2015 to 5.3% in 2016.

**Global Fixed Income** increased modestly from 0.48% in 2015 to 0.53% in 2016. The fee ratio for hedged Global Fixed Income strategies increased from 1.93% in 2015 to 2.81% in 2016, but was offset by a 1.3% reduction in average weight. The performance of Global Fixed Income improved from -0.1% in 2015 to 2.8% in 2016.

**Private Debt** declined from 1.29% in 2015 to 1.12% in 2016. The performance of Private Debt declined on a time-weighted basis from 2.7% in 2015 to 1.4% in 2016.

**Real Assets** increased from 0.63% in 2015 to 1.14% in 2016 due to a combination of an initiation of hedged Real Assets strategies that had a fee ratio of 4.18% and a spike in management and incentive fees for private funds. Two new private Real Assets funds began calling capital in 2016. The performance of Real Assets improved significantly from -12.8% in 2015 to 13.9% in 2016.

**Absolute Return** had a notable decline from 3.18% in 2015 to 2.56% in 2016 due in large part to negotiating more favorable and better aligned fee agreements with existing and newly hired managers. The performance of Absolute Return declined slightly from 1.8% in 2015 to 1.5% in 2016.

The **GTAA/Oppportunistic** asset class remained unfunded and **Cash** was roughly flat year over year.

## Analysis of Pension Year-over-Year Changes by Management Type and Other Costs

As shown in the Table 10 contribution to total plan fee ratio change column, the largest drivers of the -3 bps total plan fee ratio decline from fund management types were Active (-4 bps change in contribution) and Hedged (-3 bps), which were partially offset by an increase in Private (+3 bps).

Weight changes increased the total plan fee ratio by +4 bps with the largest contributor the 2.2% increase to hedged strategies (+7 bps attribution due to weight) which was offset by a 3.5% decline in active strategies (-2 bps) and 0.5% decline in private strategies (-1 bp).

Changes to fee ratios decreased the total plan fee ratio by -7 bps with the largest contributor coming from hedged strategies which saw its fee ratio decline from 3.03% in 2015 to 2.62% in 2016 (-9 bps attribution due to fee ratio).

As displayed in Table 11, **Other Costs** were flat at 0.08% with the largest change a \$70,000 increase in custodian expenses. State Street began providing performance, risk, and compliance services in the middle of 2015 and 2016 represents the first full year of these services.



## Analysis of Health Care Year-over-Year Changes by Asset Class

As seen in table 12, the health care total plan fee ratio increased by +12 bps from 0.24% in 2015 to 0.36% in 2016. The largest drivers of the increase were Real Assets (+9 bps contribution) and Global Equity (+2 bps).

The **Real Assets** fee ratio increased from 0.36% in 2015 to 0.74% in 2016 primarily from initiating 1.7% of average plan assets in hedged Real Assets strategies that had a fee ratio of 4.14%.

**Global Equity** increased from 0.36% in 2015 to 0.45% in 2016 as the fee ratio for active strategies increased from 0.88% in 2015 to 1.07% in 2016.

## Analysis of Health Care Year-over-Year Changes by Management Type and Other Costs

As shown in the Table 13 YoY attribution, all +12 bps of the total plan change were due to changes in fee ratios with no net change due to weight. Fee ratio changes in hedged strategies were the largest contributor (+7 bps attribution due to fee ratio) followed by active strategies (+5 bps). A 6.0% decline in average weight for active strategies (-4 bps attribution due to weight) was offset by the 3.3% increase in private strategies (+4 bps).

As displayed in Table 14, **Other Costs** were flat at 0.12%. State Street began providing performance, risk, and compliance services in the middle of 2015 and 2016 represents the first full year of these services.