Intensive Actuarial Review:

Irving Firemen's Relief and Retirement Fund

October 2018

PENSION REVIEW BOARD

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Executive Summary

Introduction

This intensive actuarial review of Irving Firemen's Relief and Retirement Fund ("Irving Fire" or "the Fund") is intended to assist the Fund's board of trustees and the City of Irving ("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 (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

Irving Fire faces significant risk associated with its deferred retirement option plan (DROP) because it offers: a guaranteed 6.25% annual rate of return, which is calculated as 2.0% less than the actuarial investment return assumption; a virtually unlimited amount of time to accrue this guaranteed return; and the ability to withdraw these funds with little to no restriction. In an era of extremely low interest rates, offering a guaranteed 6.25% rate of return on accounts that can be withdrawn on short notice is virtually unheard of and presents great risk. It is impossible for the Fund to back these liabilities with assets with a similar investment horizon while providing a similar return. The Fund's DROP balance has grown rapidly in the last few years, from just over 15% of total plan assets in 2014 to nearly 30% of total assets in 2016.

The recent change in Irving Fire's investment return assumption will lower the guaranteed rate of return to 5.50% for future DROP participants. However, this will have little, if any, effect on Irving Fire's DROP program for the next nine years, as those who are already eligible for the DROP are locked in at the guaranteed interest rate based on the Fund's previous 8.25% investment return rate.

Conclusion

To address the immediate risks posed by the DROP, the board should consider performing an in-depth asset-liability study to better understand the potential risks associated with its existing asset mix and the liabilities they support and seriously consider the risk a guaranteed rate of return places on all the Fund's stakeholders while bearing in mind the impact changes could have on DROP participant behavior.

To address the funding and governance risks, the Fund and the City should develop written funding, benefit, and investment policies that are linked to provide a formal risk-/cost-sharing arrangement. A strong funding policy that requires payment of an actuarially determined contribution (ADC) is encouraged. In addition to helping maintain a sound plan funding level, putting such forward-looking policies into place can help reduce uncertainty for stakeholders who would know, in advance, how adverse experience will be managed.

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.

Irving Fire's intensive review was initially scheduled to begin in April 2018. The City requested a delay and, after careful consideration of the exceptional circumstances surrounding the request, the PRB agreed. The agency informed the Fund and City in late July that the Fund would be reviewed with a publication date in October 2018.

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 Irving Firemen's Relief and Retirement Fund ("Irving Fire" or "the Fund") for review based on the data shown below. Unless otherwise noted, the following metrics were calculated as of the Fund's December 31, 2015 actuarial valuation.

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
33.0	74.92%	228.54%	8.25%	4.25%	82.33%	29.63%	-1.24%

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

Plan Profile

Actuarial Accrued Liability: $246,655,353

Market Value of Assets: $174,037,587

Normal Cost: 18.53% of payroll

Contributions: 13.00% employee
16.75% employer

Membership: 360 active
180 annuitants

Social Security Participation: No

At the time the Fund was selected for review:

- Its assumed rate of return on assets of 8.25% was the highest of all defined benefit pension plans in Texas and above the national averages for public pension plans.
- Its payroll growth rate of 4.25% was the most aggressive in its peer group of TLFFRA plans with assets over $100 million and one of the highest among Texas defined benefit plans.
- Actual contribution as a percent of its Actuarially Determined Contribution (ADC) was the second lowest amongst its peer group.
- Members' deferred retirement option plan (DROP) balances accounted for nearly one-third of the plan's total net assets.

Since selecting Irving Fire, the PRB received the Fund's December 31, 2017 actuarial valuation. The board lowered several key assumptions in the 2017 valuation, which combined with other factors

[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).

increased the Fund's amortization period to infinity. This data has been incorporated into this review and is summarized in the table below.

Amort. Period (Years)	Funded Ratio	UAAL as % of Payroll	Assumed Rate of Return	Payroll Growth Rate	Actual Cont. as % of ADC[2]	DROP as % of FNP	Non-Investment Cash Flow as % of FNP
Infinite	71.61%	252.13%	7.50%	3.50%	82.33%	29.63%	-1.24%

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

Risk Analysis

A pension fund faces multiple risks, which can be boiled down to one primary concern of whether there will be enough money to pay benefits when they are due. This section discusses three main risk factors facing the Fund: asset-liability mismatch, governance, and funding risks. Measuring Irving 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.

Asset-Liability Mismatch Risk

Irving Fire faces significant asset-liability mismatch risk associated with its Deferred Retirement Option Plan (DROP) because it offers:

- a guaranteed 6.25% annual rate of return; [3]
- a virtually unlimited amount of time to accrue this guaranteed return; and
- the ability to withdraw these funds with little to no restriction.

Background

Most of the benefits expected to be distributed from a public defined benefit pension plan are not expected to be paid in the

Deferred Retirement Option Program Examples*

Regular/Forward DROP - Active employee retires on paper and continues working. DROP account is credited with monthly pension benefit plus contributions and interest.

Back/Retro DROP - At retirement the employee can elect to retire on paper as of a previous date and receive the monthly pension benefits that would have been paid had the employee truly retired at the elected date plus contributions.

*DROP features vary.

[2] 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).

[3] The annual rate of return is defined as 2.0% less than the actuarial investment return assumption. Irving Fire has recently lowered its investment return assumption to 7.50%, however, the effect on the guaranteed rate of return on the DROP balance won't begin to be realized by the Fund for several years.

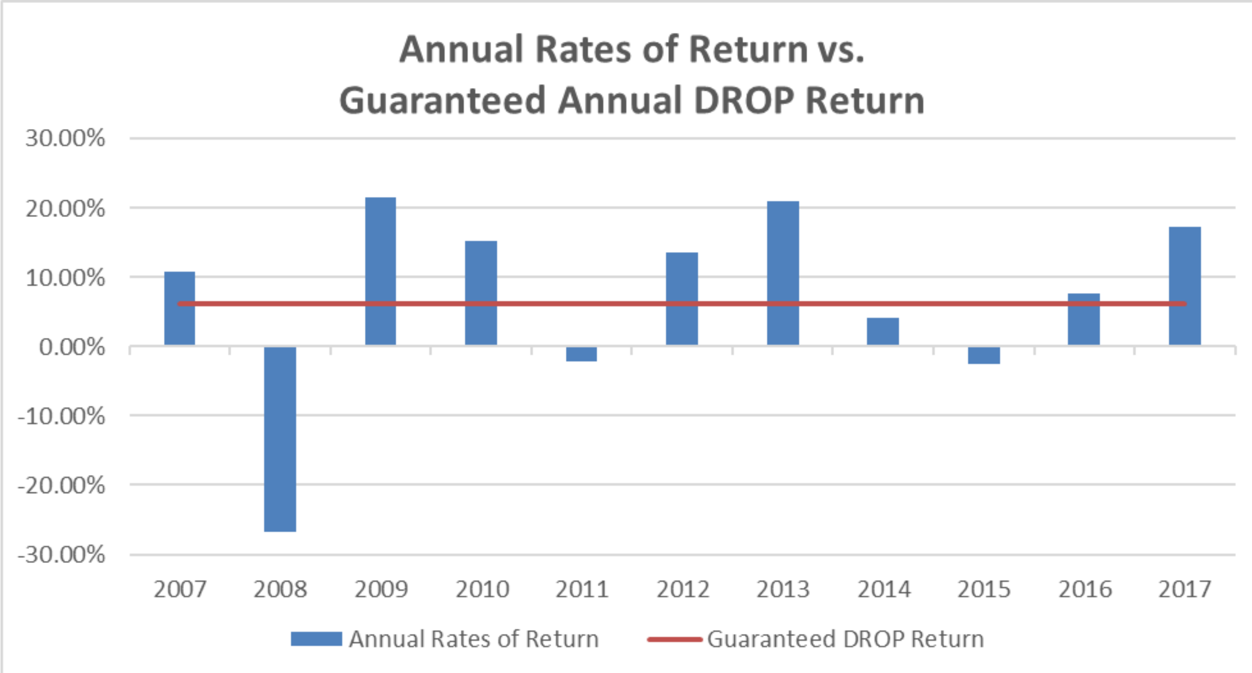
short, or even medium, term. Thus, many believe investments such as equities are more likely to achieve higher returns over a long time horizon and therefore provide a superior risk-return profile to support these long-term liabilities. This has led public pension plans to allocate a large proportion of assets to riskier and potentially less liquid investments. Irving Fire is no exception. However, Irving Fire has unique plan design features that present additional risks which must be examined when considering the reasonableness of this common asset allocation.

During the recent past, the Fund has offered two versions of its DROP, a Forward DROP and a Retro DROP. Both DROPs have a maximum length of nine years. The election into the plan's Forward DROP was ended in January 2012, while the Retro DROP continues to be offered to retiring members. Significant concerns with both versions of Irving Fire's DROP are that DROP balances are allowed to be left in the plan, earning a guaranteed 6.25% annual rate of return and can be withdrawn with virtually no restrictions at any time. The only limit to the DROP provision as specified in the plan document is that distributions must begin in accordance with Internal Revenue Service Required Minimum Distribution rules.

While the Fund lowered its investment return assumption from 8.25% to 7.50% in its December 31, 2017 actuarial valuation, Irving Fire members eligible to participate in the DROP before the assumption was changed will still earn a guaranteed 6.25% annual rate of return on their DROP balance. Because of the length of the Retro DROP, it will take nearly a decade before the Fund is able to begin crediting new DROP accounts at the lower interest rate of 5.50%. Hence, the following analysis of Irving Fire's DROP focuses on the rate credited to current DROP accounts and those due to be opened in the near future.

Risks Associated with Irving Fire's DROP

In an era of extremely low interest rates, offering a guaranteed 6.25% annual rate of return on accounts that can be left in the plan for years after retirement and withdrawn on short notice is virtually unheard of and presents great risk. It is impossible for the Fund to back these liabilities with assets that have a similar investment horizon and provide a similar return. In fact, the Fund has struggled to consistently earn a 6.25% annual rate of return on its entire portfolio for an extended period of time. For example, even though Irving Fire has surpassed a 6.25% return seven times in the past 11 years, it experienced negative returns in three other periods during the same time span, resulting in an average annual return of 5.88% for the ten-year period ending December 31, 2017.



A major concern is the lack of a trigger mechanism to lower or cease the guaranteed interest rate for years with sub-par returns. Participants are incentivized by the nature of this program to treat it like a risk-free savings account – one that earns roughly 6 times more than even the best savings accounts on the market, while the active plan members and taxpayers absorb all the risk. The combined effect of the 6.25% guaranteed return on DROP accounts, the average actual return on assets lower than the interest rate paid, and the option for all participants to leave their DROP balances in the Fund for up to 20 years explains why the Fund's DROP balance has grown to nearly 1/3 of the total assets as of the end of 2016.

DROP Balance[4]			
Fiscal Year	2014	2015	2016
DROP Balance	$27,110,677	$47,152,159	$55,284,178
Fiduciary Net Position (FNP)	$178,839,832	$174,037,587	$186,556,007
DROP Balance as % of FNP	15.16%	27.09%	29.63%

Irving Fire amended its plan design in 2012 by ending the ability for members to participate in the Forward DROP. However, because of the way the Retro DROP is designed, crediting interest on monthly benefits and member contributions for up to nine years in the past, this only serves to hide the actual DROP balance until after members have retired. As demonstrated in the table above, the Fund's DROP balance has more than doubled since 2014. Even with its ballooning DROP balance, Irving Fire has yet to make any significant changes to lower the cost of its DROP.

While it makes economic sense for members to continue to participate in the DROP as it currently exists, any attempt to modify future interest accruals may change this calculation, potentially causing the Fund

[4] The table does not include the 2017 DROP balance since the Fund has yet to submit its 2017 Annual Financial Report which would provide this information.

significant issues. Currently, roughly 3% of the Fund's net assets are in short-term investments, leaving the Fund at risk of needing to sell off assets, potentially with less than ideal market timing, if a larger than expected number of DROP members decide to withdraw their funds.

Conclusions/Recommendations

The Fund's board should consider performing an in-depth asset-liability study to better understand the potential risks associated with its existing asset mix and the liabilities they support. This should include scenario testing large DROP withdrawals coupled with potential adverse investment experience. In addition, the board should seriously consider the risk a guaranteed rate of return places on all the Fund's stakeholders while considering the impact changes could have on DROP participant behavior.

Governance Risk

The expansion of Irving Fire's DROP over time, particularly the continuation of the guaranteed 6.25% return in more recent years as interest rates plummeted, provides some insight into risks associated with the Fund's decision-making processes. The Fund did not have the benefit of written funding or benefit policies to guide its consideration of DROP enhancements over time and may have benefitted from more formal involvement of the City.

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.

However, 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. Unwillingness to reduce benefits prospectively when necessary to address funding challenges can be an obstacle to getting things back on track. In the case of Irving Fire, while the members elected to end the Forward DROP as of January 2012, the changes to the DROP provision, as discussed below, have caused the Fund's DROP balance to increase to a degree that makes the continuation of the Fund's 9-year Retro DROP with 6.25% guaranteed annual interest likely untenable in the long term.

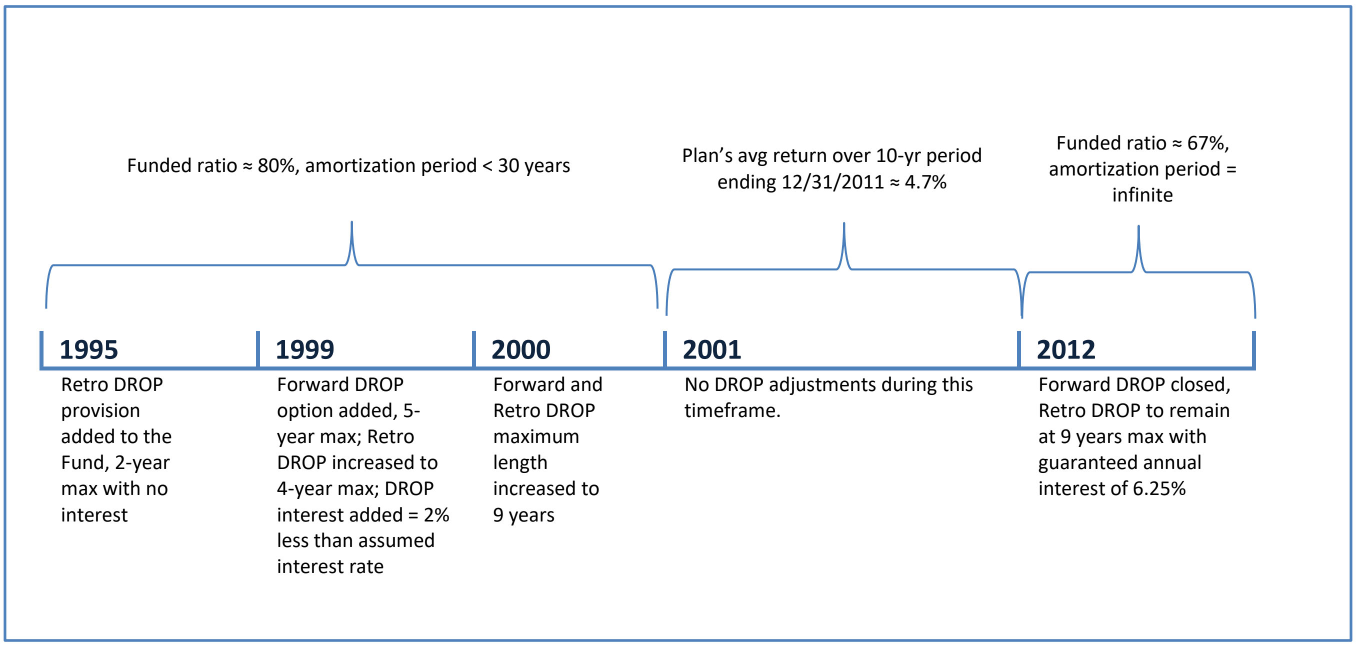
Furthermore, in certain situations even actuarial assumptions are at risk of being susceptible to this type of imbalance in decision-making. When plans choose to tie a benefit to an assumption, making the already difficult choice of changing those assumptions becomes even more complicated. Irving Fire had maintained a return assumption of 8.25% even after experiencing nearly two decades of its long-term average returns not meeting that goal. Studies show that instead of lowering the return assumption, public plans have taken on more risk (even if the asset allocation remains relatively constant) in hopes of achieving higher returns.[5] The Fund's current asset allocation is shown below.

[5] https://www.pacificresearch.org/wp-content/uploads/2017/06/2017-02-01-Risk_Taking_Appropriateness.pdf

Asset Allocation					
Asset Class	Equities	Fixed Income	Alternatives	Real Estate	Other
Current Allocation	54.30%	19.24%	19.34%	3.41%	3.71%
Target Allocation	59.00%	11.00%	18.50%	11.50%	0.00%

Governance Risk Case Study: Irving Fire's DROP

Irving Fire made a series benefit increases in the late 1990s, primarily pertaining to its DROP. Between 1997 and 2000 members elected to increase the modest, interest-free, 2-year Retro DROP to four years with an interest rate of 2% less than the assumed interest rate used in actuarial valuations. As mentioned earlier, this has been equal to a guaranteed 6.25% annual return on each DROP participant's DROP account balance every year since. Around the same time, members also added a 5-year Forward DROP with the same credited interest rate. Up until this point, the plan remained reasonably well-funded with a funded ratio hovering just under 80% and an amortization period in the 20s.



In 2000, members again elected to increase the maximum period of the Retro DROP this time from four to nine years and increased the Forward DROP length to nine years as well. At the time, Irving Fire had experienced four out of five previous years of greater than 9% rate of return on its investments, so the 6.25% annual interest rate on DROP balances was looked at as a net positive. In the following 16 years, however, the Fund reported negative returns in five years and has not reported a 10-year return on investments that meets or exceeds its assumed interest rate. Although the Fund has lowered its investment return assumption in its 2017 valuation, it has yet to take any significant measures to lower future interest accruals on the DROP accounts since the new DROP balance interest rate of 5.50% does not affect anyone currently eligible for the DROP. As mentioned before, due to the length of the Retro DROP, it will take several years before the Fund is able to begin crediting new DROP accounts at the lower interest rate. Furthermore, the new DROP interest rate is only slightly less than the Fund's current

10-year return on investment of 5.88%. Failing to address the DROP account's significant and growing risks points to a lack of proactive decision-making by key stakeholders.

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.[6] This framework helps ensure that both the system and its sponsoring employer are involved in retirement system reform decisions, but it comes at a point when actuarial health is already threatened. Irving Fire was required to submit an FSRP to the PRB in 2016 because the actuarial valuations prepared as of January 1, 2012 and January 1, 2014 reported amortization periods greater than 40 years. The FSRP was developed based on the following: an increase in the number of active members by recognizing 42 new firefighters hired during 2016 and an increase of the City's contribution rate from 15% of payroll to 16.75%. These changes helped lower the Fund's amortization period to 33 years as of December 31, 2015; however, since that FSRP was adopted, the plan's December 31, 2017 actuarial valuation reported an infinite amortization period. Irving Fire is again required to submit a revised FSRP by April 2019 with additional changes to bring the Fund back in compliance with state law.

Conclusions/Recommendations

It is imperative to the long-term health of the Fund that all stakeholders are involved in plan decisions in good times as well as bad. One step to help address these issues is for the plan and the City to develop written funding, benefit, and investment policies which are linked to provide a formal risk-/cost-sharing arrangement. 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.

For example, a benefit policy can outline the primary objectives the employer wishes to achieve, which can be as detailed as a specified replacement ratio, or as general as offering competitive benefits at a reasonable cost, as well as identifying policies and procedures designed to determine if the objectives are being met and how they can be reviewed at reasonable intervals. A benefit policy can also outline potential benefit enhancements or reductions based on the funding goals as outlined in the funding policy. The funding policy might incorporate objectives associated with benefit security, contribution stability and intergenerational equity and outline how those objectives will be met through contribution changes, as well as referencing potential changes outlined in the benefit policy. The coordinated policies might limit future benefit enhancements, cost of living adjustments, and/or contribution rate reductions such that they can only be considered or made if the plan's funded ratio remains greater than a chosen

[6] 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.

threshold. In addition, if the funded ratio falls below a certain threshold, the stakeholders may be required to come back to the table to make necessary contribution and benefit adjustments.

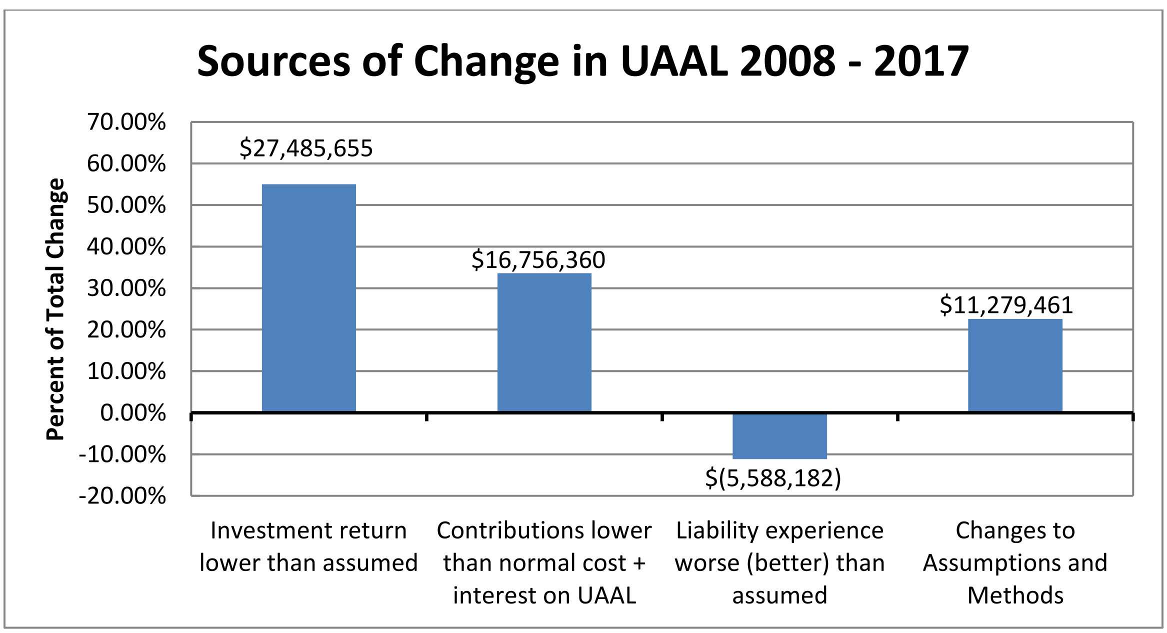
In addition to helping maintain a sound plan funding level, putting such trigger mechanisms into place can help reduce uncertainty for stakeholders who would know, in advance, how adverse experience will be managed. If Irving Fire together with the City had adopted such a forward-looking policy in the past, its DROP may not have grown to represent the level of risk for the Fund that it does today.

Funding Risk

Irving Fire's recent investment experience, with actual returns far below the assumed rate of return, coupled with the Fund's fixed rate funding structure which does not adjust to cover those actuarial losses presents serious funding risks that must be mitigated for the Fund to meet its long-term obligations.

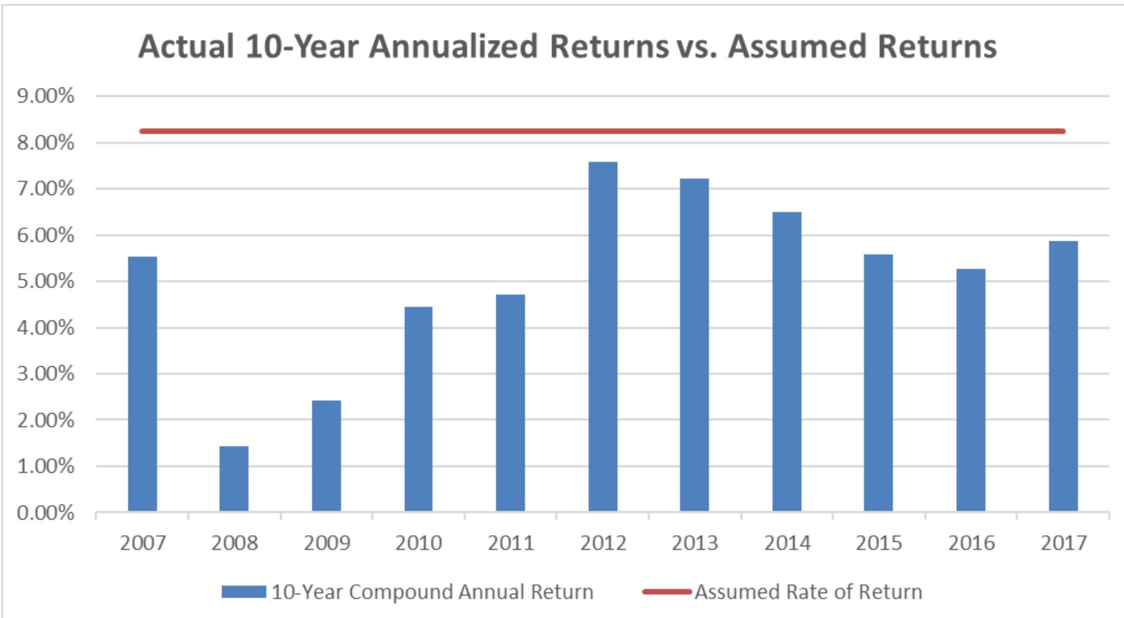
Background

Irving Fire's significant growth in unfunded liability (UAAL), which increased from just over $32 million at the beginning of 2008 to more than $82 million at the end of 2017, can be primarily attributed to actual returns consistently lower than the assumed investment return, contributions consistently lower than the annual benefit accrual plus growth of existing unfunded benefits, and partially to the recent changes in the actuarial assumptions in the Fund's latest actuarial valuation. The Fund has made significant increases in both the member and city contribution rates over the last few years. However, with current amortization period at infinite, it is likely that the Fund will need to make even more increases to contribution rates and/or benefit reductions to bring down the amortization period to an acceptable level.

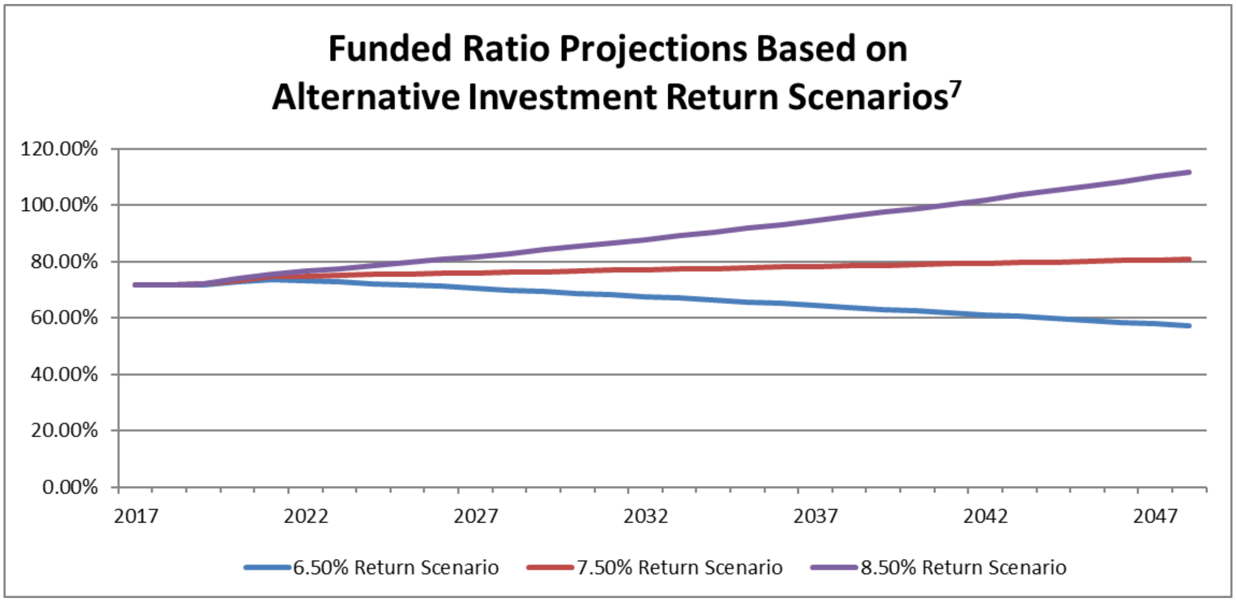


Investment Experience Compared with Investment Return Assumption

Actual investment returns lower than the assumed return has been a large contributor to the Fund's increasing UAAL. Up until the December 31, 2017 actuarial valuation, the Fund assumed an 8.25% interest rate, which exceeded the 2017 national average of 7.52% (reported by NASRA) and all of its peer systems in Texas. As illustrated below, the Fund had not achieved an 8.25% annualized return over a consecutive 10-year period in any of the 11 periods ending December 31, 2007 through December 31, 2017. In its latest valuation, Irving Fire lowered its investment assumption to 7.50%. Even so, the Fund has only exceeded a 7.50% 10-year annualized return once in the past 11 years.



The graph below projects the funded ratio for the next 30 years, assuming the member contribution rates remain at a fixed 13.00%, the city contribution rates remain at a fixed 16.75% 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 below 60%.



Contribution Insufficiency Risk

For most of Irving Fire's recent history, the City's contribution rate was tied to the rate it contributed for its police and other municipal employees who are members of the Texas Municipal Retirement System (TMRS). The problem with this contribution arrangement is that TMRS operates a completely different and much larger trust fund whose members receive different benefits than Irving Fire's members. Due to this arrangement, the Fund was unable to successfully weather negative plan experience throughout the past decade, ultimately leading it to report amortization periods of infinite and 97 years in its 2012 and 2014 valuations, respectively. After adoption of its 2014 valuation, the City's contribution into the Fund was changed to a higher, fixed-rate moving forward.

Several issues exist with fixed-rate contributions that may result in long-term problems:

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 contributions (whether as a rate of pay or a specific dollar amount) 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.

Despite the recent employee contribution rate increase to 13.00% in January 2018, the plan is only receiving approximately 76% of the most recently reported 30-year open amortization ADC.

[7] All 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 12/31/2017 Actuarial Valuation prepared by John M. Crider, Jr. Consulting Actuary.

Expected Contribution Levels vs. Actuarially Determined Contribution										
Fiscal Year	**2000**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**2016**	**2018**
Employee Contribution	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	12.00%	12.00%	12.00%	13.00%
Employer Contribution	12.00%	13.02%	13.53%	14.42%	15.04%	15.50%	12.00%	15.65%	16.75%	16.75%
Employer 30-Year ADC	12.00%	13.02%	14.87%	15.33%	15.93%	19.04%	23.27%	19.88%	19.01%	22.02%
% of ADC funded	100.00%	100.00%	90.99%	94.06%	94.41%	81.41%	51.57%	78.72%	88.11%	76.07%
Covered Payroll (in millions)	$14.06	$17.62	$18.17	$18.38	$19.51	$22.90	$20.64	$25.48	$27.07	$32.62
Contribution Shortfall (in millions)	-	-	$0.24	$0.17	$0.17	$0.81	$2.33	$1.01	$0.61	$1.72

Conclusions/Recommendations

The investment return assumption is the sole assumption that allocates expected costs between contributions and investment income and the assumed payroll growth rate drives the determination of whether the existing contribution rate is sufficient to meet those needs. Funding risk arises when these assumptions understate the contributions needed in the short and medium term, forcing future members and tax-payers to bear the burden of increased contributions and/or lower benefits.

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

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.

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 Irving 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. While the board of trustees has lowered several key assumptions in the latest valuation, they should continue to 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.

Appendix

Key Metrics[8]

Metric	Amortization period (33.0 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 17 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 Irving Fire, the higher the amortization period, the more sensitive it is to small changes in the UAAL.
Peer Comparison	Irving Fire's amortization period is in the highest 1/3 of all Texas retirement plans and is greater than the maximum PRB pension funding guideline of 30 years.

Metric	Funded ratio (74.92%)
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	Irving Fire's 74.92% funded ratio is the second highest in its peer group of TLFFRA plans with similar asset size and in the top 40% of plans in the state.

Metric	UAAL as a percent of payroll (228.54%)
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 Plan's UAAL as a percent of payroll is the second lowest among its peer group and in the bottom 40% of plans in the state.

[8] The key metrics listed in this section are from the Fund's 2015 Actuarial Valuation and 2016 Annual Financial Report available to the PRB at the time it was selected for review in April 2018.

Metric	Assumed rate of return (8.25%)
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. Irving Fire's assumed rate of return is 8.25%, while its actual ten-year investment rate of return for the period ending December 31, 2016 was only 5.28%.
Peer comparison	Irving Fire has the highest assumed rate of return in the state.

Metric	Payroll growth rate (4.25%)
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 4.25% is the most aggressive in its peer group of TLFFRA plans with similar asset size and one of the highest in the state.

Metric	Actual contributions as a percent of actuarially determined contributions (82.33%)
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 is less than 85% 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 the second largest shortfall percentage in its peer group.

[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).

Metric	DROP balance as a percent of fiduciary net position (29.63%)
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.
Peer comparison	Irving Fire's DROP balance as a percent of FNP is the highest among its peer group and third highest in the state.

Metric	Non-investment cash flow as a percent of fiduciary net position (-1.24%)
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	Irving Fire's non-investment cash flow as a percent of FNP is the second highest in its peer group and in the highest 1/3 of all plans in the state.

Plan Summary

The Irving Firemen's Relief and Retirement Fund ("Irving Fire" or "the Fund") was established in 1945 under what is now entitled 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. Irving Fire, as with all TLFFRA systems, is entirely locally funded.

Benefits

Retirement Eligibility	Age: 50 years; Years of Service: 20 years
Vesting	Fully vested at 20 years of service, 50% vested at 10 years of service with an additional 5% per year until 100% vested
Benefit Formula	Years of service (up to 21 years) x 3.175% x Final Average Salary +$60 per month for each year > 21 years of service
Final Average Salary (FAS)	Highest consecutive 78 biweekly pay periods
Automatic COLA	Option to elect a 1% automatic annual cost of living adjustment (COLA) with reduced benefits
Retirement Benefit Options	**Forward DROP (if elected before 1/16/2012):** 108-month maximum. Employee contributions credited; interest credited equal to 2% less than the greater of the assumed rate of return used in the last valuation prepared before a member's DROP date or the assumed rate of return in the last valuation prepared before a member's retirement date. May be taken in a lump sum or installments. Eligible if member is at least 50 years of age with 21 years of service. **Retro DROP:** 108-month maximum. Employee contributions credited; interest credited equal to 2% less than the valuation interest rate. May be taken in a lump sum or in installments. Under DROP distribution feature, remaining retiree money in DROP account continues to earn interest. Eligible if member is at least 50 years of age with 21 years of service.
Social Security	No

Contributions

Currently, active members of Irving Fire contribute 13.00% of pay while the City of Irving (the City) contributes 16.75% of pay.

Membership

Total Active Members	Total Annuitants (Retirees & Beneficiaries)	Terminated Vested	Total Members	Active-to-Annuitant Ratio
365	186	2	553	1.9

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 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.

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 Fund with an asset level lower than its accrued liability has insufficient funds to cover benefits. A Fund 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 Fund'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 Irving Fire.

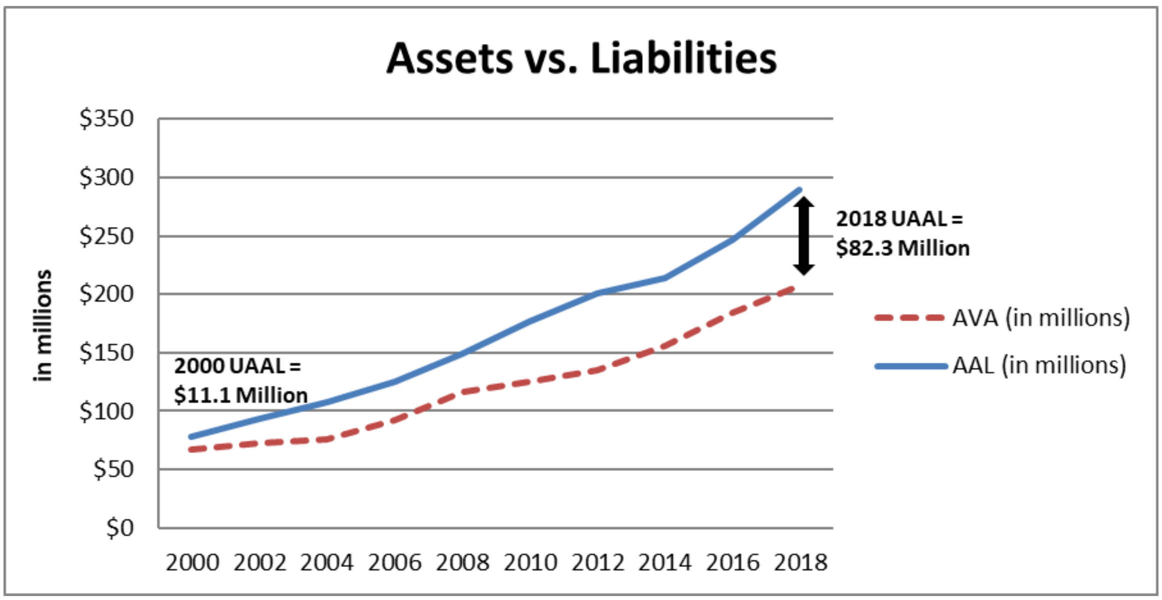
Irving Fire's funded status has been steadily declining since 2000. Numerous factors have contributed to this deterioration, including inadequate contributions, investment returns lower than the chosen assumption, and increased benefit payments due to the expansion of interest-accruing DROP accounts. The following sections discuss these and other factors in detail.

Assets and Liabilities

Funding Trends Funded Ratio, Assets, Liabilities and Year over Year Growth										
Fiscal Year*	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018
Funded Ratio	85.75%	78.43%	71.19%	73.85%	78.31%	70.98%	67.40%	73.10%	74.92%	71.61%
Am Period (years)	29.1	30.9	65.0	52.4	36.2	65.9	Infinite	63.4	33.0	Infinite
UAAL (in millions)	$11.06	$20.06	$30.84	$32.73	$32.33	$51.13	$65.25	$57.50	$61.87	$82.26
AVA (in millions)	$66.56	$72.94	$76.21	$92.45	$116.69	$125.07	$134.89	$156.22	$184.78	$207.49
AVA Growth (YoY)	-	4.69%	2.21%	10.14%	12.35%	3.53%	3.85%	7.62%	8.76%	5.97%
AAL (in millions)	$77.63	$93.01	$107.04	$125.18	$149.02	$176.20	$200.14	$213.73	$246.66	$289.75
AAL Growth (YoY)	-	9.46%	7.28%	8.14%	9.11%	8.74%	6.58%	3.34%	7.43%	8.39%

* The dates of the valuations referenced in this table are either 1/1 of the year stated or 12/31 of the prior year.

Irving Fire's actuarial accrued liability (AAL) increased by nearly 275% between 2000 and 2018. The Fund's actuarial value of assets (AVA) increased by just over than 210% over the same period. The Fund was nearly 86% funded in 2000 and fell to below 72% in 2018.



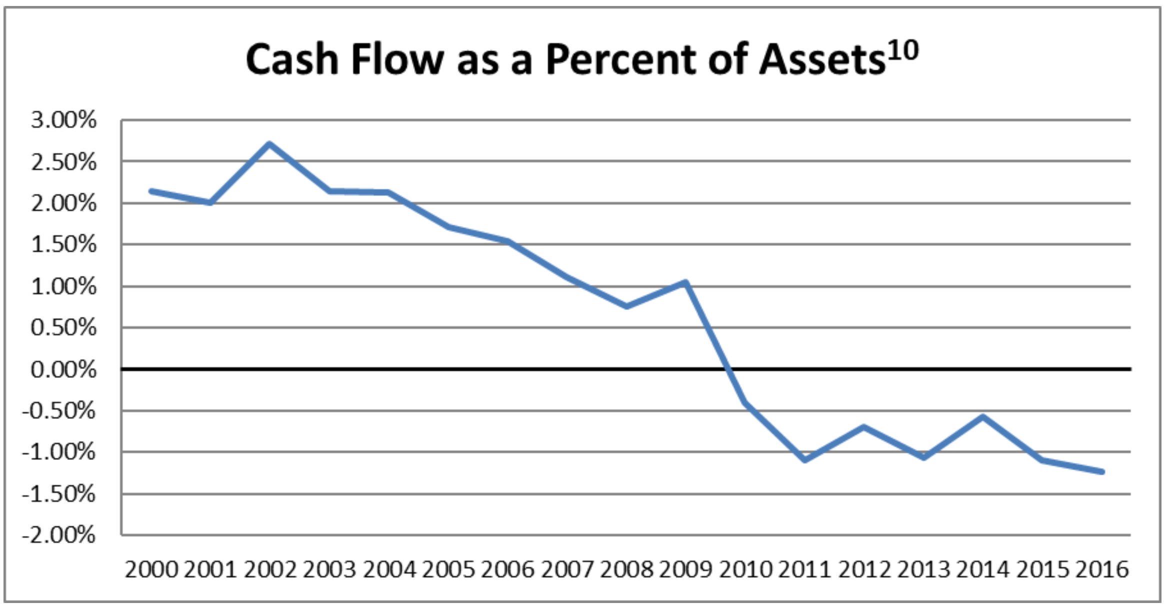
Investment Assumption and Returns

The 10-year net return on investments in 2017 was 5.88%, which was more than 150 basis points below its new assumed interest rate of 7.50%. Most retirement funds have been experiencing a difficult 10-year period since the 2008-2009 market downturn, but the Fund's aggressive 8.25% rate of return assumption for most of this period (the highest in the state) means that Irving Fire should have outperformed most other funds. However, Irving Fire's 10-year return is only the 30th highest of Texas' 93 defined benefit pension plans.

Cash flow

Irving Fire has one of the highest non-investment cash flows among its peer group. However, in 2016 the Fund's non-investment cash flow was the lowest in its recent history and has been trending negatively since 2000. Total contributions have grown on average by 4.95% annually since 2000 but are being outpaced by the average growth in yearly benefit disbursements of 9.44%. Total expenses are also the highest in their peer group as a percent of the Fund's total assets (0.81%)

A negative non-investment cash flow is not abnormal for mature defined benefit pension Funds. However, the Fund's cash flow has been negative since 2010 and with potential large benefit payouts on the horizon due to the Fund's large DROP balance, it is likely to decrease further in the near future. A low cash flow percentage 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.



Forward and Retroactive DROP

Irving Fire currently has a 9-year Retroactive Deferred Retirement Option Program (Retro DROP) provision and before 2012 offered a 9-year Forward DROP provision. Both of these provisions allow members to end their years of service before their actual retirement date and receive a lump sum payment equal to the total retirement benefits the member would have received plus the amount of contributions the member made into the Fund over that time. The Retro DROP allows members to make the election of this provision at their retirement date and apply the program retroactively rather than having to make the decision years before retirement as the Forward DROP does.

[10] The table does not include 2017 cash flow data since the Fund has yet to submit its 2017 Annual Financial Report which would provide this information.

Both of these DROP provisions give members the added benefit of accruing annual compounded interest on their DROP balance at a rate of 2% less than the Fund's actuarially assumed investment return rate during the time in the DROP and afterwards. Members may leave most of their balance in the fund, accruing interest, as DROP disbursements are only subject to a minimum threshold set by the Internal Revenue Service.

Based on the data available to the PRB, DROP balance reported as of 12/31/2016 was $55,284,178 which was more than a $28 million increase from 2014's balance of $27,110,667. The 2016 DROP balance is 29.63% of the Fund's Total Net Assets. The PRB has yet to receive the Fund's 12/31/2017 Annual Financial Report that would include its 2017 DROP balance.

Peer Group Key Metric Comparison

		Funding Val 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
Lubbock Fire Pension Fund	$ 176,016,821	12/31/2016	33.5	72.63%	240.47%	7.75%	4.00%	12/31/2016	100.00%	N/A	-3.63%
Irving Firemen's Relief & Retirement Fund	**$ 174,037,587**	**12/31/2015**	**33.0**	**74.92%**	**228.54%**	**8.25%**	**4.25%**	**12/31/2016**	**82.33%**	**29.63%**	**-1.24%**
Amarillo Firemen's Relief & Retirement Fund	$ 144,657,881	12/31/2015	34.5	81.82%	172.47%	8.00%	4.00%	12/31/2016	93.92%	N/A	-3.76%
Corpus Christi Fire Fighters' Retirement System	$ 133,901,631	12/31/2016	23.1	62.14%	265.57%	7.75%	3.50%	12/31/2016	100.00%	N/A	-3.04%
Laredo Firefighters Retirement System	$ 126,305,204	9/30/2016	28.0	59.28%	263.00%	7.90%	3.25%	9/30/2016	100.17%	N/A	1.58%
Beaumont Firemen's Relief & Retirement Fund	$ 102,435,664	12/31/2016	104.0	67.53%	274.69%	8.00%	3.50%	12/31/2016	74.37%	27.95%	-4.27%

Peer Group Sponsor Funding Comparison

Peer Group Plans	GF Expend	EOY GF Bal	UAAL	Expected Employer Contributions	ADC	30-yr Shortfall	30-yr SF % of ADC	30-Y SF % of GFE
Lubbock Fire Pension Fund	$ 162,139,351	$ 35,673,526	$ 73,353,115	$ 6,652,807	$ 6,878,532	$ 225,725	3.28%	0.14%
Irving Firemen's Relief & Retirement Fund	**$ 216,852,808**	**$ 57,666,475**	**$ 61,873,333**	**$ 4,534,842**	**$ 5,146,707**	**$ 611,865**	**11.89%**	**0.28%**
Amarillo Firemen's Relief & Retirement Fund	$ 157,909,148	$ 48,079,850	$ 33,128,756	$ 3,759,167	$ 3,884,024	$ 124,857	3.21%	0.08%
Corpus Christi Fire Fighters' Retirement System	$ 218,749,071	$ 41,873,537	$ 85,995,868	$ 6,728,823	$ 6,728,823	$ -	0.00%	0.00%
Laredo Firefighters Retirement System	$ 173,176,192	$ 42,167,732	$ 87,733,185	$ 7,047,691	$ 7,861,156	$ 813,465	10.35%	0.47%
Beaumont Firemen's Relief & Retirement Fund	$ 115,988,300	$ 26,709,699	$ 52,869,076	$ 2,911,034	$ 3,882,020	$ 970,986	25.01%	0.84%

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
Lubbock Fire Pension Fund	4.39%	1.39	$ 54,610	$ 90,715,999	$ 322,882	$ 651,091	$ -	$ 973,973	0.55%
Irving Firemen's Relief & Retirement Fund	**5.28%**	**2.00**	**$ 50,297**	**$ 76,692,304**	**$ 76,887**	**$ 1,391,083**	**$ 35,044**	**$ 1,503,014**	**0.81%**
Amarillo Firemen's Relief & Retirement Fund	6.80%	1.26	$ 53,329	$ 37,044,636	$ 80,849	$ 388,013	$ -	$ 468,862	0.31%
Corpus Christi Fire Fighters' Retirement System	5.53%	1.35	$ 44,113	$ 91,671,329	$ 257,440	$ 456,800	$ -	$ 714,240	0.53%
Laredo Firefighters Retirement System	4.33%	2.24	$ 55,268	$ 93,600,365	$ 209,946	$ 340,343	$ -	$ 550,289	0.44%
Beaumont Firemen's Relief & Retirement Fund	3.77%	1.07	$ 41,483	$ 91,716,980	$ 479,503	$ 292,841	$ -	$ 772,344	0.75%

Comments from Irving Firemen's Relief and Retirement Fund and the City of Irving

IRVING FIREMEN'S
RELIEF & RETIREMENT FUND
845 W. Irving Blvd.
Irving, Texas 75060

September 27, 2018

Anumeha Kumar
State Pension Review Board
PO Box 13498
Austin, Texas 78711

RE: Intensive Actuarial Review
Preliminary Draft Dated October 2018

The Board of Trustees for the Irving Firemen's Relief and Retirement Fund has received and reviewed the findings related to the "Intensive Actuarial Review" and offers the following response.

We are committed to the stewardship and the sustainability of the fund so that our members and beneficiaries will continue to receive benefits through their retirement years. The review does not catch us by surprise as to its findings but offers a perspective from another group of professionals that will assist us in the decision making process for future funding and plan document changes.

The "Risk Analysis" identified three main factors that could potentially threaten the funds ability to pay benefits: asset-liability mismatch, governance and funding risks.

Asset-Liability Mismatch concerning the Deferred Retirement Option Program (DROP) has been an on-going concern with the board and our active members for many years. The parameters of the DROP indeed create a "risk free" guaranteed rate of return along with a potentially long duration of assets held by the fund further contributing to the negative health of the fund.

We, like many other boards to include the Pension Review Board (PRB), consult with industry professionals such as attorneys, auditors, actuaries and others to help us in the decision making process. We have diligently sought sound advice specifically relating to the DROP and what action could be taken to alleviate the risk it has created. We were advised, due to language within the plan document, the interest rate and other parameters could not be lowered due to an accrued vested benefit protected by Article 16, Section 66 of the State Constitution. If changes were to be made to the parameters of the DROP, they had to be made through active membership vote resulting in a second tier and would only be applicable to members employed after the adopted date.

The board developed a second tier plan addressing many of the risks identified in the review. The duration of the DROP was limited to sixty months and the member would not receive any interest attributed to their theoretical DROP account. This second tier plan was presented to the active members for a vote in December 2016. The vote failed to pass.

To address the concern of DROP withdrawals, the board takes the position we have the ability to limit the withdrawals based on verbiage within the plan document concerning distributions.

There has been recent court proceedings regarding interest on the DROP and if the interest is considered a constitutionally protected benefit. In short, the results of the courts have ruled the interest is not considered a benefit and, therefore, can be adjusted. The Supreme Court of Texas has agreed to hear this case in which we are awaiting their decision to help guide us in future changes.

The board of trustees and the active members of the fund have pursued assumption risks through the increase of contributions. Since 2011 the active members have repeatedly voted to increase their contributions by some thirty (30) percent. The plan sponsor has also increased their contribution to 16.75 %. We believe this was the most viable option of governance based on professional consultation without reducing the standard service benefit. We agree the assumptions do not match current trends in salary growth and market returns. However, we have been able to address a component of the assumptions through the adoption of more conservative mortality tables and a slight decrease in salary growth. Our anticipation was to be able to "buy down" the assumptions while being compliant with PRB guidelines concerning amortization periods. To our disappointment, we have not been able to do so.

Funding risks continually to be a subject of board governance through anticipated plan design and benefit structure. We are aggressively lowering our assumptions which ultimately leads to a short fall in funding and will lengthen our amortization period beyond the PRB guidelines.

In summary, the board realizes we have work to do in addressing the concerns identified. Your recommendations are welcomed and will assist us in making these decisions regarding plan design, funding obligations and other factors/changes needed to sustain the longevity of benefits for our members.

Sincerely,

Tony Harvey

Tony Harvey, Chairman

Cc: Chris Hillman, City Manager
John Crider, Actuary
Jeff Litchfield, Chief Financial Officer

IRVING
TEXAS

September 27, 2018

Anumeha Kumar
State Pension Review Board
PO Box 13498
Austin, Texas 78711

Dear Anu:

Thank you for the opportunity to review and respond to the preliminary draft of the Intensive Actuarial Review (Review) of the Irving Firemen's Relief and Retirement Fund (Fund). We believe it contains timely and relevant information we can use as we continue the process of addressing funding shortfalls and mitigating current and potential risks of the Fund. Additionally, we are thankful you agreed to delay the Review until the fall, for the Preliminary Evaluation as of December 31, 2017, which is based on updated assumptions, presents a more negative picture than expected.

We agree with the findings of the Review and will consider the recommendations shared in the Review. We also look forward to learning the Pension Review Board members' thoughts and hearing their advice on ways to address the identified risks.

Our plan to address the calculated funding shortfall and mitigating current and potential risks will involve significant interaction with the Fund. We received the Preliminary Evaluation report on September 17 and should receive the final report soon. While it would be impossible to develop a concrete plan in such a short time period, we can provide a sketch of some of the actions we expect.

The first step in our plan will be to share the Review and Preliminary Evaluation report with the City Council via its Audit and Finance (A&F) Committee. As we shared with you earlier, we have made numerous presentations to both the A&F Committee and the full Council over the last three years. We have kept them informed of the status of the Fund and the changes made by the Firemen as well as the City.

As alluded to in our opening paragraph, the results of the Preliminary Evaluation were not expected. For example, we believed we might have an amortization rate in the upper 40 to lower 50 year range, so the second step will be to explore the impact of the assumption changes on the various components of the valuation, and why our expectations were not realized. We are particularly interested in understanding the validity of the 7.5% assumed rate of return used in the Preliminary Evaluation, especially after you report the 10 year average was just over 5.25%. This step will involve the use of consultants so we can understand the probability of having another year like 2008 as well as what the projected rate of return might be for the Fund's current investment strategy. We expect similar analysis to be prepared for the other major assumptions used by the Fund.

The next step will involve significant interactions between the Fund and the City to review and consider the recommendations in each of the three risk factors identified in the Review to determine how they can best help us jointly ensure **"There Will be enough money to pay benefits when due."**

In closing, we would like to share the City of Irving takes great steps to ensure its financial affairs are in order. This is evidenced by the City receiving a Moody's Aaa credit rating for the last 31 years. Now that we better understand the challenges of the Fund, we will work to formalize a plan to bring the Fund within the guidelines recommended by the Pension Review Board.

While I will not be able to attend your meeting on October 4, our Chief Financial Officer, Jeff Litchfield, will be in attendance to hear your thoughts and recommendations.

Sincerely,

Chris Hillman
City Manager

Cc: Tony Harvey, IFRRF Board Chair
John Crider, IFRRF Actuary
Jeff Litchfield, Chief Financial Officer