

Texas Municipal Retirement System

2019 Experience Study Analysis September 2019

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Summary of Contribution Impact

- In general, this is a rather uneventful experience study
- The change to the USC assumptions makes up a majority of the impact
- Other recommendations are mainly offsetting

	Dec 31,Change from USCChange from All2018from USC LoadOther Sources		Net Change (2) + (3)	Net Illustrated Results New Assumptions	
	(1)	(2)	(3)	(4)	(5)
Full Contribution Rates:					
Straight Average	8.97%	0.19%	-0.06%	0.13%	9.10%
Payroll Weighted Average	13.58%	0.31%	-0.03%	0.28%	13.86%



Contribution Impact by Circumstance

By Circumstance	Portion of Membership	Payroll Weighted Average Rate Change	Average Change By Individual Turnover Lo		
			Cities with 5% Decrease	Cities with 5% Increase	
Repeating USC Provision	90%	0.31%	0.43%	0.13%	
Overfunded	3%	0.28%	0.48%	0.17%	
Other	7%	-0.21%	-0.12%	-0.24%	

- Each city has a unique turnover adjustment based on how the turnover patterns for the city compare to the total TMRS experience
 - Meaning the turnover assumption might be higher or lower than the main assumption
- The adjustment is not allowed to increase or decrease by more than 5% in a given experience study (max increase and decrease)





Purpose of the 2019 Experience Study

- Assumptions are not static; they should occasionally change to reflect
 - Developing industry best practices
 - New information and changing knowledge
 - Mortality improvement
 - Changing patterns of retirements, terminations, etc.
 - Implementation of improved technology and processes
- Our analysis will address the following questions for each assumption
 - What was TMRS' actual experience?
 - How does that compare with current assumptions?
 - Is a change warranted?

Funding Process: The Right Focus

- There is a future reality that we will have to live with; but there are limitations in our ability to predict it
- Effort should be given to narrow the range of possible outcomes by:
 - Getting right what we can get right
 - Developing <u>defensive</u>, unbiased starting points
- And then implementing strategies that will provide an appropriate and <u>sustainable path</u> to the eventual outcome(s)



Big Picture Differences from 2015

- Average amortization period was 22, now 18
 - Most cities were still in negative amortization
 - Now, more than half of cities are in positive amortization, with more achieving that each year
 - Significant actuarial community guidance on negative amortization
- Capital market expectations have leveled off for several years at historically lower levels. In 2015, the expectations had just dropped into the current range.
- The median return assumption from the NASRA survey has dropped from 7.75% to 7.25%, and shows no signs of stopping
- Property tax caps from 2019 legislative session



Investment Return Assumption

- From ASOP 27: "The investment return assumption reflects the anticipated returns on the plan's current and, if appropriate for the measurement, future assets."
- For Public Sector Plans, used as the discount rate to discount future benefit payments to determine liabilities
- In 2015, the TMRS Board of Trustees approved an annual assumption of 6.75%
 - Currently represents the return, net of all administrative and investment expenses
 - Current assumption equals 6.82% gross less 0.07% for administrative expenses = 6.75% net/net



Investment Return Assumption: National Trends



The average return assumption decreased from 7.46% to 7.25% from NASRA's Survey from 2018 to 2019.

Reasonable Assumptions, per ASOP 27

- An assumption is reasonable if
 - It is appropriate for the purpose of the measurement
 - It reflects the actuary's professional judgement
 - It takes into account historical and current economic data that is relevant as of the measurement date
 - It reflects the actuary's estimate of future experience
 - It has no significant bias (i.e., it is not significantly optimistic or pessimistic)
 - Although some allowance for adverse experience may be appropriate
- Each individual assumption must satisfy the standards
- From ASOP 4: Actuary should select assumptions such that the <u>combined effect</u> of the assumptions selected by the actuary has no significant bias (i.e., it is not significantly optimistic or pessimistic) except when provisions for adverse deviation are included



Arithmetic vs Geometric Returns

- Mean: Arithmetic Mean (expected 1 year return)
- Median: 50th percentile over time (compound)
- From internal guidance from GRS Chief Actuary:
 - "A reasonable range for the assumed rate of return is between the <u>median</u> and <u>mean</u> return
 - Although the mean is acceptable, our recommendations should encourage use of the <u>median</u>"
- Your GRS Client Service Team agrees with this position
- Actuarial community has pushed heavily towards the median
- Investment professionals usually only disclose the <u>median</u>
- If evaluating historical returns, always use the compound return, or <u>median</u>



Trend of Expectations: Current Target Portfolio



GRS Survey: Distribution of Forward-Looking Returns Expectations- Shorter Time Horizons



7-10 Year Time Horizons



12

Time Horizon

- Four of the consultants provided shorter term and longer term (20-30 year) expectations
 - The average difference between the shorter and longer term for these 4 is 0.37%
 - Adding 0.37% to the 6.29% yields 6.66%
 - Thus, we find the median expectation for an 17 year duration liability to be between 6.29% (10 year) and 6.66% (20-30 year)
 - A midpoint (17 years) would be 6.48%



GRS Preferred Approach

• From ASOP 27: "In developing a reasonable assumption for these factors and in combining the factors to develop the investment return assumption, the actuary may consider a broad range of data and other inputs, including the **judgment of investment professionals**."

- "but the selection or advice should reflect the actuary's professional judgment."

- GRS:TMRS' general approach:
 - Start with the nominal, <u>median</u> expectations being provided by the client's investment advisor and/or investment staff
 - There might be an adjustment for timeframe and/or single point in time
 - Duration of the System liabilities is approximately 17 years
 - In balancing risk, we will also take into account other influences, such as potential variability of the liability stream and the funding policy
 - We will then use our broader survey of 10-14 other investment groups to verify that the result is within a defensible range
 - All provide 5-10 year time horizons, 4 provided 20-30 year time horizons as well
- We are focusing on the range <u>between</u> the two time horizons of the medians



Range of Outcomes (Current Portfolio)



Acceptable RangePreferred with Margin

- Preferred Range
- Preferred Range based on Long Term



Range of Outcomes (Alt Portfolio 3)



Acceptable RangePreferred with Margin

- Preferred Range
- Preferred Range based on Long Term



Recommendation

- We are not recommending a change at this time
 - Especially based on the Proposed Asset Allocation 3, there is a reasonable likelihood of achieving the 6.75% over the next 20 years
 - We consider the 6.75% a defendable starting point
 - When combined with the stronger proposed funding policy (i.e. 20 year amortization), there is a sustainable response if the 6.75% is not achieved
- It is also reasonable based on the Current Target Allocation, but as shown, is barely below the Arithmetic Mean



Post-Retirement Mortality

- Last study in 2013 for data through 2011
- Nationally, for public sector retirees, life expectancies continue to improve
 - However, the rate of improvement has slowed down
- The experience of a specific group will be correlated with the mix of job classification, geographic bias, economic status, and disability provisions
- An actuary makes two considerations in recommending a mortality assumption:
 - Identify the current life expectancy (data dependent)
 - Make an assumption about the rate of improvement in life expectancy (anticipated trends)
- For current life expectancy, TMRS has enough experience to provide full credibility to an analysis based on its own experience
- Thus, we have created a custom table specifically from TMRS experience
 - 2019 Municipal Retirees of Texas Mortality Tables



Historical and Projected Future Improvement National Data



Source: historical data from social security reports.



2019 Municipal Retirees of Texas Mortality Table



TMRS Female Data

An overweight portion of the experience is from members very recently retired These members will have lower mortality rates than members who have been retired for a while, even when adjusted for age If the current data is overweight towards the lower mortality rate population, but the future distribution should be more even as the demographics mature, then only using current data could understate the result



Searching for Potential Bias



2019 Municipal Retirees of Texas Mortality Table (Data shown is the combination of TMRS and ERS Female Data)



Mortality Recommendations

- Longevity for Healthy Retirees in valuation:
 - Base Table: 2019 Municipal Retirees of Texas Mortality Table
 - Change improvement assumption to "Scale UMP" to project future improvement mortality (approximately 1% per year).
 Current assumption was approximately 1.5% per year. Scale UMP was published after the 2013 study and is our universal improvement scale across our clients.



Annuity Purchase Rates

- Current APR are being phased in over 13 years from 2015
- Current APR are projected with Scale BB (1.5% per year)
- Proposed valuation assumption projects with Scale UMP (1% per year)
- Proposed valuation assumption would create almost identical APR in 2028, and remain very close for a few years afterward
 - No need to change now during the phase in period.
- However, if this difference in improvement was modeled indefinitely, it would create a situation where a subsidy was being provided from one party to another
- In the valuation, we have assumed APRs and valuation mortality would be consistent over time
- Recommend no change to the APRs at this time



Payroll Growth Assumption (PGR)

- This assumption is used to determine the trajectory of the amortization payments for units with a UAAL
 - Payments are expected to grow annually at the PGR
 - Not supposed to include population growth
- Currently 3.00%
- Adjustments are made for Cities with declining populations
- With the new property tax limitations, and with half of the TMRS active population being eligible to retire in the next 10 years, having a lower hurdle may be prudent
 - Will decrease pressure of increasing rates over time
- Recommend lowering to 2.75%



Updated Service Credit (USC)

- This is a unique benefit provision
- Attempts to overlay a final pay adjustment for promotions, etc. into a cash balance benefit design
- Different from a final pay design in that once a USC has been granted, it will grow at 5% from that point on and can never grow slower during years of low pay increases



Sample



Actuarial Gains and Losses from Salary Growth

Salary Growth In a Given Year	Traditional Final Pay Plan	Traditional Cash Balance Plan @ 5%/6.75%	With USC @ 5%/6.75% & 3%/3 Year FAC
+1% above Median	\$29,000 Loss	\$16,000 Loss	\$33,000 Loss
Median	\$3,000 Gain	\$4,000 Gain	\$3,000 Loss
<u>-1% below Median</u>	<u>\$26,000 Gain</u>	<u>\$18,000 Gain</u>	<u>\$20,000 Gain</u>
In Aggregate	\$0	\$6,000 Gain	\$16,000 Loss

This has been borne out in the annual valuations as there have consistently been losses due to salary experience that are larger than the data summaries would expect

95% of current TMRS active liabilities have a repeating USC provision



Updated Service Credit (USC)

- If not recognized, this is a bias
 - Across the distribution of members, the net gains are not large enough to offset to net losses
- We are recommending the addition of a load into the USC calculation equal to 0.1% per year into the future the calculation is occurring
- We will monitor this provision to access whether a larger load is necessary



Supplemental Death Plan

- Funded on a term cost (pay-as-you-go) basis
 - Contributions towards actives is 100% of premiums
 - Contributions towards retirees is 33% of premiums (\$2,500 of \$7,500) to pay down balance in the Fund
- This balance is declining quite rapidly
 - Approximately a decade left based on current trends
- Also, the new accounting rules make it harder to apply the credit to the retiree premiums; would be cleaner if credit is applied to active premiums



Recommendation

- Fund term cost for retirees at 100% of premiums
 Would increase average rate by 0.08% of pay
- Allow for a credit towards the active premiums equal to 2% of trust balance
 - Allows for the balance to grow at 3% each year (5% less the 2%), making the credit a perpetual one
 - Would decrease average rate by 0.03% of pay
- Impact will be a net 0.05% of payroll increase in premium



Recommendations/Analysis (Methods and Policies)

- Beginning with 2020 valuation, lower amortization period for future increases in the UAAL from 25 to 20 years
 - Example: in the 2018 valuation the average change in rate would have been 0.21% instead of 0.18% if the 20 year would have been in place
- Change amortization strategy for overfunded cities from a 25 year amortization of the surplus to one that aims to keep current overfunded status in place
 - Current policy pushes an overfunded unit back to 100%
- Reduce period for ad hoc benefit enhancements from 15 to 12 years.
 - Example: a City this year that the ad hoc would cost 0.27% will cost 0.31%. However, the City will pay this additional amount for three less years.



Overfunded Cities



Recommendations

Material Impact	Current Assumption	Proposed Assumption	Impact on Liabilities/Costs
Load for USC Asymmetry	None	0.10% per year	Increase ++ for those that have USC
Noticeable Impact			
Surplus Credit for Overfunded Cities	Credit over 25 years	Credit over all future years	Increase + for those that are overfunded
Post-Retirement Mortality for Valuation Purposes	Age 65 Life Expectancy as of 2015: 17.9/20.8 Scale BB (1.5% Annual Improvement)	Age 65 Life Expectancy as of 2015: 18.2/21.7 Scale UMP (1.0% Annual Improvement) Assume no cross subsidy in APR over time	Decrease -
Rates of Termination (A/E Ratio)	<10 YOS: 106% >10 YOS: 110%	101% 104%	Decrease -



Recommendations (cont.)

Minor Impact	Current Assumption	Proposed Assumption	Impact on Liabilities/Costs
Percent Selecting 50% Survivor Form of Payment	None	100%	Decrease
Individual Salary Scale Including Steps	4.78%	4.96%	Increase
Payroll Growth Rate (Amortization Growth)	3.00%	2.75%	Increase
Percentage taking Refund (A/E Ratio)	93%	96%	Increase
Supplemental Death Fund	100% term cost for Actives \$2,500 for retirees	Give 2% of Fund as Credit on Actives \$7,500 for Retirees	Increase
Population Decline	163 Impacted, avg 0.6%	202 Impacted, avg 0.5%	Net Increase
City Termination Load		As much as +/- 5%	Net Decrease
No Impact			
Amortization Period for New Sources of UAAL	25 Years	20 Years	Volatility will slightly increase Reduces down side on Funded Ratio
Amortization Period for Ad Hoc COLAs	15 Years	12 Years	Will increase cost approx. 15%
Inflation	2.50%	2.50%	None
Nominal Investment Return	6.75%	6.75%	None
Long-Service Salary Scale	3.50%	3.50%	None
Patterns of Retirement	86%	92%	None 36

Illustrative Results

- The following slides provide illustrative valuation results based upon the latest completed actuarial valuation of TMRS
- These results are based on current funding and amortization policies
- The impact would not become effective until the 2019 valuation and the 2021 rates



Summary of System-wide Results

\$ amounts in millions	Dec 31, 2018 Valuation	Change from USC Load	Change from All Other Sources	Net Change (2) + (3)	Net Illustrated Results New Assumptions		
	(1)	(2)	(3)	(4)	(5)		
Actuarial Accrued Liability (AAL)	\$33,731	\$65	\$23	\$88	\$33,819		
Actuarial Value of Assets	<u>29,385</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>29,385</u>		
Unfunded Actuarial Accrued Liability (UAAL)	\$4,346	\$65	\$23	\$88	\$4,434		
Funded Ratio	87.1%	-0.2%	0.0%	-0.2%	86.9%		
Average Funding Period (Years)	18.2	0.1	0.0	0.1	18.3		
Full Contribution Rates:							
Straight Average	8.97%	0.19%	-0.06%	0.13%	9.10%		
Payroll Weighted Average	13.58%	0.31%	-0.03%	0.28%	13.86%		
Normal Cost %	8.61%	0.25%	-0.15%	0.10%	8.71%		
Prior Service %	4.97%	0.06%	0.12%	0.18%	5.15%		



Distribution of Changes: By City Total Changes in Full Retirement Rate



Nearest 0.2% change in rate



Summary from ALM

											Probab	ility of			Prob,
								20 Year E	20 Year Effective Contribution			Contribution		Probability Less	
			20 Year Contribution Dollars			Rate			Increase Greater		than 80% Funded		Funded		
														Anytime	Anytime
						\	/ery			Very				before	before
	Expected				Poor	F	Poor		Poor	Poor			In 2050	2040	2040
	Return	SD	Expecte	ed	Outcome	Ou	tcome	Expected	Outcome	Outcome	0.50%	1.00%	(MVA)	(AVA)	(AVA)
Current Portfolio	6.3%	10.7%	\$ 18.	3	\$ 25.2	\$	33.4	16.4%	21.3%	27.4%	19.3%	7.0%	30.8%	33.6%	45.0%
25 Layered															
Alt 3 Portfolio	6.4%	10.6%	\$ 17.	6	\$ 24.4	\$	32.8	15.9%	20.7%	26.9%	18.5%	6.6%	28.1%	31.1%	47.4%
25 Layered															
Alt 3 Portfolio	6.4%	10.6%	\$ 17.	6	\$ 24.2	\$	32.4	15.9%	20.6%	26.7%	22.2%	8.5%	23.1%	27.0%	48.9%
20 Layered															



Summary

- Full Listing of Recommendations in Experience Study Report
 - Includes Detailed information and Rationale for each assumption
- Approved assumptions to be used in the December 31, 2019 valuation
- Changes to Amortization Periods for new bases will not take effect until the 2020 valuation



Disclaimers

- This presentation is intended to be used in conjunction with the 2019 Actuarial Experience Study. This presentation should not be relied on for any purpose other than the purpose described in the report.
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