Intensive Actuarial Review:

Paris Firefighters' Relief and Retirement Fund

October 2019

TEXAS PENSION
REVIEW BOARD

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Executive Summary

Introduction

This intensive actuarial review of Paris Firefighters' Relief and Retirement Fund ("Paris Fire" or "the Fund") is intended to assist the Fund's board of trustees and the City of Paris ("the City") in assessing the Fund's ability to meet its long-term pension obligation. The plan members and the City increased their contribution rates in 2018 from 15% to 16% and 12% to 14%, respectively. Despite these increases, the unfunded liability will continue to grow, and its low funded status will continue through the next decade.

The Pension Review Board (PRB) encourages the Fund and the City to review the findings and conclusions of this report carefully and jointly adopt a forward-looking plan to address these risks and guide the Fund towards a path of long-term sustainability. The PRB can provide technical assistance in formulating such a plan.

Overview

Paris Fire's actuarial value of assets (AVA) was lower in its latest valuation (12/31/2016) than it was in 2001, while the actuarial accrued liability has increased by more than 78% over the same time period. This has resulted in a **dramatic decrease in the funded ratio from 67.6% to 35.6%**. This underfunding can be primarily attributed to the fact that existing benefits are not funded and the contributions going into the Fund are not enough to pay current distributions, much less pre-fund future benefits or pay the interest on the existing unfunded benefit liability debt.

In fact, given the retiree (inactive member) portion of the accrued liability is less than 50% funded, in addition to using all contributions and investment income, the fund sold nearly $1.5 million in assets between 2001 and 2016 simply to pay benefits**. At 35.6% funded, Paris Fire is essentially a pay-as-you-go plan, as its assets are leaking out of the plan faster than its contributions and investment income can replace.** Spending down assets, rather than accumulating them, means that the Fund does not reap the advantage of compound interest available to traditional, pre-funded pension plans.

The Fund's board of trustees has been slow to react to its perilous situation, appearing to have focused primarily on maintaining a low amortization period rather than heeding other warning signs such as its declining funded ratio, low cash flow, and consistently underperforming its assumed investment return during a decade-long bull market. The board has not completed legislatively-mandated minimum training requirements designed to ensure fiduciaries of public pension funds are prepared to fulfill their duties.

Conclusion

Paris Fire should consider increasing contributions to address immediate funding demands in the short-term; developing a strong funding policy to alleviate the need for stopgap measures in the future; working with its actuaries and other consultants to ensure its investment assumption is not too aggressive; as well as reviewing its investment processes to generate needed improvement in asset returns.

In addition, there is also a need for a more hands-on approach to the plan's governance by its board. Completing minimum training requirements is just an initial step toward developing proactive leadership, which should also include seeking guidance from peer systems, additional educational opportunities, and asking questions of the Fund's professional advisors and reviewing their performance regularly.

Background

Texas Government Code Section 801.202(2) requires the PRB to conduct intensive studies of potential or existing problems that threaten the actuarial soundness of or inhibit an equitable distribution of benefits in one or more public retirement systems. The PRB identified a set of key metrics, in addition to amortization period, to determine and prioritize retirement systems for intensive actuarial review. After evaluating these metrics, the PRB selected Paris Firefighters' Relief and Retirement Fund ("Paris Fire" or "the Fund") for review. The following data points were calculated based on the Fund's December 31, 2016 actuarial valuation and December 31, 2017 annual financial report, the information available to the PRB at the time the Fund was selected for review in May 2019:

Amort. Period (Years)	Funded Ratio	UAAL as % of Payroll	Assumed Rate of Return	Payroll Growth Rate	Actual Cont. as % of ADC[1]	DROP as % of FNP	Non-Investment Cash Flow as % of FNP
41.9	35.64%	373.34%	7.50%	3.50%	80.16	N/A	-12.44%

Plan Profile

Actuarial Accrued Liability: $14,957,795

Market Value of Assets: $4,764,272

Normal Cost: 9.54% of payroll

Contributions: 16.00% employee
14.00% employer

Membership: 49 actives
41 annuitants

Social Security Participation: No

- Its **funded ratio** of 35.64% was the lowest in the state.
- The Fund's **non-investment cash flow as a percent of FNP** of -12.44% was also the lowest in the state.
- Its **UAAL as a percent of payroll** of 373.34% was the ninth highest in the state and the third highest among its peers.[2]
- **Actual contribution as a percent of its Actuarially Determined Contribution (ADC)** of 80.16% was one of the ten lowest in the state and the second lowest among peers.

Since selecting Paris Fire, the PRB received the Fund's 2018 annual financial report in June 2019. The data used in this review is from the December 31, 2016 actuarial valuation and December 31, 2018 annual financial report.

[1] For plans whose contributions are made as a fixed rate based on statutory or contractual requirements, the ADC for this purpose is the contribution needed to fund the benefits accrued in the current year and maintain an amortization period that does not exceed 30 years, as required to be reported under Texas Government Code §802.101(a).

[2] See Appendix for more detail on Paris Fire's peer group.

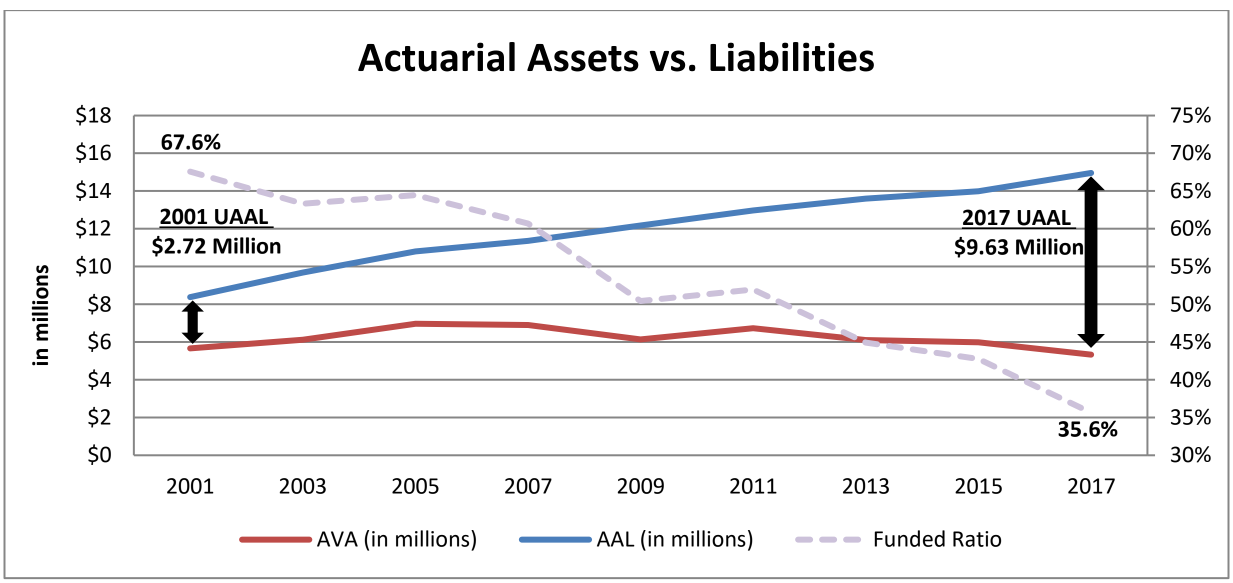
Risk Analysis

Paris Fire is one of the few Texas public retirement systems with a flat benefit design (which equates to $94 per month per year of service credit), which is typically less risky than the more common benefit structures based on final average salary (FAS) calculations. In a flat benefit structure, distributions are driven by growth in the retiree population and, unlike FAS-based benefit designs, are not impacted by payroll growth.

Despite its lower-risk benefit design, Paris Fire is experiencing significant financial stress. High distributions compared to contributions and investment experience consistently not meeting assumptions have caused a precipitous decline in funded ratio, and if not addressed, funding levels could continue to worsen in the coming years. Since 2007, Paris Fire has changed investment managers, and both the City and members have made contribution increases. However, in the short term, the Fund will require additional contributions to put it back on the path toward financial soundness. There is also a need for a more proactive approach to the plan's governance by its board to help sufficiently mitigate these risks.

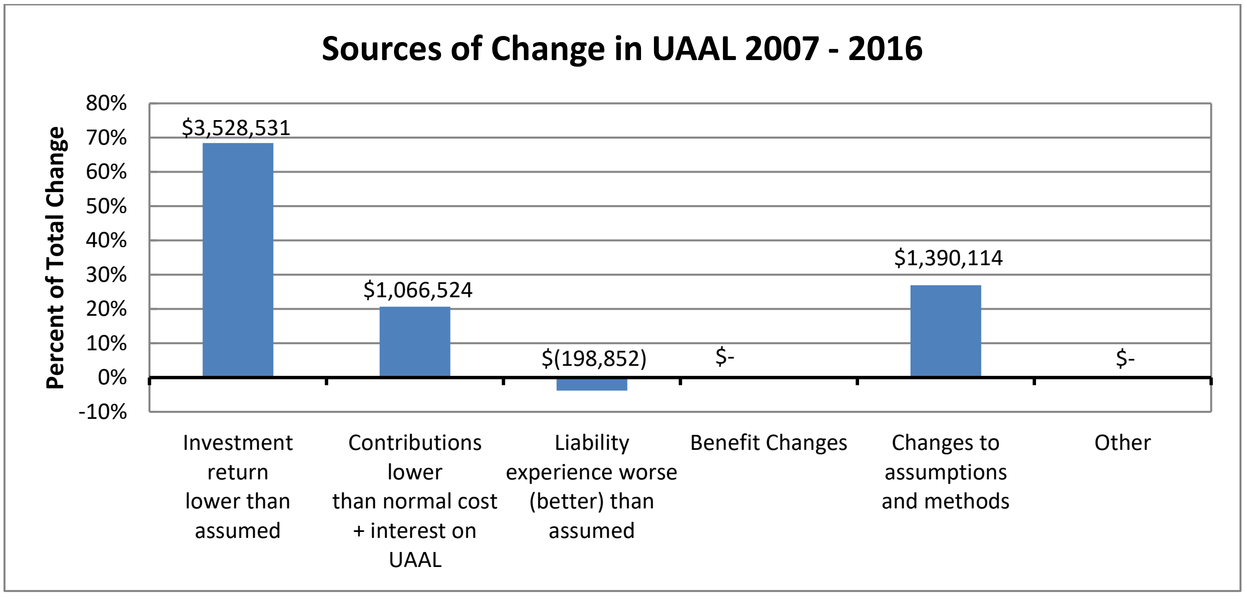
Funding Risk

Paris Fire's unfunded actuarial accrued liability (UAAL) has more than tripled since 2001, from $2.7 million to $9.6 million. As the Fund's actuarial accrued liability (AAL) has steadily climbed, its assets have stagnated, so much so that the projected 1/1/2019 AVA is more than 30% lower than its peak as of 1/1/2005. Paris Fire's funded ratio decreased from **60.7%** in 2007 to **35.6%** as of its December 31, 2016 actuarial valuation. This decrease in funding over the course of a decade is staggering, especially when considering that Standard & Poor's credit rating methodology considers a three-year average pension funded ratio of 60% or below as "weak."[3]



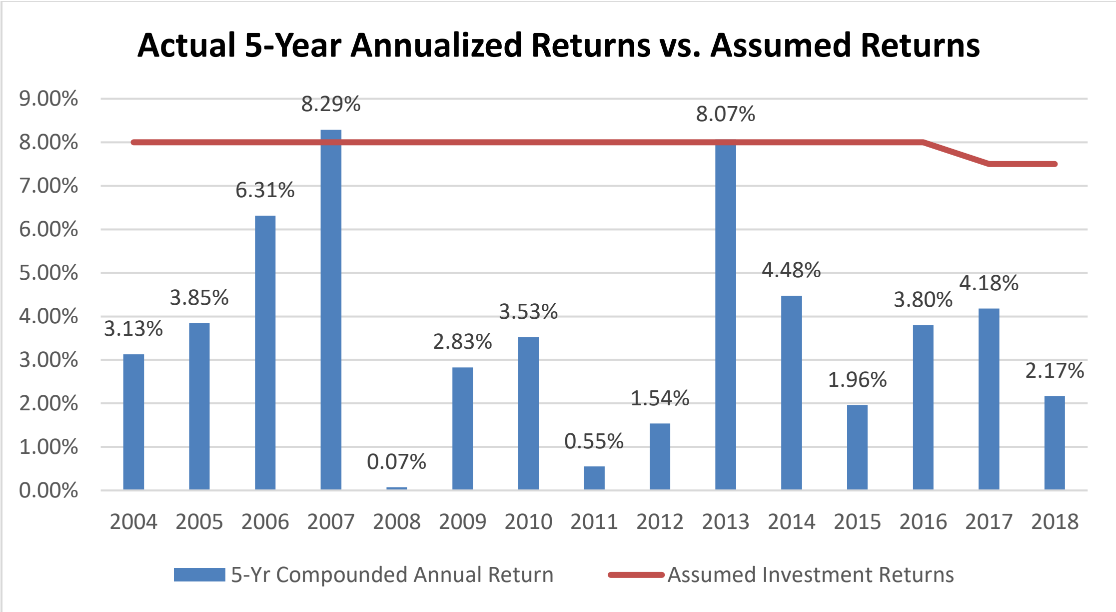
[3] *U.S. State Ratings Methodology*, Standard & Poor's, October 17, 2016.

Based on analysis of the causes of change in the UAAL, the Fund's inability to meet or exceed its assumed investment return was by far the greatest cause of the UAAL increase, as shown in the following graph. Insufficient contributions and adjustments to actuarial assumptions have also negatively impacted the UAAL, but insufficient investment returns have outpaced all other factors, combined.



Investment Return Experience vs. Assumptions

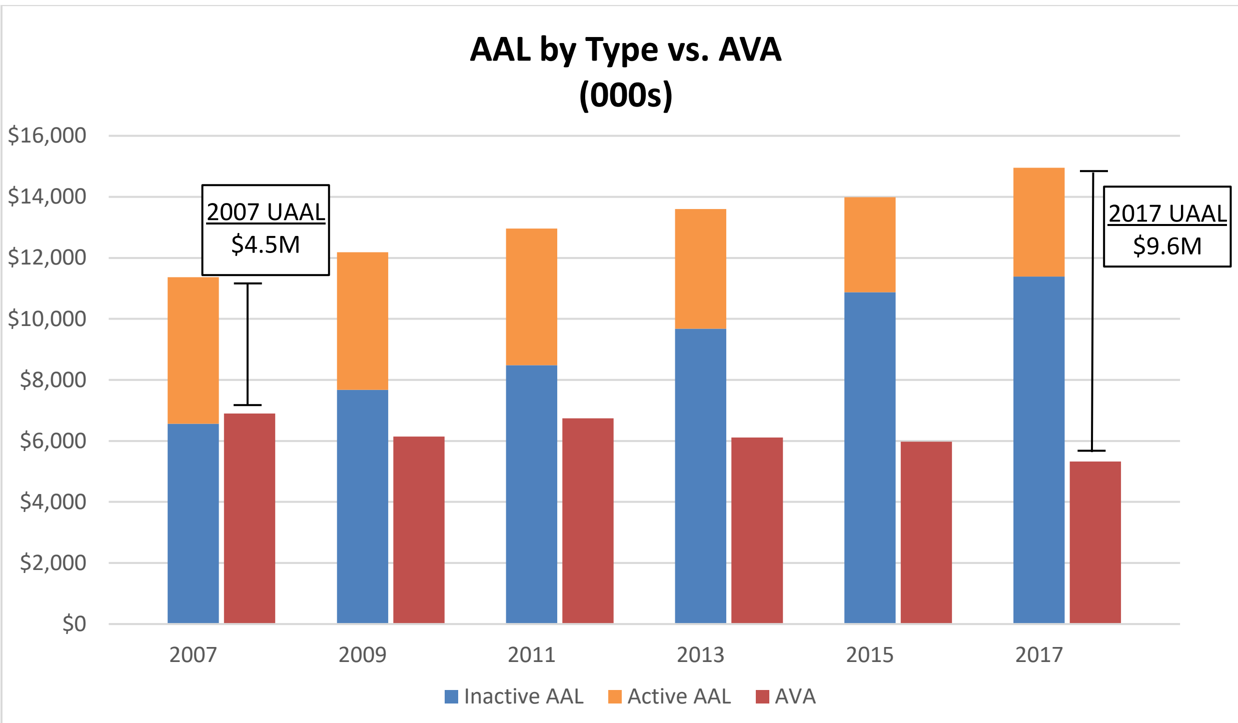
Over the time period for which data is available, Paris Fire's 5-year annualized returns fell well short of the assumed rate of return in all but two periods. Since 2008, the 5-year return has only surpassed the assumed rate once, with all other years less than 4.5%. The Fund's 10-year annualized returns are even worse, with not a single period ever reaching, much less surpassing, the assumed return.



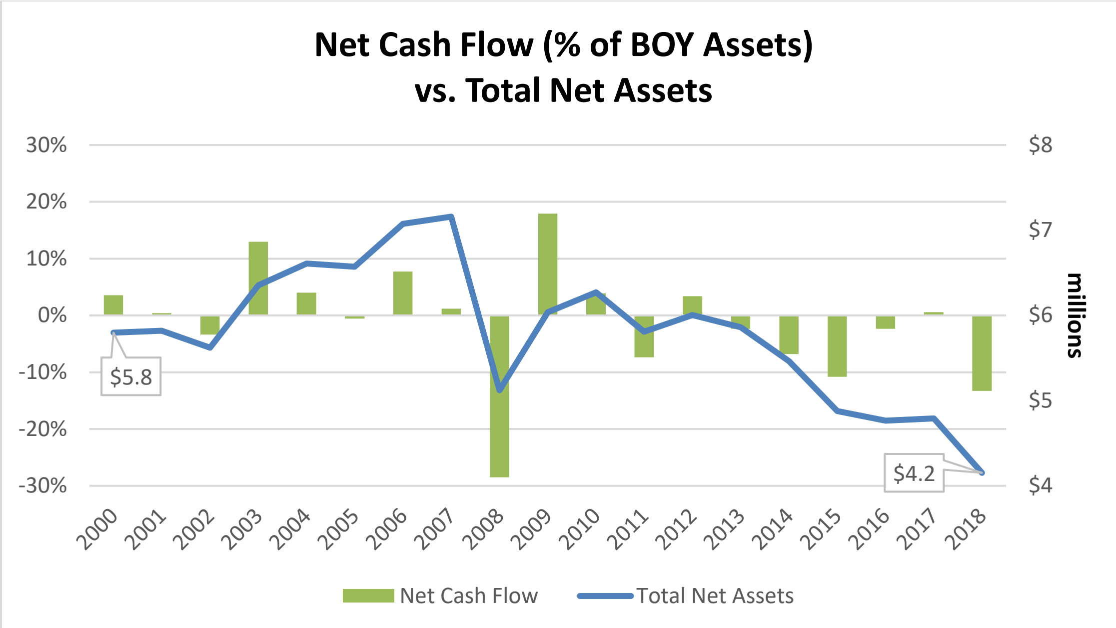
While not achieving the assumed rate of return is the largest factor causing the increase in unfunded liability, the graph shows that multi-year returns are still positive. This tells us that investment returns alone are not the cause of the rapid asset depletion mentioned above.

Cash Flow

The purpose of pre-funding a defined benefit plan is to build an asset balance sufficient to support benefit payments, which is why, negative non-investment cash flow is expected in a mature plan. In a well-funded plan, the combination of new contributions and investment growth are sufficient to pay benefits, fund new benefit accruals and pay down any outstanding unfunded actuarial accrued liability (UAAL). However, in the case of Paris Fire, where the retiree (inactive) portion of the AAL is less than 50 percent funded, **contributions and investment income are only being used to pay benefits.**

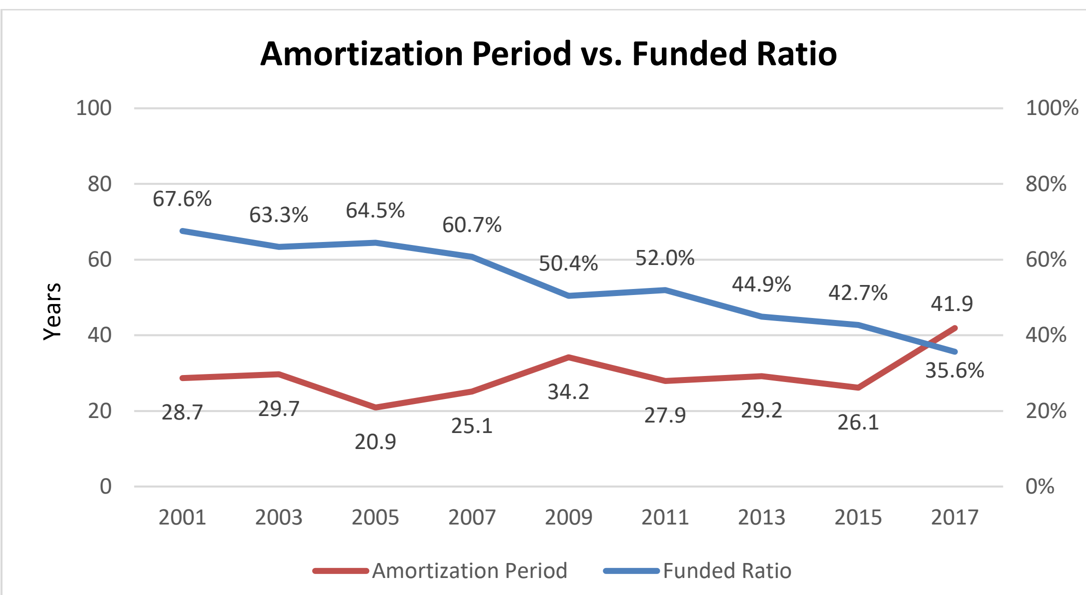


Not only is Paris Fire experiencing negative non-investment cash flow, its total net cash flow (contributions and investment income minus benefit payments, withdrawals and expenses) was negative, averaging -1.05% since 2001. **This means that in addition to using all contributions and investment income, the fund sold nearly $1.5 million in assets simply to pay benefits.**



Measuring Plan Health

Using amortization period as the sole measurement of fund health for the past decade would give a false impression of Paris Fire's financial well-being because its amortization period was less than 30 years for most of its recent history. However, a review of the long-term trend of Paris Fire's assets or funded ratio would have indicated the Fund was facing difficulties. **This is one of the reasons the PRB recommends a comprehensive review of multiple factors relating to a pension plan's long-term sustainability**, including funded ratio and cash flow, when assessing the condition of a pension plan.



Conclusions/Recommendations

Pre-funding a defined benefit plan, i.e. setting aside assets now for benefits that will be paid in the future, is necessary for a plan's ability to sustain itself over the long-term. Consistently underfunding a plan places the benefits of both retirees and active members at significant risk and/or places the burden of paying for services already rendered on future generations of taxpayers and employees through the reduction of future benefits or an increase in contributions.

Short- and Long-term Funding Options

The Fund currently cannot earn a high enough investment return on a regular basis to cover its benefit payments, normal cost and interest on the unfunded liability. To shore up funding, Paris Fire and the City should work together to determine the best balance between increased contributions and benefit reductions, even though Paris Fire already has a flat dollar benefit design. Given Paris Fire's current funding level, an increase in contributions over the near term is likely needed to stabilize the Fund.

For the long term, the Fund and the City are encouraged to develop a strong funding policy. The goals of a funding policy are threefold: establish clear and concrete funding objectives, set boundaries on what is allowable for actuarial calculations, and develop plans for both positive and negative experiences. The funding policy should strive to balance the three primary pension funding goals so that member benefits are secure; employers are afforded some level of contribution predictability from year to year; and liabilities are managed so that future taxpayers are not burdened with costs associated with a previous generation's service. For more detail, please see the PRB's *January 2019 Interim Study: Funding Policies for Fixed-Rate Pension Plans.*[4] The Fund should use the new funding policy requirement in Senate Bill 2224 (86R) as an opportunity to work with the City of Paris to address both the short- and long-term challenges faced by the Fund before funding levels deteriorate further.[5]

Governance Risk

Governance is essentially decision-making. The primary responsibility of the Fund's board is to make decisions on behalf of plan members regarding the administration and investment of the Fund's assets.

Texas Government Code Section 802.203 details the fiduciary responsibility of a retirement system's board and its investment managers when supervising and managing the investments of its assets. A board of trustees or an investment manager is required to act "solely in the interest of the participants and beneficiaries for the exclusive purposes of providing benefits to participants and their beneficiaries; and defraying reasonable expenses of administering the system." They must do this, "with the care, skill, prudence and diligence under the prevailing circumstances that a prudent person" would use conducting a similar enterprise. In addition, when contracting for professional investment management services, Texas Government Code Section 802.204(c) states that "the governing body shall specify any policies, requirements, or restrictions, including criteria for determining the quality of investments and for the use

[4] *Interim Study: Funding Policies for Fixed-Rate Pension Plans,* Texas Pension Review Board, January 2019, https://www.prb.texas.gov/txpen/wp-content/uploads/2019/02/Funding-Policy-Paper.pdf

[5] SB 2224, 86th Texas Legislature, Regular Session, 2019, https://capitol.texas.gov/tlodocs/86R/billtext/html/SB02224F.htm

of standard rating services that the governing body adopts for investments of the system." The following sections discuss specific governance-related risks facing the Fund.

Monitoring Investment Performance and Expenses

According to the investment policy statement (IPS), the Fund's board of trustees should "systematically and regularly monitor the Plan's investments to assure the objectives are being met and policy guidelines are being followed." The IPS requires the investment manager to provide performance reports to the board and make periodic presentations. However, Paris Fire was unable to explain how this information is used to monitor the investment manager's performance. The Fund's consultants responded to PRB inquiries regarding the board's performance monitoring. While the Fund appears to be engaged in some level of monitoring, it was not clear how closely the board is following its responsibilities outlined in the IPS to evaluate investment performance through a systematic, regular process.

Further, the quarterly investment performance reports provided by the Fund's investment manager show performance **gross** of investment fees while the equity benchmark is net of fees. Therefore, while the performance reports appear to show investment performance beating the established benchmark, once investment fees are deducted, the total returns fall short of a straight passive investment approach in funds that track the chosen benchmarks. Also, the performance reports do not include a benchmark for specialty investments. Since the Fund's most recent asset breakdown shows nearly 20% of assets invested in this class, the board should consider adding relevant benchmarks corresponding to the assets in this class.

Time-weighted Returns[6] (as of 12/31/2018)	1-Year	3-Year	Since Sept. 2014
Total Gross Return	-5.81%	5.08%	3.81%
Total Net Return[7]	**-6.84%**	**4.28%**	**3.04%**
Benchmark (60% Equities (Net) / 40% Fixed Income)	-6.04%	5.06%	3.53%
Equities Gross Return	**-9.87%**	**6.16%**	**5.15%**
Benchmark (MSCI ACWI IMI Net)	-10.08%	6.49%	4.14%
Fixed Income Gross Return	**-0.96%**	**3.64%**	**2.11%**
Benchmark (Bloomberg Barclays U.S. Universal USD)	-0.25%	2.56%	2.22%
Specialty Gross Return	**-4.44%**	**3.74%**	**2.72%**

After the board determined that the previous investment manager was not producing returns on par with other TLFFRA systems, the Fund selected their current investment manager in the fall of 2014. Paris Fire continues to lag behind most of its TLFFRA peers in short- and long-term returns and currently pays one

[6] From Westwood Trust's Portfolio Performance Detail as of 12/31/2018, except where noted.
[7] Calculated by PRB. 2018 investment fees were 1.03% of assets; 3-year fee average was 0.80% of assets; and 4-year fee average was 0.77% of assets.

of the highest levels of investment expenses, as a percent of assets, in its peer group and across the state.[8] In 2017, **investment expenses as a percent of assets** were 0.91% and in 2018 increased to **1.03%**.

Board Education

Recognizing the importance of trustee training, the Legislature adopted the Minimum Education Training (MET) requirement for pension trustees in 2013. This program requires trustees to complete seven hours of training in core content areas such as investments, actuarial matters and governance, during the first year they begin service. After the first year of service, trustees are only required to complete four hours of continuing education in core or non-core areas every two years. The core is designed to cover the fundamental competencies of public pensions necessary for trustees to successfully discharge their duties. The non-core includes topics that go beyond the basics and are designed to allow trustees to gain further expertise in additional areas related to their duties.

As of the time of this review, only one Paris Fire trustee was compliant with these MET Program requirements. Only one of the other six trustees had completed the basic 7-hour core training. As a comparison, in 2017, over 90% of TLFFRA systems were fully compliant with the MET Program requirements.

Conclusions/Recommendations

Monitoring Investments

Investment benchmarks should be regularly reviewed to see if they are appropriate and have been met or exceeded. The board should identify benchmarks for specialty investments and add those to the IPS to allow measurement of the performance of those assets.

Best practices include revisiting manager selection periodically, including evaluating performance, fees, and the value provided by the managers. The board should review whether its active management approach is providing returns in excess of the additional expense and may want to explore passive investment strategies for one or more asset classes. Additionally, the board should consider adding to the IPS specific actions to take if returns are not met over a market cycle, such as re-evaluating the investment goals, modifying the asset mix, revising manager composition, or a combination of these.

Since it is not expected that board members be investment experts, it is important that the information presented by consultants and managers allow trustees to easily assess investment performance. Paris Fire should ask its investment manager to report returns net of fees to more easily view the actual performance of the fund, particularly because investment expenses tend to be higher as a percentage of assets for smaller plans.

Finally, the board should consider engaging an independent third party to review its governance processes to assess how they compare against industry best practices. This type of review could include looking at the board's investment decision-making processes, delegation of authority, and board investment expertise to help identify potential improvements. Due to its small size, Paris Fire is not required to

[8] See Appendix for more detail on Paris Fire's peer group.

conduct the Investment Practices and Performance evaluation in Texas Government Code §802.109 (SB 322, 86R), but could benefit greatly from conducting even a limited-scope evaluation.

Board Member Education

Paris Fire's trustees should complete MET core training as soon as possible, which is provided online, free of cost by the PRB, and continue seeking opportunities for continuing education to keep their knowledge up to date.

Appendix

Key Metrics

Metric	Amortization period (41.9 years)
What it measures	Approximately how long it would take to fully fund the unfunded actuarial accrued liability (UAAL) based on the current funding policy.
Why it is important	Given the Plan's current assumptions, an amortization period greater than 18 years indicates that contributions to the Plan in the coming year are less than the interest accumulated for that same period, and therefore the total UAAL is expected to grow over the near term. In addition, for a plan that contributes on a fixed-rate basis such as Paris Fire, the higher the amortization period, the more sensitive it is to small changes in the UAAL.
Peer comparison	Paris Fire's amortization period is the fourth highest among its peers and is greater than the maximum PRB pension funding guideline of 30 years.

Metric	Funded ratio (35.64%)
What it measures	The percent of a fund's actuarially accrued liabilities covered by its actuarial value of assets.
Why it is important	The lower the funded ratio, the fewer assets a fund has to pay its current and future benefit payments.
Peer comparison	Paris Fire's 35.64% funded ratio is the lowest among its TLFFRA peer plans, and the lowest in the state of Texas.

Metric	UAAL as a percent of payroll (373.34%)
What it measures	The size of a plan's unfunded liability compared to the annual payroll of the active members.
Why it is important	Provides a way to compare plans of various sizes and expresses the outstanding "pension debt" relative to current personnel costs.
Peer comparison	The Fund's UAAL as a percent of payroll is the third highest in its peer group, and ninth highest in the state.

Metric	Assumed rate of return (7.50%)
What it measures	The estimated annual rate of return on the Fund's assets.
Why it is important	If actual future returns are lower than the assumed rate of return, future contributions will need to increase significantly, especially for a poorly funded plan. Paris Fire's assumed rate of return is 7.50%, while its actual ten-year investment rate of return for the period ending December 31, 2018 was 5.08%.
Peer comparison	Paris Fire has the third highest assumed rate of return in its peer group and the median of all plans in the state.

Metric	Payroll growth rate (3.50%)
What it measures	The estimated annual growth in the total payroll of active members contributing into the Fund.
Why it is important	Contributions are calculated as a percent of active members' pay and are back-loaded based on the expected growth in total payroll. If payroll does not increase at this rate, actual contributions will not meet those expected in the Fund's actuarial valuations. Persistent contributions below expected levels could have serious consequences on the Fund's long-term solvency.
Peer comparison	The Fund's payroll growth rate of 3.50% was the second highest payroll growth rate in its peer group of TLFFRA plans with similar asset size and higher than the state average.

Metric	Actual contributions as a percent of actuarially determined contributions (80.16%)
What it measures	Whether the current employer contributions have met a theoretical minimum threshold.[9]
Why it is important	The employer's portion of the contribution in 2017 was slightly greater than 80% of the amount needed to fund the plan on a rolling 30-year amortization period. The PRB's 2014 Study of the Financial Health of Texas Public Retirement Systems found that plans that have consistently received adequate funding are in a better position to meet their long-term obligations.
Peer comparison	This is was the second largest shortfall percentage in its peer group and one of the ten lowest in the state.

Metric	Non-investment cash flow as a percent of fiduciary net position (-12.44%)
What it measures	Non-investment cash flow shows how much the plan is receiving through contributions in relation to its outflows: benefit payments, withdrawals and expenses.
Why it is important	Viewing this metric as a percent of total net assets (or fiduciary net position (FNP)), in conjunction with the funded ratio and recognition of the relative maturity of the plan, provides information about the stability of a plan's funding arrangement.
Peer comparison	Paris Fire's non-investment cash flow as a percent of FNP as of 12/31/2017 was the lowest in the state.

[9] The theoretical minimum threshold, or actuarially determined contribution (ADC), is a target or recommended contribution "to the plan as determined by the actuary using a contribution allocation procedure," as defined in Actuarial Standards of Practice No 4. If contributions to the plan are made as a fixed rate based on statutory or contractual requirements, the ADC for this purpose is the contribution needed to fund the benefits accrued in the current year and maintain an amortization period that does not exceed 30 years, as required to be reported under Texas Government Code §802.101(a).

Plan Summary

The Paris Firefighter's Relief and Retirement Fund ("Paris Fire" or "the Fund") was established in 1941 under the Texas Local Fire Fighter's Retirement Act (TLFFRA). TLFFRA provides general guidelines for fund management, but leaves administration, plan design, contributions, and specific investments to the discretion of the board of trustees. Paris Fire, as with all TLFFRA systems, is entirely locally funded.

Benefits

Tiers	Tier 1: Service before 1/1/2004 Tier 2: Service on or after 1/1/2004
Retirement Eligibility	55 years of age; 20 years of service Or Rule of 80 with 20 years of service
Vesting	Fully vested after 10 years of service
Primary Benefit Formula	Tier 1: Monthly benefit = 2% x FAS before 1/1/2004 or $85.50 x years of service (< 3 years) AND $85.50 x years of service (> 3 years) OR $94 x years of service at retirement Tier 2: Monthly benefit = $94 x years of service at retirement Minimum service retirement benefit is $500 per month
Final Average Salary (FAS)	Tier 1: Highest five years; Tier 2: N/A
COLA	None
Retirement Benefit Options	2-year Retro DROP: Eligible once a member has satisfied Service Retirement requirements. DROP accumulation includes the sum of the monthly service retirement benefit the member would have received if had retired on the DROP determination date plus an amount equal to the member contributions to the fund while a DROP participant. No interest is credited on DROP accounts. DROP balance is distributed as a lump sum.
Participates in Social Security?	No

Contributions

As of October 1, 2018, active members of Paris fire contribute 16% of pay, while the City of Paris contributes 14% of pay.

Membership

Total Active Members	Total Annuitants	Terminated	Total Members	Active-to-Annuitant Ratio
49	41	6	96	1.20

TLFFRA Board Structure

Active Members	3 - Members of the retirement system; elected by fund members. Three-year terms.
Sponsor Government	1 - Mayor or designated representative, or the political subdivision's Chief Operating Officer or designated representative. 1 - Chief Financial Officer of the political subdivision, or designated representative. Terms correspond to term of office.
Taxpayer, Not Affiliated With Fund/Sponsor Govt.	2 - Residents of the State of Texas, must not be officers/employees of the political subdivision; elected by other board of trustees' members. Two-year terms.

Contribution and Benefit Decision-Making

TLFFRA authorizes members of the retirement systems to determine their contribution rates by voting. The statute requires cities to make contributions at the same rate paid by employees or 12%, whichever is smaller. TLFFRA also allows a city to contribute at a higher rate than employees do through a change in city ordinance.

TLFFRA gives the board the power to make decisions to modify the benefits (increases and reductions). However, a proposed addition or change must be approved by the actuary and a majority of participating plan members. Benefit changes cannot deprive a member, retiree or beneficiary of the right to receive vested accrued benefits.

Asset Allocation

Asset Allocation (as of 12/31/2018)					
Asset Class	Equities	Fixed Income	Alternatives	Real Estate	Other
Current Allocation	54.12%	33.79%	4.52%	4.09%	3.48%
Target Allocation	50.00%	30.00%	20.00%*		-

*Labeled as "Specialty" in Paris Fire's 2018 Investment Policy Statement, includes both Alternatives and Real Estate.

Investment Returns

Annualized Rolling Rates of Return (as of 12/31/2018)				
Time Period	1-year	3-year	10-year	Since 2000
Net Return	-7.20%	3.48%	5.08%	3.16%

Expense Breakdown

Plan Expenses (as of 12/31/2018)	
Fiduciary Net Position (FNP)	$4,152,311
Investment Expenses	$42,973
Investment Expenses % of FNP	1.03%
Administrative Expenses	$31,444
Administrative Expenses % of FNP	0.76%

Historical Trends

To conduct an intensive review of risks associated with the long-term funding of a pension Fund, it is important to analyze trends in multiple metrics. A plan with an asset level lower than its accrued liability has insufficient funds to cover benefits. A plan can experience an increase in unfunded liability due to various factors, including insufficient investment returns, inadequate contributions and inaccurate or overly aggressive assumptions. Hence, a single metric cannot effectively capture the different drivers contributing to the increase of a plan's unfunded pension obligation. This section analyzes historical trends in various metrics identified by the PRB and makes comparisons to understand the sources of growth in unfunded liability for Paris Fire.

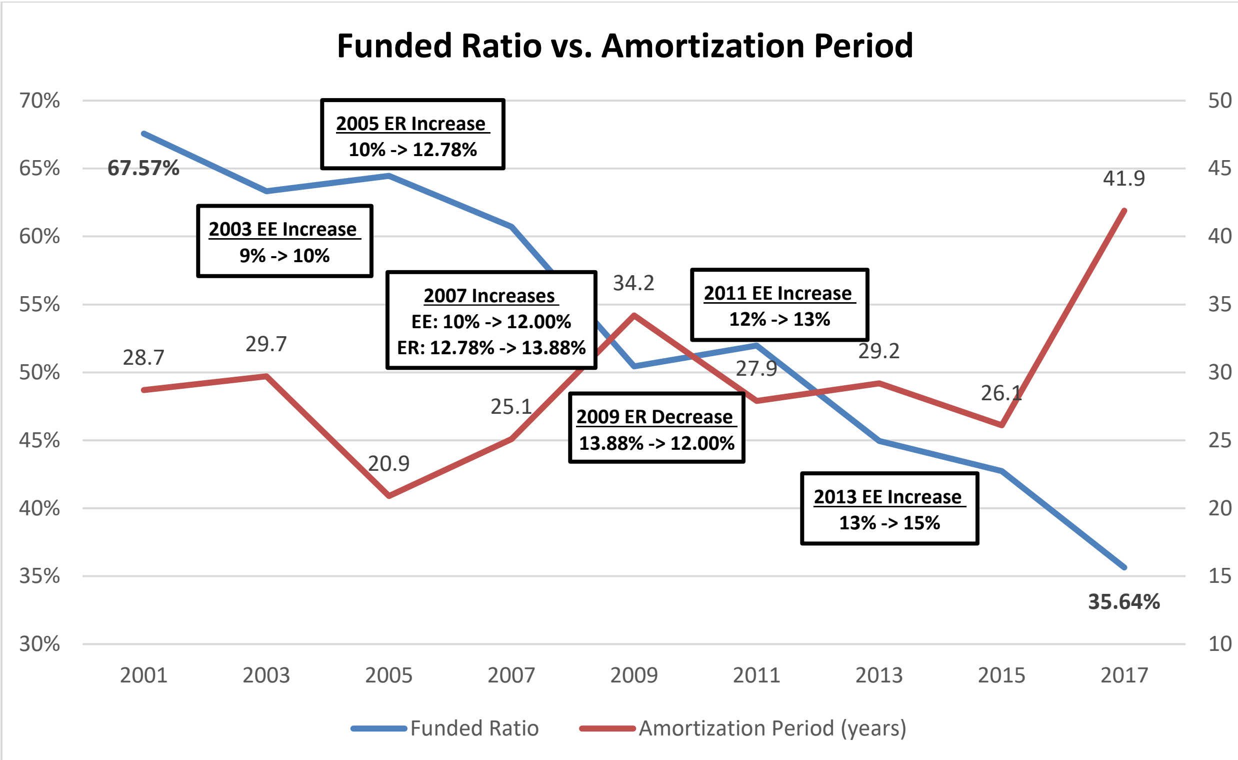
Paris Fire's funded status has been steadily declining since 2001. Numerous factors have contributed to this deterioration, including investment returns being lower than the chosen assumption, increased benefit payments, and a fixed-rate funding structure. The following sections discuss these and other factors in detail.

Assets and Liabilities

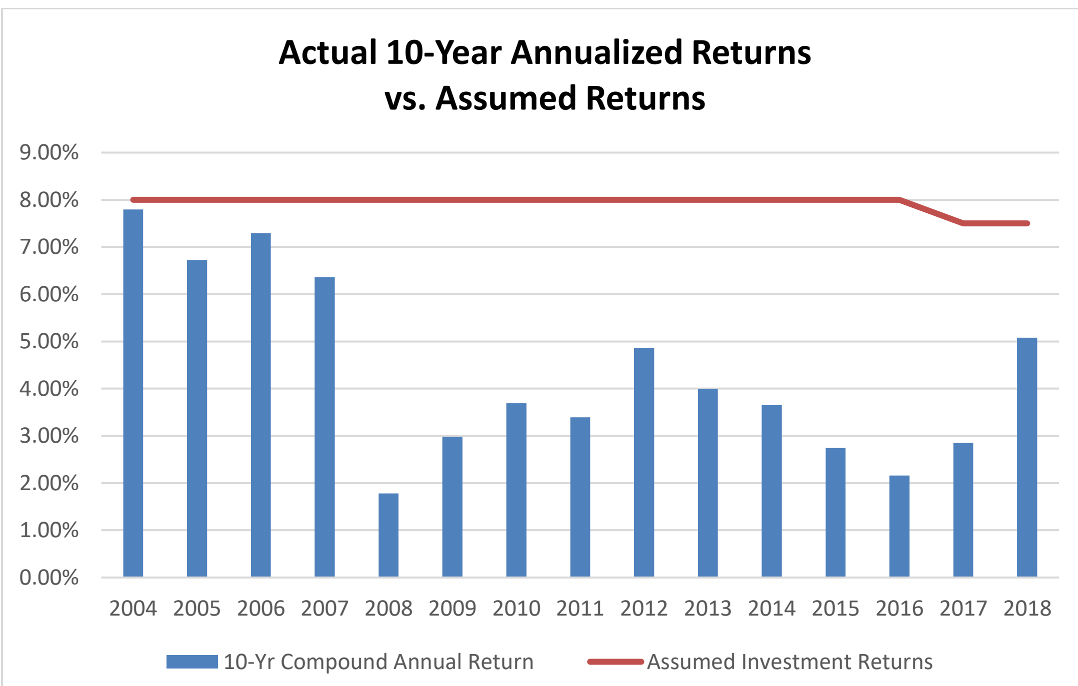
Funding Trends Funded Ratio, Assets, Liabilities and Year over Year Growth									
Valuation Year	**2001**	**2003**	**2005**	**2007**	**2009**	**2011**	**2013**	**2015**	**2017**
Funded Ratio	67.57%	63.33%	64.47%	60.70%	50.45%	51.96%	44.94%	42.74%	35.64%
Am Period (years)	28.7	29.7	20.9	25.1	34.2	27.9	29.2	26.1	41.9
UAAL (in millions)	$2.72	$3.55	$3.84	$4.47	$6.04	$6.23	$7.49	$8.01	$9.63
AVA (in millions)	$5.66	$6.13	$6.97	$6.90	$6.14	$6.74	$6.11	$5.98	$5.33
AVA Growth (YoY)	-	4.04%	6.63%	-0.48%	-5.64%	4.71%	-4.75%	-1.08%	-5.59%
AAL (in millions)	$8.38	$9.68	$10.81	$11.37	$12.18	$12.96	$13.60	$13.99	$14.96
AAL Growth (YoY)	-	7.46%	5.68%	2.56%	3.51%	3.17%	2.42%	1.43%	3.39%

The Fund's actuarial accrued liability (AAL) more than tripled between the beginning of 2001 and the beginning of 2017. During the same time period Paris Fire went from 70% funded and dropped to below 36% as of their latest valuation.

Funded Ratio vs. Amortization Period with Contribution History (2001 -2017)

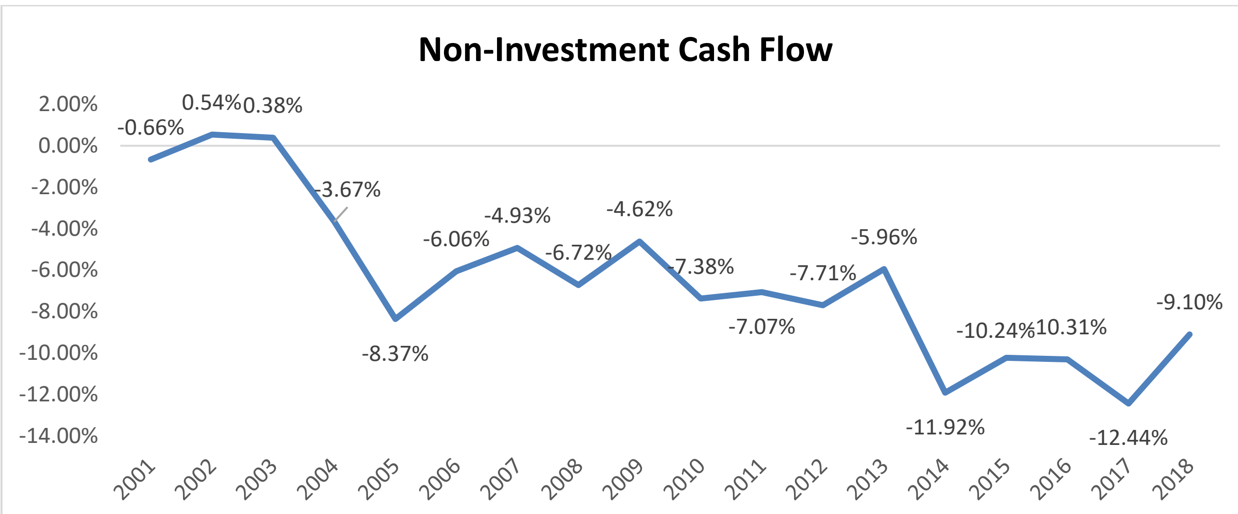


Investment Returns

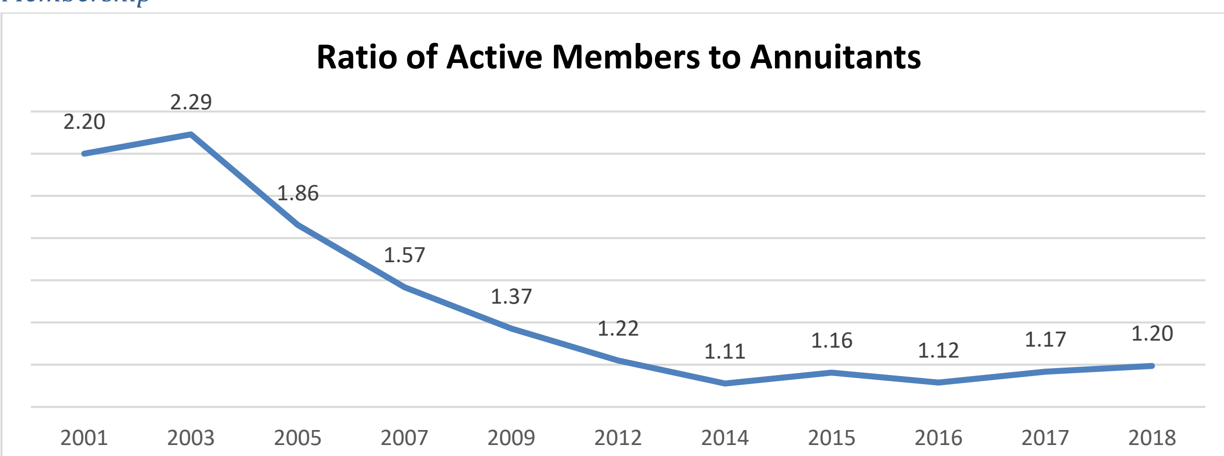


Cashflow

Outflows as a Percent of Total Net Assets (Reported over the Last Ten Years)										
Fiscal Year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Benefit Payments	11.89%	14.07%	14.69%	16.85%	14.37%	19.92%	21.56%	21.59%	21.37%	24.55%
Withdrawals	0.80%	0.57%	0.56%	0.08%	1.22%	2.07%	2.16%	2.26%	4.72%	0.80%
Admin Expenses	1.11%	1.36%	1.64%	0.53%	0.25%	0.45%	0.13%	0.79%	0.78%	0.76%
Investment Expenses	-	-	-	1.08%	0.99%	1.09%	0.71%	0.69%	0.91%	1.03%
Other Expenses	0.42%	0.25%	0.07%	-	-	-	-	-	-	-
Total Expenses	1.53%	1.61%	1.72%	1.61%	1.25%	1.55%	0.84%	1.48%	1.69%	1.79%



Membership



Peer Group Key Metric Comparison

		Funding Valuation Metrics						Fiscal Year End Metrics			
Peer Group Plans	MVA	Am Period Date	Am Period	Funded Ratio	UAAL as % of Payroll	Assumed Interest	Payroll Growth	FYE	Actual Cont. as % of ADC	DROP as % of FNP	Non-Investment Cash Flow as % of FNP
Corsicana Firemen's Relief & Retirement Fund	$8,344,317	12/31/2016	28.9	53.14%	211.44%	7.00%	3.00%	12/31/2017	101.06%	N/A	-8.11%
Orange Firemen's Relief & Retirement Fund	$8,154,674	1/1/2017	69.3	49.86%	336.03%	7.75%	4.00%	12/31/2017	72.93%	N/A	-6.77%
Sweetwater Firemen's Relief & Retirement Fund	$7,826,879	12/31/2016	27.5	69.99%	229.12%	8.00%	4.00%	12/31/2017	100.00%	N/A	-4.07%
Marshall Firemen's Relief & Retirement Fund	$7,712,228	12/31/2016	56.4	42.02%	398.51%	7.75%	4.00%	12/31/2017	77.36%	4.40%	-2.90%
Plainview Firemen's Relief & Retirement Fund	$6,154,425	12/31/2017	44.8	37.67%	517.48%	7.50%	3.50%	12/31/2017	98.82%	N/A	-3.35%
Paris Firefighters' Relief & Retirement Fund[10]	**$4,764,272**	**12/31/2016**	**41.9**	**35.64%**	**373.34%**	**7.50%**	**3.50%**	**12/31/2017**	**80.16%**	**N/A**	**-12.44%**
Brownwood Firemen's Relief & Retirement Fund	$4,158,090	12/31/2017	38.6	45.03%	263.23%	7.25%	3.25%	12/31/2017	93.90%	N/A	-1.49%
Atlanta Firemen's Relief & Retirement Fund	$3,744,867	12/31/2016	28.4	82.13%	136.63%	7.40%	3.00%	12/31/2017	112.63%	N/A	-2.72%
San Benito Firemen Relief & Retirement Fund	$3,503,753	9/30/2017	21.8	60.68%	152.30%	7.50%	4.00%	9/30/2016	143.37%	N/A	-0.88%

[10] Paris Fire's contribution, DROP and cash flow data are from the Fund's 12/31/2017 annual financial report.

Peer Group Sponsor Funding Comparison[11]

Peer Group Plans	General Fund Expenditures (GFE)	EOY GF Bal	UAAL	Employer Contributions	ADC	30-yr Shortfall	30-Y SF % of ADC	30-Y SF % of GFE
Corsicana Firemen's Relief & Retirement Fund	$15,802,887	$5,342,213	$8,135,345	$554,105	$548,285	$0	0.00%	0.00%
Orange Firemen's Relief & Retirement Fund	$22,114,218	$7,805,235	$8,199,175	$333,259	$456,978	$123,719	27.07%	0.56%
Sweetwater Firemen's Relief & Retirement Fund	$8,733,810	$3,929,907	$3,617,210	$284,446	$284,446	$0	0.00%	0.00%
Marshall Firemen's Relief & Retirement Fund	$19,191,225	$5,563,323	$10,641,648	$516,808	$668,025	$151,217	22.64%	0.79%
Plainview Firemen's Relief & Retirement Fund	$13,359,607	$15,886,659	$10,290,086	$507,975	$600,643	$92,668	15.43%	0.69%
Paris Firefighters' Relief & Retirement Fund	**$24,912,768**	**$11,622,868**	**$9,626,478**	**$326,396**	**$407,179**	**$80,783**	**19.84%**	**0.32%**
Brownwood Firemen's Relief & Retirement Fund	$19,316,832	$3,038,924	$5,085,187	$369,559	$401,518	$31,959	7.96%	0.17%
Atlanta Firemen's Relief & Retirement Fund	$3,894,117	$1,746,351	$860,536	$93,096	$82,656	$0	0.00%	0.00%
San Benito Firemen Relief & Retirement Fund	$10,728,675	$6,526,547	$2,270,845	$163,218	$163,218	$0	0.00%	0.00%

[11] For comparison purposes, data in this table is from FY 2017 end-of-year reports which was available from all plans and sponsors.

Peer Group Benefit & Expense Comparison[12]

Peer Group Plans	10 yr. return (Net)	Active/ Annuitants	Average Benefit	Benefit Payments as a % of Assets	NPL	Admin Expenses	Investment Expenses	Total Expenses	Exp as % of Assets
Corsicana Firemen's Relief & Retirement Fund	3.40%	1.59	$41,473	17.11%	$8,448,213	$38,769	$98,332	$137,101	1.53%
Orange Firemen's Relief & Retirement Fund	4.60%	0.88	$25,865	12.04%	$7,604,038	$28,872	$97,461	$126,333	1.40%
Sweetwater Firemen's Relief & Retirement Fund	4.91%	1.04	$33,311	9.35%	$4,041,873	$35,021	$66,056	$101,077	1.18%
Marshall Firemen's Relief & Retirement Fund	5.22%	1.32	$28,764	12.48%	$10,956,082	$16,563	$64,001	$80,564	0.94%
Plainview Firemen's Relief & Retirement Fund	2.88%	0.92	$25,463	15.31%	$10,355,264	$20,975	$34,590	$55,565	0.90%
Paris Firefighters' Relief & Retirement Fund	**2.85%**	**1.17**	**$24,367**	**21.37%**	**$10,266,996**	**$37,553**	**$43,407**	**$80,960**	**1.69%**
Brownwood Firemen's Relief & Retirement Fund	4.34%	1.28	$20,716	12.46%	$4,875,482	$16,550	$44,910	$61,460	1.48%
Atlanta Firemen's Relief & Retirement Fund	4.83%	1.39	$12,762	5.54%	$895,803	$22,369	$36,271	$58,640	1.41%
San Benito Firemen Relief & Retirement Fund	1.78%	2.60	$23,625	6.18%	$2,234,136	$19,316	$64,393	$83,709	2.19%

[12] For comparison purposes, data in this table is from FY 2017 end-of-year reports except for San Benito Fire which contains FY 2018 end-of-year data due to discrepancies in their 2017 annual financial report.

Comments from Paris Firefighters' Relief and Retirement Fund