City of Austin, TX

City Council: Audit and Finance Committee

Pension Analysis Report

June 3, 2020

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Contents

Background

Actuarial Status

- While calendar year 2020 is far from complete, market downturns resulting from COVID-19 will likely reduce asset values in the systems
- The data shown here and on the slides that follow are based on the last year with completed actuarial valuations for all three systems, prior to both a favorable 2019, recent changes to COAERS assumptions, and the subsequent COVID-19 market downturn
- Absent a strong market recovery in excess of system investment return assumptions, actual pressures would ultimately exceed the levels shown

	COAERS (12/31/2018)	Police (12/31/2018)	Fire (12/31/2018)
Actuarial Liability (millions)	$3,989.6	$1,389.7	$1,084.5
Actuarial Value of Assets (millions)	$2,695.4	$808.0	$954.6
Unfunded Actuarial Liability (millions)	$1,294.2	$581.7	$130.0
Funded Ratio	67.6%	58.1%	88.0%
Amortization Period	32 years	Never	17.9 years
Major Actuarial Assumptions	Inflation: 2.75% (2.5% - 2019) Payroll Growth: 4.00% (3.5% - 2019) Investment Return: 7.50% (7.0% - 2019)	Inflation: 2.50% Payroll Growth: 3.00% Investment Return: 7.25%	Inflation: 2.75% (2.5% - 2019) Payroll Growth: 3.50% (2.0% - 2019) Investment Return: 7.7% (7.5% - 2019)

Recent Experience: COAERS

- In FY2010, Council approved incremental increases to the City's contribution rate from 12% of payroll to 18% of payroll by FY2013
  - These increases over the course of the past decade have built on a City supplemental funding plan first started in 2006 to add to the employer's base contributions of 8% of payroll
- For employees hired on or after 1/1/2012, a new benefit tier was also introduced with a lower pension multiplier (2.5% instead of 3.0%) and increased age and service requirements (age 62 with 30 years of service or age 65 with 5 years, instead of any age with 23 years of service, age 55 with 20 years, or age 62)
- Nonetheless, from 12/31/2010 through 12/31/2018:
  - **The COAERS unfunded liability increased from $749.1 million to $1,294.2 million**
  - **The funded ratio fell from 69.6% to 67.6%**

Recent Experience: Police

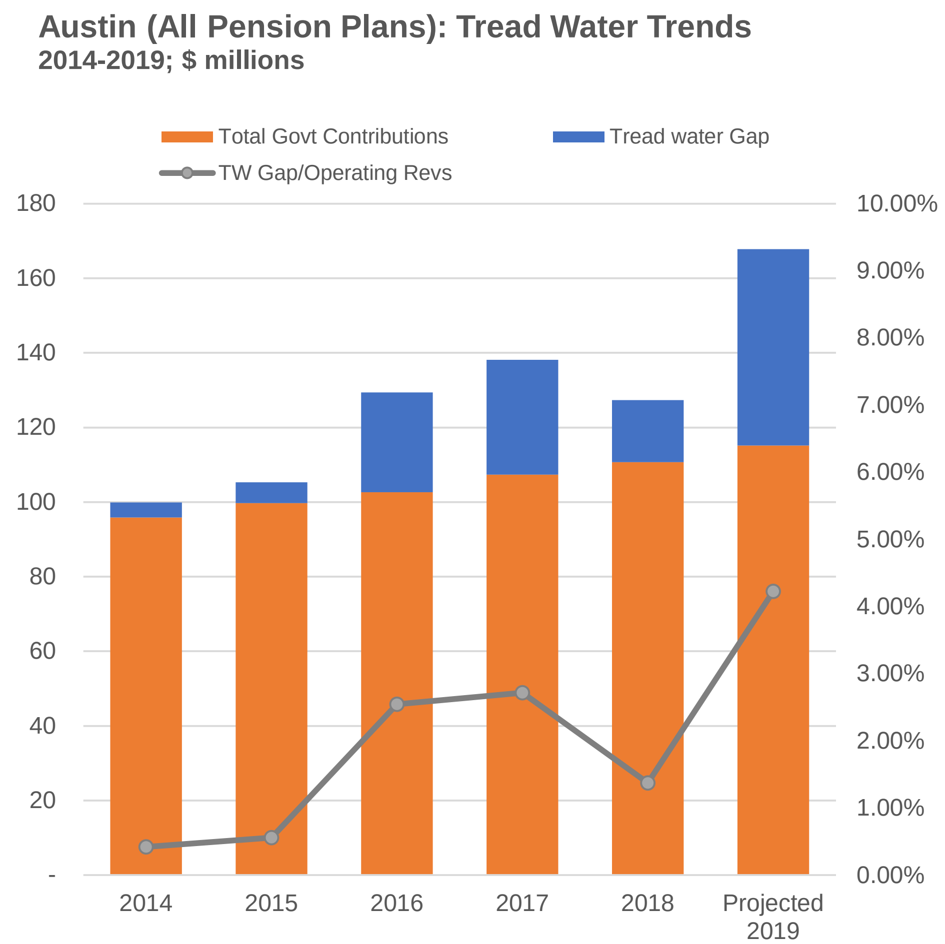
- Since FY2009, the City has increased its contribution from 18.0% of payroll incrementally up to the current 21.313% (in place since 10/1/2015)
- Nonetheless, from 2009 to 2018:
  - **The unfunded liability more than doubled from $216.9 million to $581.7 million**
  - **The funded ratio fell from 70.5% to 58.1%**
- Even with all actuarial assumptions met in full and the City continuing to contribute 100% of its current rate, without further corrective actions, the most recent valuation projects that by 2023:
  - The unfunded liability will continue to grow from $582 million to $861 million
  - The funded ratio will continue to fall from 58.1% to 51.4%
  - The system has an infinite amortization period; in other words, the current funding levels are actuarially projected to remain insufficient to adequately fund the benefits. As stated in the plan's valuation: ***"The APRS's funded ratio is expected to continue to decrease until it reaches zero when the assets of the System are depleted."***

Why Has Underfunding Grown?

- Despite no recent benefit enhancements, no COLAs since 2002 for COAERS and since 2007 for Police, and the City having fully met its statutory funding requirements to all systems (and exceeding its statutory requirements to COAERS since 2006 pursuant to a Supplemental Funding Plan)…
- Underfunding has still increased – due to factors including:
  - Investment returns below actuarial assumptions:
    - COAERS 4.0% annualized returns over five years ending 12/31/2018 (6.2% over 15 years)
    - Police 3.4% net annualized returns over five years ending 12/31/2018 (5.0% over 15 years)
  - Revised actuarial assumptions to adjust for this experience:
    - COAERS investment return assumption lowered from 7.75% to 7.5% with changes in mortality and other assumptions (12/31/2015), and lowered again to 7.0% for 2019
    - Police investment return assumption lowered from 7.70% to 7.25% with changes in mortality and other assumptions (12/31/2018)
  - Fixed annual funding falling short of actuarially determined contributions:
    - COAERS: current 18.0% vs. 19.37% to fund actuarially over 25 years
    - Police: current 21.313% v. 37.302% to fund actuarially over 20 years and 31.965% to fund actuarially over 30 years
  - "Tread water" funding dynamic

Moody's Tread Water Analysis: 2014–2019

- In 2018, Moody's began to evaluate the extent to which local governments are at least funding the contribution amounts required to prevent the liability from further increasing and introduced the concept of "tread water"
- The tread water analysis evaluates if, under the plan's stated assumptions, an issuer is funding its employer service cost plus interest on the unfunded pension liability
- The gap between this funding amount (i.e. the "tread water gap") is then measured as a % of governmental spending



Source: Moody's Investors Service.

Governance: COAERS

Authority	State Legislature	COAERS Board	Plan Sponsor
COLAs		Y	Y
Member Benefits	X		
Investment Decisions		X	
Actuarial Assumptions		X	
Disability Claims		X	
Member Contributions	X	(can call an election to increase)	
Employer Contributions	X (minimum)		X (supplemental)
Board Appointments			4 of 11 (Council member, City Manager or designee, two Council-appointed citizens)

X = sole authority
Y = requires joint approval

Governance: Police

Authority	State Legislature	APRS Board	Plan Sponsor
COLAs		X (subject to statutory parameters)	
Member Benefits	X	X (limited authority)	
Investment Decisions		X	
Actuarial Assumptions		X	
Disability Claims		X	
Member Contributions	X	(can call an election to increase)	
Employer Contributions	X (minimum)		X (supplemental)
Board Appointments			3 of 11 (Council member, City Manager or designee, Director of Finance or designee)

X = sole approval authority

Call to Action

Rating Agencies

- All major credit rating agencies consider pension funding to be a significant component of an overall rating
- Per Moody's analysis, which calculates an Adjusted Net Pension Liability (ANPL) based on a standardized investment return assumption, Austin's pension liability relative to operating revenues and pension contributions as a percentage of revenues are both higher than median large Aaa rated cities:

Key Ratio	Austin[1] Aaa/Neg Outlook	Aaa-Median Rated, Population >500k[2]	Aa1,Aa2,Aa3-Median Rated, Population >500k
Adj. Net Pension Liability to Full Value	2.3%	2.4%	4.0%
Adj. Net Pension Liability to Op. Revenue	2.8x	1.7x	2.5x
Pension Contributions as % of Revenues	9.1%	6.3%	10.7%
Net Direct Debt to Full Value	0.9%	1.4%	1.6%(2)
Net Direct Debt to Revenues	1.14x	1.16x	0.95x(2)
Debt Service as a % of Expenditures	15.5%	12.6%	9.9%(2)

1. *Municipal Financial Ratio Analysis database. Moody's Investors Service. Accessed April 27, 2020.*
2. *"Medians – Tax Base Growth Underpins Sector Strength, While Pension Challenges Remain." Moody's Investors Service. May 6, 2019.*

Rating Agencies

- In 2019, Moody's revised its outlook on the City of Austin's AAA credit rating from "stable" to "negative" – stating:

  "inability to manage the growth of liabilities and costs associated with the retiree benefit systems through changes to benefits or contribution levels could lead to balance sheet leverage and annual pension funding gaps that are inconsistent with the Aaa rating category."

- Similarly, while Standard & Poor's maintained a stable outlook, they also noted pension concerns:

  "Our analysis also acknowledges the risk that Austin's large pension obligations and associated fixed costs poses to its overall credit quality. While city management continues to evaluate potential solutions to ensure that the plans remain affordable, significant increases in contributions that negatively impact finances or material deterioration in the long-term health of the plans could affect the rating."

Texas Pension Review Board

- Under the oversight of the Texas Pension Review Board, Texas Government Code Section 802.2015(e) requires Funding Soundness Restoration Plans for retirement systems that have had amortization periods over 40 years for three consecutive annual actuarial valuations
- Based on the 12/31/2018 valuation, **the Austin Police Retirement System is now considered "at risk" because the amortization period identified was infinite**. If not corrected prior to the 12/31/2020 valuation, the Funding Soundness Restoration Plan requirement will be triggered
- More generally, the Texas Pension Review Board guidelines include that contributions made to a retirement plan should be sufficient to cover the normal cost and to amortize the unfunded actuarial accrued liability over as brief a period as possible, but not to exceed 30 years, with 10 - 25 years being the preferable target range
  - **COAERS is now also outside of the Texas Pension Review Board recommended range**

Benchmarking

General Employees

- Among major Texas cities (Dallas, El Paso, Fort Worth, Houston, San Antonio):
  - Austin, El Paso, and Houston provide general employees with both traditional pensions and Social Security coverage
    - San Antonio provides the Texas Municipal Retirement System (TMRS) cash balance plan and Social Security
    - Dallas and Fort Worth General Employees receive traditional pensions, but do not participate in Social Security
  - All of the plans, including Austin, have reduced tiers for more recent General hires
  - Among the plans with traditional, defined benefit pensions, Austin provides a competitive overall benefit structure with one of the highest pension multipliers and a below-median employee contribution requirement (see Appendices for additional benchmarking details beyond those on the following slides)

General Employees: Benefits (Current Tier)

	Eligibility	Benefit Formula	Average Final Compensation (AFC)	Pensionable Compensation	Vesting	COLA	Social Security
Austin	**Age 62 with 30 YOS or Age 65 with 5 YOS**	**2.5% x AFC x YOS**	**Highest 36 months within last 120 months**	**Base pay**	**5 YOS**	**Set by pension board on recommendation of actuary; maximum of 6%; additional parameters by policy**	**Yes**
Dallas	Age 65 with 5 YOS or Any age with 40 YOS or Age and YOS greater than or equal to 80	2.5% x AFC x YOS (up to 40 years)	Highest 60 months	All taxable earnings	5 YOS	Increase in CPI (Oct to Oct), up to 3% or annual average change in CPI for the 12-month period ending with the effective date of the adjustment, up to 3%	No
El Paso	Age 60 with 7 YOS or Any age with 35 YOS, if earlier	2.25% x AFC x YOS (minimum benefit $75)	Highest 36 months	Gross earnings	7 YOS	Ad hoc; subject to board approval and satisfaction of actuarial soundness and financial stability of the Fund	Yes
Fort Worth	Age + YOS $\geq$ 80 (minimum age 55) Age 65 with 5 YOS	2.5% x AFC x YOS	Highest 60 months	Base pay, acting pay, longevity, education incentive, assignment pay, holiday, safety award, shift differential and certification pay, worker's comp	5 YOS	None	No
Houston	Age 62 with 5 YOS	1.8% x AFC x YOS (1-25) + 1.0% x AFC x YOS (26+)	Highest 36 months	Base, longevity, shift differential	5 YOS	Average of five-year invesment return less 5%, minimum of 0% and maximum of 2%, not compounded	Yes
San Antonio	Age 60 or 20 YOS at any age	Members participate in TMRS - a hybrid cash-balance defined-benefit retirement plan. Benefits are based on a member's account balance at retirement; funded through mandatory employee deposits, city contributions, and investment income. 7% employee deposit rate with 2-1 City match			5 YOS	70% of CPI; auto readoption	No

General: Funding

	Total Employer Contribution	Employee Contribution	Actuarial or Statutory	Discount Rate
Austin	**18.0%**	**8.0%**	**Statutory**	**7.50%** **Lowered to 7.00% for 2019**
Dallas	14.39% to Plan + 8.29% for POB debt service (22.68% total)	13.32%	Statutory	7.75%
El Paso	14.05%	8.95%	Statutory	7.50%
Fort Worth	24.96%	10.05%	Statutory	7.00%
Houston	28.06%	3.0% (1.0% for cash balance)	Actuarial	7.00%
San Antonio	11.66%	6.0%	Actuarial	6.75%

Police

- Among major Texas cities (Dallas, El Paso, Fort Worth, Houston, San Antonio):
  - Only Austin provides police officers both traditional pensions and Social Security coverage; none of the other cities evaluated participate in Social Security for police officers
  - Austin is the only City without a reduced tier for more recent police hires
  - Among the plans with traditional, defined benefit pensions, Austin provides a competitive overall benefit structure with the highest pension multiplier and an employee contribution requirement in line with the other Cities (see Appendices for benchmarking details)

Police: Benefits (Current Tier)

	Eligibility	Benefit Formula	AFC	Pensionable Compensation	Vesting	COLA	Social Security
Austin	**Earlier of age 62, age 55 and 20 YOS, or 23 YOS**	**3.2% x AFC x YOS**	**Highest 36 months in last 120 months**	**Base, longevity**	**10 YOS**	**Set by pension board on recommendation of actuary; maximum of 6%**	**Yes**
Dallas	Age 58 with 5 YOS or 20 YOS	2.5% x AFC x YOS 20 and Out Retirement: 2.4% x AFC x YOS (age 57); 2.3% x AFC x YOS (age 56); 2.2% x AFC x YOS (age 55); 2.1% x AFC x YOS (age 54); 2.0% x AFC (age 53 and younger); With 20 YOS and age 55, receive supplemental benefit of 3% of total monthly pension, minimum $75/month (now frozen)	Highest 60 months	Base pay, longevity, education pay	5 YOS	Set by pension board on recommendation of actuary; maximum of 4%; now contingent on reaching financial benchmarks including 70% funded ratio	No
El Paso	Age 45 with 20 YOS	2.5% x AFC x YOS	Highest 36 months	Base, Longevity, OT, Incentive Pay (education, cert pay)	10 YOS	None	No
Fort Worth	Age + YOS ≥ 80 (minimum age 55) Age 65 with 5 YOS Any age with 25 YOS	2.5% x AFC x YOS	Highest 60 months	Base pay, acting pay, longevity, education incentive, assignment pay, holiday, safety award, shift differential and certification pay, worker's comp	5 YOS	None	No
Houston	Age + YOS > 70	2.25% x AFC x YOS (1-20) + 2.0% x AFC x YOS (21+); Extra monthly benefit of $150/month, payable for life.	Highest 36 months	Base pay, longevity, certification pay, hazardous duty pay, education pay, clothing allowance, shift differentials	10 YOS	COLAs suspended 7/1/2017 - 7/1/2020 for those not over age 70 or receiving a line of duty-connected survivor benefit. After 7/1/2020, COLA will after age 55 equal to 100% of five-year average investment return minus 5%, with a minimum of 0% and a maximum of 4%.	No
San Antonio	Any age with 20 YOS	2.25% x AFC x YOS (1-20) + 5.0% x AFC x YOS (21-27) + 2.0% x AFC x YOS (28-29) + 0.5% x AFC x YOS (30+)	Highest 36 months in last five years	Base, Longevity, Certification Pay, Education Pay, Shift Differential, Language Skill, High Class Pay	20 YOS	75% of increase in CPI	No

Police: Funding

	Total Employer Contribution	Employee Contribution	Actuarial or Statutory	Discount Rate
Austin	**21.313%**	**13.0%**	**Statutory**	**7.25%**
Dallas	34.5% + $13 million	13.5%	Statutory	7.25%
El Paso	18.25% (18% + an additional amount as a percentage of total wages of members hired above age 29)	16.368%; increasing to 16.921% (9/1/2020-8/31/2021), 17.456% (9/1/2021-8/31/2022), 18% (9/1/2022 onward)	Statutory	7.75%
Fort Worth	24.96%	12.53%; will increase to 13.13% effective January 2021	Statutory	7.00%
Houston	31.85%	10.5%	Actuarial	7.00%
San Antonio	24.64%	12.32%	Statutory	7.25%

Texas Pension Reforms

- Other large Texas cities have also faced challenges to their credit quality and ratings from pensions in recent years, and have enacted reforms using varying mechanisms – generally determined by the differing legal and governance frameworks in place
  - A 2016 ballot referendum revised benefits for Dallas General employees
  - 2017 state laws modified benefits for Houston plans and Dallas Police and Fire
    - The state law also required that a $1 billion Houston pension obligation bond (POB) be approved by voters
  - Fort Worth modified benefits for future service between 2011 and 2014, and modified benefits, contributions and other provisions in 2018, with a majority of employees voting to approve in 2019
    - **Dallas** changes included: increased police and fire employee contributions (from 8.5% to 13.5%) for all actives, and new civilian and police/fire tiers that included higher City contributions, increased normal retirement age/service requirements, benefit multiplier reductions, and other plan design adjustments. The civilian changes applied to post-1/1/2017 hires, while police and fire changes impacted both post 3/1/2011 hires and benefits earned for future service after 9/1/2017 for members hired earlier
    - **Houston** increased employee contributions for all members and added a new funding corridor provision for higher City contributions, while adopting benefit adjustments varying by plan (e.g., age and service eligibility, multiplier structure, exclusion of overtime from final compensation used to determine benefits). In some cases, changes applied to new hires only, while other adjustments applied to all members
    - **Fort Worth** also increased employee and City contributions for all members and modified some plan provisions with varying impacts on new hires and active eligible employees
  - More detail regarding specific changes may be found in the Appendices

Options for Improved Sustainability

What Are the Tools?

Consistent Budgetary Funding	• Establish/Update a Funding Policy • Fund the Actuarially Determined Contribution (ADC)
Manage Benefit Liabilities	• Plan Design Options • Plan Tiers
Risk Management	• Risk Sharing • Risk Transfer
Build Fund Assets	• Pension Obligation Bonds • Asset Monetization & In Kind Transfers

Funding Policy

- COAERS and the Police and Fire systems all have established funding policies
- Like many other Texas plans, however, these funding approaches are not tied to an Actuarially Determined Contribution (ADC) on an annual basis, but instead use a fixed-rate contribution structure
- While this approach can work, it can also be more challenging to maintain sufficient funding

"Such contribution structures do not inherently adjust to cover liability losses or gains and may not reflect the plan's expected cost. Thus, fixed-rate contributions may not be sufficient to move toward the goal of full funding. This is especially true when a plan experiences significant actuarial or investment losses.

While contributions based on a fixed percentage of pay provide the highest degree of contribution stability in the short-term, this approach increases the likelihood of not achieving the other two goals, retirement security and intergenerational equity. Without close monitoring and pro-active adjustment of the fixed contribution rate, the amount contributed to the plan may not be adequate, resulting in a poorly funded plan which provides for a lower degree of benefit security and defers necessary contributions, placing the burden of funding current plan costs on future plan members and taxpayers through increased contributions and/or benefit reductions."

Texas Pension Review Board: "Interim Study: Funding Policies for Fixed-Rate Pension Plans," January 2019

Funding Policy

- Nationally, the most common approach is to base funding on an Actuarially Determined Contribution (ADC) adjusted annually

> *"The most important step for local and state governments to take is to base their pension funding policy on an actuarially determined contribution (ADC). The ADC should be obtained on an annual or biannual basis."*
>
> Public Pension Task Force, 2013

> *"GFOA recommends that every state and local government that offers defined benefit pensions and/or OPEB formally adopt a funding policy that provides reasonable assurance that the cost of those benefits will be funded in an equitable and sustainable manner. Such a retirement benefits funding policy would need to incorporate the following principles and objectives:*
>
> 1. *Every government employer that offers defined benefit pensions or OPEB should obtain no less than biennially an actuarially determined contribution (ADC) to serve as the basis for its contributions to those respective plans;*
> 2. *The ADC should be calculated in a manner that fully funds the long-term costs of promised benefits, while balancing the goals of 1) keeping contributions relatively stable and 2) equitably allocating the costs over the employees' period of active service;*
> 3. *Every government employer that offers defined benefit pensions or OPEB should make a commitment to fund the full amount of the ADC each period."*
>
> Government Finance Officers Association (GFOA) Best Practice: "Core Elements of a Funding Policy," approved by GFOA's Executive Board, September 2016

Public Pension Task Force participants included: National Governors Association (NGA), National Conference of State Legislatures (NCSL), The Council of State Governments (CSG), National Association of Counties (NACo), National League of Cities (NLC), The U.S. Conference of Mayors (USCM), International City/County Management Association (ICMA), National Council on Teacher Retirement (NCTR), National Association of State Auditors, Comptrollers and Treasurers (NASACT), Government Finance Officers Association (GFOA), National Association of State Retirement Administrators (NASRA)

Plan Design Options

- **Defined Benefit Plan (DB):** A plan in which the employer promises a specific amount of monthly retirement income based on a formula that typically takes into account the employee's salary, years of service, and age
- **Defined Contribution Plan (DC):** A plan in which retirement savings are based on accumulated employer and employee contributions and the investment returns on those contributions
- **Hybrid Plan:** Combines elements of DB and DC or cash balance plans
  - Stacked Hybrid: Plan combines a DB component up to a certain amount of salary, and then a DC or cash balance plan benefit on income above that salary level
  - Side-by-Side Hybrid: Plan combines a DB component most often with a separate DC retirement savings account
  - Risk-Managed Hybrid: Side-by-side hybrid with additional risk sharing on the DB component
- **Cash Balance Plan (CB):** Pooled and professionally managed employee savings accounts with a guaranteed minimum annual investment return and an option for lifetime, guaranteed benefit

Benefit design typically varies by employee group (e.g., safety v. general), and different benefit levels ("tiers") may also be in place based on date of hire as systems have evolved over time

Modified Defined Benefit Plan

- Key features of the current Defined Benefit plans that could be evaluated for potential change include:
  - Multipliers for future service
  - Age and service requirements for an unreduced retirement
  - Period for calculating average final compensation
  - COLA provisions
  - City and employee contributions
  - Miscellaneous plan features – e.g. disability benefits, survivorship provisions, death benefits, service credit conversions

Risk-Sharing

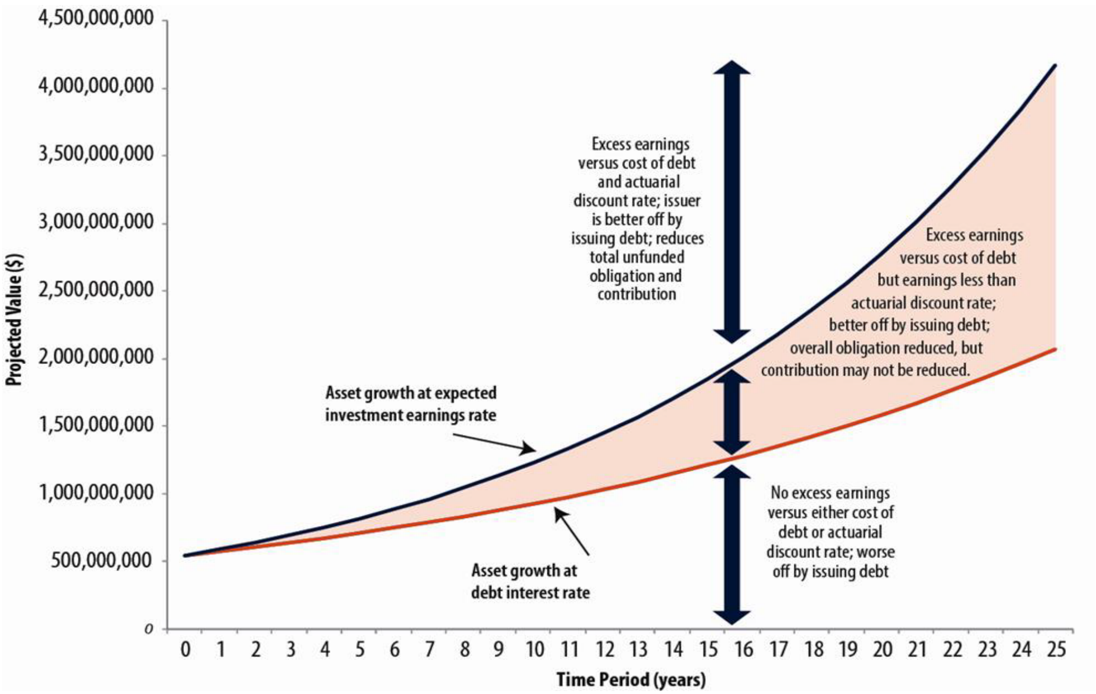
- Split normal cost
- Split ADC changes (e.g., Fort Worth)
- Cost corridor (e.g. Houston)
- Hybrid plans designs, inclusive of mechanisms to shift employer contributions toward the DC component to cover shortfalls in DB funding, when needed (e.g. State of Tennessee)

Risk Sharing Case Studies

- **Fort Worth:** As part of 2017-2018 reforms, risk-sharing features were adopted to align contributions with the actuarially determined contribution (ADC) to amortize the unfunded liability by 2048. If the contribution rates are less than the ADC for two consecutive valuations, contributions are increased in a 60/40 proportion with annual caps. If the contributions are still insufficient, City Council must consider further benefit modifications.
- **Houston:** State legislated reforms in 2017 established a permissible range of employer contribution rates or "cost corridor" for all three City of Houston pension plans. The corridor is defined as a +/- 5% range around a target municipal contribution rate = The UAL amortization on a closed 30-year basis, based on a (reduced) 7% investment return + Expected normal cost + Expected administrative expenses
  - If the estimated contribution rate exceeds the corridor rate, the City and pension board are directed to agree to increase member contributions and *"make other benefit or plan changes not otherwise prohibited by applicable federal law or regulations"*
  - If the estimated contribution rate is lower than the corridor minimum, then actuarial and funding conditions will be modified to further de-risk the plans, but also previous benefit reductions may be restored and eventually enhanced

Pension Obligation Bonds

- Issuers of Pension Obligation Bonds ("POBs") issue debt in the taxable fixed rate markets and deposit the proceeds into their pension system
- POBs are a risk-bearing arbitrage strategy between the cost of financing and the return on investment
  - Investment rates greater than borrowing costs will achieve net savings to the pension obligation
  - If investment returns are below the debt service costs, POBs can be "in the red" for some period(s) of time or even overall
- POBs replace a 'soft liability' with a 'hard liability'
- As further detailed in the appendices, there additional pros, cons, and other factors to consider as part of evaluating this potential strategy



System Actuarial Analysis

Current City Contribution Rate = 18.0%
Current Member Contribution Rate = 8.0%

COAERS Actuarial Analysis (GRS)

2020 Return	7.0%	0.0%	-7.5%	-15.0%
		Valuation*		
ADEC IF 25-Year Amortization	21.07%	22.76%	24.58%	26.42%
Funding Period IF Current Contribution Rates Continue	36	47	63	Never

*December 31, 2019 valuation results assuming future annual return on market value of assets of 7% every year after 2020

- The GRS table below shows the total amount of service purchases from 2010 to 2019 and the associated total actuarial shortfall through 12-31-2020 assuming a 0% return in 2020. In most systems, service purchases are typically designed to be "actuarially neutral"

Purchase Type	Total Purchases	Shortfall
Prior Military	$6,084,258	$28,365,310
Other (Permissive, etc.)	$65,533,638	$6,471,820

- GRS analysis of Sick Leave purchases was only completed based on data from 2017 – 2019, with total purchases of $995,782 and a shortfall of $46,098

Source: Gabriel, Roeder, Smith & Company (GRS)

APRS Actuarial Analysis (GRS)

Current City Contribution Rate = 21.313%
Current Member Contribution Rate = 13.0%

	No Benefit Changes	Scenario 1: **New Hires Only** with 2.5% Multiplier, Age 50 & 25 Years, 60-Month FAC **All Members** with 15% Member Contribution in 2021, 17% in 2022 and thereafter	Scenario 2: **New Hires Only** with 2.5% Multiplier; Age 55 & 25 Years, 60-Month FAC **All Members** with 15% Member Contribution in 2021, 17% in 2022 and thereafter
City 30-Year Rate			
0% return in 2020	**34.801%**	**27.422%**	**26.857%**
-5% return in 2020	**34.976%**	**27.666%**	**27.114%**
-15% return in 2020	**35.354%**	**28.185%**	**27.660%**

Source: Gabriel, Roeder, Smith & Company (GRS)

Summary of Key Findings

Key Findings

- As of the most recent 12/31/2018 actuarial valuations, Austin's municipal pension systems had an aggregate unfunded liability in excess of **$2 billion**
- Despite past benefit changes and City contributions above the statutory minimums, this underfunding has worsened in recent years due to factors including:
  - Investment returns below actuarial assumptions
  - Changes to those assumptions to more conservatively reflect expected future investment experience
  - A statutory funding approach that does not adjust automatically with changing experience
- Even before the COVID-19 market downturn, underfunding was projected to worsen further without changes to funding and/or benefits
  - With the recent decline in asset values, this expected weakening has likely accelerated
- These conditions can ultimately impact:
  - Long-term plan sustainability
  - City credit ratings and financial position

Key Findings

- **Benefits**
  - For General employees, Austin provides a competitive overall benefit structure with both Social Security coverage and a traditional defined benefit pension with one of the highest multipliers and a below-median employee contribution requirement
  - For Police retirees, only Austin provides both traditional pensions and Social Security coverage, and only Austin has not adopted a new tier for more recent police hires
  - Dallas, Fort Worth, and Houston have all adopted pension benefit changes over the last several years, making adjustments to traditional defined benefit structures, to address plan sustainability
  - Alternatives to a defined benefit structure with less financial risk to the plan sponsor are common in the private sector, but they feature greater risk for retirees and are not prevalent among Texas cities or most other public employers
- **Funding**
  - Although common in Texas, the practice of using a fixed employer contribution that does not adjust automatically with changing experience can make it more difficult to ensure sound funding
  - Nationally, consistent with GFOA guidance and other best practices, most public pensions use an annually adjusted actuarially determined contribution (ADC) as a key component of sustainable pension funding

Prospective Solutions

- Successfully addressing Austin's pension underfunding will likely require a balanced combination of increased contributions, closer alignment with actuarial funding requirements, and restructured benefits to achieve:
  - Financial sustainability and affordability
  - Continued competitiveness and retirement security
- Recent reforms nationally and in Texas have also incorporated risk sharing strategies to maintain a balanced approach to retiree benefit sustainability

Appendices

Additional Benchmarking Detail

Social Security Participation

	Civilians	Police	Fire
Austin	**Y**	**Y**	**N**
Dallas	N	N	N
El Paso	Y	N	N
Fort Worth	N	N	N
Houston	Y	N	N
San Antonio	Y	N	N

Plan Structure

	Plan Structure by Employee Group
Austin	**General, Police, and Fire each in separate plans**
Dallas	Police and Fire in one plan; General in separate plan
El Paso	Police and Fire in one plan; General in separate plan
Fort Worth	All groups in the same plan with different provisions
Houston	General, Police, and Fire each in separate plans
San Antonio	General in TMRS; Police and Fire in same plan

General

General Employees: Plan Overview

	Plan Name	Current Tier (if applicable)	Date of Valuation Used
Austin	**City of Austin Employees' Retirement System (COAERS)**	**Group B: Hired on or after 1/1/2012**	**12/31/2018**
Dallas	City of Dallas Employee's Retirement Fund	Tier B: Hired on or after 1/1/2017	12/31/2018
El Paso	City of El Paso Employees Retirement Trust	Tier 2: Hired on or after 9/1/2011	9/1/2018
Fort Worth	Employees' Retirement System	Tier II: Hired on or after 7/1/2011	12/31/2018
Houston	Houston Municipal Pension System	Group D: Hired on or after 1/1/2008	7/1/2018
San Antonio	Texas Municipal Retirement System	N/A	12/31/2018

Note: While actuarial recent valuations were the primary source for most benchmarking, some findings were based on data from Comprehensive Annual Financial Reports, published reports to City Councils, Texas Pension Review Board summaries, and/or direct survey outreach.

General: Disability Benefits (Current Tier)

	Ordinary Disability		Service-Connected Disability
	Eligibility (Ordinary Disability)	***Benefit***	
Austin	**5 years of service (YOS)**	**Benefit calculated on salary and accrued YOS at time of disability**	
Dallas	Active Employees: 5 YOS Inactive Employees: 10 YOS	Benefit calculated on salary accrued YOS at time of disability. Benefit assumes a minimum of 10 YOS	Same as ordinary disability, with a minimum benefit: $1,000 per month
El Paso	7 YOS	2.50% x Final Wages x YOS (Minimum Benefit: $75 per month for ordinary disability; $250 for service-connected disability)	
Fort Worth	5 YOS	Benefit calculated on salary and accrued YOS at time of disability	Benefit calculated based on earliest normal retirement benefit, but with current compensation as base
Houston	5 YOS	Benefit calculated on salary and accrued YOS at time of disability	Accrued normal retirement benefit, but not less than 20% of final monthly salary at time of disability plus 1% of final monthly salary per YOS (Maximum of 40% of final monthly salary)
San Antonio (TMRS)	5 YOS	Less than 5 YOS: refund of contributions + interest 5+ YOS: Monthly retirement benefit based on member deposits and interest, as well as city's matching funds (same as service retirement, but with restrictions on earnings)	

General: Death Benefits (Active Employees: Current Tier)

	Pre-Retirement Eligibility	Eligible for Retirement	Service-Connected
Austin	**Payment of contributions and interest + death benefit of contributions and interest**	**Lump sum of $10,000 + payment of contributions and interest, if not recovered in benefit payment**	**No separate benefit**
Dallas	If less than 2 YOS: a refund of contributions 2 YOS or more: death benefit calculated using the greater of 10 years of credited pension service or actual service credit		The greater of accrued benefit at 10 YOS or Actual Service Credit at time of death (Minimum Benefit: $1,000 per month)
El Paso	Total employee contributions without interest. If the member has more than five years of service, contributions paid with interest, credited annually at 5.5%	Amount payable if member had retired immediately prior to death with a Joint and 100% option (Minimum Benefit: $75 per month, requires age 40 with 10 YOS or age 45 with 7 YOS)	Benefits calculated as if member were age 70 with 30 YOS (Minimum Benefit: $550/month)
Fort Worth	$5,000 lump sum + 75% of actual accrued pension to date - minimum of $250 per month - plus $100 per month for each dependent child If no surviving spouse, dependent children under age of 18 share 75% of accrued pension projected to normal retirement date (minimum of $250 per month); If no surviving spouse or dependent children, dependent parents receive pension benefit that would have been paid to spouse; If no surviving spouse, dependent children, or dependent parents, beneficiary may apply for refund of employee contributions + interest		$5,000 lump sum + 75% of accrued pension projected to normal retirement date - minimum of $250 per month - plus $100 per month for each dependent child If no surviving spouse, dependent children under age of 18 share 75% of accrued pension projected to normal retirement date (minimum of $250 per month); If no surviving spouse or dependent children, dependent parents receive pension benefit that would have been paid to spouse; If no surviving spouse, dependent children, or dependent parents, beneficiary may apply for refund of employee contributions + interest
Houston	If 5+ YOS, spouse received 80% of normal accrued benefit at time of death (50% of benefit if spouse married for less than 1 year) For deferred participants, spousal survivorship benefit is 50% (actuarially reduced option available at earlier date)		If there is a surviving spouse, the spousal survivor benefit is 80% of the participant's final average salary
San Antonio (TMRS)*	Less than 5 YOS: refund of contributions + interest 5+ YOS: Monthly retirement benefit based on member deposits and interest, as well as city's matching funds		

** San Antonio has not selected TMRS' supplemental death benefit options*

General: Survivorship Benefits (Current Tier)

	Optional	Automatic	Survivorship Benefits Available
Austin	✓	-	**100% joint and survivor** **50% joint and survivor** **66 2/3% joint and survivor** **Joint and 66 2/3 last survivor** **15-year certain and life** **Customized actuarial equivalent** ***(actuarial reduction for all options)*** **If member dies before contributions and interest have been paid out, beneficiary or estate will receive the remaining balance**
Dallas	✓	✓	Automatic benefit of 10-year certain Optional benefits of joint & 50% survivor with 10-year certain and joint & full survivor with 10-Year certain also available *(actuarial reduction)*
El Paso	✓	✓	Automatic benefit of joint and 2/3 survivor annuity Optional choices include: Life only annuity, balance of remaining contributions provided to beneficiary (*actuarial increase*) 100% joint and survivor (*actuarial reduction*) 50% joint and survivor (*actuarial increase*) Life only annuity, no survivorship benefits (*actuarial increase*)
Fort Worth	✓	-	May choose one beneficiary to receive reduced monthly pension upon member's death in amount of 100%, 75%, 50%, or 25% of reduced pension *(actuarial reduction for all options)*
Houston	-	✓	If there is a surviving spouse, the spousal survivor benefit is 80% of the participant's final average salary (50% of benefit if spouse married for less than 1 year)
San Antonio (TMRS)	✓	-	Three joint survivor options (100%, 75%, and 50%) + Three guaranteed term options (5-Year, 10-Year, 15-Year) *(actuarial reductions for all options)*

General: Service Credit Purchase (Current Tier)

	Military Service (Prior to Employment)	Military Service (During Employment)	Reinstated Forfeited Service	Permissive Service*	Non-Contributing Service	Other	Actuarial Subsidy
Austin	**Up to 4 Years**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**For prior military service, members contribute 25% of estimated cost of the additional projected retirement benefits; System contributes 75% of estimated cost**
Dallas	No	Yes	Yes	Yes [1]	No	No	None
El Paso	No	Yes	Yes	No	Yes	No	None
Fort Worth	Yes	Yes	Yes	Yes	Yes	[2]	None
Houston	Yes	Yes	Yes	No (only military service)	Yes	[3]	None**
San Antonio	Yes	Yes	No [4]	Yes	Yes	No	None

* Permissive service is the ability to purchase additional service credits at full actuarial present value cost without having worked those years or having had equivalent years of service in the military or with another public employer. Once a general Austin employee has five years of COAERS membership service credit, they can purchase up to 60 months of additional "supplemental service credit." For Group A members, supplementary service credit will increase the monthly benefit payment and will also count toward retirement eligibility. For Group B members, supplementary service credit will increase the monthly benefit payment but will not count toward retirement eligibility.

**pending confirmation

[1] May be applied for vesting and retirement eligibility, but not towards calculating benefits

[2] A member who wants to increase the amount of credited benefit service at the time of termination may purchase additional credited service (does not apply to eligibility)

[3] Group B members with refunded pre-1981 Group A service; Service for which credit was forfeited to receive an early lump sum distribution

[4] Cities participating in TMRS may periodically provide opportunities to buy back previously refunded TMRS service. In San Antonio, employees hired before 1/2000 may buy previously refunded TMRS service. Post-1/2000 hires are not eligible to buy back service, though if the City were to offer another buy-back period, then post-1/2000 hires may be eligible to purchase previously refunded TMRS service

General: Sick Leave Conversion (Current Tier)

	Sick Leave Conversion to Service Credit
Austin	**Yes**
Dallas	No
El Paso	Yes Maximum of 6 months of unused sick leave counted towards eligibility; cannot be used concurrently towards credited service for benefit purposes)
Fort Worth	Only major medical leave earned prior to 7/20/2019 may be converted to service credit
Houston	No*
San Antonio	No

*Pending Confirmation

Police

Police: Plan Overview

	Plan Name	Current Tier (if applicable)	Date of Valuation Used
Austin	**City of Austin Police Retirement System**	**N/A**	**12/31/2018**
Dallas	Dallas Police & Fire Pension System	Group B: employees hired on or after 2/28/2011	1/1/2019
El Paso	El Paso Firemen & Policemen's Pension Fund	Tier 2: employees hired after 6/30/2007	1/1/2018
Fort Worth	Employees' Retirement System	Tier II: Hired on or after 1/1/2013	12/31/2018
Houston	Houston Police Officers' Pension System	Plan 3: Employees hired after 10/9/2004	7/1/2019
San Antonio	San Antonio Fire and Police Pension Fund	Employees hired on or after 7/1/2013	1/1/2019

Police: Disability Benefits (Current Tier)

	Ordinary Disability		Service-Connected Disability
	Eligibility (Ordinary Disability)	***Benefit***	
Austin	**10 YOS**	**Benefit calculated on salary and accrued YOS at time of disability**	**Benefit calculated at 20 YOS**
Dallas	Start of employment	Benefit calculated on salary and accrued YOS at time of disability (minimum prorated $2,200 per month)	Greater of 50% of Average Computation Pay or accrued benefit at time of disability (minimum $2,200 per month)
El Paso	Start of employment	Greater of 50% of member's final wages, or 2.75% x YOS x Final Wages	Greater of 50% of member's final wages, or 2.75% x YOS x Final Wages
Fort Worth	Must be vested (5 YOS)	Benefit calculated on salary and accrued YOS at time of disability	Benefit calculated based on earliest normal retirement benefit, but with current compensation base
Houston	Start of employment*	Benefit calculated on salary and accrued YOS at time of disability (Minimum of 22.5% of Final Average Pay)	Minimum of 45% of Final Average Pay; 100% of Final Average Pay if injury is catastrophic
San Antonio	Start of employment	50% of Average Salary	Disability: 50% of Average Salary Catastrophic Disability: 87.5% of Average Salary

*Pending Confirmation

Police: Death Benefits (Active Employees: Current Tier)

	Pre-Retirement Eligibility	Eligible for Retirement	Service-Connected
Austin	**Lump sum equal to twice the member's accumulated contribution (minimum of $10,000)**	**Lump sum equal to twice the member's accumulated contribution + $10,000**	**No separate service-connected death benefit**
Dallas	While in active service: The greater of 50% of accrued benefit or accrued benefit at 20 YOS (maximum of 45% of Average Computation Pay) After leaving active service, less than 5 YOS: Lump sum equal to the return of member contributions without interest After leaving active service, more than 5 YOS: 50% of the Member's accrued benefit, with no early retirement reduction, or a refund of member contributions		No separate service-connected death benefit
El Paso	5 YOS required for non-line of duty death benefits Members with 20 YOS+: Greater of 2.75% x YOS or 50% of Final Wages Members with less than 20 YOS: Greater of 50% Final Wages, or 2.75% x YOS x Final Wages x actuarial reduction factors		Greater of 2.75% x YOS or 50% of Final Wages
Fort Worth	$5,000 lump sum + 75% of actual accrued pension to date - minimum of $250 per month - plus $100 per month for each dependent child If no surviving spouse, dependent children under age of 18 share 75% of accrued pension projected to normal retirement date (minimum of $250 per month); If no surviving spouse or dependent children, dependent parents receive pension benefit that would have been paid to spouse; If no surviving spouse, dependent children, or dependent parents, beneficiary may apply for refund of employee contributions + interest		$5,000 lump sum + 75% of accrued pension projected to normal retirement date - minimum of $250 per month - plus $100 per month for each dependent child If no surviving spouse, dependent children under age of 18 share 75% of accrued pension projected to normal retirement date (minimum of $250 per month); If no surviving spouse or dependent children, dependent parents receive pension benefit that would have been paid to spouse; If no surviving spouse, dependent children, or dependent parents, beneficiary may apply for refund of employee contributions + interest
Houston	Accrued monthly benefit at time of death (minimum of 22.5%)		Spouse or dependents receive 100% of Final Average Pay
San Antonio	Spouse: 50% of Average Salary with maximum based on 27 YOS Children only: Participant's accrued benefit, with a minimum of 50% of average salary and a maximum based on 27 years of service. Benefits are divided equally among the children Dependent parents, no wife or children: 33% of Average Salary, if two; 25% of Average Salary if one No dependents: Lump sum equal to ten times the accrued retirement benefit based on service and salary at time of death, or a refund of member contributions, if greater Wholly-dependent orphaned children: 100% of the surviving spouse's benefit for life		Spouse and dependent children receive pension equal to base pay + longevity at time of death

Police: Survivorship Benefits (Current Tier)

	Optional	Automatic	Survivorship Benefits Available
Austin	✓	**-**	**100% joint and survivor** **50% joint and survivor** **66 2/3% joint and survivor** **Joint and 66 2/3 last survivor** **15 Year certain and life** ***(actuarial reduction)*** **If member dies before contributions and interest have been paid out, beneficiary or estate will receives the remaining balance**
Dallas	✓	-	100% joint and survivor 50% joint and survivor *(actuarial reduction)*
El Paso	-	✓	Members with 20 YOS+: Greater of 2.75% x YOS or 50% of Final Wages (no actuarial reduction) Members with less than 20 YOS: Greater of 50% of Final Wages, or 2.75% x YOS x Final Wages x actuarial reduction factors
Fort Worth	✓	-	May choose one beneficiary to receive reduced monthly pension upon member's death in amount of 100%, 75%, 50%, or 25% of reduced pension *(actuarial reduction)*
Houston	-	✓	100% automatic survivorship benefit with five-year certain benefit for surviving spouse or eligible dependents *(no actuarial reduction)*
San Antonio	-	✓	Retirement benefit of member at death, up to maximum of 80% of Average Salary* *(no actuarial reduction)*

* Surviving spouse married for less than 5 years after retirement receives $15,000 lump sum; if no beneficiaries listed, estate receives lump sum based on 10-Year certain benefit

Police: Service Credit Purchase (Current Tier)

	Military Service (Prior to Employment)	Military Service (During Employment)	Reinstated Forfeited Service	Permissive Service*	Non-Contributing Service	Other	Actuarial Subsidy
Austin	**Up to 2 Years**	**Yes**	**Yes**	**Yes**	**Probationary and Cadet Service (Pre-1998)**	**Deferred Retirement Permissive**	**None for members hired after 2/1/2016. Pre-2/1/2016 hires pay 25% of estimated cost additional projected retirement benefits**
Dallas	No	Yes	Yes	No	No	No	No
El Paso	No	Yes	Yes	Yes	Yes	No	None
Fort Worth	Yes	Yes	Yes	Yes	Yes	[1]	None
Houston	No	Yes	Yes	No	No	No	Prior forfeited service reinstated without interest
San Antonio	No	Yes	No	No	No	No	None

*Austin police are eligible to purchase “permissive service” of up to 60 months at 20 years of service credit or more for immediate or delayed retirement, excluding pre-membership military service, at full actuarial present value cost. Purchasing permissive service credit cannot be combined with participating in the Retro or Forward DROP programs

[1] A member who wants to increase the amount of credited benefit service at the time of termination may purchase additional credited service (does not apply to eligibility)

Police: Sick Leave Conversion (Current Tier)

	Sick Leave Conversion to Service Credit
Austin	**No**
Dallas	No
El Paso	Yes
Fort Worth	Only major medical leave earned prior to 7/20/2019 may be converted to service credit
Houston	Yes*
San Antonio	Yes accumulated sick leave over 90 days can be applied as service credit

* A member may not have any service credited for unused sick leave, vacation pay, accumulated overtime, or equivalent types of pay until the date the member retires, at which time the member may apply some or all of the service to satisfy the requirements for retirement, although the member otherwise could not meet the service requirement without the credit

Fire

Fire: Plan Overview

	Plan Name	Current Tier (if applicable)	Date of Valuation Used
Austin	**Austin Fire Fighters Relief and Retirement Fund**	**N/A**	**12/31/2018**
Dallas	Dallas Police & Fire Pension System	Group B: employees hired on or after 2/28/2011	1/1/2019
El Paso	El Paso Firemen & Policemen's Pension Fund	Tier 2: employees hired after 6/30/2007	1/1/2018
Fort Worth	Employees' Retirement System	Tier II: Hired on or after 1/10/2015	12/31/2018
Houston	Houston Firefighters' Relief and Retirement Fund	Hired on or after 7/1/2017	6/30/2018
San Antonio	San Antonio Fire and Police Pension Fund	Employees hired on or after 7/1/2013	1/1/2019

Fire: Benefits (Current Tier)

	Eligibility	Benefit Formula	AFC	Pensionable Compensation	Vesting	COLA
Austin	**Age 50 or 25 YOS**	**3.3% x AFC x YOS**	**Highest 36 months**	**Base pay, longevity**	**10 YOS**	**Percent increase in CPI-U when approved by the Board**
Dallas	Age 58 with 5 YOS or 20 YOS	2.5% x AFC x YOS 20 and Out Retirement: 2.4% x AFC x YOS (age 57); 2.3% x AFC x YOS (age 56); 2.2% x AFC x YOS (age 55); 2.1% x AFC x YOS (age 54); 2.0% x AFC (age 53 and younger); With 20 YOS and age 55, receive supplemental benefit of 3% of total monthly pension, minimum $75/month (now frozen)	Highest 60 months	Base pay, longevity, education pay	5 YOS	Set by pension board on recommendation of actuary; maximum of 4%; now contingent on reaching financial benchmarks including 70% funded ratio
El Paso	Age 45 with 20 YOS	2.5% x AFC x YOS	Highest 36 months	Base, Longevity, Incentive Pay (education, cert pay)	10 YOS	None
Fort Worth	Age + YOS ≥ 80 (minimum age 55) Age 65 with 5 YOS	2.5% x AFC x YOS	Highest 60 months	Base pay, acting pay, longevity, education incentive, assignment pay, holiday, safety award, shift differential and certification pay, worker's compensation	5 YOS	None
Houston	Age + YOS ≥ 70	2.25% x AFC x YOS (1-20) + 2.0% x AFC x YOS (21+)	Highest 36 months	Base pay, longevity, uniform allowance, education pay	Normal retirement age	COLAs suspended 7/1/2017 - 7/1/2020 for those not over age 70 or receiving a general disability pension. Effective FY2021, retirees age 55+ are entitled to a COLA equal to the five-year average of the smoothed investment return minus 4.75%. All COLAs effective 7/1/2017 onward are subject to a 0% minimum and 4% maximum.
San Antonio	Any age with 20 YOS	2.25% x AFC x YOS (1-20) + 5.0% x AFC x YOS (21-27) + 2.0% x AFC x YOS (28-29) + 0.5% x AFC x YOS (30+)	Highest 36 months in last five years	Base, Longevity, Certification Pay, Education Pay, Shift Differential, Language Skill, High Class Pay	20 YOS	75% of increase in CPI

Fire: Funding

	Total Employer Contribution	Employee Contribution	Actuarial or Statutory	Discount Rate
Austin	**22.05%**	**18.7%**	**Statutory**	**7.70%**
Dallas	34.5% + $13 million	13.5%	Statutory	7.25%
El Paso	18.5% (18% + an additional amount as a percentage of total wages of members hired above age 29)	16.368%; increasing to 16.921% (9/1/2020-8/31/2021), 17.456% (9/1/2021-8/31/2022), 18% (9/1/2022 onward)	Statutory	7.75%
Fort Worth	24.24%	10.05%, increasing to 12.05% on 1/1/2020	Statutory	7.00%
Houston	31.88%	10.50%	Actuarial	7.25%
San Antonio	24.64%	12.32%	Statutory	7.25%

Fire: Disability Benefits (Current Tier)

	Ordinary Disability		Service-Connected Disability
	Eligibility (Ordinary Disability)	***Benefit***	
Austin	**6 months of service**	**Benefit calculated on accrued salary and YOS a time of disability (Minimum benefit of 20 YOS) After 30-month period, a disability retirement benefit may be continued, reduced, or discontinued according to criteria as established by the American Medical Association and as adopted by the pension board**	
Dallas	Start of Employment	Benefit calculated on salary and accrued YOS at time of disability (minimum prorated $2,200 per month)	Greater of 50% of Average Computation Pay or accrued benefit at time of disability (minimum $2,200 per month)
El Paso	Start of Employment	Greater of 50% of member's final wages, or 2.75% x YOS x Final Wages	Greater of 50% of member's final wages, or 2.75% x YOS x Final Wages
Fort Worth	Must be vested (5 YOS)	Benefit calculated on accrued salary and YOS at time of disability	Benefit calculated based on earliest normal retirement benefit, but with current compensation base
Houston	Start of Employment	25% of the average monthly salary plus 2.5% for each full year of participation in the Fund (not to exceed 50%) or eligible service retirement	Occupational On-Duty (cannot work as firefighter): Greater of 50% of the members average monthly salary or eligible service retirement General On-Duty (cannot perform gainful activity): Greater of 75% of the members average monthly salary or eligible service retirement
San Antonio	Start of Employment	50% of Average Salary	Disability: 50% of Average Salary Catastrophic Disability: 87.5% of Average Salary

Fire: Death Benefits (Active Employees: Current Tier)

	Pre-Retirement Eligibility	Eligible for Retirement	Service-Connected
Austin	**Surviving spouse - 75% accrued unreduced pension benefit + 15% accrued unreduced pension benefit for each dependent child (Minimum benefit of 20 YOS)** **If no surviving spouse, dependent children eligible for benefit** **If no dependent children, dependent parents eligible for benefit** **If member dies before contributions and interest have been paid out, beneficiary or estate will receives the remaining balance**		
Dallas	While in active service: The greater of 50% of accrued benefit or accrued benefit at 20 YOS (maximum of 45% of Average Computation Pay) After leaving active service, less than 5 YOS: Lump sum equal to the return of member contributions without interest After leaving active service, more than 5 YOS: 50% of the Member's accrued benefit, with no early retirement reduction, or a refund of member contributions		No separate service-connected death benefit
El Paso*	5 YOS required for non-line of duty death benefits Members with 20 YOS+: Greater of 2.75% x YOS or 50% of Final Wages Members with less than 20 YOS: Greater of 50% Final Wages, or 2.75% x YOS x Final Wages x actuarial reduction factors		Greater of 2.75% x YOS or 50% of Final Wages
Fort Worth	$5,000 lump sum + 75% of actual accrued pension to date - minimum of $250 per month - plus $100 per month for each dependent child; If no surviving spouse, dependent children under age of 18 share 75% of accrued pension projected to normal retirement date (minimum of $250 per month); If no surviving spouse or dependent children, dependent parents receive pension benefit that would have been paid to spouse If no surviving spouse, dependent children, or dependent parents, beneficiary may apply for refund of employee contributions + interest		$5,000 lump sum + 75% of accrued pension projected to normal retirement date - minimum of $250 per month - plus $100 per month for each dependent child If no surviving spouse, dependent children under age of 18 share 75% of accrued pension projected to normal retirement date (minimum of $250 per month); If no surviving spouse or dependent children, dependent parents receive pension benefit that would have been paid to spouse; If no surviving spouse, dependent children, or dependent parents, beneficiary may apply for refund of employee contributions + interest
Houston**	$10,000 lump sum + 25% of the average monthly salary plus 2.5% for each full year of participation in the Fund (not to exceed 50%) or eligible service retirement	$5,000 lump sum + survivor receives 100% of retirement benefit (no reduction)	$10,000 lump sum + 100% of average monthly benefit
San Antonio	Spouse: 50% of Average Salary with maximum based on 27 YOS Children only: Participant's accrued benefit, with a minimum of 50% of average salary and a maximum based on 27 years of service. Benefits are divided equally among the children Dependent parents, no wife or children: 33% of Average Salary, if two; 25% of Average Salary if one No dependents: Lump sum equal to ten times the accrued retirement benefit based on service and salary at time of death, or a refund of member contributions, if greater Wholly-dependent orphaned children: 100% of the surviving spouse's benefit for life		Spouse and dependent children receive pension equal to base pay + longevity at time of death

* If only beneficiary is a spouse, he/she receives 100% of death benefit. If only beneficiary is dependent child/ren, they receive aggregate 66 2/3% of death benefit. If beneficiary is a spouse + dependent children, spouse receives 66 2/3% and child/ren receive aggregate 33 1/3% of death benefit ** $5,000 lump sum death benefit if member is retired and receiving benefits; $10,000 lump sum death benefit if member is active

Fire: Survivorship Benefits (Current Tier)

	Optional	Automatic	Survivorship Benefits Available
Austin	**-**	✓	**Automatic (surviving spouse) - 75% accrued unreduced pension benefit (Minimum benefit based on 20 YOS)** **Optional (if no spouse) - optional survivor benefit available based on the age difference between firefighter/retiree and survivor beneficiary. Based on age bands the percentages range from a 30% minimum to a 75% maximum**
Dallas	✓	-	100% Joint and Survivor 50% Joint and Survivor (*actuarial reduction*)
El Paso	-	✓	Members with 20 YOS+: Greater of 2.75% x YOS or 50% of Final Wages (*no actuarial reduction*) Members with less than 20 YOS: Greater of 50% of Final Wages, or 2.75% x YOS x Final Wages x actuarial reduction factors
Fort Worth	✓	-	May choose one beneficiary to receive reduced monthly pension upon member's death in amount of 100%, 75%, 50%, or 25% of reduced pension (*actuarial reduction*)
Houston*	-	✓	Only spouse: 100% benefit Only dependent children: 100% benefit split equally Spouse + child/ren: spouse receives 50% of benefit and children receive 50% benefit Other beneficiary: 100% Benefit (*no actuarial reduction*)
San Antonio**	-	✓	Retirement benefit of member at death, up to maximum of 80% of Average Salary *(no actuarial reduction)*

* If surviving spouse is married for less than 5 years at time death, surviving spouse receives 20% of benefit for each year of marriage
** Surviving spouse married for less than 5 years after retirement receives $15,000 lump sum; if no beneficiaries listed, estate receives lump sum based on 10-Year certain benefit

Fire: Service Credit Purchase (Current Tier)

	Military Service (Prior to Employment)	Military Service (During Employment)	Reinstated Forfeited Service	Permissive Service	Non-Contributing Service	Other	Actuarial Subsidy
Austin	**No**	**No**	**No**	**No**	**No**	**No**	**Employees receive service credit for military service performed during career with the City**
Dallas	No	Yes	Yes	No	No	No	None
El Paso	No	Yes	Yes	Yes	Yes	No	None
Fort Worth	Yes	Yes	Yes	Yes	Yes	[1]	None
Houston	No	Yes	Yes (must return within 5 years)	No	No	No	
San Antonio	No	Yes	No	No	No	No	None

[1] A member who wants to increase the amount of credited benefit service at the time of termination may purchase additional credited service (does not apply to eligibility)

Fire: Sick Leave Conversion (Current Tier)

	Sick Leave Conversion to Service Credit
Austin	**No**
Dallas	No
El Paso	Yes
Fort Worth	Only major medical leave earned prior to 7/20/2019 may be converted to service credit
Houston	No
San Antonio	Yes accumulated sick leave over 90 days can be applied as service credit

Recent Texas Pension Reforms

Reforms

- **Dallas**
  - General
    - New 2017 tier reduces multiplier (2.75% to 2.5%), increases normal retirement (from age 60 to age 65 with 5 years of service) and service retirement requirements (from 30 years to 40 years); Rule of 78 increased to Rule of 80 reduced before age 65
    - Final average pay increased from 36 months to 60 months, maximum COLA reduced from 5% to 3%, joint and half benefit now reduced;
  - Police and Fire
    - Normal retirement age increased from 55 to 58
    - Benefit multiplier reduced for 20 & Out, restructured for normal retirement
    - Maximum benefit reduced (96% to 90%) and AFC period extended for future service (36 months to 60 months)
    - COLA made contingent on 70% funding and other financial benchmarks
    - Supplemental benefit frozen, eliminated prospectively
    - DROP restructured to reduce interest
    - Employee contributions increased from 8.5% to 13.5%
    - City contributions increased from 27.5% to 34.5% + $13 million annually through 2024 with various floors and actuarial requirements

Reforms

- **El Paso (Police and Fire):**
  - Employee contributions increasing over five years from 13.89% (FY2018) to 18% (FY2023)
  - Back DROP replaced by a Forward DROP
  - Second tier retirement eligibility provisions improved for employees to match base plan (from age 50 and 25 years of service to 45 and 20)
- **Fort Worth 2017-8:**
  - Employee contributions increased
    - General: 8.25% to 9.35%, plus an additional 0.70% surcharge for a period of years equal to the number of service years an employee earned in the legacy benefit tier
    - Police: 8.73% to 10.53% (2019) to 12.53% (2020) to 13.13% (2021)
    - Fire: 8.25% to 10.05% (2019) to 12.05% (2020)
  - City contributions increased 4.5% (from 19.74% to 24.24% General & Fire; 20.46 to 24.96 for Police)
  - Risk-sharing features implemented to align contributions with the actuarially determined contribution (ADC) to amortize unfunded liability by 2048. If the contribution rates are less than the ADC for two consecutive valuations, contributions are increased in a 60/40 proportion with annual caps. If the contributions are still insufficient, City Council must consider further benefit modifications.
  - COLA eliminated for future service; converted to variable structure based on Fund performance for active eligible; retained for those already retired or in DROP
  - Future earned unused sick and major medical leave can no longer be converted to service credit

  Note: Fort Worth's most recent adjustments as outlined above build on a series of prior funding increases (since 2007) and benefit changes (since 2011). Beginning in 2012, a number of these benefit reductions have applied to future accrued service for incumbent employees, not only to benefits for future hires

Reforms

- **Houston**
  - Civilian
    - Employee contributions increased by 3.0% to 4.0%, depending on tier
    - City contributions increased up to the cost corridor amount (FY2018 contributions approx. 6.5% to 8% higher than FY2014, depending on the plan)
    - COLA restructured to tie to 5-year investment performance, capped at 2.0%
    - Survivorship benefit reduced from 100% to 80%; DROP interest reduced
  - Police
    - Eligibility changed from Age 55 with 10 years to Rule of 70
    - Employee contributions increased to 10.5% (previously 9.0% or 10.25%, depending on tier)
    - DROP restructured; COLA restructured with lower cap tied to performance; three-year COLA freeze for members under age 70
  - Fire
    - Retirement eligibility changed from 20 and Out to Rule of 70 for new members
    - Overtime excluded from final average compensation
    - Multiplier restructured, and reduced for new members (from 2.5% for 20 years + 3.0% for next 10 years to 2.25% for 20 years, 2.0% thereafter)
    - Employee contributions increased from 9.0% to 10.5%
    - DROP restructured, eliminated for new members

Reforms

- **Houston Cost Corridor**
  - State law SB2190 also established a permissible range of employer contribution rates or “cost corridor” for all three City of Houston pension plans
  - The corridor is defined as:
    - The target (midpoint) municipal contribution rate +/- 5%
    - Target municipal contribution rate = The UAL amortization of the 6/30/16 liability on a closed 30-year basis, based on a (reduced) 7% investment return + Expected normal cost + Expected administrative expenses
    - Any changes in normal cost in future valuations will change the estimated municipal contribution rate
    - Future actuarial gains and losses or asset/liability “layers” will be amortized over closed 30-year periods and will change the estimated municipal contribution rate
  - If the estimated contribution rate exceeds the corridor rate:
    - The City and pension board are directed to agree to increase member contributions and *“make other benefit or plan changes not otherwise prohibited by applicable federal law or regulations”*
    - If written agreement is not reached 60 days before the start of the fiscal year, the board shall increase member contributions, reduce COLAs, increase the normal retirement age, or a combination of the above
  - If the estimated contribution rate is lower than the corridor minimum, then actuarial and funding conditions will be modified to further de-risk the plans, but also previous benefit reductions may be restored and eventually enhanced

Note: Houston also agreed to issue $1 billion of pension obligation bonds to improve the funded condition of pension plans and remedy past underfunding to gain employee support for benefit modifications ($750 million Police; $250 million Municipal). The state law enacting pension plan changes and the cost corridor required that the POBs be approved by the voters. Following a successful ballot measure, Houston issued the POBs on December 20, 2017. While the rating agencies generally view POBs as credit neutral at best, Moody’s described the Houston issuance as “credit positive because it allows the retirement benefit reforms the State authorized in May to take effect” (Moody’s, November 16, 2017). Previously, the City of Dallas also issued $535 million in POBs after a public ballot in 2004, with just under half of principal currently outstanding

Benchmarking: OPEB

Retiree Health Benefits

Austin	City provides a maximum subsidy of 80% of premium for single coverage, 50% for dependent coverage, and 70% (75% if pre-Medicare) for surviving spouses. Maximum subsidy requires 20 years of service at retirement, and is reduced with fewer years of service.
Corpus Christi	Retirees contribute 100% of the blended cost of healthcare coverage (implicit subsidy)
Dallas	Post-1/1/2010 hires contribute 100% of the blended cost of healthcare coverage (implicit subsidy); for earlier hires, the City subsidy for retirees is approximately 50% pre-Medicare (dependents are not subsidized)
El Paso	Retirees contribute 45% of the cost of retiree healthcare coverage, with the same coverage as provided to active City employees. Established by ordinance and may be amended.
Fort Worth	Post-1/1/2009 hires contribute 100% of the blended cost of healthcare coverage (implicit subsidy); for earlier hires, retirees with 25 or more years of service or those hired before 10/1988 receive one plan option with no retiree premium contribution (may buy up for other plans); for hires between 1988 and 2009 with <25 years, City determines the subsidy (which is lower). Generally, the City pays only 30-50% of the cost for dependents.
Houston	Retiree contributions vary by coverage level, plan selection, and smoker status. For non-smokers, pre-Medicare retirees contribute between 43% and 76% of cost for single coverage, and higher percentages with dependents. Medicare cost-sharing levels are similar, also varying by plan, coverage level, and smoker status.
San Antonio	Police and firefighters receive full retiree and spousal coverage through the Fire and Police Retiree Health Care Fund. For civilians, subsidized benefits are covered only once Medicare-eligible, with the City targeting 2/3 of the cost for retirees hired prior to 2007 and ½ of the cost for subsequent hires with 10 or more years of service.

Source: City CAFRs, benefit books

Retiree Health Benefits: Funding

Austin	No prefunding or trust. All pay-as-you-go
Corpus Christi	No prefunding or trust. Implicit subsidy only
Dallas	No prefunding or trust. All pay-as-you-go
El Paso	No prefunding or trust. All pay-as-you-go
Fort Worth	Has an OPEB trust. Assets as of FY2018 cover 7.23% of the liability (inclusive of a small, death benefit), and recent contributions are not significantly above pay-go levels
Houston	No prefunding or trust. All pay-as-you-go
San Antonio	Prefunded for public safety through the Fire and Police Retiree Health Fund. City contributes 2/3 of a funding amount based on actuarial analysis; actives and retirees contribute 1/3 for 30 years (e.g., if an employee retirees after 25 years, they contribute as an active and then for five more years after retirement). Civilian subsidies are funded on a pay-as-you-go basis

Source: City CAFRs

Overview of Alternative Plan Design Approaches

Defined Contribution Plan

- Under a defined contribution plan, the employer, employee or both make contributions to a tax-advantaged retirement plan on a regular basis, and benefits are based on the amounts credited to the accounts plus any investment earnings. In contrast to a defined benefit plan, under a defined contribution plan the formula for computing an employer and employee contribution is known in advance, but the benefit to be paid is not known in advance.
- **Positive** factors for a defined contribution plan:
  - Will eliminate all investment risk for the employer. A pure defined contribution plan, by definition, eliminates the accrual of unfunded liabilities for new hires
  - Stabilizes cost for new hires as a fixed percentage of salary with the potential for slight variations based on how the employer matching contributions are structured
  - Portability feature may be attractive to some younger employees and/or for particular employee groups that may have shorter average tenures

Examples of a defined contribution plan include:

- Private sector 401(k) plans
- City of Jacksonville Defined Contribution plan
  - General employees: mandatory contribution 10% EE/12% ER; Public safety employees: mandatory contribution 10% EE/25% ER
- Florida Retirement System Investment Plan option (choice of DB/DC plans for state and local employees, 21-30% of employees selecting the DC option since FY05)
  - General employees: 3% EE/6.2% ER; Public safety employees: 3% EE/11% ER; Can purchase a 3% COLA option

Defined Contribution Plan

- **Negative** factors for a defined contribution plan:
  - While the portability of a defined contribution plan may be attractive for some employees during recruitment, this same characteristic may also weaken the incentive for retention relative to a traditional defined benefit plan
  - Candidates may find the stability and benefits of government employment appealing and some are willing to trade off the potential for wage growth for these benefits. If a defined contribution plan were not mandated for state and local employees, a defined contribution plan could be a recruiting disadvantage
  - Investment decisions may have an impact on the predictability of the benefit available for employees in retirement
  - Members with little experience in the market will be faced with challenging task of directing their own investments. However, use of balanced default-investment options, target-date funds, and index funds have resulted in increasingly comparable performance between defined benefit and defined contribution plans
  - The need to commit more resources to educational programs to ensure an appropriate level of member understanding
  - The recent implementation of a defined contribution plan for police and fire employees in the City of Jacksonville for new hires as of October 1, 2017 is a rare occurrence of a defined contribution plan for public safety
    - A DC plan should be structured to provide a sufficient benefit over the shorter career period for public safety employees
    - Potentially, may require obtain supplemental insurance or self-insuring public safety employees for death, disability and survivor benefits. Jacksonville, for example, is funding and administering a separate Disability Program
  - A common criticism of transitions to DC plans is that short-term actuarial contributions would increase, because the plan would be closed (impact would vary based on amortization approach)
  - Employee contributions to the closed DB plan would decline over time, but this impact would be relatively modest initially if the new plan were provided for new hires only

Hybrid Retirement Plan

- A hybrid plan approach combines elements of a reduced defined benefit pension with an individually directed defined contribution account. With a hybrid plan, an employer is able to combine the favorable elements of each plan design, manage acceptable levels of cost uncertainty, and rebalance the distribution of investment risk
- **Positive** factors for a hybrid plan:
  - The defined benefit component gives the employer the ability to invest a portion of total funds over a longer horizon (greater than any one individual can invest in a defined contribution account), taking advantage of more investment options, increased buying power, and potential for greater returns, while continuing to provide a base level of income in retirement that is guaranteed and less susceptible to market conditions
    - The assets of the hybrid DB plan could be commingled with existing assets, allowing current actuarial assumptions for *investment return* and *unfunded liability amortization* to be maintained, which would prevent cost increases
  - The defined contribution component includes the employee in sharing the investment risk, while providing the option to control portfolio assets according to one's own risk levels
  - The defined contribution component provides additional flexibility in pre-retirement savings levels and meeting post-retirement expenses
  - With less reliance on the defined benefit component, the magnitude of the potential for growth in unfunded liabilities would be substantially curtailed
  - The DB component may be a key contributor to favorable recruitment and retention of some employees. At the same time, the portability feature of the DC component may be seen as a positive factor for some other employees (again, varying by employee)

Hybrid Retirement Plan

Examples of hybrid retirement benefit plans include:

- **Federal Employees Retirement System**
  - DB portion: 1.0% multiplier (1.1% applied to all if > age 62 w 20 YOS)
  - DC portion: Minimum 1% ER contribution; no EE minimum or maximum, EE match 1:1 up to 3%, 50% of next 2%
- **City of Philadelphia Stacked Hybrid Plan 16 (certain general employees)**
  - DB portion 2.2% multiplier <10 years, 2.0% for service > 10 years, applied up to $50,000 annual salary
  - DC portion: Voluntary EE contribution on salary > $50,000, with 50% ER match up to 1.5%
- **Pennsylvania State Employees Retirement System (SERS) Hybrid Plans**
  - DB portion: Ranges from 1.0% to 1.25% multiplier, based on hybrid plan
  - DC portion: Ranges from a minimum 3.25% to 3.5% EE and 2.0% to 2.25% ER contributions based on hire date
- **Virginia Retirement System Hybrid Plan**
  - DB portion: 1.0% multiplier
  - DC portion: Minimum 1% EE/ER contributions, voluntary 4% EE contributions with ER match of 1% plus 50% from 1-4% (maximum 3.5%)

Hybrid Retirement Plan

- **Negative** factors for a hybrid plan:
  - The employer retains some portion of the investment and other funding cost risk from adverse actuarial experience (less than present in a pure defined benefit plan, but more than in a defined contribution plan)
  - Even with a reduced defined benefit component, the potential exists for unfunded liabilities relative to a pure defined contribution plan
  - An additional layer of complexity for members in understanding a hybrid benefit structure and in making prudent investment decisions, therefore, ongoing educational programs to help ensure the quality of investment decisions by members
  - Additional costs and complexity for the retirement system in administering a new DC component of the plan
  - Although hybrid plans for local public safety employees have been implemented in Indiana, Tennessee, and elsewhere, Pennsylvania, Virginia and other systems have tended to implement hybrid plans for general employees only

Cash Balance Plan

A cash balance plan provides that employer and employee contributions are pooled with the assets of other employees and retirees. The employees' accounts are typically credited with a fixed rate of return significantly lower than the typical investment return assumption for public defined benefit plans (e.g. 4-5%). The investment risk remains primarily with the employer, although the risk is reduced due to the reduction in the assumed rate of return

In contrast to a defined contribution plan where the benefit is based solely on the amount contributed to the account along with any income gains net of any expenses and losses, a cash balance plan still requires that an employee be credited with the guaranteed interest rate regardless of investment performance of the common assets of the fund over the employee's career, as in a traditional defined benefit plan

- **Positive** factors for a cash balance pension plan:
  - Provides a comparably sufficient benefit level to employees and reduced investment, longevity and under-funding risk than the defined benefit plans
  - The assets can be commingled, maintaining more favorable cash flow to the legacy system than a defined contribution plan, and allowing current actuarial assumptions for *investment return* and *unfunded liability amortization* to be maintained, which would prevent cost increases
  - Somewhat greater acceptance and use for public safety employees than hybrid and particularly defined contribution plans

Cash Balance Plan

- **Negative** factors for a cash balance plan:
  - Employer retains some investment and actuarial risk
  - Plans are still subject to investment, under-funding, economic and demographic risks, due to the guaranteed return as well as the potential for employees to receive the majority of sustained upside returns under some variations of cash balance plan design
    - Although risks are reduced compared to a traditional defined benefit plan, the perception that the risks have been eliminated in itself raises the possibility that unfunded liabilities can emerge over the long-term

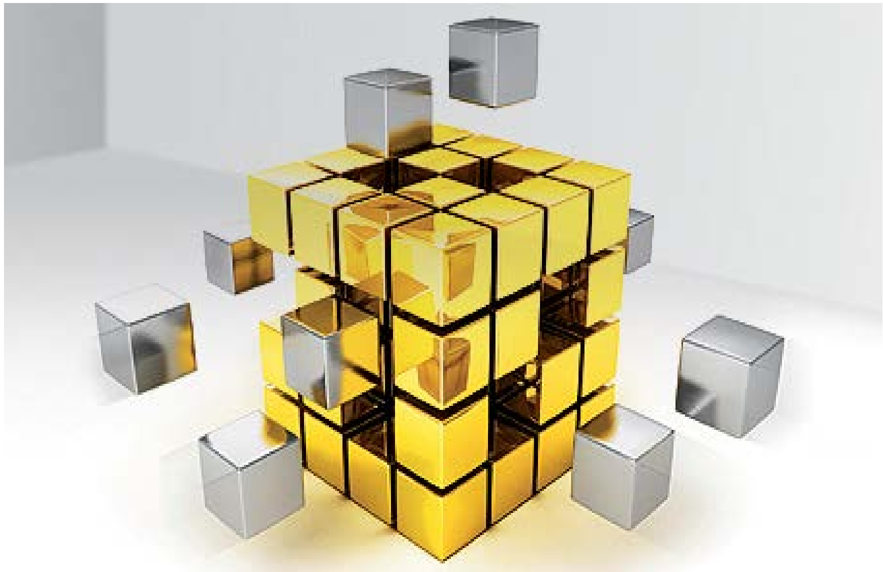
Examples of a cash balance plan include:

- **Texas Municipal Retirement System**
  - Employers choose plans with EE contribution rates from among 5-7%
  - Employee contributions are credited annually with interest. The minimum interest credit rate is 5% (rate has not exceeded 5% since it was 5.75% in 2006)
  - At retirement the employee account balance is matched with employer contributions of 1.0 – 2.0x to fund an annuity, depending on the employer plan. The employer contributions are actuarially funded.
  - Employers select COLA plan option from among none, 30%, 50%, or 70% of CPI
- **Kentucky Retirement System**
  - 5% EE/ 4% ER contribution to member's account
  - Account credited with 4% return, plus 75% of excess returns above 4% for each smoothed five-year period

Pension Obligation Bonds

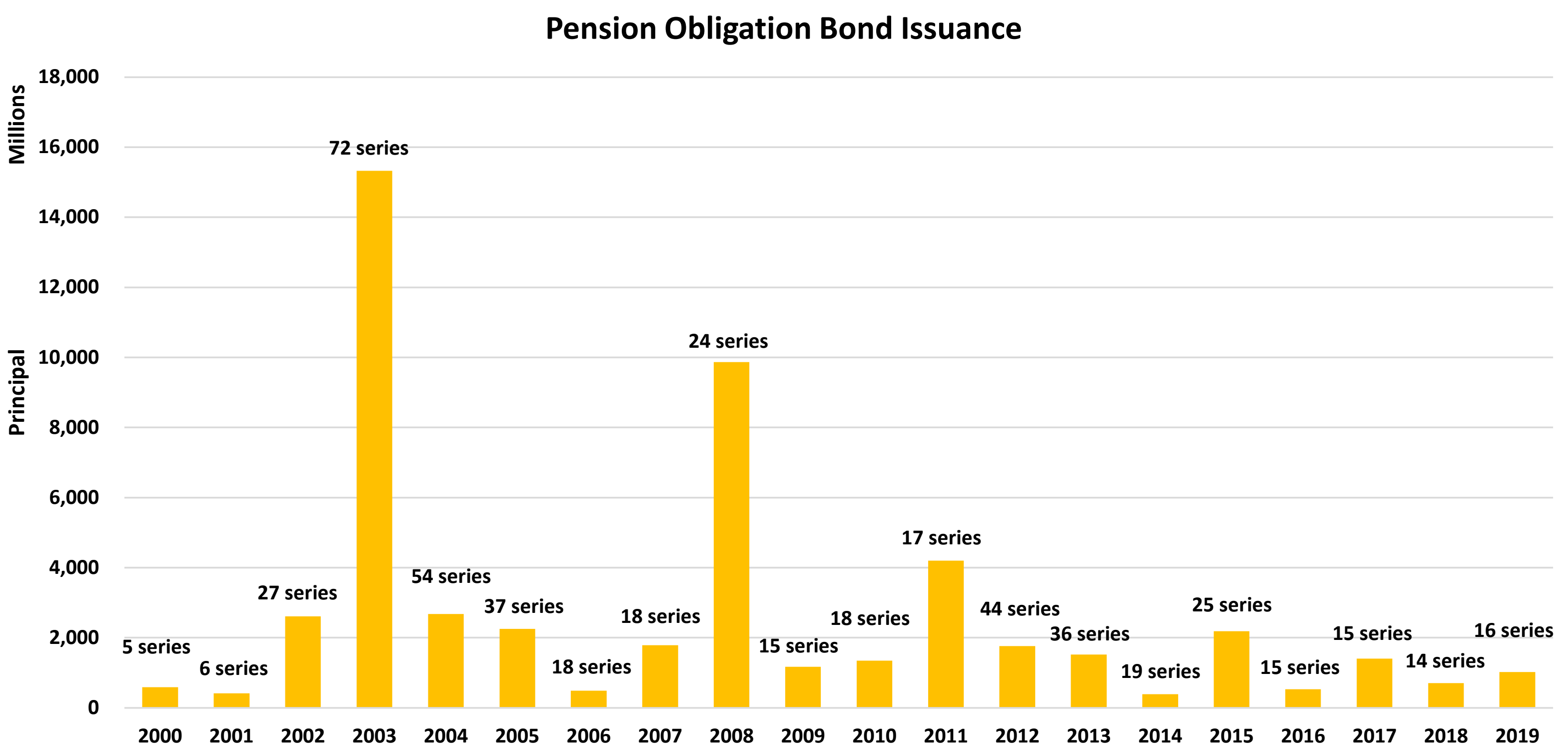
POB Considerations

- There are numerous factors that must be evaluated when considering a POB that directly impacts the funding strategy
  - Conversion of a soft liability to a hard liability
  - Issuance timing
  - Issuer debt load and capacity
  - Ratings impact
  - Covenant risk mitigation strategies while debt is outstanding (to the extent legally enforceable)
    - Create separate trust structure within retirement system to facilitate a POB investment strategy that is different than system-wide asset allocation
    - Limit ability to provide benefit enhancements while POB debt is outstanding
    - Consider a rate stabilization fund from POB excess returns once funded ratio exceeds 90%



History of Pension Obligation Bond Issuance Since 2000

- Over the last 20 years, there have been a total of 495 series of pension obligation bonds issued by state and local government entities
- The total principal associated with these series is over $52 billion



History of Pension Obligation Bond Issuance Since 2016

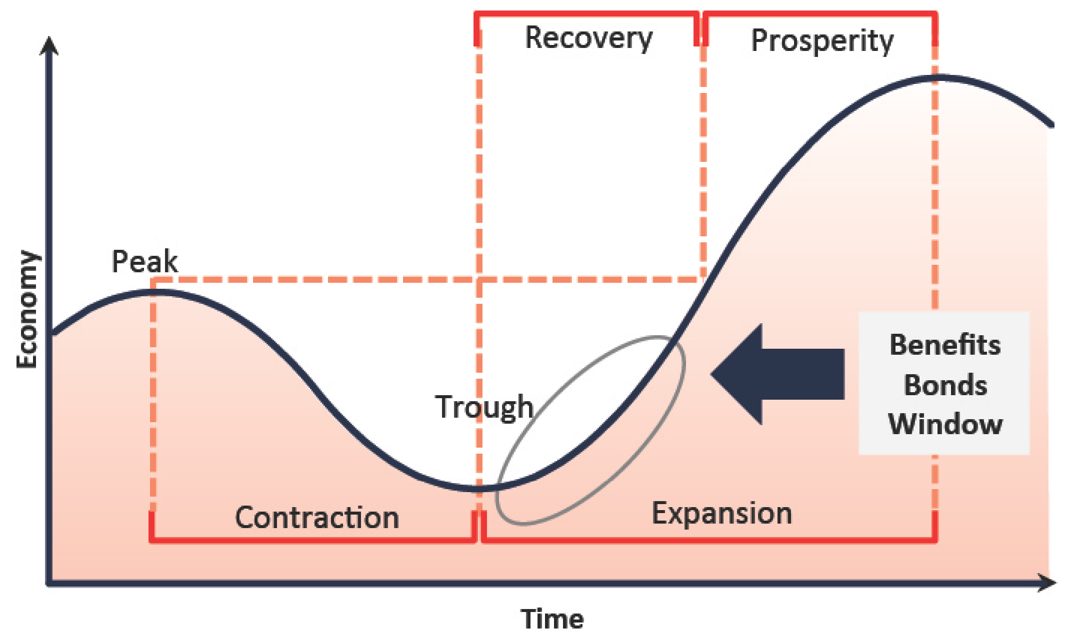
- 60 pension obligation bond series were issued by 54 unique issuers since 2016
- These series totaled over $3.6 billion in principal

List of Pension Obligation Bond Issuance 2016 - 2017			
Sale Date	Issuer	State	Par Amount
01/07/2016	Orange County (CA)	CA	134,275,000
01/07/2016	Orange County (CA)	CA	200,000,000
01/12/2016	Village of Lynbrook	NY	1,250,000
01/13/2016	Michigan City Area Schools (IN)	IN	6,990,000
03/16/2016	County of Crawford (MI)	MI	7,155,000
03/23/2016	County of Tuscola	MI	6,980,000
05/12/2016	City of Riverside (CA)	CA	31,145,000
06/08/2016	City of West Palm Beach	FL	50,400,000
07/19/2016	City of Portland (OR)	OR	28,770,000
09/07/2016	City of Grand Blanc	MI	5,760,000
09/14/2016	City of Madison Heights	MI	15,250,000
10/20/2016	Munster School Town (IN)	IN	5,055,000
11/08/2016	Dormitory Authority of the State of New York (NY)	NY	29,425,000
11/30/2016	Bartholomew Consolidated School Corporation	IN	1,620,000
12/09/2016	The County of Lawrence	PA	9,735,000
02/07/2017	County of Gratiot	MI	6,730,000
03/16/2017	County of Tuscola	MI	2,475,000
05/16/2017	Metropolitan School District of Lawrence Township (IN)	IN	7,450,000
05/24/2017	City of Riverside (CA)	CA	31,960,000
06/20/2017	Mayor and City Council of Cumberland	MD	15,055,000
07/12/2017	City of Brawley (CA)	CA	16,310,000
07/27/2017	Village of Rantoul	IL	10,810,000
09/12/2017	Lexington-Fayette Urban County Government	KY	22,445,000
10/25/2017	Dormitory Authority of the State of New York (NY)	NY	12,035,000
10/31/2017	City of Inglewood	CA	52,795,000
11/30/2017	Florence School District No. 14-1	SD	2,575,000
11/30/2017	Jackson County (MS)	MS	67,445,000
12/01/2017	City of Monrovia	CA	111,545,000
12/05/2017	Granite City	IL	40,000,000
12/20/2017	City of Houston (TX)	TX	1,005,145,000
Total	**26 Unique Issuers**	**13 States**	**1,938,585,000**

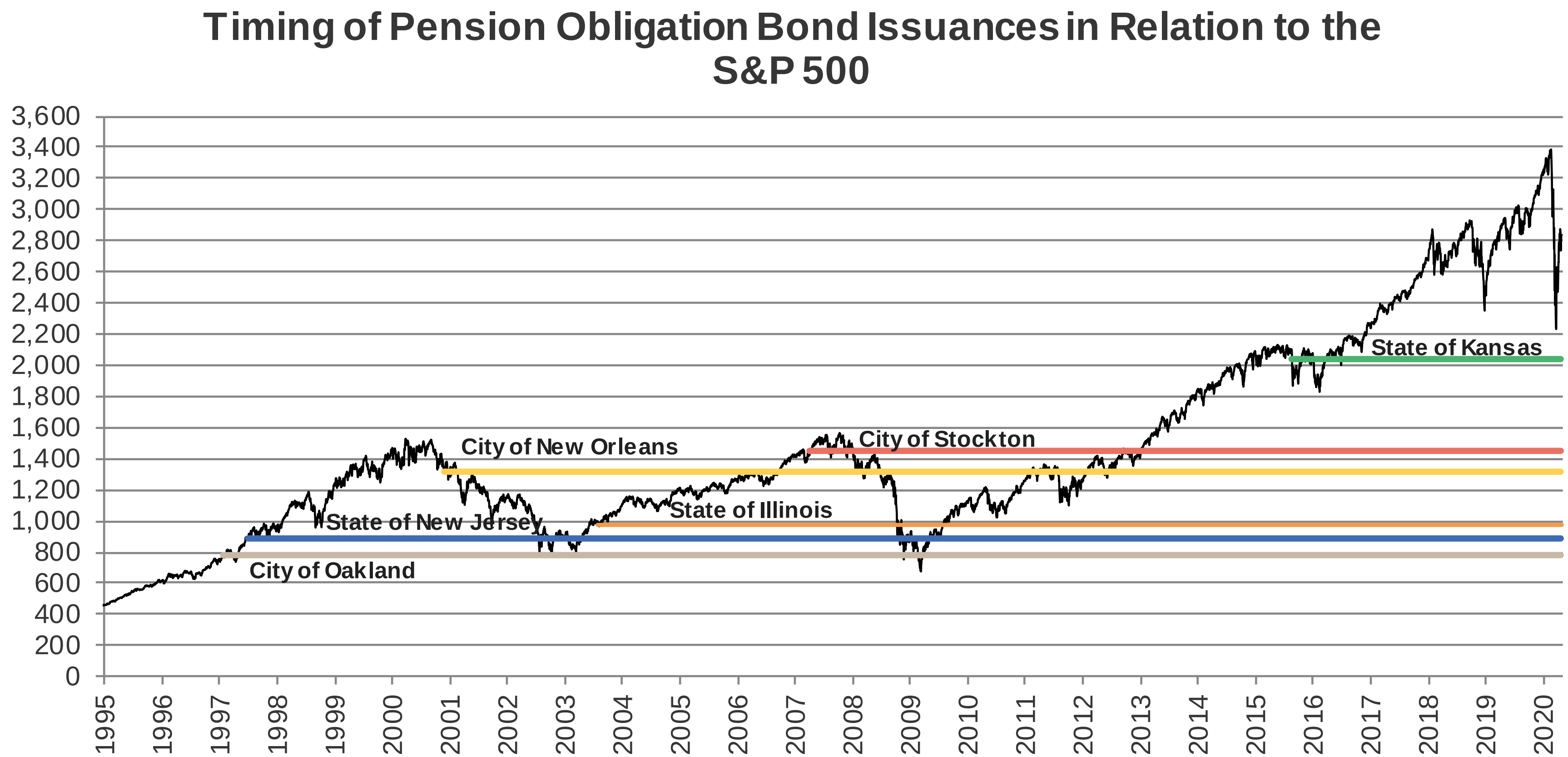
List of Pension Obligation Bond Issuance 2018 - 2019			
Sale Date	Issuer	State	Par Amount
05/30/2018	Warsaw Multi-School Building Corporation	IN	10,000,000
05/31/2018	Tulare County	CA	251,220,000
07/11/2018	City of Portland (OR)	OR	36,120,000
07/19/2018	City of Wixom	MI	21,875,000
07/26/2018	City of La Verne	CA	54,265,000
09/06/2018	City of Dearborn (MI)	MI	20,000,000
11/02/2018	County of Calhoun	MI	8,180,000
11/07/2018	Portland Community College District (OR)	OR	171,865,000
11/30/2018	Oregon Education Districts (OR)	OR	35,575,000
12/04/2018	City of Fairfield (CA)	CA	15,325,000
12/11/2018	County of Muskegon	MI	43,150,000
12/13/2018	County of Calhoun	MI	8,400,000
12/13/2018	County of Sanilac (MI)	MI	10,790,000
12/19/2018	Maryland Health and Higher Educational Facilities Authority	MD	21,000,000
02/20/2019	City of Baldwin Park (CA)	CA	54,085,000
03/06/2019	City of Chowchilla	CA	10,500,000
03/21/2019	Dormitory Authority of the State of New York (NY)	NY	26,900,000
03/26/2019	State of Illinois (IL)	IL	300,000,000
07/30/2019	City of Portland (OR)	OR	26,715,000
08/16/2019	Charter Township of Bloomfield	MI	49,995,000
08/22/2019	City of Glendora (CA)	CA	64,420,000
08/29/2019	City of Rogers City (MI)	MI	5,845,000
09/13/2019	City of Marysville (CA)	CA	15,000,000
09/24/2019	Steel Valley School District	PA	12,245,000
09/24/2019	City of Hawthorne	CA	121,865,000
10/02/2019	Public Finance Authority (WI)	WI	49,320,000
10/09/2019	City of Pacifica	CA	9,685,000
11/21/2019	Monterey County Regional Fire District (CA)	CA	20,250,000
11/25/2019	Shelby County Health, Educational and Housing Facility Board	TN	219,250,000
12/04/2019	Orange Unified School District (CA)	CA	33,595,000
Total	**28 Unique Issuers**	**10 States**	**1,727,435,000**

What is the Pension Obligation Bond Window?

- The period of time an issuer of benefits bonds can most reasonably expect to invest bond proceeds in the stock market without witnessing lower stock prices in the subsequent economic recession
  - Measured from the bottom of the stock market (which typically corresponds to the trough of an economic business cycle) until the stock market 'breakeven' level with the subsequent stock market bottom
  - Theoretically, the period in which the risk of subsequent cycle loss is < 50%
  - Quantifiable only in hindsight
  - No one can ever predict in real-time when there is a bottom

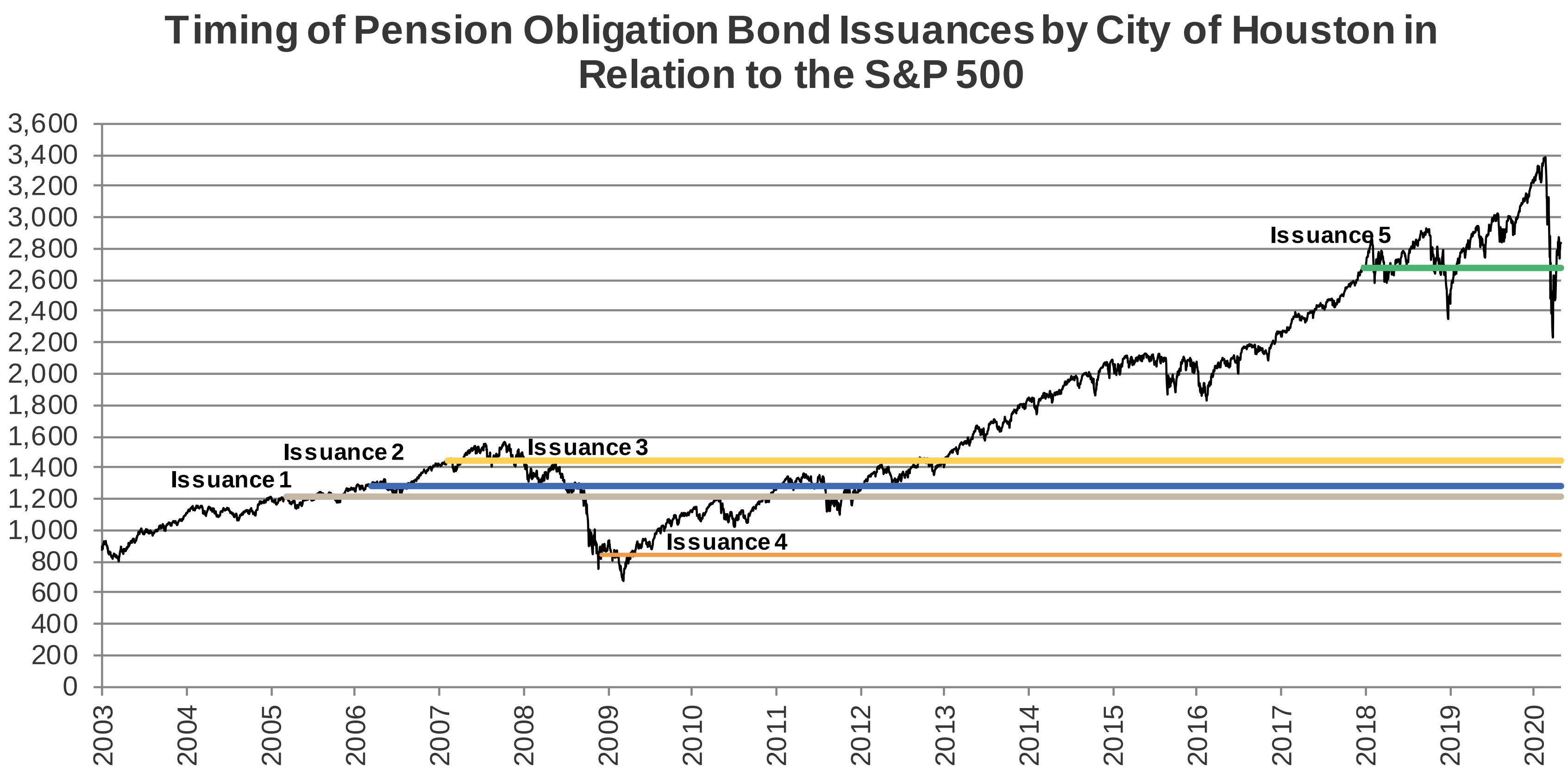


Evaluating POB Strategy Timing



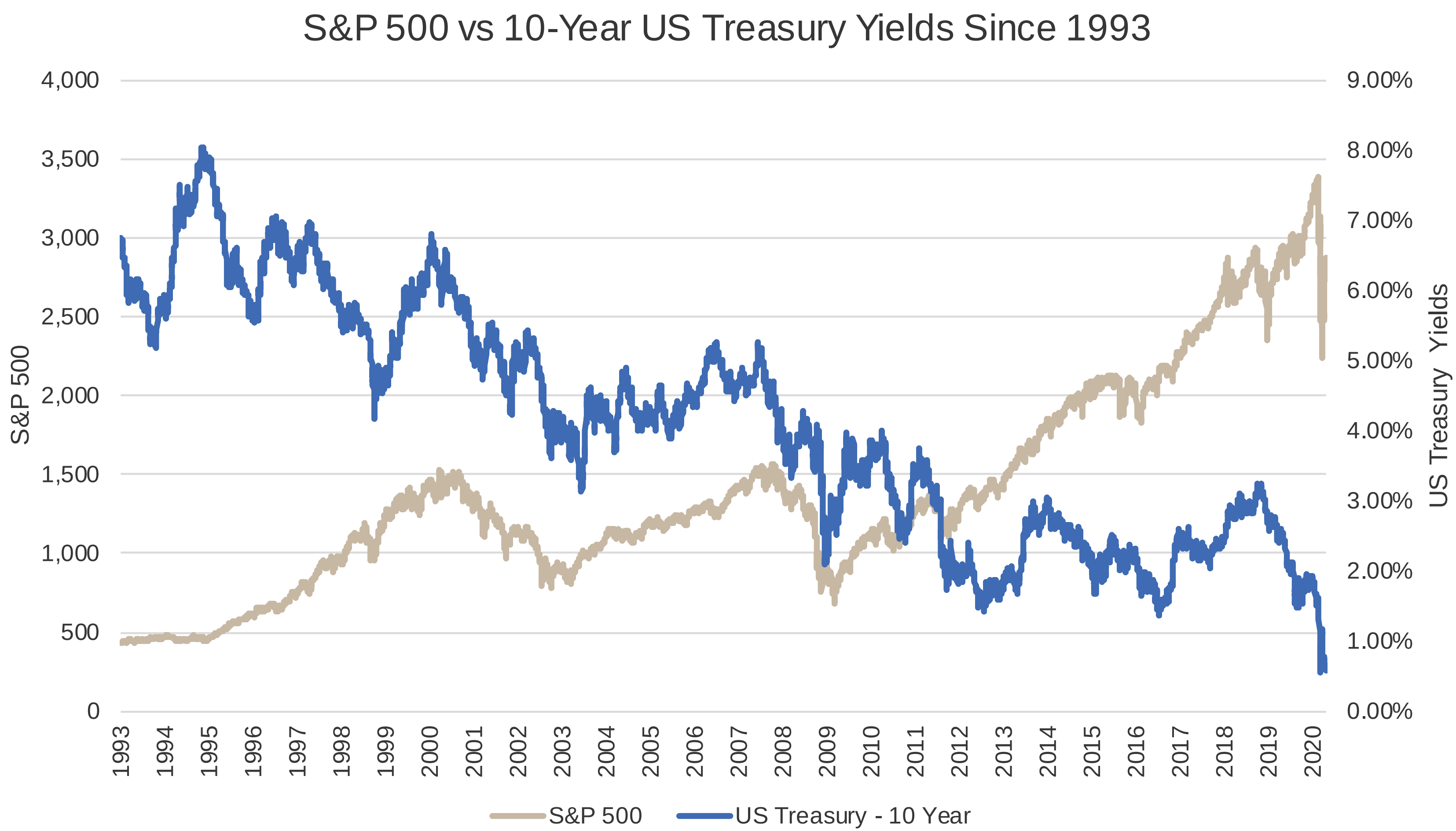
Data source: Ibbotson Associates, Inc.

Evaluating POB Strategy Timing (Continued)



Data source: Ibbotson Associates, Inc.

Market Conditions Comparison



Data source: Bloomberg

Investment of POB Proceeds

- Proceeds of a POB issuance should be invested differently than the balance of the retirement system assets
  - Typical pension plan investment strategies have asset allocation targets that include equities, fixed income, and other asset classes
  - Plan sponsors should not issue bonds to buy bonds
  - POB proceeds should primarily be invested in equity asset classes

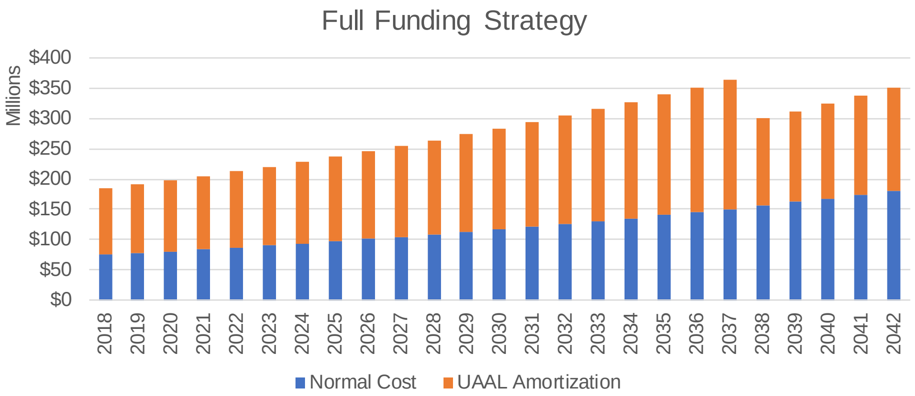
  - Over a 20-year history, equity asset classes have regularly out-performed fixed income classes, on a relative basis

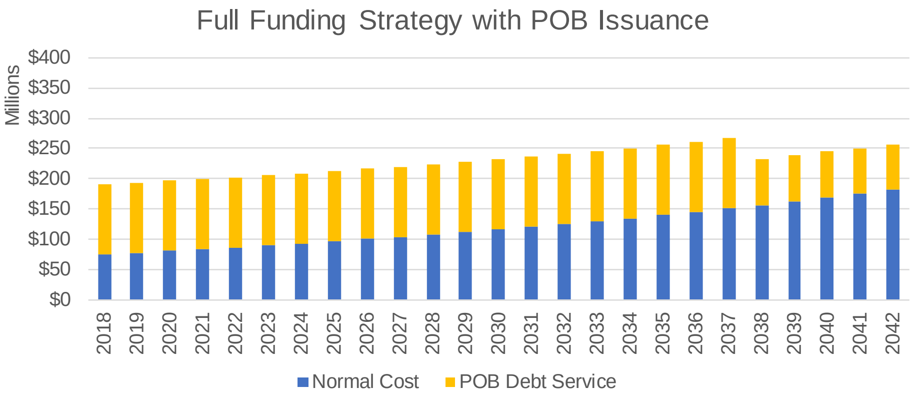
Asset Class Annual Returns (1999-2019)

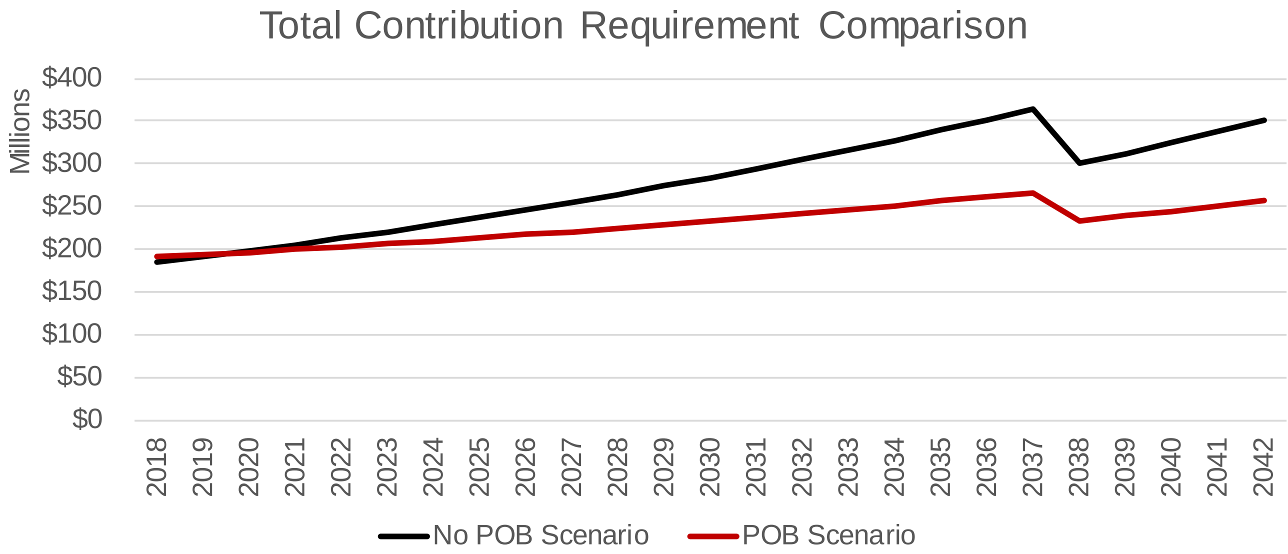
2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Real Estate 13.84%	U.S. Fixed Income 8.43%	Glbl ex-U.S. Fixed 22.37%	Emerging Market Equity 55.82%	Real Estate 37.96%	Emerging Market Equity 34.00%	Real Estate 42.12%	Emerging Market Equity 39.38%	U.S. Fixed Income 5.24%	Emerging Market Equity 78.51%	Small Cap Equity 26.85%	U.S. Fixed Income 7.84%	Real Estate 27.73%	Small Cap Equity 38.82%	Real Estate 15.02%	Large Cap Equity 1.38%	Small Cap Equity 21.31%	Emerging Market Equity 37.28%	Cash Equivalent 1.87%	Large Cap Equity 31.49%
U.S. Fixed Income 11.63%	High Yield 5.28%	U.S. Fixed Income 10.26%	Small Cap Equity 47.25%	Emerging Market Equity 25.55%	Real Estate 15.35%	Emerging Market Equity 32.17%	Dev ex-U.S. Equity 12.44%	Glbl ex-U.S. Fixed 4.39%	High Yield 58.21%	Real Estate 19.63%	High Yield 4.98%	Emerging Market Equity 18.23%	Large Cap Equity 32.39%	Large Cap Equity 13.69%	U.S. Fixed Income 0.55%	High Yield 17.13%	Dev ex-U.S. Equity 24.21%	U.S. Fixed Income 0.01%	Small Cap Equity 25.52%
Cash Equivalent 6.18%	Cash Equivalent 4.42%	Real Estate 2.82%	Real Estate 40.69%	Dev ex-U.S. Equity 20.38%	Dev ex-U.S. Equity 14.47%	Dev ex-U.S. Equity 25.71%	Glbl ex-U.S. Fixed 11.03%	Cash Equivalent 2.06%	Real Estate 37.13%	Emerging Market Equity 18.88%	Glbl ex-U.S. Fixed 4.36%	Dev ex-U.S. Equity 16.41%	Dev ex-U.S. Equity 21.02%	U.S. Fixed Income 5.97%	Cash Equivalent 0.05%	Large Cap Equity 11.96%	Large Cap Equity 21.83%	High Yield -2.08%	Dev ex-U.S. Equity 22.49%
Small Cap Equity -3.02%	Small Cap Equity 2.49%	Cash Equivalent 1.78%	Dev ex-U.S. Equity 39.42%	Small Cap Equity 18.33%	Large Cap Equity 4.91%	Small Cap Equity 18.37%	U.S. Fixed Income 6.97%	High Yield -26.16%	Dev ex-U.S. Equity 33.67%	High Yield 15.12%	Large Cap Equity 2.11%	Small Cap Equity 16.35%	High Yield 7.44%	Small Cap Equity 4.89%	Real Estate -0.79%	Emerging Market Equity 11.19%	Small Cap Equity 14.65%	Glbl ex-U.S. Fixed -2.15%	Real Estate 21.91%
Glbl ex-U.S. Fixed -3.91%	Emerging Market Equity -2.61%	High Yield -1.37%	High Yield 28.97%	Glbl ex-U.S. Fixed 12.54%	Small Cap Equity 4.55%	Large Cap Equity 15.79%	Large Cap Equity 5.49%	Small Cap Equity -33.79%	Small Cap Equity 27.17%	Large Cap Equity 15.06%	Cash Equivalent 0.10%	Large Cap Equity 16.00%	Real Estate 3.67%	High Yield 2.45%	Dev ex-U.S. Equity -3.04%	Real Estate 4.06%	Glbl ex-U.S. Fixed 10.51%	Large Cap Equity -4.38%	Emerging Market Equity 18.44%
High Yield -5.86%	Glbl ex-U.S. Fixed -3.75%	Emerging Market Equity -6.16%	Large Cap Equity 28.68%	High Yield 11.13%	Cash Equivalent 3.07%	High Yield 11.85%	Cash Equivalent 5.00%	Large Cap Equity -37.00%	Large Cap Equity 26.47%	Dev ex-U.S. Equity 8.95%	Small Cap Equity -4.18%	High Yield 15.81%	Cash Equivalent 0.07%	Cash Equivalent 0.03%	Small Cap Equity -4.41%	Dev ex-U.S. Equity 2.75%	Real Estate 10.36%	Real Estate -5.63%	High Yield 14.32%
Large Cap Equity -9.11%	Real Estate -3.81%	Dev ex-U.S. Equity -15.80%	Glbl ex-U.S. Fixed 19.36%	Large Cap Equity 10.88%	High Yield 2.74%	Glbl ex-U.S. Fixed 8.16%	High Yield 1.87%	Dev ex-U.S. Equity -43.56%	Glbl ex-U.S. Fixed 7.53%	U.S. Fixed Income 6.54%	Real Estate -6.46%	U.S. Fixed Income 4.21%	U.S. Fixed Income -2.02%	Emerging Market Equity -2.19%	High Yield -4.47%	U.S. Fixed Income 2.65%	High Yield 7.50%	Small Cap Equity -11.01%	U.S. Fixed Income 8.72%
Dev ex-U.S. Equity -13.37%	Large Cap Equity -11.89%	Small Cap Equity -20.48%	U.S. Fixed Income 4.10%	U.S. Fixed Income 4.34%	U.S. Fixed Income 2.43%	Cash Equivalent 4.85%	Small Cap Equity -1.57%	Real Estate -48.21%	U.S. Fixed Income 5.93%	Glbl ex-U.S. Fixed 4.95%	Dev ex-U.S. Equity -12.21%	Glbl ex-U.S. Fixed 4.09%	Emerging Market Equity -2.60%	Glbl ex-U.S. Fixed -3.09%	Glbl ex-U.S. Fixed -6.02%	Glbl ex-U.S. Fixed 1.49%	U.S. Fixed Income 3.54%	Dev ex-U.S. Equity -14.09%	Glbl ex-U.S. Fixed 5.09%
	Dev ex-U.S. Equity -21.40%	Large Cap Equity -22.10%	Cash Equivalent 1.15%	Cash Equivalent 1.33%	Glbl ex-U.S. Fixed -8.65%	U.S. Fixed Income 4.33%	Real Estate -7.39%	Emerging Market Equity -53.33%	Cash Equivalent 0.21%	Cash Equivalent 0.13%	Emerging Market Equity -18.42%	Cash Equivalent 0.11%	Glbl ex-U.S. Fixed -3.08%	Dev ex-U.S. Equity -4.32%	Emerging Market Equity -14.92%	Cash Equivalent 0.33%	Cash Equivalent 0.86%	Emerging Market Equity -14.57%	Cash Equivalent 2.28%

Source: Callan Associates

Pension Obligation Bond Funding Illustrative Scenario Comparison







Disclosures

The returns presented in this simulation are not actual returns experienced by a real investor, but rather simulated returns that we believe could have been achieved under controlled circumstances using a number of assumptions. No representation or warranty is made to the reasonableness of the assumptions made or that all assumptions used in achieving the returns have been stated or fully considered.

No assurance can be given as to whether the information and/or assumptions upon which this hypothetical performance is based reflect present market conditions or future market performance. Actual performance results may differ from this hypothetical performance presented. Changes in the assumptions may have a material impact on the hypothetical performance presented. Past performance is no guarantee of future results.

The material is provided to you on the understanding that, as a sophisticated investor, you will understand and accept its inherent limitations.

Asset Monetization / Transfer

Asset Monetization and Asset Transfers as Funding Strategies

- **Asset Monetization:** Many governments own significant assets that provide a stable and long-term source of cash-flows. Governments may sell or lease these assets to match long-term cash-flows with the long-term liabilities associated with retirement systems
  - Such strategies rely on the identification of an appropriate asset, a willingness to cede control over use of the asset, and a determination that pension funding is the optimal use of the proceeds, among other considerations

- **Asset-In-Kind Transfer:** Under this newer and still uncommon approach, an existing core public infrastructure asset (such as toll facilities, regulated utilities, etc.) is transferred to one of the pension systems, such that the fair market value of the transferred asset can immediately boost the funded ratio of a plan, and possibly eliminate the unfunded liability. Reduced unfunded liabilities will create savings for the City, and the pension plan managing the asset will be strongly incentivized to guarantee the future success of the asset as it will be depending on its eventual resale value and/or the interim cash flows that will go to support benefit payments
  - Challenges with this approach may include asset valuation, an understanding of the asset monetization and exit options and potential future risks due to loss of municipal control of the asset, the additional organizational burden that will be levied on the pension plan based on assuming the responsibility of this asset, and any legal limitations the pension plan will have when it comes to making future changes to the asset in order to help it grow and meet the plan’s needs