Putting Out the Fire: Pension Governance of TLFFRA Plans

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Executive Summary

The purpose of this study is to evaluate pension systems that fall under the Texas Local Fire Fighters Retirement Act (TLFFRA). These plans, overseen by the Texas Pension Review Board (PRB), demonstrate wide variability in actuarial outcomes. Governance and the methods in which plans decide on investments, contribution levels, and benefit payouts play a role in this variability. To further investigate how governance within TLFFRA pension plans varies, our team utilized a mixed methods approach to identify variables associated with strong outcomes and governance best practices. First, we conducted a series of six multivariate regression models under different scenarios and subsequently grouped the 42 TLFFRA plans based on their performance. From this breakdown, our team identified differences between high-performing plans and under-performing plans and what factors were most associated with strong financial outcomes. Lastly, we conducted semi-structured interviews with TLFFRA board members to uncover and contextualize our quantitative findings as they relate to decision-making processes.

Through this methodology, our team found that governance and expertise were statistically significant in every regression model. Medium-performing pension systems demonstrated the highest governance scores, while high-performing pension systems tended to have the most support from the plan sponsor. Under-performing pension systems tended to have the lowest population growth, the most retirees, and limited support from the plan sponsor. Our semi-structured interviews underscored some of these topics in further depth. We found that although there may be variance in actuarial outcomes, most TLFFRA pension systems struggle with the same issues. This includes the inherent tension and hesitancy of plan sponsors to raise their contributions for fear of a subsequent benefit increase on behalf of the TLFFRA board, the difficulty in filling citizen seats on

the TLFFRA board, and reliance on previous board member's expertise. However, some of the pension systems described varying levels of financial expertise, while others described having good governance principles outlined in this report.

From these findings, our team outlines six recommendations for the consideration of the PRB, individual TLFFRA plans, and the Texas Legislature. The key themes of our recommendations revolve around stability, city support, and open governance. First, we recommend that an opt-in statewide TLFFRA fund be established to mitigate risk among the smaller plans. Secondly, an annual memorandum of understanding (MOU) should be created each year by the plan and plan sponsor to create guardrails and accountability around pension performance. Third, we recommend requiring all plan sponsors to use an actuarily determined contribution (ADC) rate to ensure that plan sponsors are adequately funding their pension systems. Fourth, each TLFFRA plan should establish its own website for enhanced transparency. Fifth, the PRB should commence a study into the viability of countywide TLFFRA plans to illuminate how this program may be different under different political subdivision structures. Finally, our team recommends taking a closer look at reforming the citizen seats on TLFFRA boards to increase board flexibility and ensure that only quality members are at the decision-making table.

1. Introduction

1.1 The National Pension Landscape

Public pension plans in the United States have undergone significant changes over the past decade. These retirement plans, which promise a guaranteed benefit to retirees based on certain factors, help the public sector attract high-quality employees. However, these plans have faced significant funding challenges in recent years due to a combination of factors, such as insufficient contributions from state and local governments, poor investment returns, and demographic factors, which has led to a funding gap and a significant liability for taxpayers. All pensions operate on the same equation: employee (i.e., government)/employer contributions + investment returns = retirement benefit + cost of administering the plan. The ideal plan has both sides of these equations exactly evened out. According to the U.S. Census Bureau, state and local defined-benefit pension systems, on average, were 73.6% funded with 83.4% of these plans reporting a net liability (U.S. Census Bureau, 2019). Nearly 21 million Americans are members of a public pension plan. To address this alarming trend, some states have enacted major changes within their systems to reduce costs both presently and into the future. Among the most frequent reforms are reduced benefit levels, longer vesting periods, increased age and service requirements, limited cost-of-living adjustments, and increased employer and employee contributions (Urban Institute, 2018). There is a vested interest for taxpayers, plan members, and governments, to implement reforms that will put these plans on a path to fiscal solvency. Each plan has different attributes, governing board structures, and regulatory environments that they must navigate. This report contributes to existing literature by undertaking a

deep analysis on a specific kind of pension plan in Texas, but the findings are relevant for all public plans looking to make strategic reforms.

1.2 Texas Pensions

Texas has 93 public retirement systems with nearly 2 million members that all promise different pension packages at retirement. Seven of these systems are statewide, like the Teacher's Retirement System, and 86 of them are administered at the local level. Under the umbrella of these systems are 347 individual retirement plans overseen by the Texas Pension Review Board (PRB). The PRB officially functions as an independent oversight and reporting body for all pension plans across the state of Texas. The PRB currently employs 13 full time employees (FTE) and is responsive to the State Pension Review Board. The State Pension Review Board is composed of seven members that serve six-year terms and are appointed by the Governor. In the current state budget for the 2024-2025 biennium, the PRB is appropriated $2,562,518 to carry out its operations. In its enabling statute, the PRB is tasked with eight objectives (McGee, 2020):

1. Review all public retirement systems in the State of Texas.
2. Conduct and publish studies of potential or existing problems that threaten the financial stability of public pension plans in the state.
3. Provide technical assistance and policy advice to state pension plans and their government sponsors.
4. Make concrete reform recommendations to be implemented by plans or their sponsoring governments.
5. Analyze and comment on all legislation that affects Texas's retirement systems.
6. Administer the reporting requirements that the Texas legislature has instituted for the state's public pension plans.

7. Develop, administer, and track compliance with an educational training program for trustees and system administrators.
8. Report on its activities over the previous biennium before each new legislative session.

The PRB has been cited as a model for their work on maintaining and improving the structure of pensions in the state (McGee, 2020). Most states do not have a centralized authority for this kind of consolidated oversight for pension systems. The PRB's ability to offer guidance, resources, and recommendations to individual plans has allowed for the improvement in the funding levels of many pension systems across the state. Over the course of its history, PRB's analysis and legislative recommendations have led to the passage of several bills that has expanded and clarified their own powers while also maintaining the limited power the board holds over the pensions under its jurisdiction (Sunset, 2013). In 2018, S&P Global listed PRB oversight as a positive long-term factor for the state's finances and views, "the transparency provided by the PRB as elevating emerging national themes and standard practices to elected officials, plans, and the public" (McGee, 2020). Additionally, the PRB has provided critical support to pension systems across the state that were at risk of financial crisis. While the PRB has certainly provided tangible positive impact to many plans across the state, one subset of pension systems continues to struggle with making the necessary adjustments to reach long-term fiscal solvency.

1.3 Texas Local Firefighters Retirement Act (TLFFRA)

The Texas Local Firefighters Retirement Act (TLFFRA) was created to allow paid and part-time fire departments and volunteer fire departments in participating Texas cities to administer their own local retirement systems separated from the host city. The TLFFRA statute provides general guidelines for fund management, including some investment restrictions, but leaves most aspects of administration, plan design, contributions, and specific investments to each system's local board. Currently there are 42 programs that are governed by TLFFRA with approximately 10,000 total

members (Texas, 2022). Systems that operate under TLFFRA are entirely locally funded from the city and contributions from the active members of the plan. TLFFRA plans are designed to give an element of local control to fire departments who prefer more autonomy in their plan structure. A vast majority of fire departments across the state opt for the Texas Municipal Retirement System, a statewide, pooled asset fund that places administration in a centralized entity. Members of this plan have little discretion in contribution rates, investment decisions, and benefit payouts. Therefore, TLFFRA serves as a locally controlled alternative for plans who seek to have more decision-making authority.

Local retirement systems established under TLFFRA have authority to democratically determine member contribution rates, benefit levels, and other plan provisions locally outlined in TLFFRA. However, the composition of TLFFRA boards of trustees is set in statute and all 42 plans follow the same overarching structure. TLFFFRA plans must meet a statutory minimum contribution rate but may adopt a higher contribution rate than the one set in statute depending on individual need.

The TLFFRA statute includes rigid guidance for fund management, including the composition of the seven member board of trustees consisting of the mayor, or the mayor's designated representative for the sponsoring municipality; the chief financial officer of the municipality; three members of the retirement system that are elected by participating members; and two citizens who reside in the state and are not officers or employees of the municipality or any other political subdivision and who are elected by a majority vote of the members of the board. It also sets the contribution minimum for the sponsor at 12% of payroll (Interim, 2022).

In 2022, staff from the PRB testified to the Texas House Committee on Pensions, Investments, and Financial Services. They offered the following evidence that TLFFRA plans are among the lowest performing in Texas. Compared to other pension systems in the state, TLFFRA systems are underperforming state averages and are consistently underfunded as a group. When

looking at the funded ratio, the actuarial value of assets shown as a percentage of its actuarial accrued liability, they trend worse as a peer group, compared to all other Texas public plans by about 20% on average over the last decade. On average, TLFFRA plan's amortization period and unfunded ratios are among the highest in the state of Texas. These plans also tend to have poor investment returns relative to statewide funds with considerable variation between the plans. TLFFRA plans average a 10-year return assumption of 7.39%, with actual returns coming in at 6.95%. This is the lowest actual return compared to the other groups of plans in Texas (Interim, 2022). As demonstrated, individual TLFFRA plans are among the lowest performing across an array of metrics. According to data from the PRB's October 2022 meeting, five of the seven plans in Texas with an infinite amortization period were from TLFFRA. Therefore, it can be assumed that the poor performance of these plans may be attributed to the unique statutory makeup of their governance boards.

One function of the PRB is to undertake intensive reviews of plans that fall below a minimum threshold for fiscal solvency. These reviews are undertaken either as a precaution for warning signs that could lead to downturns in pension plans or for plans that are already in a dire situation. Out of the past 11 reviews, 10 have been TLFFRA plans. The most recent PRB intensive reviews have focused on TLFFRA pensions in Midland and Wichita Falls. In the case of both plans, the liabilities threatened to significantly begin outpacing assets in the near future. However, the cause of this mismatch is markedly different between both plans. Midland's plan was in danger due to risky investments and a portfolio that did not deliver on its return over the last 10 years (Midland, 2022). In Wichita Falls, the plan was in danger due to a lack of support of the plan from the city (Wichita, 2022). These reviews, among others, serve as preliminary evidence that there is not a universal reason for the underperformance of TLFFRA plans. Rather, there may be different factors affecting different cities in ensuring these plans are fiscally solvent in the long-term. For example, some of the TLFFRA plans demonstrate impressive outcome measures. Moreover, there is considerable variability among

the different TLFFRA plans across the state, suggesting that the outcome measures for long-term fiscal solvency may be better analyzed at an individual level, rather than in aggregate. Regardless, the failure of any individual TLFFRA plan to match liabilities with assets puts the retirement of firefighters at risk. The underperformance of these programs is not only dangerous for Texas firefighters who rely on these benefits upon retirement, but it would indicate a failure in terms of oversight and regulation. To best analyze the governance of TLFFRA pension systems, our team developed the following research questions.

1.4 Research Questions

1. Why are some TLFFRA pension plans more actuarially sound than others and what is the best way to evaluate them?

This question is the "umbrella" for our project and serves as the main focus of our engagement. PRB documents prove that the differences in these programs are leading to a wide variation of current performance along with mixed future projections (Texas Pension Review Board, 2022). Identifying these differences and giving recommendations to correct poor performance will be key to helping the future performance of all TLFFRA programs.

2. How can best practices improve the governance of struggling TLFFRA programs?

This question provides a specific response to the initial prompt from the PRB. To answer this question, our research delves into the practices that make some TLFFRA programs more successful than others. Our team also examines the practices of successful pension programs in both Texas. A general analysis of best industry practices and their application to TLFFRA programs is also included as a part of this study.

3. Is there a taxonomy for the management of TLFFRA programs?

The PRB uses a version of a taxonomy to determine the wellness of the programs under their review. One form of analysis currently performed by the PRB is a score given to struggling

programs to determine which of the programs will undergo an intensive review. Our team took various components of this review process and developed our own methodology for assessing the performance of a TLFFRA plan.

4. How do the structural differences in TLFFRA programs affect their governance?

In answering this question, our team understands all the various differences between each of the TLFFRA programs. Our objective was to identify the differences in these programs and understand how the different applications of the TLFFRA enabling statute affect their overall governance. In some cases, the governance of the programs may be affected by limitations set on their investment decisions, decisions on the openness of their operations, or the composition of their board.

Our approach to answering these questions was done in three phases. We first identified the most salient variables to analyze among all 42 plans through a literature review that is detailed in the next section. Once these variables were identified and collected, we began our discovery process. Phase 1 entailed a multivariate regression analysis to identify which variables, out of all that were examined, were the most correlated to positive or negative outcomes. This also allowed us to see how much predictive strength our selected variables had in comparison to outcomes. Phase 2 included a sorting of plans into three categories of performance: high, medium, and under. These placements were based on an assessment of various outcome variables and a rubric created by our team. Our goal in this phase was to identify how each of the independent variables compare between different performing plans. Phase 3, the last phase of our discovery, involved semi-structured interviews with plan members to contextualize our findings from the first two phases and understand the governance process in a more qualitative setting. Our takeaways from each of these phases informed our recommendations.

2. Literature Review

The following chapter is broken down into three sections. The first details prior pension studies we used to craft our methodology and justification for our approach. The second explains each of our independent variables and why they were chosen as aspects of pension performance that are relevant to our analysis. These variables are broken further into three primary subsections: governance, assumptions, and city support. The third section explains the outcome variables we chose as a way to measure performance. We ultimately concluded that for our findings to be as robust as possible we needed to look at more than one outcome measure because of the complexity associated with these numbers. In summary, our variables are organized as follows:

- Governance
    - MET Compliance broken down by board member
    - Risk Tolerance
    - Transparency
- Assumptions
    - Discount rate difference
        - Assumed discount rate – investment return
    - Payroll difference
        - Assumed payroll growth – actual payroll growth
- City Support
    - Benefit Difference
        - Normal cost of the plan – employee contribution
    - Contribution Difference
        - Fixed contribution – actuarially determined contribution

- Outcomes
    - Funded ratio difference from 2011 to 2021
    - Unfunded liability as a percentage of payroll
    - Amortization period

The following section serves as a justification and a deeper dive into the variables we used to compare each plan, the process for comparing them, and lays a road map for how these variables differed among each of the plans.

2.1 Approach

To examine the 42 TLFFRA plans in depth, our team utilized a mixed-method approach to underpin some of the most salient factors explaining pension performance and differences in governance structure. A further explanation of our methodology is discussed later in this report in the methodology sections of chapters 3-5. The first part of this methodology is grounded in existing literature that quantitatively examines factors underlying pension performance. Martin Luby developed a pension taxonomy to group 337 different pension plans in Michigan by common characteristics that were predictive of fiscal solvency (Luby, 2021). This approach specifically analyzed four broad categories of factors: political, institutional, fiscal, and financial and their statistical relationship with the funded ratio (i.e. the ratio of projected assets vs. projected liabilities). The paper finds that plan design and management (i.e. institutional factors) are significantly correlated to a plan's funded ratio. Political ideology, sociodemographic factors, and intergovernmental constraints are not strongly associated with the success of a pension plan. Because plan design and management are what makes TLFFRA plans unique in Texas, this article serves as the basis of our quantitative approach to

answering the stated research questions. This article serves as both justification for a taxonomy analysis and further signifies the importance of plan administrators in making investment decisions (i.e. governance). However, our approach uses a subcategorization for the individual plans, rather than the underlying factors. Moreover, our approach utilizes three broad buckets of independent variables: governance, assumptions, and city support, to reflect the unique stature of the TLFFRA statute. In line with Martin Luby, our approach utilizes a multivariate regression model to see which variables are the most associated with certain outcomes. From there, we grouped each of the plans into taxonomies for close analysis to pinpoint what makes high-performing plans different from under-performing plans. While our sample size only includes the 42 TLFFRA plans in Texas (which poses statistical difficulty in making causal claims), this approach for analyzing a group of pension plans is in line with our desired objectives.

However, there are many ways for analyzing pension governance and its relationship to performance. Research suggests that evaluating pension governance needs a multi-faceted approach that incorporates the structure and composition of the plan's governing board, evaluating the plan's investment policies and practices, and assessing the transparency and communication of the plan. Chen. et al (2015) examined the effect of board composition on pension funding by using a panel data set of large public pensions across the United States from 2001-2009. They found that increasing political appointees and active members of the system increases the funding performance of the system. Plans that were composed of more beneficiaries tended to perform better than those that were composed of outsiders. This is a critical finding in the context of TLFFRA plans. Active seats make up the majority of the governing board (particularly true in light of the fact that these three seats have the unstated authority to choose the other two citizen seats). However, it can be theorized that these members have an incentive to be hesitant to reduce the benefits they currently receive. Our research aims to identify where TLFFRA plans fall on this spectrum and to see if the active-member heavy

nature of the board influences pension performance. Anne Maher argues that accountability and transparency are key for good governance of pension plans (Maher, 2003). Although Maher focuses on private pension plans, she finds a link between different aspects of pension governance and pension performance. Moreover, inconsistent performance is associated with indicators of poor performance. One of the most critical factors for good governance, she argues, is having effective accounting and auditing requirements and a clear method for identifying how decisions are made within the governing body.

Our approach attempts to take the insights from these various approaches to analyzing pension governance and to contextualize them with the unique structure and performance of TLFFRA plans. In consultation with the PRB and the existing literature, we selected variables that are germane to these specific plans that all incorporate some component of governance and decision-making, whether it be the compliance of each board member in fulfilling their training requirements or how transparent the board's meeting minutes are. Further justification and detail of each variable included in our analysis is detailed below.

2.2 Independent Variables

In creating our TLFFRA taxonomy and identifying the variables that begin to uncover patterns in governance, our team identified 14 independent variables and three outcome variables. These variables represent a mix of qualitative governance variables, financial assumption variables, individual plan design, and city contribution variables. These variables are grounded in both the findings of various research on pension systems across the United States and new variables developed in conversations with the PRB. While there is a large amount of existing literature on pension systems in the wider United States, there is limited scholarly research on Texas plans specifically, let alone TLFFRA plans. While our research helps fill the gap on scholarly research on TLFFRA pension systems and informs the PRB on potential reasons that some TLFFRA plans are underperforming,

existing literature provided the necessary evidence that pension system governance is associated with pension system performance and assisted with the identification of methods for assessing that.

2.2.1. Pension Governance

The following research articles seem to serve as strong evidence that governance plays a role in the bigger picture of pension performance. Brooks (2019) used 210 observations from the Public Plans Data (PPD), collected by the Center for Retirement Research at Boston College, to determine if there is a statistical relationship between public pension board governance variables and pension performance. The author used the pension fund's average rate of return and funding ratio as measures of pension fund performance. Using OLS regression analysis, the author identified a statistically significant relationship between the number of active employee board members and higher funding ratios. The author found that, on average, plans with more active members on board demonstrated better overall financial solvency. Furthermore, Dobra et al. (2013) tested the hypothesis that variation in public pension asset decisions could be explained by governance factors, such as board composition. The data used in their study is from the National Association of State Retirement Administrators and covered 246 pension systems. They identified statistically significant associations between governance factors and asset allocation and found that larger pension system boards and boards with a greater number of retirees were associated with riskier investments. The proposed causal mechanism for this statistical association is that poor pension governance increased the risk tolerance of pension system board members, leading to riskier investments which resulted in poor pension performance on average.

To better pinpoint the direct relationship between pension governance and pension performance, Albrecht and Hingorani (2004) conducted a regression analysis that controlled for intervening variables such as investment strategy and assumptions that pension systems make at the beginning of each fiscal year (i.e. discount rate and payroll growth). The article utilized data from 290

public pension systems from a Public Pension Coordinating Council (PPPC) survey conducted by the National Association of State Retirement Administrators (NASRA). The authors identified a statistically significant relationship between governance factors and pension system performance even while controlling for the variability of asset allocation and rates of return. Consequently, Albrecht and Hingorani (2004) argued that the variability of pension system asset allocation and investment returns should be controlled for to better identify the relationship between governance factors and pension system performance. Our goal, in this research, is to see the extent to which these findings apply to TLFFRA plans.

There is a substantial body of literature that supports this report's research approach to explain the variation of TLFFRA pension system performance through the lens of pension system governance. However, unlike the existing literature which primarily compared pensions systems across the United States, the board structure of TLFFRA pension systems is statutorily set by the Texas Local Fire Fighters Retirement Act (TLFFRA) and is the same across all 42 plans. As a result, our report does not utilize board composition explicitly as a governance factor to compare and explain variation in individual TLFFRA plans, even though the previously stated research identified it an important element in the performance of pension systems. Rather, our research utilizes indirect measures of board composition based on three variables: board expertise, board transparency, and board risk tolerance to better understand differences in governance across each plan.

2.2.1.1. Board expertise

Our report measures board expertise by utilizing the rates of compliance among each member of each plan's governing board with the statutorily required Minimum Educational Training (MET) program. Established in 2013, these requirements are a minimum number of hours of training for board trustees and administrators that covers topics such as, fiduciary procedures, governance, the Texas Open Meetings Act, and risk management (PRB, 2023). While these trainings are required by

law, there is varied completion among different pension trustees. In providing recommendations that promote good governance of pension systems, Juan Yermo stressed the need for higher levels of expertise that may be achieved via training or the use of independent trustees that are knowledge about actuary matters (Yermo, 2008). Therefore, our research uses these training modules and the completion metrics from each of the TLFFRA board members to identify how expertise may be associated with positive outcomes. While there may be alternative measures to capture expertise, this variable is quantifiable and represents the closest proxy to relative expertise (Yermo, 2008).

2.5.1.2 Board transparency

To complement our quantitative measure of board expertise, we evaluated and ranked TLFFRA pension system board transparency by comparing the quality of their board meeting minutes. Transparency and accountability involving the critical decisions and investments policies that these governing boards undertake is central to the best practice principles adopted by the International Monetary Fund (IMF) Code of Good Practices on Fiscal Transparency and the Code of Good Practices on Transparency in Monetary and Financial Policies (Carmichael and Palacios, 2003). In developing this framework, the driving principles cited include clear objectives, free from conflict of interest, transparency regarding decisions, and accountability for outcomes. Therefore, as a measure of transparency, our team went through the publicly available meetings for each plan's board meeting and assigned it a "transparency score." The process for quantifying each pension system's board transparency utilized a rubric that ranked their quality on a 1 – 4 scale.

Meeting Minutes Transparency Scale

- **Scale 1** – pension system board meeting minutes are difficult to find, or nonexistent.
- **Scale 2** – pension system board meeting minutes lack sufficient detail or are missing one or more components (such as public comments, consent agenda, and attendance).

- **Scale 3** – pension system board meeting minutes contain purpose of meeting, time and location of board meeting, name of board member making a motion, title of motion, number of votes for or against motion.
- **Scale 4** – pension system board meeting minutes contain factors outlined in Scale 3. In addition, pension system board meeting minutes provide further explanation of meeting items, beyond simply stating the name of the item.

2.2.1.3 Board risk tolerance

For our evaluation matrix we used the standard deviation of TLFFRA ten-year returns as an indirect measure of board risk tolerance. The ten-year time frame of this variable is designed to screen out poor investment returns that may come from external factors, such as a recession or poor market year. By looking across the span of a decade, a better sense of how these returns have fluctuated demonstrates how tolerant these plans are of risk. In addition, we used the standard deviation of returns instead of actual rates of return to control for the possibility that poor performing TLFFRA pension systems may inherently make riskier investment decisions because of the required higher rate of return needed to maintain a higher funding status. According to the findings of the Albrecht and Hingorani (2004) study, failing to account for this possibility could confound the effects of governance factors on pension performance.

As stated previously, one of the potential causal mechanisms that explains the statistically significant relationship between board governance and pension system performance is that board governance factors, such as composition and expertise, influence the risk tolerance for pension system investments. However, Andonov and Cremers (2017) identified another causal mechanism that influences board risk tolerance. For example, Andonov and Cremers (2017) conducted a comparative study of 850 pension system in the United States, Canada, and Europe. The authors focused primarily

on the impact of linking a pension system's liability discount rate with the expected return on assets for U.S. pension systems, which is outlined in the Government Accounting Standards Board (GASB) guidelines for public pensions. As opposed to the regulatory practice in other countries, the authors argued that this linkage gives U.S. pension systems incentives to invest in more risky assets to report a higher funding status.

Based on their findings, U.S. pension systems invested in risker assets yet also underperformed when compared to international pension systems. In addition, Andonov and Cremers (2017) also identified a statistically significant relationship between board composition and risk tolerance. This indicates that the regulatory and governance landscape in the U.S. may provide unique incentives for pension systems to invest in riskier assets. As such, including the standard deviation of returns in our evaluation matrix of TLFFRA pension systems allows us to identify the presence of these incentives and identify how the risk tolerance of these plans may be associated with negative performance outcomes.

2.3.1. Assumption variables

The governing board of a pension plan makes a number of assumption decisions to properly plan for the future and predict future liabilities. However, research suggests that these assumptions are manipulated by certain plans to protect from having to make difficult decisions surrounding benefits decreases or contribution increases (Eaton, 2004). To control for this, our research includes two of these assumptions as an independent variable. However, our team focuses on the difference between the assumption and the real figure that the plan demonstrated. This allowed for our research to properly pinpoint how these positive or negative mismatches may contribute to overall outcomes. While this is a secondary component of governance, our research includes these assumptions to assess and identify the magnitude of its effect on performance outcomes.

2.3.1.1. Discount rate

In addition to governance factors influencing asset allocation decisions, existing literature also indicates that governance factors influence the initial discount rate selected for pension systems. For example, Anzia and Moe (2019) analyzed the political aspects of pension governance by studying how board composition of an individual pension plan (and their consequent incentives) plays into their decision making. They found that public employees have a higher likelihood of selecting an ambitiously high discount rate to lower their contributions to the fund. Political appointees, on the other hand, tended to choose a more realistic discount rate that may require either less benefits or more contributions from current employees. However, as stated previously TLFFRA plan board composition is statutorily defined and the only variation among the systems is based on who actually sits on these boards. Weng and Peng (2018) utilized an event history analysis of discount rate changes for 81 public pension plans over the span of 14 years. They utilized data from the Public Plans Data (PPD), collected by the Center for Retirement Research at Boston College. They identified that a state's fiscal health, the number of active employees, and a high initial discount rate were the variables that had the greatest effect on changes in pension plan discount rates. Their findings are useful for our research because these authors identified variables beyond pension governance that may have a greater effect on discount rate selection, which is a measure of pension fund performance. In addition, this research ties discount rate selection to other variables included in our evaluation matrix, such as the level of city support to the pension systems.

2.3.1.2. Payroll growth assumption

Another variable included in our report is payroll growth assumptions, which is the growth in new employees and the amount contributed by the pension system's city. We included this variable in our evaluation matrix because it is a useful benchmark to compare TLFFRA plans among each other

and with pension systems across the nation. Additionally, this variable serves as a relative proxy for population growth. Research suggests that current demographic trends are unsustainable for public pensions as aging and longer life expectancy are poised to put public pension systems under pressure (Bongaarts, 2004). Individual plans must forecast their payroll growth, or the number of new employees relative to the current number of employees, to balance their finances. While high payroll growth suggests an influx of contributions in the future, the long-term effect of having to pay for these benefits is often neglected. Therefore, our research includes the assumed difference vs. the actual difference to get a sense of how accurate the plans predicted population growth and identify if this is a mechanism in which plans manipulate assumptions to avoid having to raise contributions. Preliminary research suggests this may be the case. Based on the findings of the National Association of State Retirement Administrators *(*NASRA) *Public Fund Survey FY 2021,* payroll growth assumptions have gone down across the United State, on average, to reflect changing economic conditions. However, PRB research indicates that TLFFRA plans are showing the opposite trend and projecting increases in payroll growth. This consolidated data on all public pension plans provided by NASRA is critical for identifying how TLFFRA plans differ from the national median. Moreover, our research aims to identify how these assumptions differ across different subgroups of TLFFRA plans.

2.4.1. City support

City representatives make up two seats of the seven-person governing board and play a pivotal role in the larger governance apparatus. It is worth noting that the city, as the employer, plays a critical role in the decisions that might affect fiscal solvency, namely the contribution level at which they match employee contributions. This figure, and the arrangement that different cities have with their TLFFRA plans, varies considerably from plan to plan. Insufficient support from the city, as in the case of Wichita Falls, may indicate a breakdown in governance or disagreement between active members on the pension systems board and representatives from its city that sit on the board.

Regardless, research has identified the importance of undergoing an analysis of the employer's support as a critical part of the overall landscape. For example, Evgenia Gorina (2019) analyzed the relationship between municipal funding of pensions and city revenue structure. This research gives insight into how various funding models of cities have an effect on how well their pensions are funded into the future. The paper concludes that cities who rely on elastic sources of revenue are more likely to have lower levels of fiscal autonomy and more unfunded liabilities. While our study does not incorporate characteristics like elasticity of revenue source of the employing cities in the quantitative model, this finding informs our ultimate recommendations.

Conversely, our research is aware of the importance of the city's perspective when it comes to funding TLFFRA pension systems. Based on research from Munnell et al. (2013), some cities may have higher pension burdens than others due to the number of disparate pension systems they must fund. An economic downturn exclusive to that region (such as a natural disaster) may also complicate the picture. Therefore, our research attempts to quantitatively identify the impact of city contributions and qualitatively incorporate context through interviews with select plan administrators to develop a holistic understanding of the role that cities, as the overarching employer and plan sponsor, play in promoting long-term fiscal solvency for TLFFRA plans.

2.4.1.1. Additional plan benefit

To calculate the additional plan benefit for each plan, our team subtracted the normal cost of the plan's stated contribution level from the employee's contribution level. This figure represents the additional benefit that a retiree receives from investing a portion of their paycheck into the pension fund. For example, if a plan's normal cost is 20% and the employee contributes 15% of their paycheck, the retiree receives a 5% benefit at retirement for investing today. This variable reflects the generosity of each plan. This is a critical variable that varies across each plan with some plans demonstrating a *negative* APB, meaning that these employees are paying a disproportionately high percentage of their

paycheck to cover current liabilities. Luby (2021) found that individual plan design and the generosity of the plan had the most statistically significant relationship with funded ratios. Because our research is modeled after this approach, our team included this variable to test if the findings from this research are comparable to our findings. Similarly, Bagshi (2018) found that public pension plan benefits tended to be more generous in politically competitive municipalities. Since the majority of the governing board is elected by members of the plan, it can be theorized that these trustees have an incentive to structure as generous a plan as possible. Identifying how this unique, democratic structure differs among the 42 plans is critical for understanding the context in which decisions are made. Moreover, by using the difference between normal cost and employee contribution level our research will uncover the range of different plan structures among different performing plans that are incorporated into the overall findings.

2.4.1.2 City contribution

As a measure for identifying if the city is contributing enough, our team subtracted the fixed cost of the plan (i.e. the percentage that the city actually contributes) from the actuarily determined contribution, a calculation based on actuarial projections that reflect the amount of money an employer needs to contribute to fund future pension benefits. The difference between these two variables is aimed to identify if the city is contributing "enough" to be fiscally solvent in the long term. This variable was key to fiscal solvency in the case of the TLFFRA plan in Wichita Falls. The contribution level from the city had fallen to such a point that even plan investments outperforming estimates was not enough to cover this gap (Wichita, 2022). According to analysis from the Society of Actuaries, most large state and municipal plans received insufficient contributions to reduce their unfunded liabilities between 2005-2016, even if all the actuarial assumptions were met exactly (Moore, 2019). However, the report notes that employer contribution amounts are only one of many factors that influence pensions plans' funded status. Including this metric in our model is critical for seeing

the extent to which city contributions play into the fiscal solvency of the plan (as in the case of Wichita Falls), or if the other independent variables that are more germane to governance are more associated with performance outcomes. That is, this variable aims to see if plans like Wichita Falls are more of the exception or more of the rule.

2.5 Outcome variables

Our pension evaluation matrix utilizes three different outcome variables in conjunction with the independent variables stated previously. This is due to the fact that measures of pension performance can be misleading when based on single variables. For example, because pension systems performance changes overtime, using cross sectional data for funded ratios for a single year can be misleading. Poor decisions made decades ago may still haunt current plans. Our goal, in this research, is to measure *improvement* in addition to current outcomes. Therefore, our evaluation matrix compares the 10-year change in funded ratios, the amortization period in 2021, and unfunded liability as a percentage of the overall payroll. These three outcome variables provide a robust amount of various performance measures to accurately measure and compare TLFFRA pension system performance. These outcome variables are described in the Texas Pension Review Board's 2022 Texas Local Fire Fighters Retirement Act (TLFFRA) Pension Report and are commonly used to assess plans from a performance perspective. This report contains the actuarial details and describes the financial condition of all 42 TLFFRA programs consistent with our approach for the pension evaluation matrix. By validating our findings across multiple performance measures, our ultimate findings are able to be as robust as possible.

2.5.1 Change in funded ratio

The funded ratio represents a measure of a pension plan's ability to meet its current and future obligation to its members based on the current valuation of its assets and contributions from

employees. A funded ratio of 100% means that a plan has enough assets to cover all of its liabilities, while a ratio of less than 100% indicates that a plan is underfunded. Using data from the PRB, our research utilizes the difference between a plan's funded ratio in 2011 to 2021 to get a sense of the improvement or decline of each plan over the past decade and control for prior decisions that may skew the overall health of the plan. Wang and Peng (2014) utilized changes in funded ratio from 2001-2009 of 84 large public pension plans to assess differences in losses amid the Great Recession through a similarly structured multivariate regression model. This research found that differences were most attributed to variations in annualized investment return and changes in investment return assumption, which is also one of the independent variables utilized in our research. The report notes significant differences between investment strategies and outcomes of state and local governments and recommends the use of investment council, managing risk effectively, and adjusting portfolios to reflect the employing entities current status as methods for addressing declining funded ratios. Nonetheless, this paper draws a link between investment decisions and change in funded ratio, which is one of the central questions of our research.

2.5.2 Unfunded liability as % of payroll

Unfunded liability represents the difference between a plan's liabilities and its assets and reflects the actual amount a plan would need to have on hand today to fund future benefit payments. When expressed as a percentage of payroll, this figure represents the proportion of a plan's total payroll that would need to be set aside to pay future benefit payments. While this is a useful variable for assessing the extent of a plan's fiscal status and the magnitude of its liabilities in proportion to its size, confounding variables such as demographics, benefit changes, or an economic downturn, make this variable difficult to stand alone. However, out of our three outcome variables, this is the only one that takes into account some of these external factors, which is why it is included in our overall analysis. Existing research suggests that current accounting rules tend to significantly understate unfunded

pension liabilities and argues that public pensions need to adopt rules similar to private sector pensions to accurately reflect the magnitude of unfunded liabilities (Biggs, 2012). Public pension accounting methods assumes that plan investments can earn high returns without taking any account of the market risk involved. Biggs recommends using an options-pricing method for calculating these unfunded liabilities to reflect the true extent of how much state and local governments need to contribute to be fiscally solvent. While there is debate on how to accurately calculate future unfunded liabilities, our team includes this figure as reported. However, our team calculates this figure as a percentage of payroll to capture this metric in proportion to the number of employees to standardize the magnitude of these liabilities in relation to each other. However, this academic debate serves as further evidence for including multiple outcome variables as a robustness check.

2.5.3. Amortization period

The amortization period, our final outcome variable, reflects an estimate of when a plan will become fully funded based on current contribution rates and investment returns. The PRB Pension Funding Guidelines establish a maximum amortization period of not more than 30 years with a preferred target range of 10 to 25 years (PRB, 2023). Our research includes this outcome variable because it incorporates a holistic actuarial value of each plan by taking into account future projections, current valuation of assets, and contribution rates from both the employer and employee. Moreover, this variable is used by the PRB to determine which plans must submit a Funding Soundness Restoration Plan. Eaton (2004) uses amortization period as the dependent variable in his analysis of the effect of political and fiscal constraints on a plan's likelihood of using overly optimistic assumptions relating to discount rate and expected payroll growth. He notes that the calculated amortization period is affected by these assumptions and cautions against using this variable as a sole determinant of performance. Moreover, he finds that the less constraints that a plan has, the lower the amortization period on average. This is informative in the context of TLFFRA plans, which have

less constraints on decisions regarding contributions and investments but more financial constraints due to the back-seat role of the employing city. Including this variable for analysis will help inform the relationship between assumptions and amortization in the context of TLFFRA plans and provide additional analysis that informs the final recommendations.

2.6 Literature Review Summary

Our study and methodology are informed by the deep existing literature on both quantitative methodologies and qualitative theories surrounding pension governance and performance. Additionally, these variables were chosen in consultation with the PRB and their perspective on the most relevant factors pertaining to pension governance. Because the TLFFRA statute and governance model is relatively unique, an analysis of how our findings compare to other bodies of research will be insightful in the context of overall effective pension governance. A multi-layered approach that incorporates different aspects of governance and is validated through three different outcome variables is necessary for our findings to be robust. While there are certainly many ways to examine pension governance, this approach attempts to combine the most salient factors identified by previous research. Further detail on the methodology, data sources, taxonomy creation, and statistical methods employed by this report are described in the next section.

3. Phase 1 Methodology

Each of the variables detailed in the previous section were put into six separate regression models to test which, if any, had the strongest relationships with positive or negative outcomes. The purpose of a regression analysis to test the relationships between an array of independent variables and a dependent variable. Each of the models had slight variations in the variables included that are detailed in the next section.

3.1 Phase 1 Limitations

Our team acknowledges the limitations associated with this approach. The regression analysis does not determine causality and there are specific design changes that may certainly influence the overall approach. There are certainly numerous variables that our team neglected or failed to consider. By running the regression model six times using different designs, we attempted to control for this as much as possible. But ultimately, there are many things beyond the scope of the project that likely influence the overall health of TLFFRA plans. Moreover, past correlations are not necessarily determinative of future outcomes. These regression models are not designed to be prescriptive about the future of TLFFRA plans. Rather, they are an attempt to explain current outcomes using historical data.

3.2. Quantitative Findings

The mixed-methods approach of our study allowed for in-depth conversations with different TLFFRA stakeholders to complement our quantitative findings. By first conducting a series of regression models, our team was able to see how certain relationships changed when broken down by different categories of performance. This, in turn, informed the conversations that we had with TLFFRA board members. Although we had a relatively small sample size, our regression model yielded a critical finding: governance variables continually demonstrated statistically significant relationships. That is, governance as we have defined it plays a predictive role in the success of a TLFFRA plan. Further illumination of this is detailed below.

3.2.1 Regression 1: All/Funded Ratio

Figure 1

Regression Model #1: All Variables With Funded Ratio

Regression Statistics	
Multiple R	0.910877524
R Square	0.829697864
Adjusted R Square	0.704356016
Standard Error	0.095998881
Observations	42

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	0.4900128	0.194	2.520	0.017924	0.0911543	0.888871274
Active Member MET	**-0.068394**	**0.030**	**-2.22**	**0.03452**	**-0.13142**	**-0.005361307**
City Rep MET	-0.053583	0.034	-1.563	0.12953	-0.12389	0.01672774
Citizen MET	-0.015697	0.034	-0.455	0.65213	-0.08635	0.05495587
Plan Administrator MET	-0.081088054	0.048936	-1.6570	0.109094623	-0.181497347	0.019321239
MET Compliance %	**0.3134967**	**0.182**	**1.71314**	**0.09814**	**-0.06197**	**0.688970862**
Standard Deviation of Return	**3.837643**	**1.925**	**1.99279**	**0.05648**	**-0.11368**	**7.788973411**
Minutes	0.0129948	0.018	0.69985	0.49000	-0.02510	0.051093251
Discount Rate Difference	1.0621523	1.750	0.60678	0.54906	-2.52952	4.653826421
Payroll Grow Difference	-1.006563	0.947	-1.062	0.29747	-2.95060	0.937481213
Normal Cost	4.9058888	5.556	0.88293	0.38506	-6.49478	16.30656654
Employee Contribution	-4.263014122	5.509634	-0.77374	0.44580787	-15.5678495	7.041821254
Benefit Difference	-2.232883142	5.626238	-0.39687	0.694583281	-13.77697039	9.311204103
Fixed Contribution Rate	-0.070604929	0.20428	-0.34563	0.732300089	-0.489751935	0.348542077
Actuarily Determined Condition	**-1.391307691**	**0.288449**	**-4.8234**	**4.89573E-05**	**-1.983156946**	**-0.799458436**
Actuarily Determined Difference	0	0	65535	#NUM!	0	0

This model reflects all of the variable's standalone relationship with the difference in funded ratio from 2011 to 2021. MET compliance was the strongest predictor of positive improvement with two other governance variables also demonstrating statistical relationships. With an adjusted R-squared of 0.7, 30% of the change in funded ratio may be attributed to other variables and/or randomness. Under this model, for each additional board member that completed their MET requirement, the funded ratio improved, on average, by approximately 4.42%. This figure should be taken in consideration of all the other variables, but this relationship certainly stands out as noteworthy. The association with the actuarily determined contribution (ADC) represents some collinearity. As the ADC increases, or the amount that the employer should contribute based on an actuarial calculation, the funded ratio decreases by a significant amount. This reflects the notion that as TLFFRA plans liabilities grow faster than their assets, the amount that they must contribute to stay to achieve solvency increases in tandem.

3.2.2 Regression 2: Difference/Funded Ratio

This model also measures the difference in funded ratio from 2011 to 2021. The difference between the two lies in the independent variables: rather than all variables in isolation, only the difference between normal cost and employee contribution (i.e. benefit difference) and the difference between the employer fixed contribution rate and the actuarily determined contribution (i.e. contribution difference) are inputs in the model. This is to reflect that the "plan generosity" and "necessary contribution rate" are the important factors that matter to beneficiaries and employers alike. Additionally, these are the two emerging themes that kept showing up in the literature review.

Figure 2

Regression Model #2: Difference Variables with Funded Ratio

Regression Statistics	
Multiple R	0.727759307
R Square	0.529633609
Adjusted R Square	0.357165933
Standard Error	0.117000256
Observations	42

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	-0.046774673	0.190631	-0.24537	0.807842314	-0.436094505	0.342545159
Active Member MET	-0.019223506	0.036935	-0.52046	0.606559976	-0.094655407	0.056208395
City Rep MET	**-0.107245319**	**0.03825**	**-2.80383**	**0.008770586**	**-0.185361425**	**-0.029129213**
Citizen MET	-0.027203738	0.039649	-0.68612	0.497906948	-0.108177224	0.053769749
Plan Admin MET	**-0.161616772**	**0.055014**	**-2.93776**	**0.006299377**	**-0.273969496**	**-0.049264049**
MET Compliance %	0.323463699	0.208167	1.553865	0.130704008	-0.101670501	0.748597899
Standard Deviation of Return	1.102050377	2.256035	0.48849	0.628754727	-3.505388101	5.709488855
Minutes	0.011744471	0.021954	0.534965	0.596617504	-0.033091016	0.056579958
Discount Difference	-0.810004629	2.041428	-0.39678	0.694335927	-4.979157773	3.359148515
Payroll Growth Difference	-0.535839145	1.123638	-0.47688	0.636903969	-2.830614186	1.758935896
Benefit Difference	**1.130054511**	**0.522557**	**2.162548**	**0.03867479**	**0.062850653**	**2.197258368**
Actuarily Determined Contribution	0.644078921	0.242379	2.657317	0.012501148	0.149074103	1.13908374

This model demonstrated a much lower R-square value, likely stemming from less variables in the model, which suggests that there is still a lot of randomness/other variables at play. Two MET requirement positions (city representatives and plan administrators) showed up as statistically significant, albeit with negative coefficients. This suggests that the relationship between MET

requirement completion and an improved funded ratio may depend on which members of the board are not in compliance. Regardless, it is noteworthy that these variables showed up again. In this model, the plan generosity demonstrates statistically significant positive relationships with an improved funded ratio. If a plan improves the benefits that it gives to its members, the funded ratio also improves. However, this may stem more from the inverse. As plans become more funded, they are able to offer more generous benefits to their members. This finding is highlighted when broken down by taxonomy.

3.2.3 Regression 3: All/Unfunded Liability as a Percentage of Payroll

This model and the following model demonstrate the same independent variable usage as the previous two. The only difference is the dependent variable: unfunded liability as a percentage of payroll. This attempts to account for the size of the plan in the dependent variable and see how much of a difference it makes when compared to the other dependent variables.

Figure 3

Regression Model #3: All Variables with Unfunded Liability

Regression Statistics	
Multiple R	0.972171304
R Square	0.945117044
Adjusted R Square	0.879622177
Standard Error	0.404597338
Observations	42

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	0.880652822	0.819283	1.074906	0.291929069	-0.80037788	2.561683523
Active Member MET	**0.285818435**	**0.129475**	**2.207516**	**0.035960533**	**0.020157353**	**0.551479517**
City Rep MET	**0.316020325**	**0.144424**	**2.188149**	**0.037489063**	**0.019687671**	**0.612352978**

Citizen MET	-0.003102428	0.145127	-0.02138	0.98310185	-0.300878281	0.294673425
Plan Administrator MET	**0.567460911**	**0.206248**	**2.751355**	**0.010469978**	**0.144275427**	**0.990646394**
MET Compliance %	**-1.277863119**	**0.77125**	**-1.65687**	**0.109122241**	**-2.860338245**	**0.304612007**
Standard Deviation of Return	**-25.22335129**	**8.116312**	**-3.10774**	**0.004404827**	**-41.87664717**	**-8.570055418**
Minutes	-0.078906035	0.078257	-1.0083	0.322263644	-0.239475746	0.081663676
Discount Rate Difference	9.998876321	7.377552	1.355311	0.186549094	-5.138610251	25.13636289
Payroll Grow Difference	-2.152040204	3.993205	-0.53893	0.594354441	-10.34541918	6.041338776
Normal Cost	-13.63130851	23.4178	-0.58209	0.565334147	-61.6806588	34.41804178
Employee Contribution	20.10947202	23.22093	0.866006	0.394117166	-27.53594081	67.75488485
Benefit Difference	-1.86853651	23.71237	-0.0788	0.937772768	-50.5223014	46.78522838
Fixed Contribution Rate	0.972554119	0.860958	1.129619	0.268572932	-0.793984842	2.739093079
Actuarily Determined Contribution	14.26707384	1.2157	11.73568	4.12411E-12	11.77266317	16.76148452
Actuarily Determined Difference	0	0	65535	#NUM!	0	0

As a whole, this model demonstrates the least amount of randomness with a large adjusted R-squared (0.87). It is telling, then, that there are five statistically significant variables and all of them deal with governance. Under this model, a negative coefficient represents a positive outcome. If the unfunded liability goes down, that is generally considered to be a good thing as presumably more of the liability becomes funded or the liability itself decreases. In this model, a relatively surprising finding is that the higher the standard deviation of investment returns over the past ten years (i.e. board risk tolerance) the lower the unfunded liability as a percentage of payroll. While we caution against risky investments to reduce the unfunded liability, this suggests that for each increase in investment return standard deviation, the unfunded liability decreases by 25%. This consider the size of plans and is rather general, but this model suggests that the bigger change from year to year that a

plan saw in investment returns, the better their results were. Perhaps this may be indicative of investment improvements and strong market years, but it is hard to conclude for certain without data at an individual level. MET compliance, again, demonstrated a positive relationship: the more board members that completed the training, the lower the unfunded liability.

3.2.4. Regression 4: Difference/Unfunded Liability as a Percentage of Payroll

Figure 4

Regression #4: Difference Variables with Unfunded Liability

Regression Statistics	
Multiple R	0.723312092
R Square	0.523180383
Adjusted R Square	0.348346523
Standard Error	1.131364596
Observations	42

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	3.715940454	1.843353	2.015859	0.052847694	-0.048689549	7.480570457
Active Member MET	0.565411095	0.357155	1.583096	0.123886285	-0.163997416	1.294819606
City Rep MET	**1.061985729**	**0.369865**	**2.871283**	**0.007429948**	**0.306621594**	**1.817349863**
Citizen MET	0.273678575	0.383394	0.713832	0.480848383	-0.509315744	1.056672893
Plan Admin MET	**1.559698094**	**0.531968**	**2.931938**	**0.006391509**	**0.473274028**	**2.64612216**
MET Compliance %	**-4.395031297**	**2.012928**	**-2.1834**	**0.036962421**	**-8.505977704**	**-0.284084889**
Standard Deviation of Return	-11.09978677	21.81532	-0.50881	0.614609419	-55.65261893	33.45304538
Minutes	-0.185456165	0.212287	-0.87361	0.389270648	-0.61900464	0.24809231
Discount Difference	31.85690586	19.74013	1.613815	0.117038563	-8.457811557	72.17162328

Payroll Growth Difference	4.613211998	10.86531	0.424582	0.674171285	-17.57671581	26.80313981
Benefit Difference	**-17.00436916**	**5.053002**	**-3.3652**	**0.002107702**	**-27.32397615**	**-6.684762163**
Actuarily Determined Contribution	-1.649062512	2.343751	-0.7036	0.487107545	-6.435641151	3.137516126

This model, like the previous set of models, showed lower R-squared values than all the variables considered independently. Like the other unfunded liability model, benefit difference, and MET compliance showed up with similar trends. The more generous the benefits, the lower the unfunded liability. But again, this may be reflective of an inverse relationship. Additionally, for each additional board member that is in compliance with their MET requirements, the unfunded liability as a percentage of payroll decreases by, on average, approximately 65%. These recurring findings suggest that, as a whole, the more in compliance that a plan's board member are, the better outcomes they demonstrate. Additionally, the type of board members that are compliant are important, namely the fact that city member compliance has a heightened relationship with positive outcomes. By our calculations, these members were in the lowest compliance with MET, which makes this relationship important for plans that are seeking to improve outcomes.

3.2.5. Regression 5: All/Amortization

The following two models follow the same pattern as the previous two sets. Table 5 reflects all of the variables with the amortization period. These two models are the first and only two that show relationships with investment/assumption variables.

Figure 5

Regression #5: All Variables with Amortization

Regression Statistics	
Multiple R	0.715400795
R Square	0.511798297
Adjusted R Square	0.221619636
Standard Error	18.14438088
Observations	42

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	-5.243296238	36.7412	-0.14271	0.887579735	-80.63000412	70.14341164
Active Member MET	4.715502846	5.806382	0.812124	0.423823116	-7.19820841	16.6292141
City Rep MET	3.978915752	6.47675	0.614338	0.544134304	-9.310278277	17.26810978
Citizen MET	5.320912917	6.508293	0.817559	0.420765482	-8.033002179	18.67482801
Plan Administrator MET	**18.80066288**	**9.24929**	**2.03266**	**0.05202861**	**-0.177313189**	**37.77863895**
MET Compliance %	-31.94473812	34.58713	-0.9236	0.363874619	-102.9116693	39.02219303
Standard Deviation of Return	387.6561733	363.9803	1.065047	0.2962868	-359.1696581	1134.482005
Minutes	2.912081039	3.509468	0.829779	0.413940674	-4.288752282	10.11291436
Discount Rate Difference	**-8.067113975**	**3.308502**	**-2.4383**	**0.021616464**	**-14.85559962**	**-0.1278628333**
Payroll Grow Difference	82.23518258	179.0774	0.459216	0.649754939	-285.2012165	449.6715816
Normal Cost	147.1378906	1050.183	0.140107	0.889615543	-2007.66055	2301.936331
Employee Contribution	-337.3473297	1041.355	-0.32395	0.748471746	-2474.030982	1799.336323
Benefit Difference	-200.1254333	1063.394	-0.1882	0.852131075	-2382.029165	1981.778299
Fixed Contribution Rate	**74.83130107**	**38.61009**	**1.938128**	**0.063129782**	**-4.390069754**	**154.0526719**
Actuarily Determined Condition	-11.52207864	54.51871	-0.21134	0.83420775	-123.3852404	100.3410831
Actuarily Determined Difference	0	0	65535	#NUM!	0	0

Under this model, only one governance variable showed a relationship: plan administrator MET compliance. The adjusted R-square is 0.51, which is about average for all of our models, and points to some validity of the relationships from this model. Even as such, the relationship between

plan administrator and amortization period is inverse of what we might expect. The critical finding from this model lies in the difference between the assumed discount rate and the actual investment return. This model shows that when plans beat their assumptions by 1%, their amortization period decreases by 8 years. This doesn't take into account the fact that plans may set their discount rate assumption lower as a cautionary measure or they may have just made strong investments. This regression model does not account for this. Regardless, it is important to note that plans who have investments that exceed their expectations are more likely to have a lower amortization period.

3.2.6. Regression 6: Difference/Amortization

Amortization period, as this model shows, had the most consistent relationships between the model with all independent variables and the model with just the differences. This makes these findings robust and significant.

Figure 6

Regression Model #6: All Variables with Amortization Period

Regression Statistics	
Multiple R	0.668068026
R Square	0.446314887
Adjusted R Square	0.243297013
Standard Error	18.33138112
Observations	42

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	-20.81658947	29.86766	-0.69696	0.491193231	-81.81449202	40.18131308
Active Member MET	6.217034795	5.78695	1.07432	0.291244672	-5.601494308	18.0355639
City Rep MET	6.589409385	5.992876	1.09954	0.280277977	-5.649675944	18.82849471
Citizen MET	8.241470447	6.212087	1.326683	0.194624304	-4.445303838	20.92824473
Plan Admin MET	**19.60733169**	**8.619425**	**2.274784**	**0.030232797**	**2.004117227**	**37.21054614**

MET Compliance %	-46.40273853	32.61525	-1.42273	0.165129983	-113.0119692	20.20649216
Standard Deviation of Return	414.7998258	353.4714	1.173503	0.249826923	-307.0850106	1136.684662
Minutes	1.569693658	3.439668	0.45635	0.65142489	-5.455046513	8.594433828
Discount Difference	**-802.874166**	**319.8472**	**-2.51018**	**0.017691546**	**-1456.089277**	**-149.6590553**
Payroll Growth Difference	53.67658197	176.0495	0.304895	0.76255154	-305.864476	413.2176399
Benefit Difference	-1.917352885	81.87326	-0.02342	0.981471487	-169.1248557	165.2901499
Actuarily Determined Contribution	61.19914162	37.97555	1.61154	0.117534591	-16.35728679	138.75557

The same findings are seen with the discount rate difference and plan administrator. The coefficients are nearly identical in addition to the p-values (i.e. strength of statistical significance). This suggests that investment returns are critical important to a low amortization period. The PRB considers 30 years to be the threshold of an acceptable period. For plans looking to decrease their amortization period, either lowering the assumed discount rate or improving investment returns may be suitable options to accomplish this and avoid a Funding Soundness Restoration Plan.

3.3 Analysis

These regression models represent the first phase of our quantitative research. Figure 7 demonstrates the number of times each variable demonstrated a statistically significant relationship. However, there were a handful of times that the direction of the correlation went in opposite directions. Nevertheless, our goal was to identify which variables were the most correlated with positive outcomes out of approximately 14 and to do this in a way that captures the many ways to study and assess pension outcomes.

Figure 7

Statistical Significance of Variables

Variable	**Statistical Significance Count**
Active Member MET	2
City Rep MET	3
Plan Admin MET	5
MET Compliance	3
Risk Tolerance	2
Transparency	0
Governance Total	**15**
Discount Rate Difference	2
Payroll Growth Difference	0
Assumptions Total	**2**
Normal Cost	0
Employee Contribution	0
Benefit Difference	2
Fixed Contribution	1
Actuarily Defined Contribution	0
Contribution Difference	0
City Support Total	**3**

By and large, governance variables dominated the statistical significance count across all six regression models. This suggests that on average, governance does have a statistical relationship to TLFFRA pension system outcomes. In addition, the variables that showed no statistical significance have just as much importance as the ones that did. Transparency, payroll growth, normal cost of the plan, employee contribution rate, and difference between employer contribution and ADC never showed any strong relationship with any of the models. However, some of these variables do tend to show trends in higher-performing plans. This regression analysis simply identifies that out of all of these variables taken together on behalf of all the plans, the governance variables are the most predictive of a plan's strength. However, based on the differentiation of these plans by outcome variable, we find that the highest-performing plans do not necessarily exhibit the strongest governance metrics. A close analysis of how each of these variables compares across different performing plans is detailed in the next section.

4. Phase 2 Methodology

The regression analysis allowed for a robust understanding of which variables showed relationships as a conglomerate of the 42 plans. However, our team wanted to break down these 42 plans even further and separate them into a taxonomy for closer analysis. Based on the existing literature and consultation with the Pension Review Board, we placed each team into one of three categories: high-performing, medium-performing, and low-performing. The following criteria was used to determine the placement of each plan:

High Performing Pension Systems

Two out of the three outcome variables are considered good using PRB standards:

- Positive funded ratio from 2011 – 2021

- Amortization period under 30 years
- Unfunded liability percentage is below TLFFRA average (268.1)

Medium Performing Pension Systems

1 out of three outcome variables are considered good using PRB standards

Underperforming Pension Systems

- Negative funded ratio from 2011 – 2021
- Infinite amortization period
- Unfunded liability percentage is above TLFFRA average (268.1)

After each plan was sorted into a taxonomy, the independent variables detailed in the literature review were compared across the three different categorizations. This allowed our team to determine characteristics that differentiate high-performing plans from other plans that served as a basis for our recommendations.

4.1 Phase 2 Limitations

The taxonomy and placement of plans into each category could certainly be debated. We recognize that some plans have made improvements in their decision-making in recent years that might be reflecting in this data. Moreover, this data is from December 2022 and plans may have different outcome variables at the time of publication of this paper. We also acknowledge that there may be more robust methods for ordering the plans. For example, a weighted formula that incorporates these three outcome variables would fit within this criterion. However, our team felt that it was important to weight each of the outcome variables equally. A plan could still be considered high-performing even if they had one outcome variable that might not be considered

"good." Additionally, in constructing a tiered formula that assigns weights to the outcomes, our team felt that cut-off scores and giving preference to one outcome variable over another could be interpreted as subjective. However, we implore future researchers to examine how our findings may be different if this approach were adopted.

Uncovering the difference between plans that are high-performing and under-performing was one of the main objectives of this research project. More specifically, what are the lessons that plans who are struggling can learn from plans that are high performing? By using the criteria described in the methodology section, each plan was placed into the following categories:

- **High-performing (10)**
- **Medium-performing (18)**
- **Under-performing (14)**

Just because a plan is designated as "under-performing" does not mean that it is a bad plan or that its board members are incompetent. Some of the reasons these plans may be in this category may stem from decisions made from years past. Additionally, many of these plans have made positive improvements either in recent years or since this data was collected that may not be reflected in this designation. Regardless, based on our conversations with the PRB and the existing literature, our team determined that these designations were helpful in understanding what separates a TLFFRA plan with very strong outcomes and a plan with outcomes that have room for improvement.

4.2 Taxonomy Comparison: Outcome Variables

Figure 8

Outcome Variables by Plan Performance

Performance	Funded Difference	Unfunded Liability	Amortization
High	18.28%	110.02%	20.29
Medium	-0.39%	260.69%	42.24
Under	-10.08%	391.76%	48.53

This table illustrates the three outcome variables broken down by taxonomy. As expected, the higher-performing plans demonstrated the strongest outcome metrics. It is especially remarkable that these plans, on average, improved their funded ratio by ~18% over a ten-year period. Medium-performing plans remained relatively stable in their funded status while under-performing plans showed negative trends in this regard. Another key observation is the relatively large gap between high-performing plans and both medium and underperforming plans in the amortization period. These plans had nearly half the amortization period, which suggests there may be features of these plans outside of the variables included in this study that explain such drastically strong outcomes. These attributes are explored further in the last section.

4.3 Taxonomy Comparison: Governance

Figure 9

Governance Variables by Plan Performance

Performance	Active Member MET	City Rep MET	Citizen MET	Plan Admin MET	MET Compliance %	Standard Deviation of Return	Minutes
High	1.5	0.7	0.8	0.4	0.4909	7.68%	**2.5**
Medium	**2.2777**	**1.333**	**1**	**0.8889**	**0.729983**	7.50%	1.9444
Under	1.8571	0.857	0.75	0.92857	0.533057	7.55%	1.8571

Across the different governance variables, there is certainly some notable differences across the taxonomies. For one, high-performing plans were the *least likely* to be in MET compliance than either of the other two categories. This finding is particularly surprising considering the strong relationship that the regression models exhibited. It can be theorized, however, that these plans may have actuarial experts or previous experience that do not necessitate these trainings. However, these plans had the highest-quality minutes and scored the highest on our measure of transparency. Additionally, these plans had the greatest variation in their annual returns which suggests that strategic investments may have also played a role in their strong outcomes.

Medium-performing plans, by and large, showed the strongest governance variables across the board. Approximately 73% of their board was in compliance with the MET and their returns were the most stable out of all the other plans.

4.4 Taxonomy Comparison: Assumptions

Figure 10

Assumption Variables by Plan Performance

Performance	Discount Rate Difference	Payroll Growth Difference
High	0.36%	1.03%
Medium	-0.55%	0.98%
Under	-0.32%	0.31%

An analysis of how each of the plan's assumptions (a critical part of the amortization calculation) fared with what they experienced also fills in another piece to the larger puzzle. High-performing plans were the only ones that had investment returns exceed their assumptions, exemplifying the notion that strong pensions must meet their actuarial assumptions to demonstrate strong outcomes. When pension plans artificially set a high assumed rate of return and fail to meet it, they are setting themselves up for years of trying to catch up.

Another important observation that these table shows is the difference between payroll growth assumptions. In particular, the relatively low difference demonstrated by under-performing plans compared to medium and high performing plans. Each of these two taxonomies exhibited considerable growth in their payroll relative to assumptions. That is, these plans, on average, grew their contribution base at a much higher rate than under-performing plans. This suggests that population growth, which is correlated with payroll growth of the local fire department, may be one important indicator to consider when evaluating each plan individually. In can be further theorized that medium-performing plans were able to overcome poor investment returns through higher-than-expected growth in the payroll. Had these plans seen better investment returns, they would likely fall in the high-performing category. On the flip side, had these plans not grown as rapidly, they would likely fall in the under-performing category. This finding demonstrates the importance of the left-side of the equation for pension solvency (contributions + investment returns) and the importance of maintaining high values for each of these components.

4.5 Taxonomy Comparison: City Support

Figure 11

City Support Variables by Plan Performance

Performance	Normal Cost	Employee Contribution	Benefit Diff.	Fixed Cont.	Actuarily Defined Cont.	Actuarily Defined Diff.
High	19.52%	13.40%	**6.13%**	17.60%	14.38%	**3.22%**
Medium	18.66%	14.10%	**4.68%**	18.87%	20.07%	**-1.21%**
Under	17.81%	15.11%	**2.69%**	25.09%	25.12%	**-0.03%**

Plan design and employer contribution are crucial elements to each plan's overarching success. This table not only captures the current employer contribution rates and benefit generosity of the plan, but it also demonstrates how historical patterns have affected the different categories of plans. As the plans increase in performance, the normal cost increases while the employee contribution decreases. That is, higher-performing plans can offer more generous benefits. While the normal cost may be higher, these plans have the financial strength to require a lower contribution amount. There is a similarly inverse relationship shown the difference between the employer contribution rate and the actuarily defined contribution rate (i.e. the calculated contribution rate needed to maintain fiscal solvency). High-performing plans, on average, contribute ~3% more than they need to. This may be why their employees receive such a generous benefit. That is, high-performing plans tend to receive strong support from the host city that is reflected in higher benefits. Medium-performing plans tended to contribute less than their ADC while under-performing plans tended to contribute almost the exact ADC. The reason these ADC's tend to get higher as the performance of the plans gets lower may be attributed to a few factors or a combination of poor investment performance, disproportionately high number of retirees, failure of adequate contributions in the past, etc. Thus, it would be hard for these plans to contribute more

than this amount, the basic percentage needed to maintain the level they are at. This signifies the difficulty in trying to "play from behind" as a pension plan. As evidenced by this table, plans seeking to move into the high-performing category need to consider contributing more than the ADC. This decision lies at the city level. Cities may be reluctant because of the unique nature of the TLFFRA statute: members can vote to increase or decrease their benefits at any time. Therefore, strong communication and understanding between these two parties is necessary for these plans to improve. Cities must contribute a higher percentage under the condition that members do not go around and simply raise benefits. This idea is further explored in the next section.

4.6 Taxonomy Comparison: External Characteristics

Figure 12

External Variables by Plan Performance

Performance	Population Growth	Active/Retiree Ratio	Credit Rating
High	10.08%	8.88	3.27
Medium	7.76%	1.51	4.22
Under	5.28%	1.01	3.53

After presenting the previous findings to the PRB, our team was encouraged to investigate external characteristics that may be playing a role and might be predictive of outcomes. Specifically, the size of the city that the fire department resides in, the ratio of active (i.e. members contributing to the fund) to retired (members receiving money from the fund), and the financial health of the

city. Population growth from 2010 to 2020 was collected as a proxy for size of the city. Active/retiree data was collected from the 2022 TLFFRA report. The credit rating was collected from Moody's using a 7 point scale: AAA represented a 7, AA2 represented a 6, A represented a 1. This figure, while important, poses additional challenges stemming from the fact that not every city even had a credit rating (nearly 1/3 were missing). Our team either used the most recent credit rating or assigned a 1 if the city had never received a credit rating. We recognize that this may pose limitations, but concluded it was still important to include.

Our team ran each of the regression models again with these three new variables. The statistical significance of the model remained largely unchanged. The R-squared only improved slightly in some cases, while certain models actually demonstrated a lower figure. Our models didn't change that much, if at all. Governance variables continued to dominate as statistically significant. Although the R squared slightly increased, the ultimate findings remained consistent. For this reason, our team opted to not include them in the final model. However, we felt that it was necessary to see how these factors were different across the different taxonomies. The results, reflected above, demonstrate how these factors are important considerations when assessing pension plans and highlights how the demographics of the host city may hinder or create obstacles to the success of an individual plan.

Population analysis

The highest-performing plans tended to grow at a much more rapid pace than the other plans. This points to the importance of a strong tax base and financial condition of the city that employs these firefighters. Additionally, this points to the growing significance of external factors that impact the actuarial status of individual pension plans. That is, factors beyond the scope of the TLFFRA board may be at play. Plans in the higher-performing category tended to be more urban

and consolidated close to urban centers. Medium-performing plans tended to be more suburban and slightly more isolated than high-performing plans. Under-performing plans tended to be more rural and had smaller populations. There are exceptions to this in each of the taxonomies, but on average, this trend seemed to emerge. This suggests that the nature of TLFFRA plans, and perhaps pensions at large, may be better conformed to certain types of firefighter departments that lend themselves to strong actuarial outcomes.

Ratio analysis

One key takeaway from our interviews was the impact that the age of TLFFRA plan's inception had on its current funding levels. In one interview with a high-performing plan, there were only two members that had ever retired. That is, there were many members contributing into the plan with very few members receiving contributions. As such, we postured it would be important to see this ratio broken down by the different taxonomies. The results are not surprising. High-performing plans, which includes two plans that were established within the last 15 years, had a very large positive ratio. Even if these two plans were taken out, the ratio would still be the largest among all three taxonomies (1.71). It seems obvious to suggest that plans who have more members contributing that receiving benefits would lend themselves to stronger funded outcomes. But as a robustness check, our data confirms this. It follows the same trend that population growth displayed. Under-performing plans had a near even 1:1 ratio. This reflects how these plans lack any kind of safety net from both inadequate contributions from the city or a poor investment year. High-performing and even medium-performing plans may be able to counteract these things in the short term because they have more individuals contributing into the fund that paid benefits.

Credit rating analysis

The lack of current credit ratings from nearly 1/3 of the plans makes an analysis on the financial condition of the city difficult. Our team incorporated some proxy variables to incorporate the financial condition of the city (payroll growth, population growth, etc.) but we postured that there would be no more direct way to look at this then credit rating. Our limited data shows that medium-performing plans tended to have the highest credit-rating while high-performing plans had the lowest credit rating. Unfunded pension liabilities tend to be a major driver in credit downgrades, but that doesn't seem to be the case in our findings. Our data perhaps demonstrates that even in poor financial conditions, high-performing plans can contribute enough to be well-funded. As a result, while there may be external characteristics that play a role in these decisions, high-performing plans tend to find a way to get the necessary contributions from the city, which in turn, leads to more generous benefit plans for members.

4.7 Taxonomy Analysis

The separation of the 42 TLFFRA plans unveiled critical differences between plans that are high-performing, medium-performing, and under-performing. Medium-performing plans tended to demonstrate the strongest MET compliance and good governance as our team defined it. Notably, high-performing plans were the most likely to take and publish strong minutes and scored the highest on transparency. These plans also were the only ones that beat their assumptions on both investment returns and payroll growth – both of which bring in additional revenue to pay off unfunded liabilities and benefits for current retirees. Medium-performing plans tended not to meet investment expectations, but exceed payroll growth at a rate that was only slightly less than high-performing plans. That is, it can be assumed that these plans were able to overcome underwhelming investment returns by growing at a faster-than-expected rate. Under-performing plans did not grow as rapidly and tended to just meet investment expectations. The real distinction between each of the

taxonomies lies in the city support. There was a very clear inverse relationship between the normal cost of the plan and the employee contribution rate. The normal cost tended to increase and the employee contribution rate tended to decrease as the performance of the plan went up. That is, higher-performing plans were able to offer the most generous benefit packages (6% vs. 2%). This indicates that it is possible for plans to have strong actuarial outcomes while still offering good benefits to members. This finding may be more a symptom than a cause: high-performing plans may be able to offer more generous plans because they are well-funded, rather than the opposite. However, when analyzing the support from the city it becomes clear that the employee contribution variable is, perhaps, the most explanatory of strong outcomes. Employers within the high-performing category tended contribute more than their actuarily defined contribution. That is, they made above and beyond the necessary contributions to stay solvent to, presumably, offer more generous benefits. These plans also had the lowest unfunded liability likely because of these strong contributions. Medium-performing plans did not make adequate contributions above the ADC. By our research, this is the biggest separator between medium-performing and high-performing plans. Although these plans had strong governance and payroll growth, these gains were offset by lower contributions from the city. If a medium-performing plan with strong governance seeks to become a high-performing plan (and consequently offer more generous benefits), more contributions from the city are needed. Although low-performing plans made contributions right at the ADC, the lack of payroll growth, investment returns, and low active/retiree ratio make actuarial strength difficult. The safety net that exists for high-performing plans is not present for under-performing ones. External characteristics play a role too. These plans tended to have the lowest population growth and active/retiree ratios. The only way for a low-performing plan to make gains in its outcomes is to either beat investment/payroll assumptions (by either lowering the initial assumption or having a strong actual result), contribute more than the ADC, or demonstrate better governance. In sum,

good governance and transparency can help an under-performing plan become a medium-performing plan. But to become a high-performing plan, a city must contribute above its actuarial defined contribution to 1) pay off outstanding liabilities, 2) offer more generous benefits (which may also have the effect of recruiting more firefighters), and 3) create a safety net in the event that investments or payroll growth do not meet assumptions. However, external characteristics like population growth, the financial condition of the city, and the ratio of active members to retirees pose some additional barriers. Plans may, to an extent, be handcuffed by these variables. Regardless, these are the necessary decisions that need to be made to improve TLFFRA plans. Plans seeking to improve should seek advice from the PRB, their city council, and plan members on possible steps to overcome these barriers.

5. Phase 3: Qualitative Analysis

To better understand the results from our modeling and taxonomy, our team conducted semi-structured interviews with TLFFRA stakeholders. This phase involved acquiring understanding of the decision-making processes, interactions with plan sponsors/PRB, and pension system best practices. Our team developed several themes that correlated with our quantitative findings. A further description of our process is detailed below.

5.1 Phase 3 Methodology

Our team wanted to ensure that we incorporated the thoughts, opinions, and expertise of TLFFRA pension system board members. As a result, the questions and topics we explored during our semi-structured interviews were driven by the statistically significant variables identified in our regression analysis and trends in our pension system taxonomy. For example, some of the topics we

wanted to discuss with interviewees were how their pension governing board operates and makes decisions, challenges facing their system, the relationship between the pension system boards and plan sponsor, and any other issues they wanted to discuss regarding governance, performance, or challenges. In sum, we utilized the key differences that emerged from the quantitative research to identify and contextualize the decision-making process and governance of TLFFRA boards.

Because of the variability in pension system performance and the overall broad topics of discussion, our team chose a semi-structured interview format to allow for greater freedom for interviewees to express their experiences with topics we identified as potentially relevant to pension system performance. In addition, the PRB assisted the research team by providing the contact information for TLFFRA pension system board members. In total, our team conducted five semi-structured interviews with a total number of seven interviewees. Four interviewees were firefighter TLFFRA board members, two were TLFFRA board administrators, and one was a TLFFRA plan sponsor. The five semi-structured interviews included interviewees from at least one TLFFRA pension system from each subcategory of our taxonomy (high performing, medium performing, and underperforming). At least two researchers were present for each semi-structured interview. While we wanted the interviews to be as conversational as possible, we prepared questions to help guide the interview towards topics of importance identified during our quantitative research.

5.2 Phase 3 Limitations

We interviewed pension systems that represented all varying levels of pension performance as defined by our taxonomy. However, this study's sample size is small and does not statistically reflect the opinions of all 42 TLFFRA pension system board members. In addition, to protect the confidential information of interviewees and the pension systems they represent, the level of detail that this report can provide on their responses is somewhat limited. Nevertheless, the five semi-

structured interviews provided insightful information that couldn't be gleaned solely from quantitative analysis and also confirmed some of the quantitative findings previously outlined.

5.3 Phase 3 Findings

Overall, each pension system described facing different challenges and opportunities, highlighting the variability in TLFFRA pension system performance. For example, the best performing pension system had been established more recently than the underperforming systems. However, four findings were consistent across the TLFFRA pensions systems, no matter their performance:

1. All TLFFRA pensions system boards had differing levels of formalized governance structures.

2. Filling citizen seats were a challenge for all boards.

3. Most pension system interviewees described support for the implementation of an actuarily defined contribution system.

4. All pension system interviewees described changes overtime in the working relationship between pension system boards and plan sponsors.

The semi-structured nature of each interview meant that each was relatively unique in terms of the topics we discussed. As such, our team organized some of the key takeaways under the

following four themes: board governance, board composition, interaction with external parties, and key differences.

5.4 Pension System Board Governance

Pension system governance refers to how these boards make decisions and acquire expertise. Our questions centered around process, relationships, and communication. Overall, the medium performing pension system had a more formalized board governance structure than the other pension systems. This qualitative finding is consistent with the taxonomy finding that medium performing TLFFRA pension systems on average have higher measures of governance than the high and underperforming plans. In addition, to alleviate some of the structural friction between plan sponsors and TLFFRA boards, the medium performing pension system implemented a contractual agreement in which the board agreed to a framework that limited increases in employee benefits when plan sponsor contributions increased. Also, the medium performing pension system created a board succession plan to maintain continuity of expertise should board members leave. This is a critical governance step as all pension system interviewees described having to rely on the expertise of previous board members for effective governance when they initially joined the pension system board. There were also clear guidelines in place that guided contribution and benefit decisions that brought an element of stability in the plan. These examples offer a preview of what good governance looks like within the statutory purview of TLFFRA plans.

All pension system interviewees described their investment decision making and actuarial assumptions as being guided by advice received from external fiduciary services. Additionally, all pension system interviewees described using a request for proposal (RFP) to acquire external professional services. However, the mandatory use of an RFP varied for each pension system by the

cost of external services. For example, the medium performing may be required to use an RFP if external services cost over $50,000 while the other pension systems may be required to use an RFP for a higher or lower cost of services. It became clear that the services used to advise each plan varied by size. It can be theorized that well-funded plans are able to acquire more advanced actuaries and expert knowledge than plans who don't have these kinds of funds. This is perhaps indicative of why high-performing plans tended to have strong investment returns above their assumed discount rate. All in all, these conversations point to further evidence that having a clearly defined board structure, reliable communication, and expertise are important indicators for a plan's financial soundness.

5.5 Pension System Board Composition

The second theme that emerged was issues stemming from board composition and expertise that have been consistently tied to pension performance. In this case, board composition focuses on the individual stakeholders that make decision and how their different roles, experiences, and perspectives shape the overall decision-making process. Although there is no variability in TLFFRA board structure amongst the 42 pension systems, the semi-structured interviews managed to uncover variability in more subtle ways. For example, all pension system interviewees had varying levels of financial or investment experience. Again, the medium performing TLFFRA pension system had members with greater financial and actuarial experience than the high performing and underperforming pension systems. In addition, all pension system interviewees described having a challenging time attracting quality volunteers to fill the citizen seats on their boards. The pension system interviewees described the high volunteer work hours, level of knowledge required, and lack of compensation as contributing factors. As a result, some of the citizen seats on these boards were filled by retiree firefighters. These factors led to the plan sponsor interviewee to describe the TLFFRA boards as being primarily dominated by firefighter perspectives. This aspect may add to the complicated relationship described between TLFFRA boards and plan sponsors and is explored

further in this report's subsequent recommendations. Lastly, adding to the high volunteer work hours required for TLFFRA boards to effectively govern, only two of the pension systems interviewed had fulltime paid administrators to assist with operations. These administrators played a key role in making the decision-process more fluid and consistent by taking the operational burden off of the board members. Even though each TLFFRA plan has the same statutory structure, there is wide differences between what these individuals bring to the table. While having former firefighters serve in the citizen seat role may be helpful in terms of finding knowledgeable individuals to fill these seats, there is a clear conflict of interest that may create a tense atmosphere at the decision-making table.

5.6 Interactions with the PRB and external parties

The extent to which the PRB and the plan sponsor interact with the plan is an area that came up in each of our interviews. The PRB is charged with carrying out duties set by the Legislature. Their expertise, resources, and assistance are designed to help plans, not come after them. Our team sought to uncover these interactions to see how each of the interviewees viewed the oversight body and if there were major differences between them.

All pension system interviewees found the statutorily required Minimum Educational Training (MET) program to be useful. However, interviewees with greater financial/investment experience found their experience to be more useful than the MET program alone. Nevertheless, interviewees with more financial experience still considered the MET program to be a useful baseline for all board members. Some pension system interviewees described the lack of an enforcement mechanism for MET noncompliance as an issue, particularly for pension system sponsor noncompliance. In our quantitative analysis, city representatives were less likely to have been in compliance with the MET requirements. The one city representative we did interview was in compliance, but also brought decades of experience and cited the training as unnecessary for someone like them. It can also be theorized that bigger cities (which tended to fall in the high-performing category) have more on their

plate in terms of running a city and fulfilling their duties in other domains than cities with a smaller budget. This may explain why high-performing plans tended to score low on our governance metrics. However, without an enforcement mechanism for completing these trainings, expertise is developed voluntarily.

In addition, three pension system interviewees described some of the statutorily required reporting requirements as duplicative and costly. These interviewees identified SB 322 Investment Expense Reporting in Annual Financial Reports and Funding Soundness Restoration Plans (FSRPs) reporting requirements in particular. These interviewees seemed to blame the PRB for enforcing these requirements that are set by the Legislature. It became clear that some of the under-performing plans had a relatively negative opinion of the PRB. In addition, all pension system interviewees described the working relationship between plan sponsors and the TLFFRA board as varying overtime. For example, interviewees described how levels of trust and interaction could vary overtime depending on plan sponsor board member transitions or through compromises reached through negotiated MOUs or contracts. A salient example of this structural dynamic came up during the plan sponsor interview. For instance, the plan sponsor interviewee expressed concern over increasing contribution rates as required by an actuarily determined contribution rate. The concern stemmed from fears that an increase in contribution rates would lead to the perceived firefighter dominated TLFFRA board in turn increasing plan benefits, thus negating the purpose of increasing the contribution rate.

In describing their current relationship with their plan sponsor, most of the TLFFRA board members expressed a positive relationship that was collaborative. However, the plan sponsor interviewee described the complicated nature of this relationship. For example, the plan sponsor described how the city had a desire to raise contributions to rectify poor outcomes, but was concerned

about the "human nature element" inherent in the ability for TLFFRA board members to vote on benefits. In contrast, the interviewees from the medium-performing plan, which scored very high on quantitative governance metrics, did not describe this contentious relationship. It's possible that the rigid, clear guidelines that governed contribution and benefit decisions, established by a contract, eliminated this tension and made for easier decision-making as the goals of each stakeholder were now clearly aligned.

5.7 Key Differences Between Pension Systems

While all interviewees described perspectives shared across the taxonomy categories, the semi-structured interviews also highlighted some key differences among different performing TLFFRA pension systems. For example, the high performing pension system interviewees described having consistent, and reliable communication with their TLFFRA members as a key governance factor for its success. This finding is supported by our report's indirect measure of transparency: board minutes. This pension system received a higher transparency score than other high performing pension systems. The interviewees also described the Office of Fire Fighters' Pension Commissioner as being instrumental to its initial success establishing itself as a TLFFRA pension system. However, this agency is currently inactive after the Texas Sunset Advisory Commission issued the results and recommendations of a sunset review conducted in 2013. After becoming inactive, the role and responsibilities of the office were absorbed into the PRB. The interviewee also described that messaging and clear communication were necessary to convince the fire department of the merits that TLFFRA would bring. The interviewee ultimately stressed that these benefits, which they may raise their contributions in the near-term, will increase in the future over the alternative option. That is, the members of the plan itself had an outsized role in the decision-making process. Decision-making went

beyond the board, as the interviewee cited a conscious effort to keep pension system members informed on everything going on and actively seeking their input.

The medium-performing pension system interviewees described having a formal succession plan to address board turnover, had board members with actuarial experience, and described heavy emphasis on firefighter control of the board over plan sponsor members. The medium performing pension system interviewees also described their pension system performance as being the result of having to recover from the poor decisions of previous board members. This is further evidence for the need to consider the history of the plan and other characteristics outside of the scope of the TLFFRA board. Even though they demonstrated many best practices regarding pension governance, these plans struggle to rectify prior decisions. Decisions made in the past continue to impact the current outcomes and performance of each plan. Therefore, it is important to consider the external characteristics of each plan when prescribing remedies to improve. If these plans had some of the same histories/consistent support from the plan sponsor, it is possible that many of them would fall under the high-performing category.

Lastly, the under-performing pension system interviewees described creating a tiered plan in response to a PRB intensive review, did not have a formal risk-sharing plan with the plan sponsor, and strongly disagreed with the PRB's intensive review findings. The interviewees also described the annual conferences and trustee trainings provided by the nonprofit organization, the TLFFRA Education Foundation, as offering useful actuarial and financial knowledge for TLFFRA board members that goes beyond the statutorily required MET program.

5.8 Summary of Qualitative Findings

All in all, there were many elements of governance, decision-making process, and board composition that were consistent across each of the interviewees. There was also variation among different aspects of governance that highlights the importance of the individuality of each of the plans. TLFFRA cannot be fixed with a sweeping solution. Rather, careful consideration of each plan's history, board makeup and the expertise they bring, and external factors of the city are needed to identify the problem and subsequent solution. As a result, the following recommendations are intended to create flexibility and accountability for all TLFFRA plans regardless of performance.

6. Recommendations

Our recommendations center around three concepts: open governance, mitigating risk, and strong city-plan relationships. These six recommendations vary from changes to statute to internal changes that can be made by each individual plan. Implementation of these would include structural changes by both plan sponsors and their TLFFRA boards. Each of these recommendations are informed by both our quantitative and qualitative findings. While each of these recommendations may have their limitations, our team believes that each of these options deserves proper consideration.

6.1 Establish a Statewide TLFFRA Fund

Our research uncovered concerning trends among TLFFRA pension systems that could endanger their long-term prospects. Among these notable trends are a lack of payroll growth and population growth in rural communities. The relative lack of growth in these areas may make a TLFFRA program unsustainable in a rural area if the program is not properly managed. Many pension programs function in rural places in Texas due to asset pooling into a larger system, like the

Texas Municipal Retirement System (TMRS). TMRS is the pension system that most municipal employees contribute to for their retirement savings. This includes some firefighters as well. Each city contributes to the system a whole. A partial explanation for the relative stability of TMRS is due to the pooling of assets from cities across the state.

TLFFRA programs have lacked stability as a group compared to other programs in the state of Texas. Asset pooling may be the answer to the issue of stability. Texas has a potential best practice to follow with asset pooling with the state of Massachusetts. The Pensions Reserves Investment Management Board of Massachusetts (PRIM) has a unique model that may be perfect for TLFFRA programs. PRIM manages all of Massachusetts' statewide pension programs such as their equivalents to TRS and TMRS. However, PRIM has an addition feature: optional asset pooling. Local pension programs have the option to invest their assets into the PRIM portfolio to be pooled with others from around the state. The individual programs still exist and negotiate with cities, but the assets and resulting pensions come from investment performance in the larger fund.

Local control is a key value behind the TLFFRA statute. These boards are established by firefighters to control their own pensions. If a statewide program were established keeping it optional would be essential for allowing plans that already exist to maintain their autonomy. Even if a plan were to opt into a statewide program, they would maintain some autonomy. In PRIM each local board still exists as a separate entity but chooses to invest into PRIM. This could potentially allow for board to divest as necessary. Alternatively, the TLFFRA state fund could take control of a program if it continually underperforms. Some plans in the TLFFRA system have underperformed for multiple years. This puts these programs in danger of losing the rest of their assets and firefighters losing their benefits. Taking control of the assets can stabilize a spiraling program and allow firefighters to gain better benefits.

Certain limitations exist that make the implementation of this recommendation difficult. For a statewide fund to be established, it would require changes to the TLFFRA statute. This would require action from the legislature. Despite support for reforming TLFFRA indicated from the last interim report from the Texas House Pensions, Investments, and Financial Services Committee, it is uncertain that the legislature would have an appetite for this solution. For this fund to succeed it will need the trust of the firefighters. The investment strategy must be clear and have the proper balance of risk and stability to ensure that an underperforming program will succeed when they opt into the fund. The managers of the fund must have clear communication with the client boards. A publicly appointed board with some sort of firefighters input will likely be necessary to ensure that boards have trust in the fund.

6.2 Require an annual MOU between the city council, TLFFRA board, and PRB

There is an inherent dynamic present between the city, who determines an annual contribution rate, and the TLFFRA board, who votes on benefits and contributions. Cities have a clear incentive to contribute a sufficient amount because a growing unfunded pension liability only constricts budgetary flexibility in the future and hurts credit scores. However, they may feel hesitant to do so because of the democratic nature in which the TLFFRA board can use the funds. There is nothing to stop a TLFFRA board from taking more support from the city to increase their own benefits or lower their own contributions. In fact, many TLFFRA plans seemed to have done this. The better-performing plans, however, tended to have strong lines of communication between these two parties and many of the good governance plans had clear risk-sharing agreements to mitigate against this. This MOU would first start with an actuarial status update provided by the PRB that details how the plan did in the preceding year, the magnitude of its unfunded liabilities, and what the

actuarial determined contribution should be. Based on these projections, the PRB will recommend a benefit and contribution rate that would help the plan improve its funded ratio, amortization period, and unfunded liability. With this data, all these stakeholders will agree on a contribution rate and benefit packages at the beginning of the fiscal year. Or, an agreement that determines the conditions for benefit increases (certain investment return thresholds, new employees, etc.) would also help alleviate some of these communication issues.

Data from the taxonomy revealed that the highest-performing plans contributed above the ADC and receiving strong support from the employing city. One key takeaway from the interviews was the tension between cities and TLFFRA board inherent in this kind of pension structure. Both parties have an incentive to adopt a contribution/benefits rate that is intergenerationally equitable, provides ample retirement benefits to retirees, and preserves the actuarial soundness of the plan. This option creates that dialogue to bridge gaps in perspectives on how to get there. Additionally, nearly all the plans that underwent an intensive review from the PRB tended to improve rather dramatically in the periods following the review. While some of the interviewees may have rejected the nature of how the review was conducted, these recommendations ultimately lead to improvements from the plans that needed it the most. Therefore, these annual MOUs also serve the function of being "informal intensive reviews" from the PRB. For high-performing plans, this may simply be a "keep doing what you're doing" message. But regardless, this gives the PRB a more hands-on approach and identifies problems and subsequent solutions before the problem becomes unsolvable. In making recommendations and reports to the Legislature, PRB will be more aware each TLFFRA plan and can testify to each plan's adherence to the MOU.

One of the medium-performing plans that we interviewed cited a similar process that they undergo with their plan sponsor. This plan regularly communicates with the plan sponsor about the

actuarial status of the plan, any changes that are made, and what they intend to discuss at future board meetings. They have established a relationship that is built on trust and, in return, both parties benefit. This plan sponsor contributes above its actuarially determined contribution on a relatively regular basis. It also scored relatively high on many of the governance aspects of our model. The plan sponsor contributes this amount because they have a clear, written agreement with the board on what the benefit payout will be and establishes the thresholds needed to raise them (i.e. strong investments, more employee contributions, etc). As a result, this plan has shown improved outcomes over the past few years. It is this level of collaboration, trust, and formal risk-sharing that serves as a best practice for all TLFFRA plans. If every plan was required to undergo this process with the PRB serving as a mediator, we believe that all plans regardless of current performance would stand to improve into the future.

This option is intended to be considered as one immediate measure that the PRB could take to achieve multiple objectives. However, without statutory changes, this would have to be done on a voluntary basis. That is, there is no legal mechanism for enforcing an annual MOU. This would add to the burden of TLFFRA plans which already administratively stretched thin. Additionally, there is currently only one FTE at the PRB that focuses on TLFFRA plans. Adding 42 annual casual intensive reviews will require a lot of work. It is unclear if the PRB has capacity to do this annually. Regardless, forcing the stakeholders and the experts to the same table to talk about what is needed in the best interest for all parties would certainly be helpful in improving the financial strength of each TLFFRA plan.

6.3 Require plan sponsors to utilize an actuarily determined contribution (ADC) rate

This recommendation attempts to alleviate some of the issues our research has identified with TLFFRA pension systems. An actuarily determined contribution (ADC) rate is a funding method that uses an actuarial calculation to determine a plan sponsors annual contribution required to eliminate the pension systems unfunded liabilities in timely manner. There are many ways to calculate an ADC, but guidance developed by the Actuarial Standards Board (ASB) may act as a guide. Conversely, a fixed contribution rate is a funding method not tied to the pension systems unfunded labilities and is usually determined at the discretion of plan sponsors or statute. Based on the PRB's December 2022 AV Report, few TLFFRA pension systems utilize an ADC, the majority utilize a fixed contribution rate. This is an important finding because our taxonomy indicated that higher performing plans tended to have higher contribution rates. In addition, contribution rates were found to be statistically significant and had coefficients positively associated with pension system performance in our regression analysis. As a result, requiring all TLFFRA pension systems to use an ADC would require plan sponsors to make the necessary contributions to ensure TLFFRA systems are properly funded. Additionally, most TLFFRA board member interviewees supported the implementation of a required ADC. However, based on our semi-structured interview with a plan sponsor, plan sponsors are opposed to an ADC because they fear that TLFFRA boards will then elect to increase plan benefits. This is a fair criticism and this structural tension between plan sponsors and TLFFRA boards has been identified in this research. Requiring an ADC may also increase the short-term financial stress on plan sponsors. Another potential limitation is that an ADC may make it harder for plan sponsors to predict future contributions because ADCs may vary overtime. However, some TLFFRA plans fixed contributions are significantly lower than their ADC. As a result, failing to make the appropriate annual contributions consistently will only make the necessary contributions more costly over time. In addition, there are options to prevent TLFFRA boards from increasing pension benefits with an ADC. One of the TLFFRA pension systems that we interviewed signed an MOU with the plan sponsor

outlining the conditions that pension benefits could be increased. In another example, a TLFFRA pension system negotiated with their plan sponsor that employees would match the plan sponsor's contribution rate.

6.4 Each plan should establish an independent website

Out of the 42 plans, our team was unable to locate the minutes for 19 of them. Often, this was due to our team being unable to find the website for the plan itself. In other cases, this was due to the city having an inadequate system for posting and archiving minutes and required documents. Statute requires public posting of minutes and TLFFRA statute has certain reporting requirements. Even if these minutes are technically available, they are not easily accessible. As such, each plan should establish a website that is independent of their city. Despite the close relationship between a city and their TLFFRA plan, they are separate entities. Reliance upon an outside source (the city) to post their minutes and documents can be risky. Putting the burden onto each program to post their own documents and minutes is better for transparency. Most governmental organizations have their own website. However, just because a plan has a website does not mean that the website is easy to use. Many individual plan websites were outdated and lacked basic information about plans. Even if a plan already has a website, steps should be taken to ensure websites are brought up to date. More specifically, these sites should be user and mobile friendly. These websites are not only useful for displaying information for the public, they are marketing tools for these plans. TLFFRA is a complex statute and these websites are a plan's way of creating their brand and showing their usefulness to their community.

The obvious downside is lack of ability to implement this recommendation. Some of the smaller plans have indicated that they have difficulty affording a plan administrator or a 3rd party

actuary. If they are having difficulty in hiring for these roles, hiring a 3rd party web designer may not be feasible. There may also be some difficulties in updating websites for anyone who is not familiar with web design or has received training.

6.5 Conduct a study on expanding TLFFRA to county fire department's

The PRB has the capacity to do research on certain pension policies. In one interview with a county fire department, the differences between working with a commissioner's court and a city council certainly became evident. This plan was created in 2008 and has enjoyed strong outcomes since its inception. This is likely due to the age of the plan, but members receive a higher retirement benefit package than they would if they simply opted into TMRS. The interviewee described the ease of working with the commissioner's court and how the incentives they have may be different than a city council. Thus, a further examination into how these dynamics may be different under a TLFFRA framework would illuminate more about the different natures of pension systems. Specifically, the study should include 1) current landscape of county fire department pension structures, 2) openness of these departments to TLFFRA, 3) how benefits might change under TLFFRA, 4) how the makeup and electoral incentives of county commissioners may be different than those elected to city council, and 5) how the budget of a county may affect the potential adoption of TLFFRA.

This option is intended to be coupled with a statewide TLFFRA fund. If TLFFRA were to be expanded, more plans will be needed to collectively strengthen the fund. Counties seem like a prime place to start in potentially expanding TLFFRA. They often have smaller budgets to begin with but employ a large amount of fire fighters. A study surrounding this topic would not help the

PRB understand TLFFRA on a deeper level, but they would learn more about how pensions are different at the county level. Using the county plan currently as a TLFFRA as a basis, more fire fighters that serve in counties across the state could stand to see increases in their retirement benefits and more rewarding plans if deployed efficiently.

This option does not involve any remedies to outstanding TLFFRA problems. Those should take precedent. However, if the PRB wishes to expand TLFFRA, this would be the first place to start. The county fire department our team interviewed demonstrated that when done right, TLFFRA can deliver wins for all parties involved. However, some plans continue to be plagued from decisions made years in the past. This option looks further into the future rather than trying to solve problems from the past. It could be argued that limited resources from the PRB may be better used in attempting to rectify and assist plans that are currently struggling. However, if the statewide TLFFRA fund were to be adopted, this could be a useful tool to determine and identify county fire departments that would make that fund strong while still delivering generous benefits to the fire fighters it serves.

6.6 Reform citizen seats on TLFFRA boards

The final recommendation aims to alleviate some of the governance concerns described by plan sponsors and challenges described by other TLFFRA board members in our semi-structured interviews. For example, all interviewees described having a difficult time finding qualified candidates with actuarial or financial experience to fill the two citizen seats on their boards. In addition, interviewees described the high volunteer work hours, level of knowledge required, and lack of compensation as contributing factors to the challenge. Furthermore, as an indirect measure of governance, citizen TLFFRA board members had the lowest percentage of MET compliance out of

the three categories of TLFFRA board members. Based on the 2022 MET compliance report, for all 42 TLFFRA plans, 65.1% of firefighters, 51.2% of plan sponsors, and 43.4% of citizen board members were compliant. Additionally, during our interview with the plan sponsor, they described how TLFFRA boards tend to be firefighter dominated because it is possible for the citizen seats to be filled by retired firefighters, leading to a board majority of five vs two (plan sponsor board members). This has also caused a sense of deference to these firefighters from the perspective of city representatives. This format allows for an overwhelming amount of burden to be placed upon the firefighters in terms of board composition and control.

To avoid situations of overwhelming firefighter control on TLFFRA board, we recommend reforming TLFFRA statute to make citizen seats optional. This will remove the burden placed upon these boards, especially those in rural areas, of having to find qualified citizens to fill those seats. We recommend keeping these seats optional to allow boards that have located qualified citizen members to keep their seats as they will likely offer substantive advice upon governance and actuarial matters. Taking the pressure off boards that cannot find qualified candidates will allow them to instead dedicate their time to discussing and improving their plan instead of constantly trying to remain in statute. However, for TLFFRA boards that wish to maintain their citizen seats, we recommend that firefighters, either current or retired, be barred from holding those seats. This will reduce the potential conflict of interest these firefighters have in controlling their own benefits. The idea behind having citizen seats on the board stems from the fact that they, as taxpayers, have a stake in the financial success of pension plans. It is ultimately them who must pay for any unfunded liability. However, citizens still maintain the ultimate direction of the plan through election of city councilors who oversee the plans. Therefore, our team believes that by making these seats optional, plans are granted additional flexibility by removing a statutory burden but still offers a way to provide expertise.

However, this recommendation alone may not lead to better relations between plan sponsors and TLFFRA boards. Interpersonal relations in each board can vary and citizen seats are not the determinant issue for individual boards. In addition, plan sponsors share some of the responsibility in the variability of working relationships with TLFFRA boards since our research indicates that plans sponsors tended to have lower levels of compliance with the statutorily required MET program.

7. Conclusion

The PRB is charged with overseeing all pension plans in Texas, including the 42 that fall under the Texas Local Fire Fighters Retirement Act (TLFFRA). These plans are unique in their statutory design: members vote on contribution and benefit levels while still relying on contributions from the plan sponsor that employs them. Investment and high-level decisions are made by a board that includes nearly a majority of active plan members. This is one of the most democratic forms of pension governance across the country, which naturally lends itself to some of the same tensions inherent in any democratic model.

Our research uncovered that governance, expertise, and transparency are key elements of strong outcomes. Moreover, above-and-beyond contributions from the city makes a world of difference in both the generosity of the benefits that members receive and the long-term funded status of each of the plan. However, it is also important to consider the external factors of an individual plan before making any conclusions. Population growth and the age of the plan can either create or eliminate any form of protection against low contributions or a poor investment year. As such, the highest-performing plans tended to have strong population growth, above the minimum required contributions from the city, and demonstrated strong expertise in decision-making. Examples of good governance in the context of TLFFRA pensions systems includes having a formalized board structure

where roles are clearly delineated, having a succession plan to pass down valuable insights from previous boards, and ensuring strong, consistent lines of dialogue between all stakeholders. TLFFRA, if utilized and regulated appropriately, can be a vehicle for fire fighters to receive more generous retirement benefits than if they were folded into TMRS. To establish accountability and guardrails for ensuring that both fire fighters and plan sponsors benefit from this program, statutory changes may be needed. This may include the creation of a statewide TLFFRA fund to share risk and mitigate population differences in smaller, rural parts of the state. It may also simply require the plan sponsors to sit down with the TLFFRA board and agree on contribution/benefit levels based on data produced by the PRB. Or, it may simply involve a mandatory city contribution rate that is equal to the actuarial determined contribution. Any of these changes would help make this program more effective for all parties involved and begin to rectify some of the poor performance in prior years.

Additionally, smaller changes may help individual plans that are struggling. Creating a website to increase transparency of how decisions are made would help all stakeholders evaluate these plans. A study on expanding TLFFRA to county fire departments may be helpful with the creation of a statewide TLFFRA fund. Additionally, making citizen seats optional might help plans make more effective decisions. Regardless, these options should be considered as both short-term and long-term solutions to the wide variability in TLFFRA performance. These changes would likely take time to implement, but firefighters across the state deserve to have a retirement package that values the work they do.

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