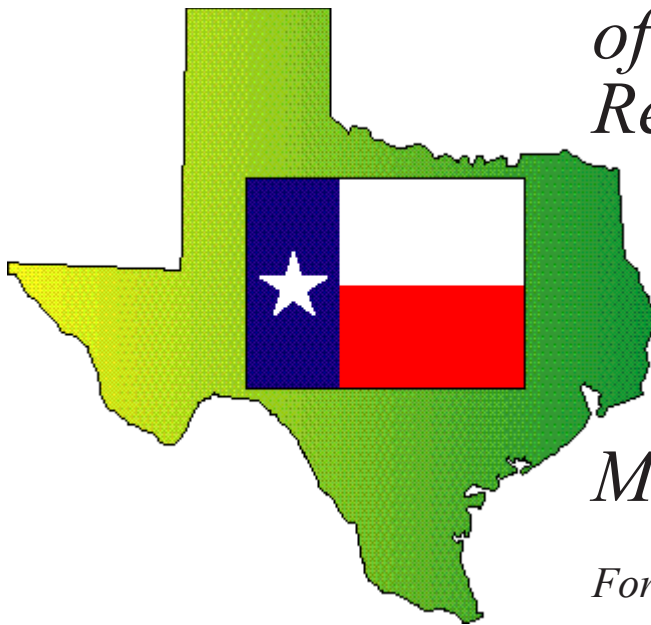


# TEXPERS

## Report on the Asset Allocation and Investment Performance of Texas Public Employee Retirement Systems

.....



*The Texas Association  
of Public Employee  
Retirement Systems*

*March 2016*

*For Periods Ending September 30, 2015*



# Table of Contents

**KEY FINDINGS** ..... 3

**INTRODUCTION**..... 4

**TEXPERS COMPOSITE** ..... 5

    ASSET ALLOCATION..... 5

    INVESTMENT PERFORMANCE..... 6

    ACTUARIALLY REQUIRED CONTRIBUTION (ARC) ..... 6

**INDIVIDUAL PENSION SYSTEMS**..... 7

    ASSET ALLOCATION..... 7

    INVESTMENT PERFORMANCE..... 12

    FIVE YEAR RETURN VERSUS STANDARD DEVIATION ..... 13

    TEN YEAR RETURN VERSUS STANDARD DEVIATION ..... 14

    FIFTEEN YEAR RETURN VERSUS STANDARD DEVIATION ..... 15

    TWENTY YEAR RETURN VERSUS STANDARD DEVIATION ..... 16

**APPENDIX 1** ..... 17

    ASSET ALLOCATION AND INVESTMENT PERFORMANCE STUDY OF TEXPERS MEMBERS . 17

**APPENDIX 2** ..... 23

LIST OF TEXPERS SURVEY RESPONDENTS ..... 23

**APPENDIX 3** ..... 24

    RESPONDENT FUND NUMBER - NAME CROSS REFERENCE ..... 24

**APPENDIX 4** ..... 25

    RESPONDENT FUND NUMBER - RETURN ASSUMPTIONS ..... 25

TEXPERS®  
1225 North Loop West, Suite 909  
Houston, Texas 77008  
Tel: 713/622-8018 - Fax: 713/622-7022 | e-mail: [texpers@texpers.org](mailto:texpers@texpers.org)  
All rights reserved. The text of this report, or any part, may not be reproduced without written permission from the Texas Association of Public Employee Retirement Systems (TEXPERS®).  
©2016, TEXPERS® and Commonfund Institute

*Prepared by:*  
**Commonfund Institute**

# Key Findings

---

Fifty-six participating members contributed data for the fiscal year 2015 Commonfund Benchmarks Study® Report on the Asset Allocation and Investment Performance of Texas Public Employee Retirement Systems, and represented approximately \$50.4 billion in total assets.

Ninety-one percent of members that contributed data this year also participated in last year's Study, lending to the integrity of the data.

- Participating TEXPERS members' FY2015 dollar-weighted asset allocation (for the fiscal year ending September 30, 2015) was: alternative strategies, 31 percent; domestic equities, 26 percent; fixed income, 22 percent; international equities, 19; and short-term securities/cash/other, 2 percent.
- When measuring investment performance for survey respondents as a group over the 20-year period ending September 30, 2015 the respondents' composite investment return was 6.45%, compared to the average actuarial investment return assumption of 7.6%.
- For the trailing 15-year period ending September 30, 2015 survey respondents' 5.15% return moderately underperformed the 5.86% return for the Wilshire Median Public Fund for the same period.
- For the trailing 10-years ending September 30, 2014 survey respondents' 5.68% return moderately underperformed the 6.06% return for the Wilshire Median Public Fund for the same period.
- Among all TEXPERS members, the average trailing five-year return was 6.95%, while the average trailing three-year return was 6.23%, both down year over year.

# Introduction

---

This report reviews the asset allocation and investment performance for local pension systems that are members of the Texas Association of Public Employee Retirement Systems (TEXPERS) for the trailing one-, three-, five-, 10-, 15- and 20-year periods ending September 30, 2015. Both the aggregate TEXPERS and individual systems' asset allocation as well as investment performance will be examined.

The purpose of this report is to document TEXPERS member systems' diversification with respect to the types of assets invested in, and the investment performance of these systems with respect to their actuarially assumed returns, market benchmarks and other public funds. This will demonstrate that local systems are being managed in compliance with the "prudent expert" rule, which requires that fiduciaries of the system exercise their duties with the care, skill, prudence and diligence under the prevailing circumstances that a prudent person acting in a like capacity and familiar with matters of the type would use in the conduct of an enterprise with a like character and like aims.

Individual pension system data in this report was obtained from a December 2015 survey requesting asset allocation and investment return information from TEXPERS members. A total of seventy-four surveys were sent to TEXPERS members. Fifty-six surveys were completed and returned, a seventy-six percent response rate. While the overall average was skewed downward slightly by some newcomers, essentially ninety-one percent of last year's universe was captured in this year's Study. The member systems responding represent approximately \$50.4 billion in total assets. A copy of the survey is contained in Appendix 1 and a listing of TEXPERS members responding to the survey is contained in Appendix 2. Respondents that agreed to have their name disclosed in this report are listed in Appendix 3. A listing of actuarial return and inflation assumptions is in Appendix 4.

This year, we continue our partnership with Commonfund Institute, whose mission aligns with TEXPERS' primary objectives involving education and research. We believe that this partnership is of great benefit to the TEXPERS community. Commonfund Institute houses the education and research activities of Commonfund and provides the entire community of long-term investors with investment information and professional development programs. Commonfund Institute is dedicated to the advancement of investment knowledge and the promotion of best practices in financial management.

Thanks to Wilshire Compass<sup>SM</sup> for providing the market return and peer group comparison data.

# TEXPERS Composite

## Asset Allocation

Figure 1 illustrates the average dollar-weighted\* asset allocation of survey respondents as a composite group. The Domestic and International Equity asset classes include investments such as U.S. and Non-U.S. common stocks. Fixed Income includes investments such as government and corporate bonds from domestic and international issuers. Alternative Strategies includes private equity, private equity real estate, venture capital, marketable alternative strategies and energy and natural resources.

Figure 1

Market Value \$50.4 Billion

As of September 30, 2015

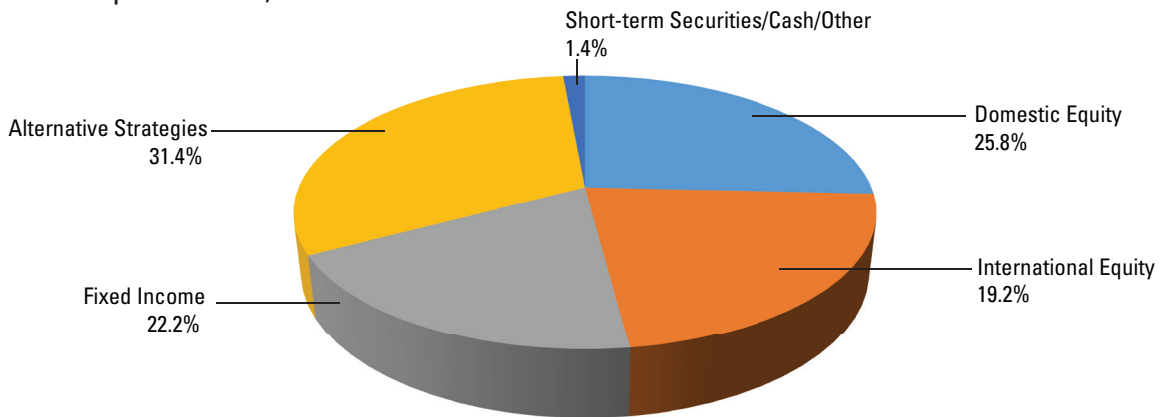
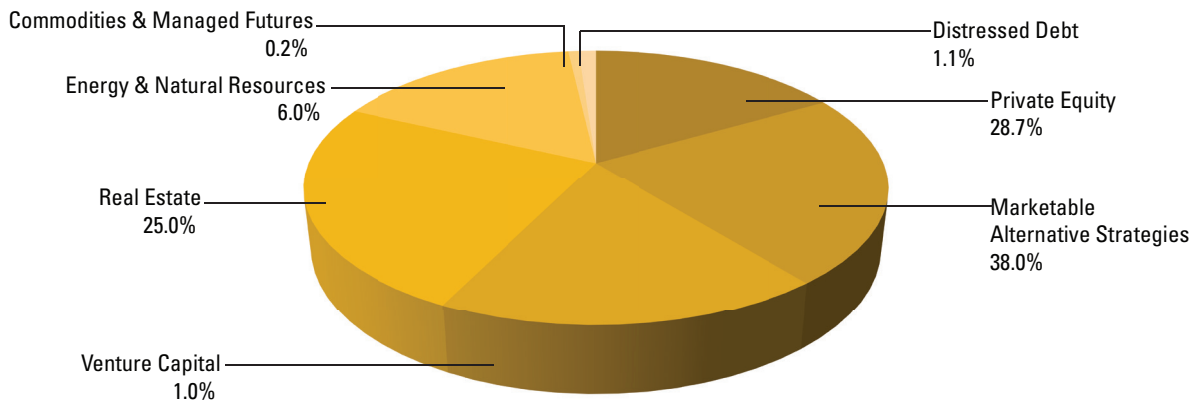


Figure 2

Alternative Strategies Breakout



The asset allocation demonstrates that, in aggregate, the respondents have a level of diversification within the norm for public pension systems.

*\*What is "dollar-weighted"?*

*Dollar-weighted means that individual responses are weighted according to size of asset base when calculating average results—meaning that responses from large participants have a greater impact on average results than those of smaller participants. By contrast, when overall results are calculated on an "equal-weighted" basis, each response has an equal impact on the average, regardless of the size of the respondent.*

## Investment Performance

### Trailing Period Returns - Table

Table 1

Annualized Returns for the Periods Ending 9/30/2015	One Year	Three Years	Five Years	Ten Years	Fifteen Years	Twenty Years
TEXPERS Average	-2.6	6.2	7.0	5.7	5.2	6.5
Actuarial Assumption*	7.6	7.6	7.6	7.6	7.6	7.6

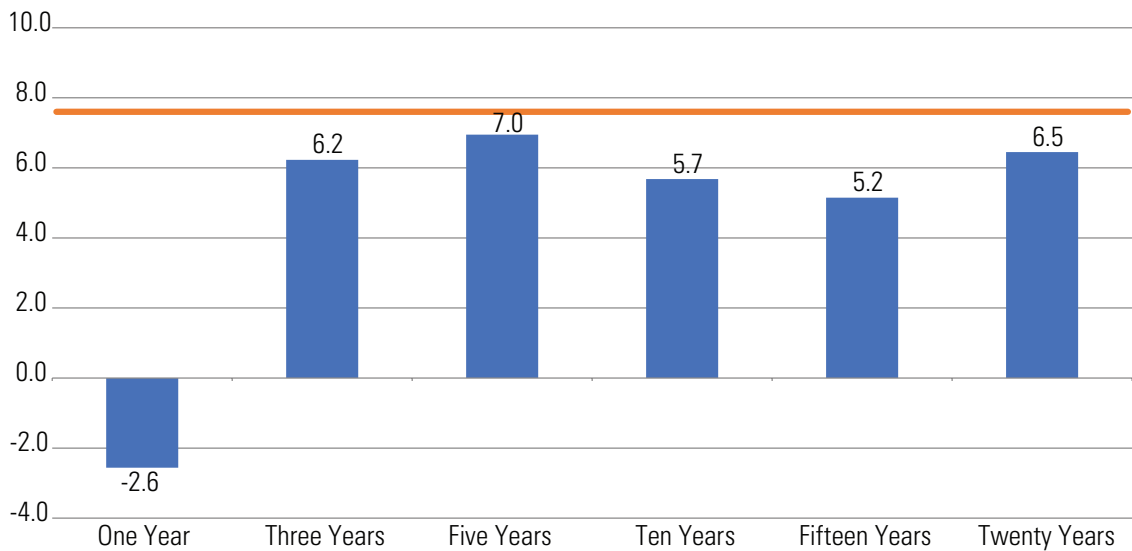
Table 1 and Figure 3 compare the survey respondents' average investment return over the one-, three-, five-, 10-, 15- and 20-year periods ending September 30, 2015 to their average actuarial investment return assumption of 7.6%. Given several extraordinarily difficult market environments over the 20-year period, the average annual return of 6.45% compares to the actuarial return assumption of 7.6%.

### Trailing Period Returns - Chart

Figure 3

#### Returns vs. Average Actuarial Assumption\*

For periods ending September 30, 2015



\*This year's actuarial assumption of 7.6% is the average of what was reported among participating TEXPERS members.

## Actuarially Required Contribution (ARC)

Table 2

In a new line of questioning for this year's Study, TEXPERS members were asked if their funds received their full actuarially required contribution for fiscal year 2015

Period Ending 9/30/2015	Yes	No	Uncertain
Number Responded	36	13	6
Percentage	64	23	11

# Individual Pension Systems

## Asset Allocation

Table 3 details the percentage allocation to the major asset classes by each survey respondent.

Table 3

	1	2	3	4	5	6	7	8	10	11	12
Domestic Equity	26.73	34.05	32.81	35.80	36.70	38.60	37.74	12.74	40.62	26.90	30.09
Fixed Income	35.49	21.90	28.80	35.30	27.00	21.30	35.81	13.72	34.97	9.10	30.95
International Equity	21.02	28.21	18.99	28.83	13.20	19.10	26.37	7.46	24.10	22.50	21.70
Alternative Strategies	16.47	6.75	18.68	0.00	17.50	20.50	0.00	62.85	0.00	46.50	16.33
Private equity	4.51	0.00	5.12	0.00	0.00	0.00	0.00	17.17	0.00	7.85	4.39
Marketable alternative strategies	5.90	4.79	0.00	0.00	10.20	16.70	0.00	13.53	0.00	31.20	7.84
Venture capital	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00
Private equity real estate	0.74	0.00	10.07	0.00	3.50	0.00	0.00	17.27	0.00	3.60	4.10
Energy & natural resources	0.00	1.96	3.49	0.00	3.80	3.80	0.00	14.88	0.00	2.60	0.00
Commodities & managed futures	5.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Distressed debt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives not broken out	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Short-term Securities/Cash/Other	0.29	9.09	0.72	0.07	5.60	0.50	0.08	3.23	0.31	-5.00	0.93
Short-term securities/cash	0.29	0.22	0.72	0.07	5.60	0.50	0.08	3.23	0.31	-3.90	0.93
Other	0.00	8.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.10	0.00
Short-term securities/cash/other not broken out	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

# Individual Pension Systems

## Asset Allocation

Table 3 - continued

	14	15	16	17	19	20	22	23	24	25	26
Domestic Equity	66.67	35.30	38.57	36.01	36.77	47.00	49.00	18.37	38.80	29.00	45.30
Fixed Income	29.93	12.20	11.28	26.94	26.37	37.80	33.70	20.43	20.40	25.00	29.40
International Equity	0.00	14.00	23.19	22.94	22.75	15.20	12.50	14.36	20.30	23.00	13.30
Alternative Strategies	0.00	36.50	26.76	12.73	12.63	0.00	0.00	45.02	20.50	23.00	11.40
Private equity	0.00	6.60	6.60	0.00	0.00	0.00	0.00	8.99	0.00	0.00	0.40
Marketable alternative strategies	0.00	10.10	5.62	9.90	9.73	0.00	0.00	20.66	9.50	9.00	5.10
Venture capital	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.24	0.00	4.00	0.00
Private equity real estate	0.00	14.40	12.19	0.00	0.00	0.00	0.00	11.32	0.00	5.00	5.90
Energy & natural resources	0.00	5.40	2.35	2.83	2.90	0.00	0.00	0.00	6.80	2.00	0.00
Commodities & managed futures	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	4.20	0.00	0.00
Distressed debt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00
Alternatives not broken out	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Short-term Securities/Cash/Other</b>	<b>3.40</b>	<b>2.00</b>	<b>0.20</b>	<b>1.38</b>	<b>1.48</b>	<b>0.00</b>	<b>4.80</b>	<b>1.82</b>	<b>0.00</b>	<b>0.00</b>	<b>0.60</b>
Short-term securities/cash	0.00	2.00	0.20	1.38	1.48	0.00	4.80	1.82	0.00	0.00	0.60
Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Short-term securities/cash/other not broken out	3.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



# Individual Pension Systems

## Asset Allocation

Table 3 - continued

	27	28	29	30	31	32	33	34	36	37	38
Domestic Equity	41.72	33.24	42.60	36.11	30.12	38.28	43.78	40.27	59.00	36.19	18.20
Fixed Income	34.22	33.49	29.50	27.00	30.61	24.69	20.26	41.03	34.00	26.64	23.10
Non-Domestic Equity	23.94	22.22	13.90	23.13	28.88	25.26	15.60	7.40	6.00	22.69	18.20
Alternative Strategies	0.00	10.17	13.20	12.91	10.28	11.77	19.85	10.44	0.00	13.03	40.00
Private equity	0.00	0.00	4.50	0.00	3.94	0.00	0.00	0.00	0.00	0.00	5.00
Marketable alternative strategies	0.00	7.62	0.00	9.92	0.00	0.00	14.70	0.00	0.00	10.24	14.50
Venture capital	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Private equity real estate	0.00	0.00	8.70	0.00	6.34	11.77	5.15	10.44	0.00	0.00	9.90
Energy & natural resources	0.00	2.55	0.00	2.99	0.00	0.00	0.00	0.00	0.00	2.79	4.80
Commodities & managed futures	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Distressed debt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.80
Alternatives not broken out	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Short-term Securities/Cash/Other</b>	<b>0.12</b>	<b>0.88</b>	<b>0.80</b>	<b>0.85</b>	<b>0.11</b>	<b>0.00</b>	<b>0.51</b>	<b>0.86</b>	<b>1.00</b>	<b>1.45</b>	<b>0.50</b>
Short-term securities/cash	0.12	0.88	0.80	0.85	0.11	0.00	0.51	0.86	1.00	1.45	0.50
Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Short-term securities/cash/other not broken out	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

# Individual Pension Systems

## Asset Allocation

Table 3 - continued

	39	41	42	43	44	45	47	48	49	50	51
Domestic Equity	42.40	48.70	49.30	44.55	36.80	12.74	13.20	44.00	47.40	36.58	34.98
Fixed Income	26.40	33.20	21.30	24.23	26.06	13.72	17.50	30.00	34.90	26.52	27.09
International Equity	26.80	13.90	5.50	12.87	22.94	7.46	13.30	20.00	11.14	22.62	24.19
Alternative Strategies	4.40	0.00	23.80	17.54	12.49	62.85	45.20	4.00	4.88	12.59	13.52
Private equity	0.00	0.00	0.00	6.25	0.00	17.17	18.50	0.00	0.00	0.00	0.00
Marketable alternative strategies	0.00	0.00	7.70	0.00	9.69	13.53	9.20	0.00	0.00	9.74	10.30
Venture capital	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Private equity real estate	0.00	0.00	15.50	5.41	0.00	17.27	11.70	0.00	0.00	0.00	0.00
Energy & natural resources	4.40	0.00	0.00	0.00	2.80	14.88	5.80	4.00	0.00	2.85	3.22
Commodities & managed futures	0.00	0.00	0.00	5.88	0.00	0.00	0.00	0.00	4.88	0.00	0.00
Distressed debt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives not broken out	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Short-term Securities/Cash/Other</b>	<b>0.00</b>	<b>4.20</b>	<b>0.10</b>	<b>0.81</b>	<b>1.71</b>	<b>3.23</b>	<b>10.80</b>	<b>2.00</b>	<b>1.68</b>	<b>1.69</b>	<b>0.22</b>
Short-term securities/cash	0.00	4.20	0.10	0.81	1.71	3.23	1.20	2.00	1.68	1.69	0.22
Other	0.00	0.00	0.00	0.00	0.00	0.00	9.60	0.00	0.00	0.00	0.00
Short-term securities/cash/other not broken out	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

# Individual Pension Systems

## Asset Allocation

Table 3 - continued

	56	57	58	59	61	62	63	64	66	70	73	77
Domestic Equity	37.38	41.04	36.58	43.10	36.01	52.00	38.10	59.46	23.00	52.22	35.00	66.00
Fixed Income	30.64	31.89	26.64	40.94	35.16	34.00	31.80	27.75	24.00	22.74	42.00	24.00
International Equity	23.89	13.37	22.89	15.96	23.80	12.00	13.80	12.79	22.00	14.13	11.00	7.00
Alternative Strategies	7.79	9.24	12.58	0.00	4.99	1.00	15.70	0.00	30.00	6.72	6.00	0.00
Private equity	0.92	0.59	0.00	0.00	0.00	0.00	0.00	0.00	11.00	0.00	0.00	0.00
Marketable alternative strategies	6.27	8.65	9.76	0.00	0.00	1.00	10.30	0.00	12.00	0.00	0.00	0.00
Venture capital	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.72	0.00	0.00
Private equity real estate	0.60	0.00	0.00	0.00	0.00	0.00	5.40	0.00	7.00	0.00	0.00	0.00
Energy & natural resources	0.00	0.00	2.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.00
Commodities & managed futures	0.00	0.00	0.00	0.00	4.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Distressed debt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives not broken out	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Short-term Securities/Cash/Other	0.30	4.46	1.31	0.00	0.04	1.00	0.60	0.00	1.00	4.19	6.00	3.00
Short-term securities/cash	0.30	4.46	1.31	0.00	0.00	1.00	0.60	0.00	1.00	4.19	6.00	3.00
Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Short-term securities/cash/other not broken out	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00

## Investment Performance

Table 4 lists investment returns for survey respondents over the one-, three-, five-, 10-, 15- and 20-year periods ending September 30, 2015. For comparison purposes the benchmark of 60% of the Wilshire 5000 equity index and 40% of the Barclays Capital Aggregate fixed income index is represented by the “Index”.

Table 4

Fund	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
1	-0.74%	5.48%	5.66%	4.22%	N/A	N/A
2	-2.83%	6.07%	7.10%	5.92%	5.16%	6.90%
3	-2.02%	7.23%	7.83%	6.13%	5.69%	6.81%
4	-3.01%	6.40%	6.91%	5.70%	4.83%	6.40%
5	-4.58%	N/A	N/A	N/A	N/A	N/A
6	0.05%	10.09%	10.22%	9.14%	6.68%	N/A
7	-3.89%	5.13%	6.02%	5.49%	4.08%	3.05%
8	-8.44%	3.05%	3.96%	5.06%	4.90%	6.81%
10	-2.55%	6.67%	7.59%	6.20%	4.27%	N/A
11	N/A	N/A	N/A	N/A	N/A	N/A
12	-8.74%	2.66%	4.39%	3.88%	2.54%	5.11%
14	N/A	N/A	N/A	N/A	N/A	N/A
15	3.10%	4.38%	5.97%	3.83%	4.62%	6.11%
16	-4.93%	7.63%	8.00%	6.09%	5.06%	N/A
17	-3.52%	5.94%	7.02%	N/A	N/A	N/A
19	-3.62%	6.05%	7.17%	N/A	N/A	N/A
20	0.66%	7.72%	8.16%	6.41%	5.82%	6.84%
22	-4.41%	5.59%	7.24%	5.25%	4.69%	6.41%
23	-0.77%	6.20%	6.67%	4.98%	4.89%	6.41%
24	-2.28%	6.70%	7.12%	5.98%	5.04%	N/A
25	0.10%	7.83%	7.71%	5.70%	5.46%	7.12%
26	-2.99%	4.34%	5.59%	4.69%	N/A	N/A
27	-2.68%	6.56%	6.93%	6.27%	N/A	N/A
28	-3.08%	5.89%	6.94%	3.78%	N/A	N/A
29	N/A	N/A	N/A	N/A	N/A	N/A
30	-3.65%	6.14%	7.19%	N/A	N/A	N/A
31	-0.92%	7.12%	6.89%	7.02%	6.85%	7.72%
32	1.86%	8.84%	9.23%	5.71%	5.50%	6.89%
33	-4.79%	N/A	N/A	N/A	N/A	N/A
34	0.87%	N/A	N/A	N/A	N/A	N/A
36	0.47%	N/A	N/A	N/A	N/A	N/A
37	-3.53%	6.05%	7.11%	5.63%	4.99%	5.82%
38	-1.73%	5.97%	6.92%	5.06%	4.58%	6.46%
39	-2.85%	N/A	N/A	N/A	N/A	N/A
41	-6.11%	5.14%	7.21%	5.16%	4.63%	6.36%
42	N/A	N/A	N/A	N/A	N/A	N/A
43	-4.62%	4.52%	5.78%	5.70%	4.78%	6.84%
44	-3.48%	6.14%	7.19%	6.20%	6.39%	7.59%
45	-8.44%	3.05%	3.96%	5.06%	4.50%	5.97%
47	-0.56%	7.90%	8.25%	7.35%	6.70%	7.46%
48	-5.13%	N/A	N/A	N/A	N/A	N/A
49	-4.73%	N/A	N/A	N/A	N/A	N/A
50	-3.51%	6.08%	7.10%	6.04%	6.14%	N/A
51	-3.81%	N/A	N/A	N/A	N/A	N/A
56	-2.62%	5.21%	N/A	N/A	N/A	N/A
57	-4.38%	N/A	N/A	N/A	N/A	N/A
58	-1.96%	N/A	N/A	N/A	N/A	N/A
59	-0.79%	7.45%	6.58%	N/A	N/A	N/A
61	-4.82%	N/A	N/A	N/A	N/A	N/A
62	0.97%	8.49%	N/A	N/A	N/A	N/A
63	0.66%	N/A	N/A	N/A	N/A	N/A
64	N/A	N/A	N/A	N/A	N/A	N/A
66	0.59%	6.95%	7.46%	5.90%	N/A	N/A
70	-2.63%	6.74%	6.90%	N/A	N/A	N/A
73	-1.38%	7.29%	8.14%	6.43%	N/A	N/A
77	1.54%	N/A	N/A	N/A	N/A	N/A
Index	1.05%	8.16%	9.24%	6.34%	5.10%	7.48%

# Five Year Return versus Standard Deviation

Figure 4

For the Five Years Ending September 30, 2015



Figure 4 shows the five-year return and standard deviation characteristics of the individual TEXPERS survey respondents versus two benchmarks. The first benchmark defines the four quadrants and is the Wilshire Public Funds Universe, representing the returns of Wilshire’s public fund clients. The second benchmark is a combination of 60% of the Wilshire 5000 equity index and 40% of the Barclays Capital Aggregate fixed income index. Annualized return and standard deviation are based on quarterly returns for the period. Standard deviation is a measure of the dispersion or volatility of the quarterly returns around their average value.

The points representing the performance of the TEXPERS survey respondents are located in all four quadrants of the chart. One respondent is located in the most desirable northwest quadrant, indicating higher returns with less standard deviation than the benchmark. Thirteen respondents are located in the northeast or southwest quadrants, indicating reasonable return versus standard deviation trade-offs. That is, they have either a higher return with a higher standard deviation, or a lower return with a lower standard deviation, than the benchmark. Twenty-two respondents are located in the least desirable southeast quadrant, where return is lower and standard deviation is higher than the benchmark.

# Ten Year Return versus Standard Deviation

Figure 5

For the Ten Years Ending September 30, 2015



Figure 5 shows 10-year return and standard deviation characteristics of individual TEXPERS survey respondents versus two benchmarks. The first benchmark defines the four quadrants and is the Wilshire Public Funds Universe, representing the returns of Wilshire’s public fund clients. The second benchmark is a combination of 60% of the Wilshire 5000 equity index and 40% of the Barclays Capital Aggregate fixed income index. Annualized return and standard deviation are based on quarterly returns for the period. Standard deviation is a measure of the dispersion or volatility of the quarterly returns around their average value.

The points representing the performance of the TEXPERS survey respondents are located in all four quadrants of the chart. Six respondents are located in the most desirable northwest quadrant, indicating higher returns with less standard deviation than the benchmark. Twenty-one respondents are located in the northeast or southwest quadrants, indicating reasonable return versus standard deviation trade-offs. That is, they have either a higher return with a higher standard deviation, or a lower return with a lower standard deviation, than the benchmark. Four respondents are located in the least desirable southeast quadrant, where return is lower and standard deviation is higher than the benchmark.

# Fifteen Year Return versus Standard Deviation

Figure 6

For the Fifteen Years Ending September 30, 2015

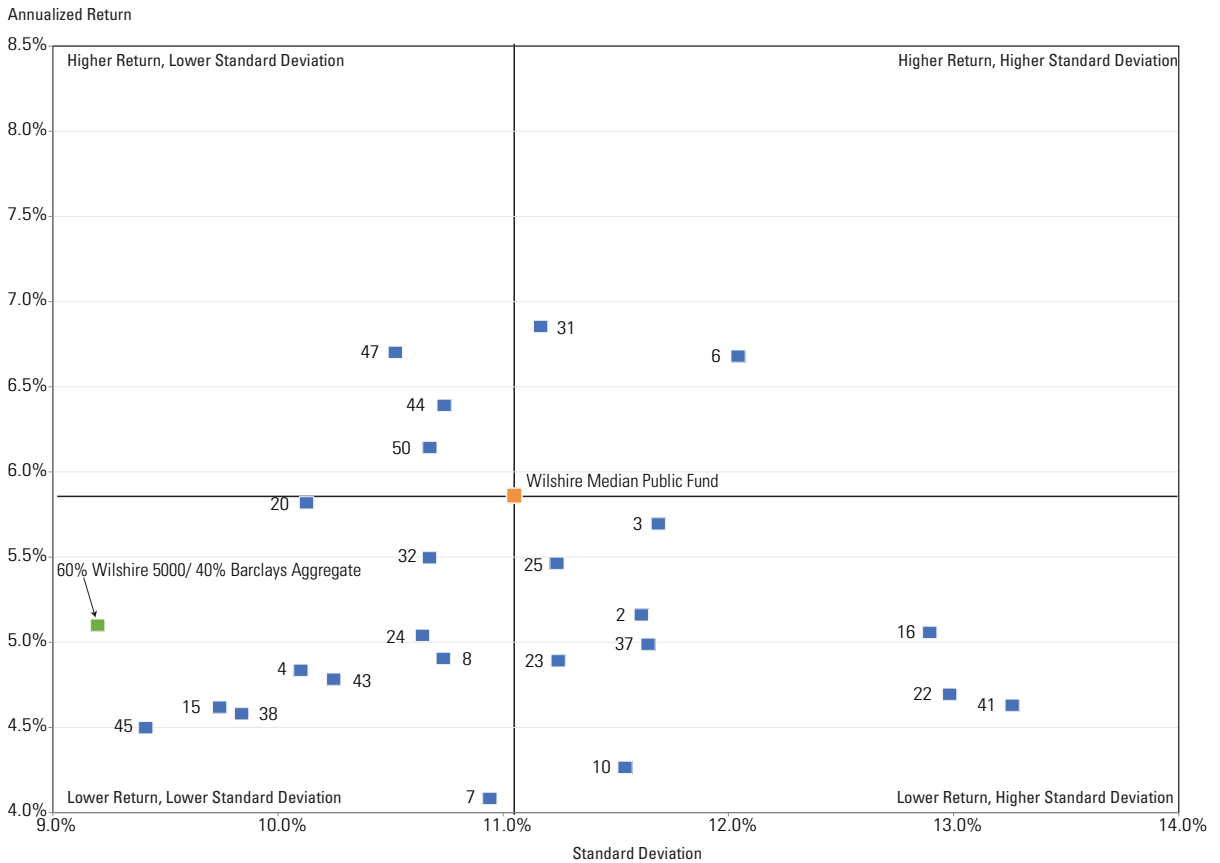


Figure 6 shows 15-year return and standard deviation characteristics of individual TEXPERS survey respondents versus two benchmarks. The first benchmark defines the four quadrants and is the Wilshire Public Funds Universe, representing the returns of Wilshire’s public fund clients. The second benchmark is a combination of 60% of the Wilshire 5000 equity index and 40% of the Barclays Capital Aggregate fixed income index. Annualized return and standard deviation are based on quarterly returns for the period. Standard deviation is a measure of the dispersion or volatility of the quarterly returns around their average value.

The points representing the performance of the TEXPERS survey respondents are located in all four quadrants of the chart. Three respondents are located in the most desirable northwest quadrant, indicating higher returns with less standard deviation than the benchmark. Twelve respondents are located in the northeast or southwest quadrants, indicating reasonable return versus standard deviation trade-offs. That is, they have either a higher return with a higher standard deviation, or a lower return with a lower standard deviation, than the benchmark. Nine respondents are located in the least desirable southeast quadrant, where return is lower and standard deviation is higher than the benchmark.

# Twenty Year Return versus Standard Deviation

Figure 7

## For the Twenty Years Ending September 30, 2015

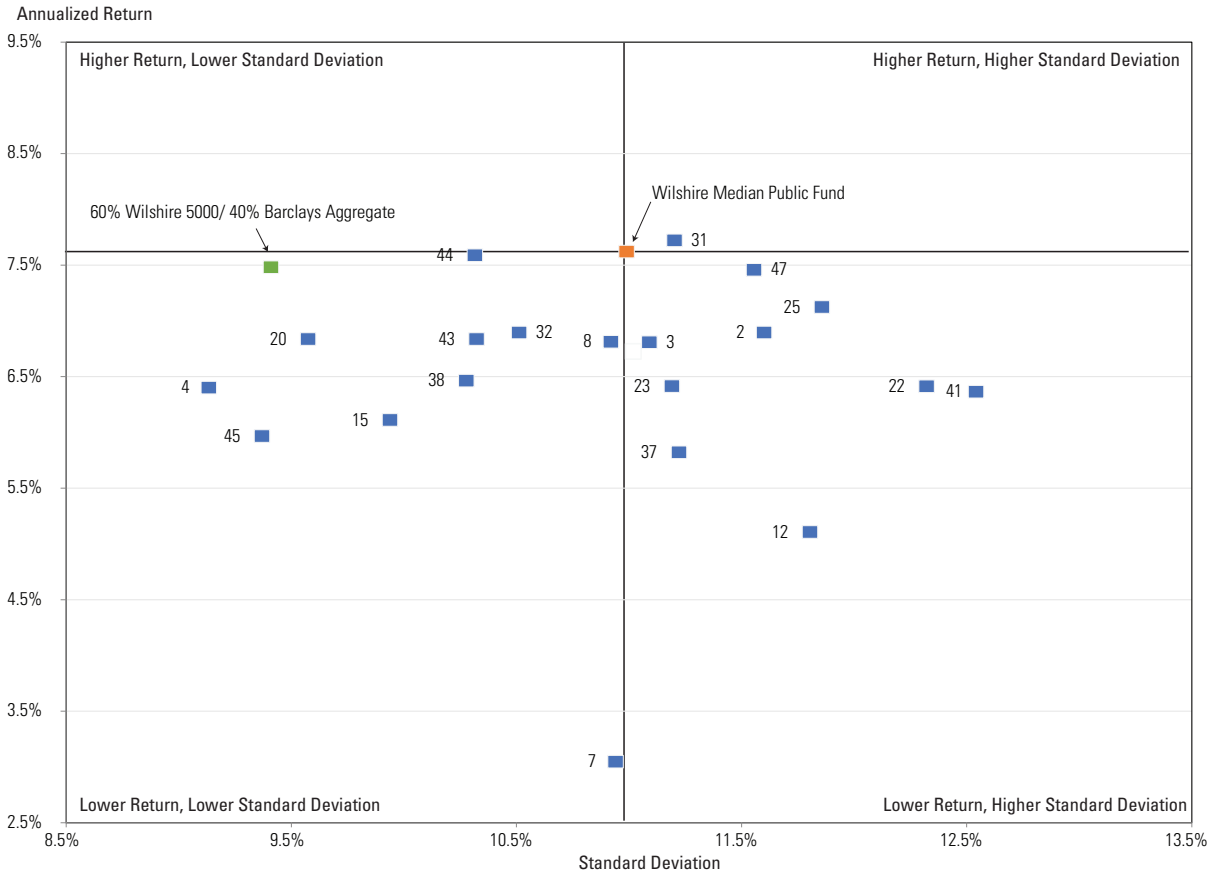


Figure 7 shows 20-year return and standard deviation characteristics of individual TEXPERS survey respondents versus two benchmarks. The first benchmark defines the four quadrants and is the Wilshire Public Funds Universe, representing the returns of Wilshire’s public fund clients. The second benchmark is a combination of 60% of the Wilshire 5000 equity index and 40% of the Barclays Capital Aggregate fixed income index. Annualized return and standard deviation are based on quarterly returns for the period. Standard deviation is a measure of the dispersion or volatility of the quarterly returns around their average value.

The points representing the performance of the TEXPERS survey respondents are located in all four quadrants of the chart. No respondents are located in the most desirable northwest quadrant, indicating higher returns with less standard deviation than the benchmark. Eleven respondents are located in the northeast or southwest quadrants, indicating reasonable return versus standard deviation trade-offs. That is, they have either a higher return with a higher standard deviation, or a lower return with a lower standard deviation, than the benchmark. Nine respondents are located in the least desirable southeast quadrant, where return is lower and standard deviation is higher than the benchmark.



# Appendix 1

## Asset Allocation and Investment Performance Study of TEXPERS Members

(a Commonfund Benchmarks Study®) FISCAL YEAR 2015

October 1, 2014 - September 30, 2015

### FUND FLOWS

#### Total Fund Rates of Return (%)

Please provide returns both GROSS and NET of fees in the appropriate columns. (Net returns being net of all external fees; Gross being the return before all fees.) All returns must be actual quarterly returns and should not be annualized. The returns must include both income and changes in market value; income yields alone are not sufficient. If your fund WAS in last year's report only the four quarters ending September 30, 2015 are required. (Please note that the Dec 31 return is for the quarter ended, NOT the year ended):

Quarter Ended	Gross Returns (%)	Uncertain	Net Return (%)	Uncertain
September 30, 2015				
June 30, 2015				
March 31, 2015				
December 31, 2014				

#### Historical Rates of Return (%)

You've responded that your fund did NOT participate in last year's Study. If your fund was a prior participant, please enter last year's quarterly return data below. If your fund has never previously participated in this Study: Please provide actual (not annualized) GROSS quarterly returns for at least the trailing five years, 10 if possible. *\*December 31, 2014 return already provided above.*

Quarter Ended	Mar. 31	Jun. 30	Sept. 30	Dec. 31
2014				**N/A**
2013				
2012				
2011				
2010				
2009				
2008				
2007				
2006				
2005				

Actuarial Investment Return Assumption (%) \_\_\_\_\_

Inflation Assumption (%) \_\_\_\_\_

**Market Value Data (in Dollars \$)**

---

Please provide the Total Market Value of your Fund as of September 30, 2015. This does not have to be an audited number, custodial market value is sufficient.

Total Fund Value (\$) \_\_\_\_\_

**Actuarial Required Contribution (ARC)**

---

Did your Fund receive its full Actuarially Required Contribution (ARC) for the last fiscal year?

- Yes
- No
- Uncertain

Please provide thoughts or commentary as to why you did not receive your full ARC for the last fiscal year.

---

---

---

---

---

**ASSET ALLOCATION**

What percentage of your total endowment was invested in each of the asset classes listed below at September 30, 2015? As of September 30, 2015, what were your percentage one-year **NET** returns in each asset class?

PLEASE ANSWER FOR EACH OF THE MAJOR ASSET CATEGORIES, INCLUDING THE CORRESPONDING RETURN (ONLY UTILIZE "UNCERTAIN"; WHERE RETURN DATA IS NOT AVAILABLE). PLEASE PROVIDE DETAIL WITHIN EACH ASSET CLASS (AS A PERCENTAGE OF YOUR TOTAL PORTFOLIO), WHERE DATA ARE AVAILABLE.

TOTALS FOR THE FIVE MAJOR ASSET CLASSES MUST SUM TO 100% OF THE TOTAL PORTFOLIO – PORTFOLIO SUMMATION RUNNING TOTAL APPEARS IN THE BOX TO THE LEFT OF YOUR SCREEN.

**Domestic Equities**

---

	Percentage Invested at 9/30/2015	Percentage Return at 9/30/2015	(Return Only) Uncertain
Total Domestic Equities			

## Domestic Equities | Detailed Asset Allocation Breakdown

*Sum total should equal total invested percentage above*

	Percentage Invested at 9/30/2015
Active - Include REITs here	
Index (Passive/Enhanced)	
Multi-Strategy Equity Fund	

## Fixed Income

	Percentage Invested at 9/30/2015	Percentage Return at 9/30/2015	(Return Only) Uncertain
Total Fixed Income			

## Fixed Income | Detailed Asset Allocation Breakdown

*Sum total should equal total invested percentage above*

	Percentage Invested at 9/30/2015
Domestic (U.S.) Investment Grade (Active) – Include TIPs here	
Domestic (U.S.) Investment Grade (Passive)	
Domestic (U.S.) Non-Investment Grade (Active or Passive)	
International (Non-U.S.) Investment Grade (Active or Passive)	
Emerging Markets (Active or Passive)	
Multi-Strategy Bond Fund	

## International Equities

---

	Percentage Invested at 9/30/2015	Percentage Return at 9/30/2015	(Return Only) Uncertain
Total International Equities			

## International Equities | Detailed Asset Allocation Breakdown

---

*Sum total should equal total invested percentage above*

	Percentage Invested at 9/30/2015
Active MSCI EAFE®	
Passive/Index MSCI EAFE®	
Emerging Markets	

## Alternative Strategies

---

	Percentage Invested at 9/30/2015	Percentage Return at 9/30/2015	(Return Only) Uncertain
Total Alternative Strategies			

## Alternative Strategies | Detailed Asset Allocation Breakdown

*Sum total should equal total invested percentage above. Please also provide corresponding net return.*

	Percentage Invested at 9/30/2015	Percentage Return at 9/30/2015	(Return Only) Uncertain
Private Equity Real Estate – Excludes REITs			
Venture Capital			
Private Equity – LBOs, Mezzanine, M&A Funds, International Private Equity			
Energy and Natural Resources – Includes Oil, Gas, Timber			
Commodities and Managed Futures			
Marketable Alternative Strategies – Include Hedge Funds, Absolute Return, Market Neutral, Long/Short, 130/30 Strategy, Event Driven and Derivatives			
Distressed Debt			

## Cash and Other

	Percentage Invested at 9/30/2015
Total Cash and Other	

## Cash and Other | Detailed Asset Allocation and Return

	Percentage Invested at 9/30/2015	Percentage Return at 9/30/2015	(Return Only) Uncertain
Cash, Money Market Investments, Treasuries – All investments <1 year			
Other – Please Specify			

Thank you in advance for your assistance in this important research. Our goal will be to compile and analyze the data we receive from you and your colleagues and release the results at the TEXPERS 2016 Annual Conference in Dallas, Texas on April 2 - 6, 2016.

OK to identify your Fund by name in the annual performance report?

Yes     No

# Appendix 2

## List of TEXPERS Survey Respondents

Abilene Firemen's Relief and Retirement Fund  
Amarillo Firemen's Relief & Retirement Fund  
Atlanta Firemen's Relief and Retirement Fund  
Austin Employees' Retirement System  
Austin Fire Fighters Relief & Retirement Fund  
Austin Police Retirement System  
Beaumont Firemen's Relief & Retirement Fund  
Retirement Plan for Employees of Brazos River Authority  
Brownwood Firemen's Relief and Retirement Fund  
Capital Metro Retirement Plan for Star Tran  
Corpus Christi Firefighters' Retirement System  
Corsicana Firemen's Relief & Retirement Fund  
CPS Energy Employees' Benefit Trust  
Dallas Employees' Retirement Fund  
Dallas Police and Fire Pension System  
Dallas Police and Fire Supplemental Pension System  
DART Employees' Defined Benefit Retirement Plan & Trust  
El Paso City Employees' Pension Fund  
El Paso Firemen & Policemen's Pension Fund  
Fort Worth Employees' Retirement Fund  
Galveston Firefighters Pension Fund  
Greenville Firemen's Relief and Retirement Fund  
Guadalupe-Blanco River Authority Defined Benefit Plan  
Harlingen Firemen's Relief and Retirement Fund  
Houston Municipal Employees Pension System  
Houston Police Officers' Pension System  
Irving Firemen's Relief & Retirement Fund  
Irving Supplemental Benefit Plan  
Killeen Firefighters' Relief & Retirement Fund  
Laredo Firefighters Retirement System  
Longview Firefighters' Relief & Retirement Fund  
Lubbock Fire Pension Fund  
Lufkin Firemen's Relief & Retirement Fund  
Marshall Firemen's Relief & Retirement Fund  
McAllen Firemen's Relief and Retirement Fund  
MTA of Harris County Non-Union Pension Plan  
MTA of Harris County Workers Union Pension Plan  
Odessa Firefighters' Relief & Retirement Fund  
Orange Firemen's Relief & Retirement Fund  
Paris Firefighters' Relief and Retirement Fund  
Plano Retirement Security Plan  
Port Arthur Firemen's Relief and Retirement Fund  
Port of Houston Authority Restated Retirement Plan  
San Antonio Fire & Police Pension Fund  
Sweetwater Firemen's Relief & Retirement Fund  
Texarkana Firemen's Relief and Retirement Fund  
Texas City Firefighters Relief and Retirement Fund  
Texas Emergency Services Retirement System  
Texas Employees Retirement System  
Travis County ESD#6 Firefighters' Relief & Retirement Fund  
Tyler Firefighters Relief and Retirement Fund  
University Park Firefighters Relief and Retirement Fund  
VIA Metropolitan Transit Retirement Plan  
Waxahachie Firefighter's relief and Retirement  
Weslaco Firemen's Relief & Retirement Fund  
Wichita Falls Firemen's Relief & Retirement Fund

# Appendix 3

## Respondent Fund Number - Name Cross Reference

Number	Name
24	Abilene Firemen's Relief and Retirement Fund
14	Amarillo Firemen's Relief & Retirement Fund
30	Atlanta Firemen's Relief and Retirement Fund
2	Austin Employees' Retirement System
25	Austin Fire Fighters Relief & Retirement Fund
15	Austin Police Retirement System
27	Brownwood Firemen's Relief and Retirement Fund
64	Capital Metro Retirement Plan for Star Tran
20	Corpus Christi Firefighters' Retirement System
7	Corsicana Firemen's Relief & Retirement Fund
8	Dallas Police and Fire Pension System
45	Dallas Police and Fire Supplemental Pension System
34	DART Employees' Defined Benefit Retirement Plan & Trust
3	El Paso City Employees' Pension Fund
31	El Paso Firemen & Policemen's Pension Fund
23	Fort Worth Employees' Retirement Fund
56	Galveston Firefighters Pension Fund
19	Greenville Firemen's Relief and Retirement Fund
5	Guadalupe-Blanco River Authority Defined Benefit Plan
50	Harlingen Firemen's' Relief and Retirement Fund
47	Houston Municipal Employees Pension System
11	Houston Police Officers' Pension System
16	Irving Firemen's Relief & Retirement Fund
1	Irving Supplemental Benefit Plan
57	Killeen Firefighters' Relief & Retirement Fund
6	Laredo Firefighters Retirement System
12	Longview Firefighters' Relief & Retirement Fund
43	Lubbock Fire Pension Fund
28	Lufkin Firemen's Relief & Retirement Fund
17	Marshall Firemen's Relief & Retirement Fund
33	McAllen Firemen's Relief and Retirement Fund
51	Odessa Firefighters' Relief & Retirement Fund
4	Orange Firemen's Relief & Retirement Fund
58	Paris Firefighters' Relief and Retirement Fund
36	Plano Retirement Security Plan
59	Port Arthur Firemen's' Relief and Retirement Fund
73	Port of Houston Authority Restated Retirement Plan
44	Sweetwater Firemen's Relief & Retirement Fund
48	Texarkana Firemen's Relief and Retirement Fund
61	Texas City Firefighters Relief and Retirement Fund
39	Texas Emergency Services Retirement System
66	Texas Employees Retirement System
62	Travis County ESD#6 Firefighters' Relief & Retirement Fund
49	Tyler Firefighters Relief and Retirement Fund
37	University Park Firefighters Relief and Retirement Fund
32	VIA Metropolitan Transit Retirement Plan
10	Waxahachie Firefighter's relief and Retirement
77	Weslaco Firemen's Relief & Retirement Fund
63	Wichita Falls Firemen's Relief & Retirement Fund



# Appendix 4

## Respondent Fund Number - Return Assumptions

Fund	Nominal	Inflation	Real
1	7.00	2.00	5.00
2	7.75	3.25	4.50
3	7.50	3.50	4.00
4	7.75	2.00	5.75
5	7.25	3.50	3.75
6	8.00	3.75	4.25
7	7.75	2.00	5.75
8	7.25	2.75	4.50
10	7.00	3.00	4.00
11	8.00	2.00	6.00
12	8.00	3.00	5.00
14	8.25	3.00	5.25
15	7.90	3.25	4.65
16	8.25	2.00	6.25
17	7.75	1.90	5.85
19	8.25	1.90	6.35
20	7.90	3.75	4.15
22	6.75	2.50	4.25
23	8.00	3.00	5.00
24	8.00	3.00	5.00
25	7.70	3.50	4.20
26	8.00	3.50	4.50
27	7.25	2.00	5.25
28	7.50	1.90	5.60
29	5.00	3.00	2.00
30	7.25	1.90	5.35
31	7.75	3.50	4.25
32	7.50	3.00	4.50
33			
34			

Fund	Nominal	Inflation	Real
36	7.75	3.00	4.75
37	8.00	1.90	6.10
38	7.25	3.00	4.25
39	7.75	3.50	4.25
41	6.75	2.50	4.25
42	7.50	3.00	4.50
43	8.00	2.00	6.00
44	8.00	1.90	6.10
45	7.25	2.75	4.50
47	8.00	2.50	5.50
48	7.75	3.50	4.25
49	7.75	3.75	4.00
50	8.00	1.90	6.10
51	8.25	1.90	6.35
56	8.00	2.00	6.00
57	8.00	2.50	5.50
58	8.00	1.90	6.10
59	8.00	3.00	5.00
61	7.75	2.00	5.75
62	7.00	3.00	4.00
63	8.00	2.50	5.50
64	7.50	3.00	4.50
66	8.00	3.50	4.50
70	6.50	3.00	3.50
73	7.00	2.50	4.50
77	7.25	2.50	4.75