

Intensive Actuarial Review:

Marshall Firemen's Relief and Retirement Fund

April 2018



PENSION REVIEW BOARD

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Executive Summary

Introduction

This intensive actuarial review of Marshall Firemen's Relief and Retirement Fund ("Marshall Fire" or "the Fund") is intended to assist the Fund's board of trustees and the City of Marshall ("the City") in assessing the Fund's ability to meet its long-term pension obligation. Overall, the review shows the Fund is facing significant financial stress and is taking considerable risks in its approach to funding. The Pension Review Board 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 Pension Review Board can provide technical assistance in formulating such a plan.

Overview

Marshall Fire's unfunded actuarially accrued liability (UAAL or "unfunded liability") increased from \$4.5 million in 2002 to \$10.6 million by the end of 2016, and the Fund has routinely maintained an asset-to-liability ratio less than 50%. This chronic underfunding can be primarily attributed to actual investment returns consistently being lower than the assumed investment return and regularly contributing less than the annual benefit accrual plus growth of existing unfunded benefits. At current contribution rates and benefit levels, the unfunded liability can be expected to continue to grow and the funded status to continue to languish. Constantly 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. Marshall Fire and the City have made incremental contribution increases since 2006, but these changes have not been enough to put the fund on a solid path to sustainability. Marshall Fire and the City have yet to make difficult decisions on additional needed changes to benefit or contribution levels.

Conclusion

Marshall Fire should consider the following actions to help ensure financial stability and mitigate the risks that lead to underfunding: ensuring contributions are adequate to fully fund Marshall Fire over a reasonable period; developing formal policies to guide decision-makers under different economic conditions; reviewing actuarial assumptions against actual experience and making necessary changes; and monitoring investment performance and evaluating asset allocation decisions on a forward-looking basis.

In addition, plans and their sponsors can develop policies that proactively manage risk in the future by laying out a formal risk-sharing plan. Funding and benefit policies can be adopted that provide a framework for how benefit and contribution levels may be modified under different conditions. An advantage of such policies is that changes to plan benefits and costs are known and understood by all parties in advance, rather than negotiated under difficult circumstances. Marshall Fire in conjunction with the City should utilize the funding soundness restoration plan requirement to develop such a long-term funding policy.

Background

Texas Government Code Section 801.202(2) requires the Pension Review Board (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 the following key metrics, in addition to amortization period, to determine and prioritize retirement systems for intensive actuarial review. The PRB selected Marshall Firemen’s Relief and Retirement Fund (“Marshall Fire” or “the Fund”) for review based on the 2016 actuarial valuation data shown below. Unless otherwise noted, the following metrics were reported or calculated as of December 31, 2016.

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
56.4	42.02	398.51%	7.75%	4.00%	78.11%	3.99%	-5.50%

Contribution, DROP and cash flow data are from the Fund’s 12/31/2016 financial audit.

Plan Profile
Actuarial Accrued Liability: \$18,353,876
Market Value of Assets: \$7,712,228
Normal Cost: 16.39% of payroll
Contributions: 14.0% employee 19.05% employer
Membership: 49 active 47 annuitants
Social Security Participation: No

At the time the Fund was selected for review:

- Its funded ratio was the second lowest of all defined benefit pension plans in Texas.
- Its amortization period was the fifth highest finite period of all defined benefit pension plans in Texas.
- Its unfunded actuarial accrued liability (UAAL or "unfunded liability") as a percent of payroll was the second highest among Texas Local Fire Fighter Retirement Act (TLFFRA) plans with assets of less than \$12 million and the fifth highest of all defined benefit pension plans in Texas.
- Actual contribution as a percent of its actuarially determined contribution (ADC) was the second lowest among TLFFRA plans with assets of less than \$12 million.
- Its non-investment cash flow as a percent of assets was the 12th lowest of all defined benefit pension plans in Texas.
- Its assumed rate of return was 7.75%, but the Fund reported to the PRB in February 2018 that it has since been lowered to 7.50%.

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).

Risk Analysis

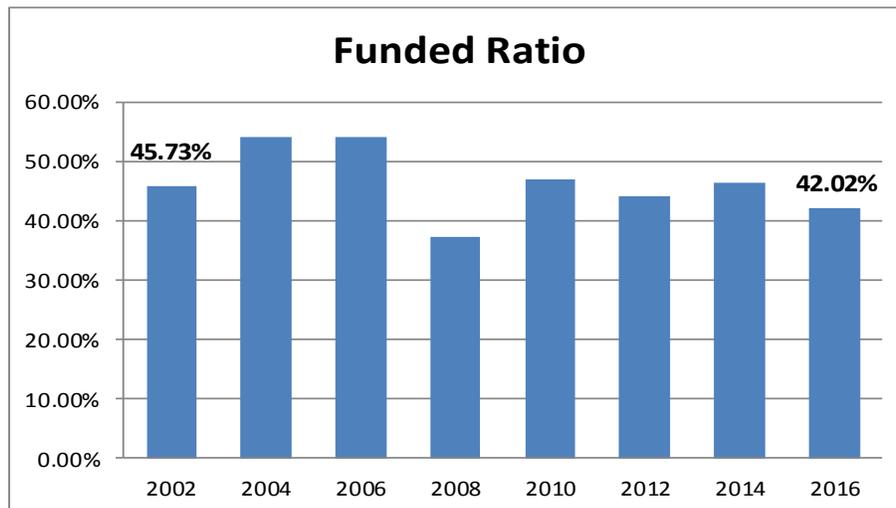
The various risks faced by a pension fund all boil down to one relatively simple question, “Will there be enough money to pay benefits when due?” This section discusses two main risk factors facing the Fund: governance and funding risks. Measuring Marshall Fire based on these factors reveals a significant amount of risk being taken in each of these areas, increasing the probability of a continued period of severe financial stress for the Fund. This also raises the likelihood of deteriorating funding conditions in the coming years, further imperiling the Fund’s ability to pay promised benefits.

Funding Risk

Marshall Fire’s significant growth in unfunded liability, which increased from \$4.5 million in 2002 to \$10.6 million by the end of 2016, can be attributed to many factors including: actual returns consistently lower than the assumed investment return; contributions consistently lower than the annual benefit accrual plus growth of existing unfunded benefits; and adjustments to the fund’s assumptions.

Background

According to Marshall Fire’s December 31, 2016 actuarial valuation, it was 42% funded on an actuarial basis, and according to reports filed with the PRB, it has not had a funded ratio above 55% for at least the past 15 years.



For a plan’s funding level to improve, its assets should grow faster than liabilities, which can be achieved by three key levers: contribution increases, benefit reductions to lower cost, and/or consistently high investment returns over a long period of time.

Fixed-Rate Funding Model and Contribution Insufficiency Risk

Most Texas plans use a fixed percent of pay funding approach. This is especially true for plans governed by the TLFRA statute. Under a fixed-rate funding structure, no formal amortization policy (i.e. the expected time to fully fund the plan) exists; therefore, the plan’s actuary estimates the amortization

period at each valuation date based on the current financial condition of the plan and the current contribution rates.

The nature of a fixed-rate, percent-of-pay contribution policy may exacerbate this risk over the long-term because:

- 1) Contributions to percent-of-pay plans are inherently back-loaded because the expected contributions to a percent-of-pay plan grow on a nominal basis at the assumed rate of total payroll growth.
- 2) Fixed-rate plans provide budgetary stability for the employer in the short term, but do not include any inherent mechanisms for reacting to changes in a plan’s financial condition.

Currently, active members of the Fund contribute 14.00% and the City contributes 19.05% of pay. This reflects an increase in the active members’ and multiple increases in the City’s contribution rate over the past 15 years. Despite these increases, during this period the Fund’s unfunded liability increased by \$6.1 million. This increase in the UAAL was caused by total contributions that were not sufficient to cover the cost of both the new benefits being accrued (normal cost) and the interest accumulated on the unfunded benefits already earned (amortization payment), or to start reducing the total UAAL. This resulted in *negative amortization* because contributions were not sufficient or large enough to cover the interest that accrues on the unfunded liability or pay down the unfunded liability during the year. In part, this can be attributed to the lack of a written funding policy and the nature of contributions that are a fixed-rate of pay set through statute or negotiation.

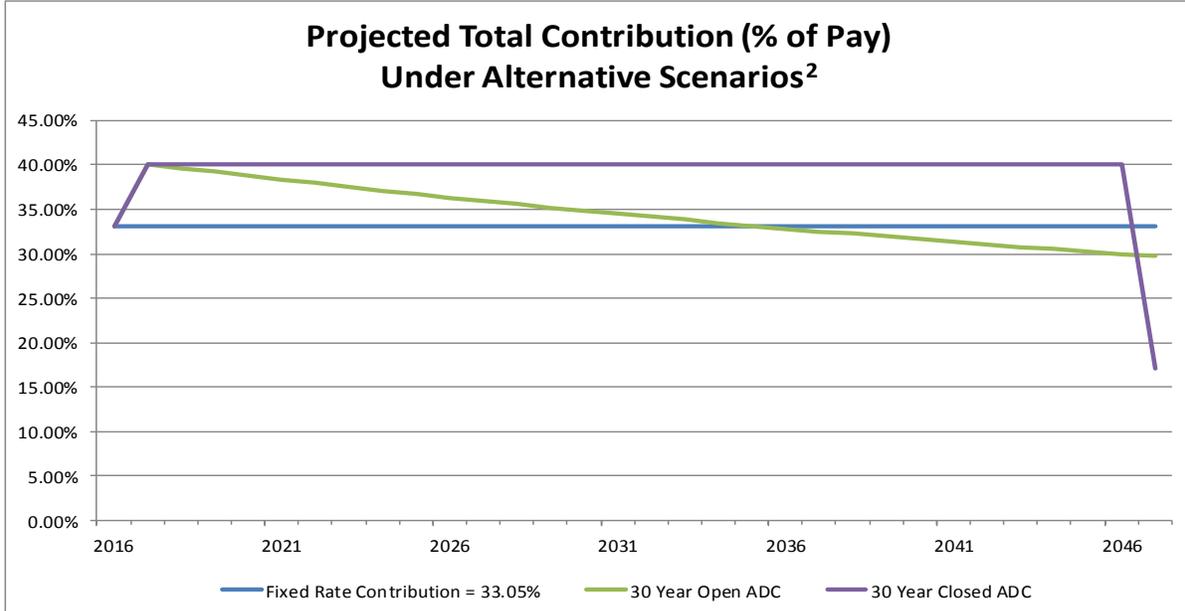
According to its actuarial valuations, Marshall Fire has not received the reported ADC in any year since 2002, with the exceptions of 2006 and 2010. Even with contribution increases in 2006, 2010, and 2012, employer contributions have averaged less than 90% of the Fund’s ADC over that period. Furthermore, the reported ADC is calculated using an open amortization period that results in perpetual negative amortization. If the fund were to use this ADC as a funding policy, the UAAL would grow indefinitely and the “pension debt” would never be paid off.

For the fiscal year ending December 31, 2016, the expected contributions were about 78% of the reported ADC. This shortfall of \$142,596 is equal to 0.70% of the City’s total General Fund expenditures for the fiscal year ending December 31, 2016 and is the highest among TLFFRA plans of similar size.

Contribution Levels vs. Actuarially Determined Contribution								
Date (12/31)	2002	2004	2006	2008	2010	2012	2014	2016
Employee Contribution	12.00%	12.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%
Employer Contribution	14.00%	14.00%	16.00%	16.00%	18.69%	19.05%	19.05%	19.05%
Employer 30-Year ADC	18.27%	16.20%	13.69%	20.91%	18.30%	21.51%	22.50%	24.39%
% of ADC funded	76.63%	86.42%	116.87%	76.52%	102.13%	88.56%	84.67%	78.11%
Covered Payroll (in thousands)	\$1,581	\$1,617	\$1,916	\$2,064	\$2,218	\$2,399	\$2,466	\$2,670
Contribution Shortfall (in thousands)	\$68	\$36	-	\$101	-	\$59	\$85	\$143

The projection below illustrates the expected total contributions (both employer and employee) under 3 contribution scenarios. The scenarios are 1) maintaining the current fixed contribution rates; 2) adopting a funding policy that utilizes a 30-year open amortization approach; and 3) adopting a funding policy

that utilizes a single-layer 30-year closed amortization approach (i.e. will fully fund the plan in 30 years). As illustrated here, the Fund’s current fixed contribution structure under Scenario 1 is not sufficient to pay down the unfunded liability and in fact allows the UAAL to continue to grow, resulting in negative amortization.



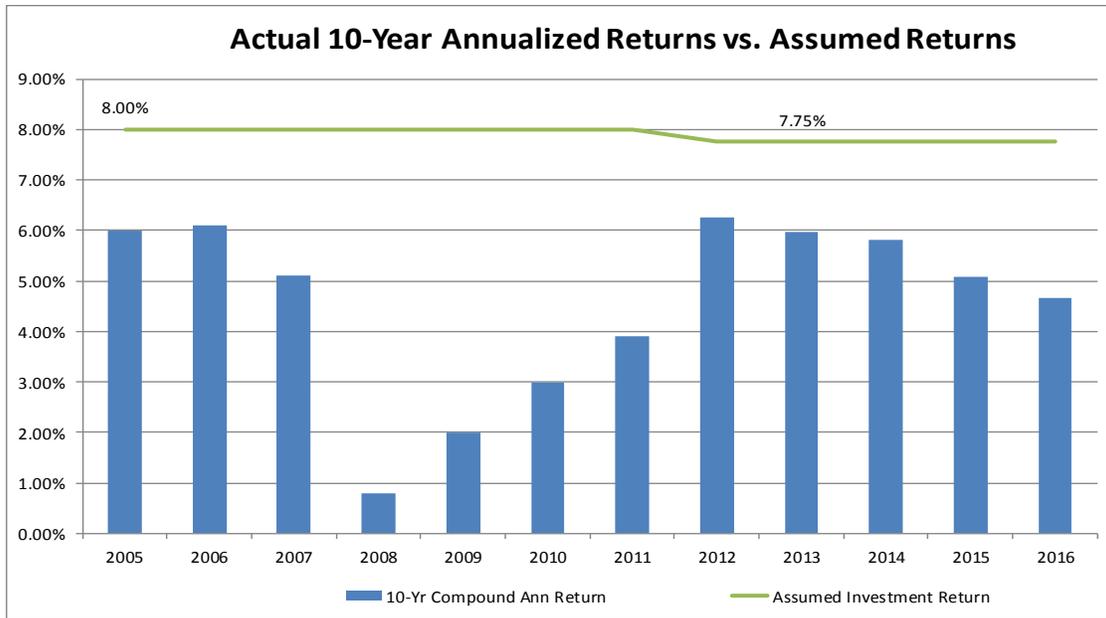
Benefit Adjustments

Benefit changes can be utilized as another lever by public pension plans to reduce cost and address a prolonged, low funding level. Marshall Fire has not made any benefit changes for current or future members of the fund to address its chronic funding shortfall. To the contrary, in 2007 the Fund gave a one-time 3% cost of living adjustment to retirees and 2% to beneficiaries, which may have contributed to the increase in the unfunded liability in the 2007–2008 period.

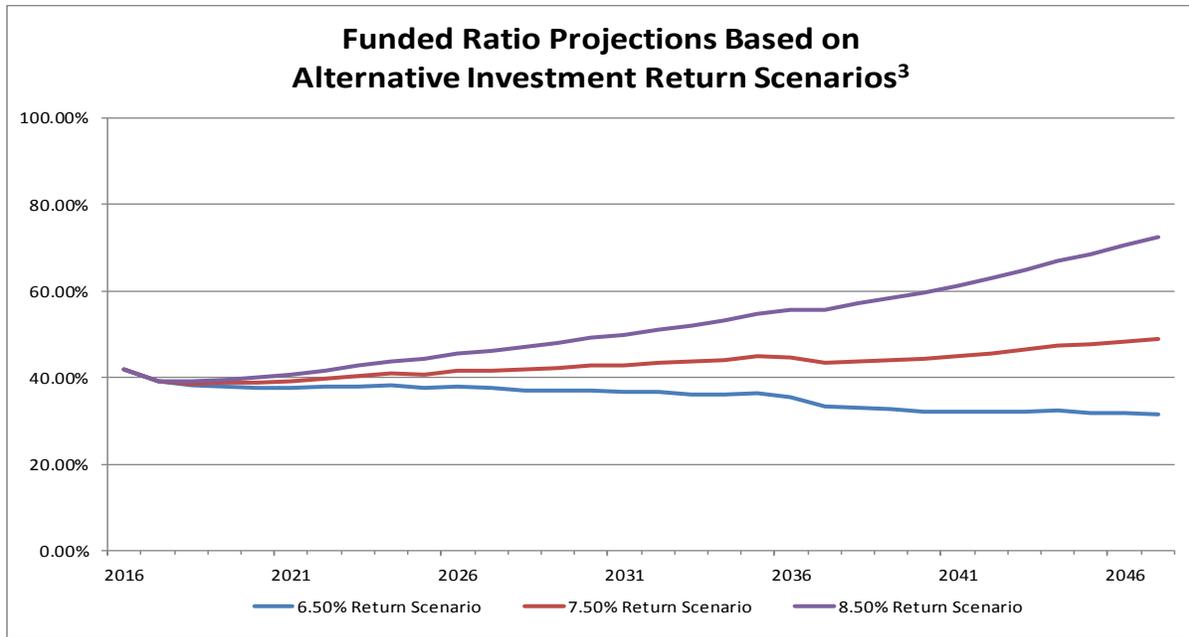
Investment Experience Compared with Investment Return Assumption

For Marshall Fire, actual investment returns lower than the assumed investment return increased the UAAL by more than \$2.1 million between 2006 and 2016. As illustrated below, the Fund has not achieved a 7.75% annualized return over a consecutive 10-year period in any of the 12 periods ending December 31, 2005 through December 31, 2016.

² The updated assumed rate of return of 7.50% was used for this projection. All other current and projected assets and liabilities reflect the actuarial accrued liabilities, actuarial value of assets, plan provisions, and actuarial assumptions and methods as reported in the 12/31/2016 Actuarial Valuation prepared by Retirement Horizons Incorporated.



The graph below projects the funded ratio for the next 30 years, assuming the member and the City contribution rates remain at a fixed 14.00% and 19.05% respectively, and the investments return 6.50%, 7.50%, or 8.50%. The impact of consistently earning less than the expected return on assets (EROA) but *even as high as 6.50% over the next 30 years*, results in the funded status sinking to 31%. Earning 8.50% over the next 30 years would put Marshall Fire at 82% funded. However, based on the current asset allocation, the PRB estimates the probability of earning less than or equal to a 6.50% annualized return is approximately twice as likely as achieving an 8.50% or greater annualized return over the next 30-year period.



Conclusion/Recommendations

Pre-funding a defined benefit plan, i.e. setting aside assets now for benefits that will be paid in the future, is necessary to help balance the three primary policy goals of benefit security, equity between generations of taxpayers and employees, and a stable contribution from year to year. 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.

In the absence of a formal, written funding and risk-sharing policy, the result is a de facto risk-sharing arrangement that is simply a reaction to events, often well after the plan finds itself with financial difficulties. Plans and their sponsors can take many actions to ensure financial stability and mitigate the risks that lead to underfunding. These steps include ensuring contributions are adequate to fully fund the plan over a reasonable period; developing formal policies to guide decision-makers under different economic conditions; reviewing actuarial assumptions against actual experience and making necessary changes; and monitoring investment performance and evaluating asset allocation decisions on a forward-looking basis.

Adequate Funding. To address these concerns, a strong funding policy that requires payment of an ADC is encouraged. Numerous actuarial methods can be utilized to help mitigate contribution volatility, including directly smoothing contribution rates or adding “guardrails” that require the stakeholders to come back to the table if the contribution rate falls outside a specified range. If funding according to an

³ The updated assumed rate of return is 7.50% was used for this projection. All other current and projected assets and liabilities reflect the actuarial accrued liabilities, actuarial value of assets, plan provisions, and actuarial assumptions and methods as reported in the 12/31/2016 Actuarial Valuation prepared by Retirement Horizons Incorporated.

ADC is not adopted, a funding policy that fully funds the plan over a finite period, such as 30 years, is recommended.

Actuarial Assumptions. Public pension plans must monitor actuarial assumptions continually through their actuarial valuations and make appropriate adjustments to mitigate bias in the assumptions that result in consistent actuarial gains or losses. Actuarial gains and losses occur when the plan's actual experience does not match expected experience. Over time, without required changes, pension funds such as Marshall Fire whose assumptions consistently diverge from actual experience in the same direction (i.e. consistently seeing actuarial gains or consistently seeing actuarial losses) can exacerbate the issue of intergenerational inequity, causing one group of members and taxpayers to over- or under-pay. Boards of trustees should work with their actuaries and other consultants to ensure assumptions are neither too aggressive nor too conservative, while striving to maintain (or achieve) sound fiscal health to secure existing accrued benefits. PRB's *Pension Funding Guidelines* recommend systems to monitor, review, and report the impact of actual plan experience on actuarial assumptions at least once every five years.

Investment Performance. Whatever the investment return assumption used, investment returns should be closely monitored, and investment managers' performance should be assessed regularly and compared to appropriate asset class benchmarks. Benchmarks should be reviewed to see if they have been met or exceeded, and should be viewed considering the risk taken to achieve those returns. Best practices also include revisiting investment manager selection periodically, with boards of trustees evaluating managers' performance, fees, and whether their current managers are providing the highest possible value at the lowest possible cost. The asset allocation should also be assessed from a risk perspective to provide insight into how the fund would weather a market correction.

Governance Risk

When public pension plans and their sponsors wait too long to address them, the funding challenges compounding over time can reach a point where small, incremental improvement, such as the contribution increases made for Marshall Fire, are not sufficient to make consistent, long-term improvements to the overall health of the plan. Marshall Fire and the City have yet to make difficult decisions on additional needed changes to benefit or contribution levels. If necessary changes are ultimately made, they may right the ship, but they will potentially be made under less than ideal conditions.

Background

Governance is essentially decision-making, and decision-making for public pension plans must balance the competing interests of plans and their sponsors and should feature collaboration between the two. The primary source of governance risk is the potential lack of involvement of key parties or stakeholders (members, the sponsor government, and taxpayers) in important areas of decision-making for a pension plan including plan design (benefits) and funding (contributions). When a key party is not engaged in important decisions, the risk increases that benefit levels and the contributions required to fund them will diverge, potentially putting the plan's funding stability at risk.

For example, TLFFRA allows boards of trustees to make prospective benefit modifications, both increases and reductions. These changes must be approved by an actuary and a majority of participating members, and may not deprive an eligible participant of vested accrued benefits. Although jointly responsible for funding the retirement plan along with plan members, the sponsoring city may have limited involvement in benefit decision-making, a structure which generates the risk that benefit levels adopted could be unsustainable.

Benefit increases are not the only potential risk related to a potential lack of sponsor involvement under TLFFRA; unwillingness to reduce benefits prospectively when necessary to address funding challenges can be an obstacle to getting things back on track. It should be noted that even plans with very engaged boards and sponsors can be susceptible to increasing benefits to unsustainable levels in good times or failing to lower them when necessary in bad times. Governance risk related to an imbalance in decision-making can only exacerbate these risks. Given the Fund's historically poor funding levels of under 55% for the last 15 years, the absence of benefit modification or member contribution increase discussions by Marshall Fire illustrates this point.

Funding Soundness Restoration Plan

State law recognizes the potential risks of underfunding and a lack of engagement by some key stakeholders and imposes cooperation between the system and sponsoring governmental entity by requiring retirement systems having trouble meeting their long-term obligations work with their sponsors to develop a restoration plan for addressing those issues.⁴ This framework helps ensure that both the system and its sponsoring employer are involved in pension plan reform decisions, but it comes at a point when actuarial health is already threatened. Marshall Fire submitted an FSRP for review on April 19, 2018. The FSRP proposed some eligibility changes for members hired after December 31, 2018 and additional employer contributions that have not been considered in the analysis contained in this report. The benefit changes have since been approved, but the increase in employer contributions is still pending approval by the City. The changes outlined in the FSRP will project an amortization period of 36.5 years in 2026; however, that calculation is contingent upon the City increasing its contribution, nor does it consider already approved assumption changes (i.e. a reduction in the assumed return on investments) that will likely result in the plan being out of compliance when it completes its December 31, 2018 actuarial valuation.

Conclusion/Recommendation

Plans and their sponsors can develop policies that proactively manage risk in the future by laying out a formal risk-sharing plan. To proactively manage governance and funding risk, retirement plans and their sponsors should work together to adopt written policies far in advance, that can guide them through both good and bad years and shield against the risk of either party's exclusion or disengagement from decision-making. Funding and benefit policies can be adopted that provide a framework for how benefit

⁴ Texas Government Code 802.2015 and 802.2016 require public retirement systems whose amortization period exceeds 40 years for 2 or 3 consecutive actuarial valuations to develop, with their sponsor, a funding soundness restoration plan designed to bring their amortization period within 40 years over 10 or fewer years.

and contribution levels may be modified under different conditions. An advantage of such policies is that changes to plan benefits and costs are known and understood by all parties in advance, rather than negotiated under difficult circumstances.

For example, a funding policy might state that future benefit enhancements, cost of living adjustments, and/or contribution rate reductions can only be considered or made if the plan's funded ratio remains greater than a chosen threshold. A funding policy can also state that if the funded ratio falls below a certain threshold, the stakeholders are required to come back to the table to make necessary contribution and benefit adjustments. Marshall Fire in conjunction with the City should utilize the funding soundness restoration plan requirement to develop such a long-term funding policy.

Appendix

Key Metrics

Metric	Amortization period (56 years)
What it measures	Approximately how long it would take to fully fund the unfunded actuarial accrued liability (UAAL or "unfunded liability") based on the current funding policy.
Why it is important	Given the Fund’s current assumptions, an amortization period above 17 indicates the contributions to the fund 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 Marshall Fire, the higher the amortization period, the more sensitive it is to small changes in the UAAL.
Peer Comparison	Marshall Fire currently has the fifth highest finite amortization period of all defined benefit pension plans in Texas.
Metric	Funded ratio (42.02%)
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	Marshall Fire’s funded ratio is the second lowest of all defined benefit pension plans in Texas.
Metric	UAAL as a percent of payroll (398.51%)
What it measures	The size of a plan’s unfunded liability compared to the annual payroll of its 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 second highest among TLFFRA plans with assets of less than \$12 million and the fifth highest of all defined benefit pension plans in Texas.
Metric	Assumed rate of return (7.75%)
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. Marshall Fire’s assumed rate of return was 7.75%, while its actual ten-year investment rate of return for the period ending December 31, 2016 was only 4.67%.
Peer comparison	Marshall Fire has the second highest assumed rate of return in its peer group of TLFFRA plans with assets of less than \$12 million.

Metric	Payroll growth rate (4.00%)
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. Given the fund’s inactive and active liabilities are not fully funded; contributions below expected levels will have serious consequences on the Fund’s long-term solvency.
Peer comparison	The Fund’s payroll growth rate of four percent is tied for the third most aggressive in its peer group of TLFRA plans with assets of less than \$12 million.

Metric	Actual contributions as a percent of actuarially determined contribution (78.11%)
What it measures	Whether the current employer contributions have met a theoretical minimum threshold. ⁵
Why it is important	The employer’s portion of the contribution is less than 80% of the amount needed to fund Marshall Fire on a rolling 30-year amortization period. The PRB’s 2014 <i>Study of the Financial Health of Texas Public Retirement Systems</i> found that plans that have consistently received adequate funding are in a better position to meet their long-term obligations.
Peer comparison	This is second largest shortfall percentage in its peer group of TLFRA plans with assets of less than \$12 million.

Metric	DROP as a percent of fiduciary net position (3.99%)
What it measures	The amount of the Fund’s assets that are designated for lump-sum payouts to retired members as a percent of its total assets.
Why it is important	Viewing this metric as a percent of total net assets (or fiduciary net position (FNP)) shows how large a decrease in the Fund’s assets could be if most or all DROP participants decided to take their balances out in a short amount of time. As of December 31, 2016, Marshall Fire’s DROP balance was \$307,546 and represented 3.99% of the fund’s Fiduciary Net Position (FNP).

⁵ 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).

Metric	Non-investment cash flow as a percent of fiduciary net position (-5.50%)
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 a plan, provides information about the stability of a plan’s funding arrangement.
Peer comparison	Marshall Fire’s non-investment cash flow as a percent of FNP is the 12 th lowest of all defined benefit pension plans in Texas. If this trend continues, the Fund could face the potential risk of needing to liquidate a portion of existing assets to pay current benefits and/or expenses.

Plan Summary

The Marshall Firemen’s Relief and Retirement Fund (“Marshall Fire” or “the Fund”) was established in 1992 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. Marshall Fire, as with all TLFFRA systems, is entirely locally-funded.

Benefits

Retirement Eligibility	Age: 50 years; Years of Service: 10 years
Vesting	10 Years of Service
Benefit Formula	Years of Service (up to 20 years) x 3.125% x Final Average Salary +\$65 per month for each year > 20 Years of Service
Final Average Salary (FAS)	Final 78 biweekly average salary
COLA	None
Retirement Benefit Options	Forward DROP: 3-year maximum. Employee contributions credited; no interest. Eligible at 50 years of age and 20 years of service.
Social Security	No

Contributions

Currently, active members of Marshall Fire contribute 14.00% of pay while the City of Marshall (the City) contributes 19.05% of pay.

Membership

Total Active Members	Retired Members	Beneficiaries	Total Annuitants	Total Members	Active-to-Annuitant Ratio
49	29	8	37	90	1.32

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 Trustee 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 contribute the lesser of 12% of pay or the rate at which the active members contribute. TLFFRA also allows a city to contribute at a higher rate than employees 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.

Funding Soundness Restoration Plan

Texas Government Code §802.2015 requires the governing body of a public retirement system and its governmental sponsor formulate a funding soundness restoration plan if the system’s actuarial valuation shows its amortization period exceeds 40 years for three consecutive annual actuarial valuations, or two consecutive actuarial valuations if the system conducts valuations less frequently.

Marshall Fire meets the requirement because the actuarial valuations prepared as of December 31, 2014 and December 31, 2016 reported amortization periods greater than 40 years. Marshall Fire submitted an FSRP for review on April 19, 2018. The FSRP proposed some eligibility changes for members hired after December 31, 2018 and additional employer contributions that have not been considered in the analysis contained in this report. The benefit changes have since been approved, but the increase in employer contributions are still pending approval by the City. The changes outlined in the FSRP will project an amortization period of 36.5 years in 2026, however, that calculation is contingent upon the City increasing its contribution, nor does it consider already approved assumption changes (i.e. a reduction in the assume return on investments) that will likely result in the plan being out of compliance when the plan completes its December 31, 2018 actuarial valuation.

Historical Trends

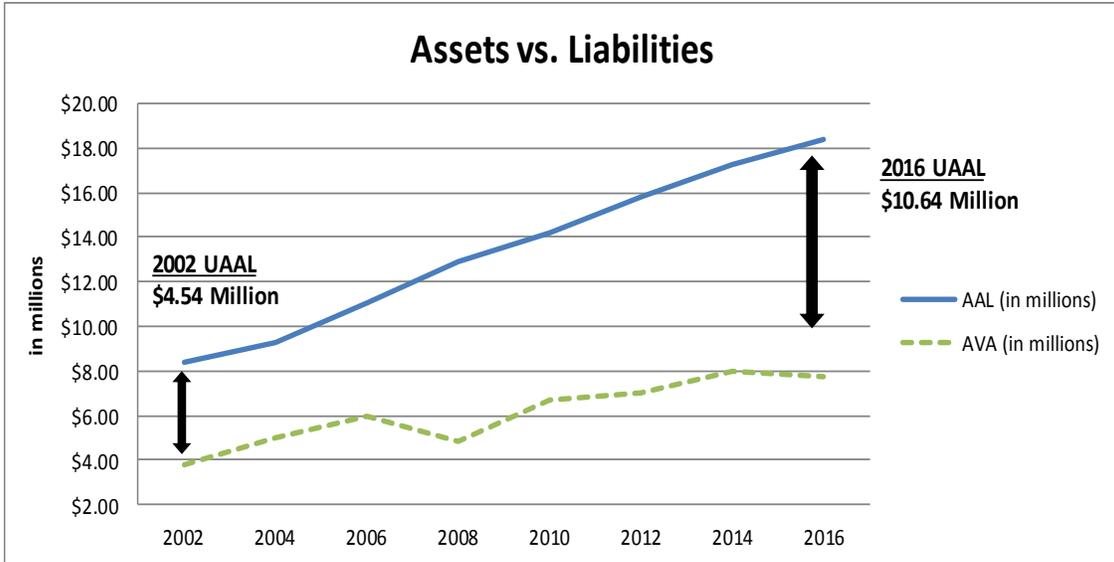
To conduct an intensive review of risks associated with the long-term funding of a pension plan, it is important to analyze trends in multiple metrics. A plan with an asset level lower than its accrued liability has insufficient funds to cover benefits. A plan can experience an increase in unfunded liability 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 Marshall Fire.

The health of Marshall Fire has been deteriorating since the early 2000s. Numerous factors have contributed to this deterioration, including inadequate contributions, investment returns lower than the assumed return, and increased benefit payments. The following sections discuss these and other factors in detail.

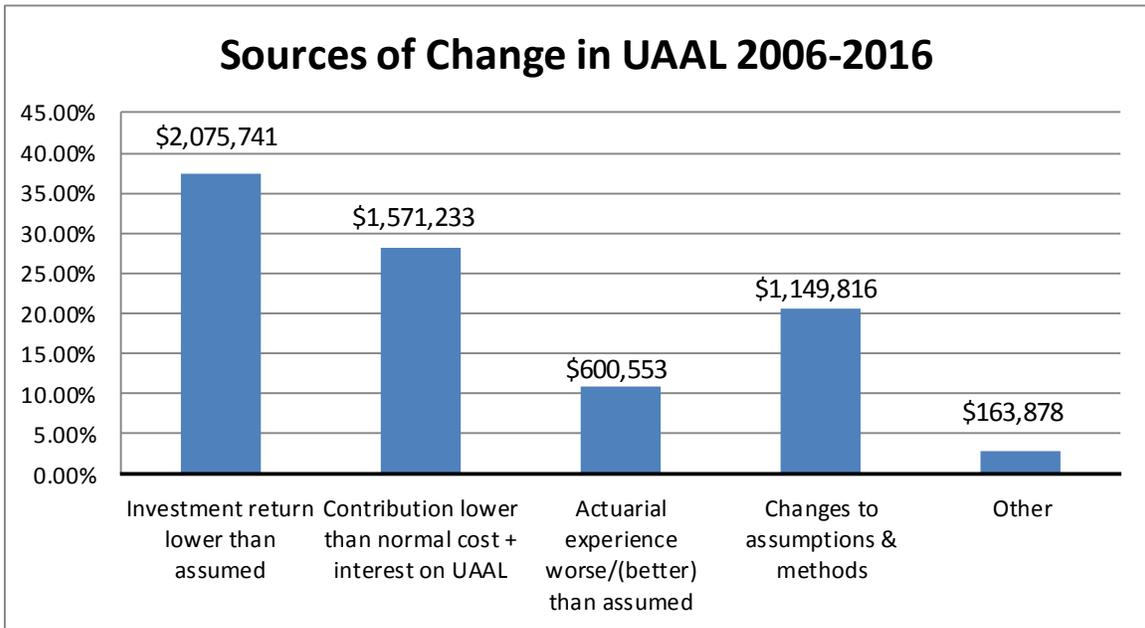
Assets and Liabilities

Funding Trends								
Funded Ratio, Assets, Liabilities and Year over Year Growth								
Date (12/31)	2002	2004	2006	2008	2010	2012	2014	2016
Funded Ratio	45.73%	54.02%	53.93%	37.14%	46.95%	44.18%	46.39%	42.02%
Am Period (years)	55.9	38.3	23.3	51.1	23.5	38.6	43.2	56.4
UAAL (in millions)	\$4.54	\$4.26	\$5.08	\$8.12	\$7.52	\$8.83	\$9.25	\$10.64
AVA (in millions)	\$3.82	\$5.01	\$5.95	\$4.80	\$6.65	\$6.99	\$8.00	\$7.71
AVA Growth (YoY)	-	14.50%	8.96%	-10.19%	17.76%	2.50%	7.00%	-1.84%
AAL (in millions)	\$8.36	\$9.27	\$11.03	\$12.92	\$14.17	\$15.82	\$17.25	\$18.35
AAL Growth (YoY)	-	5.35%	9.05%	8.23%	4.74%	5.66%	4.42%	3.14%

Marshall Fire’s actuarial accrued liability (AAL) increased by 119.62% between 2002 and 2016. Conversely, the Fund’s actuarial value of assets (AVA) only grew by 101.80% over that same period, resulting in an increase of the UAAL of 134.63%. The funded ratio (AVA/AAL) also fell from 45.73% in 2002 to 42.02% in 2016.



The graph below illustrates that the \$5.6 million increase in UAAL (from \$5.1 million in 2006 to \$10.6 million in 2016) is primarily a result of investment returns lower than the assumed rate of return (\$2.1 million increase in UAAL), the annual contribution lower than the normal cost plus the interest accumulated on the UAAL (\$1.6 million increase in UAAL), and changes to actuarial methods and assumptions (\$1.1 million increase in UAAL).



Investment Assumption and Returns

As illustrated above, actual investment returns lower than the assumed investment return increased the UAAL by more than \$2.1 million between 2006 and 2016. While Marshall Fire lowered its assumed rate of return from 8.00% to 7.75% in 2012, it still exceeds the 2017 national average of 7.52% (reported by

NASRA). In addition, the Fund has not achieved a 7.75% return on assets over a consecutive 10-year period in any of the 12 periods ending December 31, 2005 through December 31, 2016.

Asset Allocation

As shown in the chart below, the Fund’s actual asset allocation is close to its target allocation and within the ranges of the Fund's Investment Policy Statement. The asset allocation is very similar to other TLFRA plans.

Asset Allocation			
Asset Class	Equities	Fixed Income/Cash	Specialty ⁶
Current Allocation	50.9%	27.3%	21.8%
Target Allocation	50.0%	30.0%	20.0%

*Current allocation as of 12/31/2016 financial audit.

Payroll Growth

Marshall Fire lowered its annualized payroll growth assumption from 4.25% to 4.00% as of December 31, 2012. Even with this decrease, the Fund still has one of the highest payroll growth rate assumptions when compared to other TLFRA plans of similar size. The Fund’s actual payroll growth rate averaged 3.82% between 2002 and 2016 and has only exceeded the target rate in 2006 and 2016.

While this assumption under a fixed-rate funding policy does not directly affect actual contributions, the calculation of the amortization period is highly sensitive to it, especially when a plan’s amortization period is as high as the Fund’s.

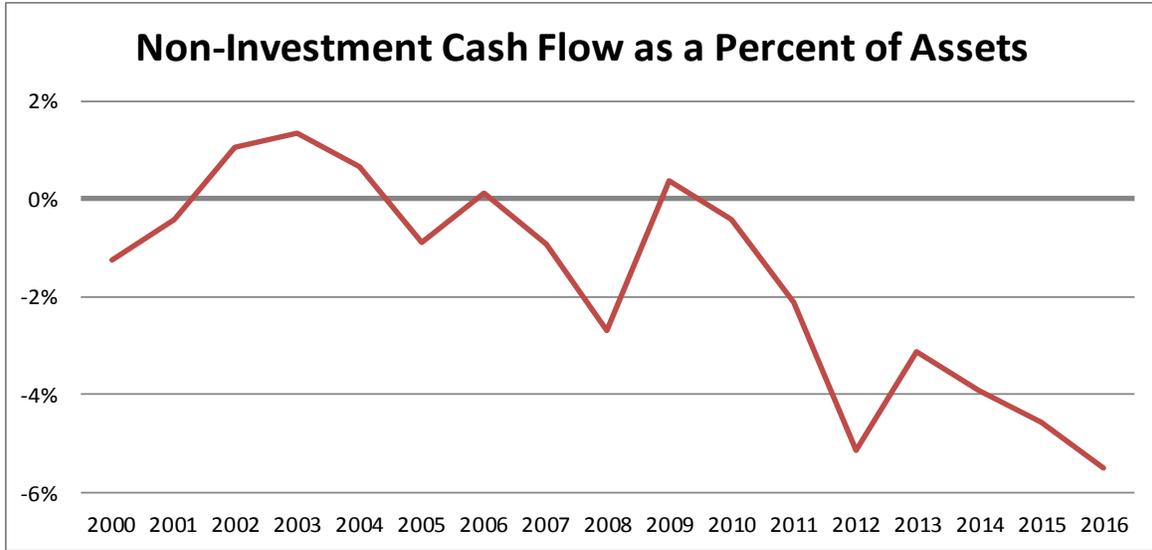
Sensitivity to Changes in Payroll Growth Assumption	
Assumed Payroll Growth	Amortization Period
4.00%	56
3.50%	96

*Based on UAAL as of December 31, 2016 and an employer contribution of 19.05%.

Cash Flow

Marshall Fire’s non-investment cash flow was -5.5% in 2016 and has been in decline since 2010. The decrease is due to benefit payments growing 39.7% between 2011 and 2016 while contributions only grew by 6.3% during that same period. A negative non-investment cash flow is not abnormal for mature defined benefit pension plans. However, a cash flow percentage this low is likely to be a drag on potential investment returns because a fund must either invest in a higher proportion of income-producing investments, which traditionally provide lower returns, or must liquidate existing assets to pay out current benefits and/or expenses.

⁶ The specialty asset class consists of convertible securities, a multi-asset fund, a master limited partnership (MLP) and a Real Estate Investment Trust (REIT). These funds hold publicly traded debt and equity securities across various asset classes.



DROP

In 2012, Marshall Fire implemented a deferred retirement option plan (DROP) that allows eligible members to continue to work, but their monthly retirement benefit is calculated as of the date of DROP election and is deferred until formal retirement. The City and the member will continue to make contributions to the Fund during this period. Upon formal retirement, the member will begin to receive their monthly retirement benefit and is then eligible to receive a lump sum payment equal to the total retirement benefit amount the member would have received plus the amount of contributions, with no interest, that the member made into the Fund over the 3-year period of DROP participation.

As of December 31, 2016, Marshall Fire's DROP balance was \$307,546 and represented 3.99% of the fund's fiduciary net position (FNP). The DROP allows members to participate for a maximum of 3 years and does not credit interest.

Intensive Actuarial Review: Marshall Firemen's Relief and Retirement Fund

Peer Group Key Metric Comparison

		Funding Val Metrics						Fiscal Year End Metrics			
Peer Group Plans	MVA	Am Period Date	Amortization 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
Big Spring Firemen's Relief & Retirement Fund	\$ 11,157,022	1/1/2015	28.7	54.82%	248.61%	8.00%	5.00%	12/31/2016	110.08%	0.00%	-9.54%
Weslaco Firemen's Relief & Retirement Fund	\$ 9,186,148	9/30/2016	14.1	68.53%	111.07%	7.25%	3.25%	9/30/2016	145.69%	N/A	1.33%
Corsicana Firemen's Relief & Retirement Fund	\$ 8,344,317	12/31/2016	28.9	53.14%	211.44%	7.00%	3.00%	12/31/2016	100.01%	N/A	-1.97%
Sweetwater Firemen's Relief & Retirement Fund	\$ 8,264,183	12/31/2014	58.8	69.01%	246.28%	8.00%	4.50%	12/31/2016	83.61%	N/A	-4.60%
Orange Firemen's Relief & Retirement Fund	\$ 8,154,674	12/31/2016	69.3	49.86%	336.03%	7.75%	4.00%	12/31/2016	70.49%	N/A	-7.91%
Marshall Firemen's Relief & Retirement Fund	\$ 7,712,228	12/31/2016	56.4	42.02%	398.51%	7.75%	4.00%	12/31/2016	84.67%	3.99%	-5.50%
Paris Firefighters' Relief & Retirement Fund	\$ 5,461,762	12/31/2014	26.1	42.74%	311.01%	8.00%	4.50%	12/31/2016	100.00%	N/A	-10.31%
Plainview Firemen's Relief & Retirement Fund	\$ 5,296,898	12/31/2015	31.6	37.33%	453.72%	7.75%	3.50%	12/31/2016	87.77%	N/A	-2.63%
Atlanta Firemen's Relief & Retirement Fund	\$ 3,614,929	12/31/2014	36.2	81.87%	130.44%	7.50%	3.00%	12/31/2016	107.62%	N/A	-1.55%
Brownwood Firemen's Relief & Retirement Fund	\$ 3,397,474	12/31/2015	36.1	44.63%	257.78%	7.40%	3.40%	12/31/2016	93.90%	N/A	0.32%
San Benito Firemen Relief & Retirement Fund	\$ 3,301,643	12/31/2015	21.7	60.52%	156.71%	7.50%	4.00%	9/30/2015	0.00%	N/A	0.15%

Peer Group Sponsor Funding Comparison

Peer Group Plans	GF Expend	EOY GF Bal	UAAL	Expected Employer Contributions	ADC	30-yr Shortfall	30-Y SF % of ADC	30-Y SF % of GFE
Sweetwater Firemen's Relief & Retirement Fund	\$ 8,733,810	\$ 3,929,907	\$ 3,674,028	\$ 238,689	\$ 294,781	\$ 56,092	19.03%	0.67%
Orange Firemen's Relief & Retirement Fund	\$ 17,985,946	\$ 8,272,029	\$ 8,199,175	\$ 341,606	\$ 469,709	\$ 128,103	27.27%	0.71%
Marshall Firemen's Relief & Retirement Fund	\$ 20,353,433	\$ 6,537,285	\$ 10,641,648	\$ 508,698	\$ 651,293	\$ 142,595	21.89%	0.70%
Plainview Firemen's Relief & Retirement Fund	\$ 12,768,715	\$ 15,844,471	\$ 9,781,866	\$ 532,083	\$ 606,247	\$ 74,164	12.23%	0.58%
Brownwood Firemen's Relief & Retirement Fund	\$ 19,316,832	\$ 3,038,924	\$ 4,563,878	\$ 354,088	\$ 377,104	\$ 23,016	6.10%	0.12%

Peer Group Expense Comparison

Peer Group Plans	10 yr return (Net)	Active/ Annuitants	Average Benefit	NPL	Admin Expenses	Investment Expenses	Other Expenses	Total Expenses	Exp as % of Assets
Big Spring Firemen's Relief & Retirement Fund	4.26%	1.27	\$ 37,713	\$ 9,713,127	\$ 100,927	\$ -	\$ -	\$ 100,927	0.90%
Weslaco Firemen's Relief & Retirement Fund	2.71%	2.21	\$ 18,578	\$ 4,588,953	\$ 45,252	\$ 52,746	\$ -	\$ 97,998	1.07%
Corsicana Firemen's Relief & Retirement Fund	3.40%	1.81	\$ 31,722	\$ 8,837,348	\$ 22,168	\$ 92,459	\$ -	\$ 114,627	1.37%
Sweetwater Firemen's Relief & Retirement Fund	4.38%	1.04	\$ 30,612	\$ 4,965,694	\$ 41,956	\$ 62,322	\$ -	\$ 104,278	1.26%
Orange Firemen's Relief & Retirement Fund	3.72%	0.88	\$ 26,036	\$ 8,946,685	\$ 18,742	\$ 93,636	\$ -	\$ 112,378	1.38%
Marshall Firemen's Relief & Retirement Fund	4.67%	1.32	\$ 30,632	\$ 10,956,850	\$ 4,077	\$ 45,898	\$ -	\$ 49,975	0.65%
Paris Firefighters' Relief & Retirement Fund	2.16%	1.17	\$ 24,491	\$ 9,642,566	\$ 37,674	\$ 32,730	\$ -	\$ 70,404	1.29%
Plainview Firemen's Relief & Retirement Fund	1.95%	1.03	\$ 24,050	\$ 10,746,840	\$ 12,557	\$ 49,439	\$ 811	\$ 62,807	1.19%
Atlanta Firemen's Relief & Retirement Fund	4.84%	1.25	\$ 9,039	\$ 1,129,175	\$ 23,941	\$ 25,495	\$ -	\$ 49,436	1.37%
Brownwood Firemen's Relief & Retirement Fund	3.52%	1.28	\$ 16,378	\$ 5,056,328	\$ 35,414	\$ 41,080	\$ -	\$ 76,494	2.25%
San Benito Firemen Relief & Retirement Fund	0.94%	2.50	\$ 23,082	\$ 2,154,088	\$ 15,722	\$ 38,370	\$ -	\$ 54,092	1.64%

Comments from Marshall Firemen's Relief and Retirement Fund



City of Marshall

Fire Department

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REGINALD K. COOPER, EFO FIRE CHIEF

March 26, 2018

State Pension Review Board

P.O. Box 13498

Austin, TX 78711-3498

Re: Funding Soundness Restoration Plan

The purpose of this letter is to inform the State Pension Review Board of the Marshall Firemen's Relief and Retirement Funds current status in the development of the required Funding Soundness Restoration Plan. Members of the board have been actively working with the City of Marshall Administrative staff in order to make the necessary changes to the fund. The proposed changes to the fund are listed below.

- Increasing the age of eligibility for service retirement benefit from 50 to 53 years of age years for members hired after December 31, 2018.
- Increasing the years of vested pension service from 10 years to 20 years for members hired after December 31, 2018.
- City contributions will be made at the end of the year for unfilled vacancies that existed throughout the year effective December 31, 2018.
- City will consider increasing its contribution rate by 0.75% of payroll effective January 1, 2019, with future contributions being reviewed upon completion on each actuarial evaluation.

For purposes of preparing the Funding Soundness Restoration Plan (FSRP), a cumulative plan design study was performed by Retirement Horizons Inc. to measure the impact that these changes will have based on the assumptions and methods used in the December 31, 2016 valuation of the Marshall Firemen's Relief and Retirement Fund. The result of this study indicates that the 10 year future expected amortization period reaches 36.5 years in 2026 under the assumptions, which is under the required 40 years.

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Pension Review Board

The Marshall Firemen's Relief and Retirement board will consider approval to have an election of the members to approve increasing the age of eligibility for service retirement benefit from 50 to 53 years of age for members hired after December 31, 2018. The election will also vote on increasing the years of vested pension service from 10 years to 20 years for members hired after December 31, 2018. The board will discuss and consider the approval at the next scheduled agenda meeting.

The City of Marshall City Manager has agreed to present to the city commission for approval that contributions will be made at the end of the year for unfilled vacancies that existed throughout the year effective December 31, 2018. Additionally, the city manager has agreed to present to the commission during the 2019 budget process the board's request to increase the employer contribution rate 0.75% of payroll effective January 1, 2019. It was also discussed that future contributions rates would be evaluated at the completion of each actuarial evaluation.

The combined changes will have a positive impact to the fund by reducing the years of amortization below 40 years within 10 years, thus satisfying Pension Review Board requirements. Although no formal changes have been made thus far, the Pension Review Board will be notified once the proposed changes have been approved by the City Commission as well as the members of the fund.

Respectfully,



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Chairman
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