



June 4, 2021

City # 00757

City of Liverpool
P.O. Box 68
Liverpool, TX 77577-0068

Attention: Finance Director

Subject: 2022 City Contribution Rate

Based on your TMRS plan provisions in effect as of April 1, 2021, your city's 2022 monthly contribution rates are shown below. These rates were determined by the December 31, 2020 actuarial valuation.

Normal Cost	1.73%
Prior Service	<u>0.12%</u>
Total Retirement Rate	1.85%
Supplemental Death Benefit	<u>0.16%</u>
Total Combined Contribution	2.01%

Detailed information on your city's TMRS plan is contained in the attached report. The Total Retirement Rate shown above represents the Actuarially Determined Employer Contribution (ADEC) for 2022.

If you have questions about your city's Contribution Rate or would like to evaluate potential changes in your TMRS plan, please contact me at 512-225-3760 or lharty@tmrs.com.

Sincerely,

A handwritten signature in blue ink that reads "Leslee S. Hardy". The signature is written in a cursive, flowing style.

Leslee S. Hardy, ASA, EA, FCA, MAAA
Director of Actuarial Services

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Historical and Projected Accumulation of the BAF Balance	This schedule provides your city with historical cash flows, interest credits and the year-end balance of its Benefit Accumulation Fund (BAF), as well as projected values for calendar years 2021 and 2022.
Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution	An explanation of risk measurements associated with your city's TMRS plan.

Rate Stabilization Techniques

Contribution rate stabilization is a strategic goal of the TMRS Board of Trustees. Since 2007, the Board has approved many actuarial changes to minimize short-term volatility in contribution rates while maximizing long-term System sustainability. Under the current funding policy in which rates are actuarially determined each year, contribution rate stabilization is fully optimized at the System level; therefore, any further rate stabilization must be achieved at the city level.

For cities with an Unfunded Actuarial Accrued Liability (UAAL), the most effective way for a city to stabilize its TMRS contribution rate is to determine an affordable contribution rate that exceeds the required rate and continue to pay that same rate even when the calculated rate decreases in subsequent valuations. These additional contributions at a predetermined fixed rate accomplish the following:

- Provide a stable annual contribution rate for budgeting purposes;
- Directly reduces the UAAL dollar for dollar;
- Pays off the UAAL quicker;
- Produce cost savings over the long run; and
- Provide a contribution rate cushion for future adverse plan experience.

For cities with an Overfunded Actuarial Accrued Liability (OAAL or surplus), the calculated contribution rate is determined by decreasing the normal cost rate (the cost of the current year accruals for active employees) by a prior service rate calculated to keep the funded ratio at approximately the current level. The result is a required contribution rate less than the normal cost. It is important to note that there is still a chance that adverse plan experience could result in the funded ratio dropping below 100%. In order to dampen contribution rate volatility and to increase the likelihood of maintaining a funded ratio greater than 100%, TMRS encourages cities in a surplus position to consider paying the full normal cost rate (or as much as possible toward the full normal cost rate) until the funded ratio is at least 110%.

Because additional contributions are entirely voluntary, a city may revert to paying the minimum required rate if financial circumstances change during the year. There is no formal action that needs to be taken by a city to contribute at a higher level than the required monthly minimum. Additional monthly contributions may be made during the normal payroll reporting process by simply filling out line 2. A. of Form TMRS 3 with the increased city contribution rate.

If your city would like to explore the impact of any of these rate stabilization techniques on your TMRS plan, please contact Leslee Hardy, Director of Actuarial Services, at lh Hardy@tmrs.com.

Executive Summary

Valuation as of	12/31/2020	12/31/2019
Membership as of the Valuation Date		
• Number of		
- Active members	5	5
- Retirees and beneficiaries	0	0
- Inactive members	<u>3</u>	<u>3</u>
- Total	8	8
• Prior year's payroll provided by TMRS	\$ 230,520	\$ 224,449
• Valuation Payroll	\$ 240,450	\$ 235,760
Benefit Accumulation Fund (BAF) Assets		
• Market BAF Balance	\$ 122,351	\$ 98,996
• BAF crediting rate	7.45%	15.42%
• Interest credited on beginning BAF balance	\$ 7,377	\$ 10,923
• Employer contributions	4,453	6,015
• Member contributions during year	11,526	11,222
• Benefit and refund payments	0	0
Actuarial Value of Assets (AVA)		
• Market BAF Balance	\$ 122,351	\$ 98,996
• Actuarial Value of Assets (AVA)	119,918	97,422
• AVA as a Percentage of BAF	98.0%	98.4%
• Return on AVA	6.69%	6.57%
Actuarial Information		
• Actuarial accrued liability (AAL)	\$ 122,008	\$ 98,951
• Actuarial value of assets (AVA)	119,918	97,422
• Unfunded actuarial accrued liability (UAAL)	2,090	1,529
• UAAL as % of pay	0.9%	0.7%
• Funded ratio (AVA/AAL)	98.3%	98.5%
• Employer normal cost	1.73%	1.74%
• Prior Service Rate	0.12%	0.09%
Contribution Rates	2022	2021
• Member	5.00%	5.00%
• Full retirement rate (ADEC)	1.85%	1.83%
• Supplemental Death rate	0.16%	0.14%
Total Employer Contribution Estimates	2022	2021
• Projected payroll	\$ 247,062	\$ 242,243
• Combined contribution rate	2.01%	1.97%
• Estimated employer contribution	\$ 4,966	\$ 4,772

Note: Results from prior year reflect the plan provisions shown on the next page.

Summary of Benefit Provisions

The plan provisions are adopted by the governing body of the City, within the options available in the state statutes governing TMRS. Plan provisions for the City in effect as of April 1, 2021 were as follows:

Employee deposit rate	5%
Matching ratio (city to employee)	1 to 1
Years required for vesting	5
Retirement Eligibility (Age/Service)	60/5, 0/20
Updated Service Credit	0%
Annuity Increase (to retirees)	0% of CPI
Supplemental Death Benefit to Active Employees	Yes
Supplemental Death Benefit to Retirees	Yes

If you have any questions about your city's benefit provisions or would like to discuss plan changes, please contact the City Services Department at cityservices@tmrs.com.

Calculation of Contribution Requirements

From Valuation Report as of			
		<u>December 31, 2020</u>	<u>December 31, 2019</u>
1. Prior year's payroll reported to TMRS	\$	230,520	\$ 224,449
2. Valuation payroll		240,450	235,760
3. Employer normal cost rate		1.73%	1.74%
4. Actuarial liabilities			
a. Active members	\$	97,283	\$ 75,602
b. Inactive members		24,725	23,349
c. Annuitants		<u>0</u>	<u>0</u>
d. Total actuarial accrued liability	\$	122,008	\$ 98,951
5. Actuarial value of assets		<u>119,918</u>	<u>97,422</u>
6. Unfunded actuarial accrued liability (UAAL) (4d - 5)	\$	2,090	\$ 1,529
7. Funded ratio (5 / 4d)		98.3%	98.5%
8. Equivalent Single Amortization Period*		8.6 Years	9.1 Years
9. Assumed payroll growth rate		2.75%	2.75%
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Contribution Rates:		2022	2021
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10. Full retirement rate			
a. Normal cost		1.73%	1.74%
b. Prior service		<u>0.12%</u>	<u>0.09%</u>
c. Full retirement rate		1.85%	1.83%
11. Supplemental Death rate		0.16%	0.14%
12. Combined contribution rates (10c+11)		2.01%	1.97%

* New Losses are laddered on a 10-year period.

UAAL/OAAL Amortization Bases and Payments

Year Established	Description	Years Remaining	Remaining Base	Payment
2013	2013 Valuation (Fresh Start)	23	\$ 649	\$ 43
2014	2014 Experience	3	937	335
2018	Remaining Balance of 2018 Experience Gain	3	(383)	(137)
2019	2019 Experience	9	488	65
2019	2019 Actuarial Changes	3	(277)	(99)
2020	2020 Experience	10	<u>676</u>	<u>82</u>
Total			2,090	289

TMRS amortizes the UAAL/OAAL through the process of laddering each base created during the valuation process. The City's UAAL/OAAL equals the total of the remaining amortization bases. The City's Prior Service Rate equals the total amortization payments divided by the valuation payroll (Item 2 of the prior page).

Reconciliation of Full Retirement Rate from Prior Actuarial Valuation Report

Actuarial valuations are based on long-term assumptions, and results in a specific year can, and almost certainly will, differ as actual plan experience deviates from the assumptions. The following table provides a detailed breakdown of changes in your city's Full Retirement Rate (ADEC) from 2021 to 2022. A brief description of such changes follows the table.

Change in Full Retirement Rate	
Full Rate from 12/31/2019 Valuation (2021 Rate)	1.83 %
Benefit Changes	0.00 %
Return on Actuarial Value of Assets	0.00
Contributions/Fully Amortized Prior Bases	(0.01)
Payroll Growth	0.00
Normal Cost	(0.01)
Liability Growth	0.04
Total Change	0.02 %
Full Rate from 12/31/2020 Valuation (2022 Rate)	1.85 %

Benefit Changes - Shows the increase or decrease in the contribution rate associated with any plan changes.

Return on Actuarial Value of Assets (AVA) - Shows the change in the contribution rate associated with the return on the AVA being different than the assumed 6.75%. For the year ending December 31, 2020, the return on an AVA basis was 6.69%. The impact may show as 0.00% due to rounding.

Contributions/Fully Amortized Prior Bases - Shows the total increase or decrease in the contribution rate associated with contributions different than the Full Rate, the contribution lag, and the impact of the amortization bases which become fully amortized as of this valuation since payments for those bases are no longer part of the prior service rate calculation. Contributions different from the Full Rate may include phase-in contributions, contributions in excess of the Full Rate, and/or lump sum contributions. The effect of the contribution lag refers to the time delay between the actuarial valuation date and the date the contribution rate becomes effective (i.e., the Actuarial Valuation as of December 31, 2020 sets the rate effective for 2022). This impact is expected to become immaterial once a city is contributing the Full Rate and the Full Rate stabilizes.

Payroll Growth - Shows the increase or decrease in the contribution rate associated with higher or lower than expected growth in the member city's overall payroll. The amortization payments were calculated assuming payroll grows at 2.75% per year. Overall payroll growth greater (less) than 2.75% will typically cause a decrease (increase) in the prior service rate.

Normal Cost - Shows the increase or decrease in the contribution rate associated with changes in the average normal cost rate for the city's active members. The normal cost rate for an employee is the contribution rate which, if applied to a member's compensation throughout their period of anticipated covered service with the city, would be sufficient to meet all benefits payable on their behalf. The salary-weighted average of the individual rates is the city's total normal cost rate. The employer normal cost rate is the pay-weighted average of the individual normal cost rates less the employee deposit rate and will generally increase (decrease) as the average entry age of the group increases (decreases).

Liability Growth - Shows the increase or decrease in the contribution rate associated with larger or lower than expected growth in the city's overall plan liabilities. The most significant sources for variance will be turnover and individual salary increases differing from the assumptions.

Historical and Projected Accumulation of the BAF Balance

Year Ending December 31, (1)	Payroll for the Year (2)	Effective Retirement Contribution Rate ^a (3)	Employer Contributions for the Year (4)	Member Contributions for the Year (5)	Benefit Payments (6)	External Cash Flow for the Year (7)	Interest Credit (8)	BAF Balance ^b (9)
		(4) / (2)				(4) + (5) + (6)		
2018	\$ 194,673	2.64%	\$ 5,133	\$ 9,734	\$ (3,948)	\$ 10,919	\$ (1,902)	\$ 70,835
2019	224,449	2.68%	6,015	11,222	0	17,237	10,923	98,996
2020	230,520	1.93%	4,453	11,526	0	15,979	7,377	122,351
2021	240,450	1.83%	4,400	12,023	(7,675)	8,748	8,259	139,358
2022	247,062	1.85%	4,571	12,353	(6,778)	10,146	9,407	158,911

a. Effective retirement contribution rate is the actual rate determined by dividing the employer contribution received by the payroll paid.

b. BAF Balance may not sum due to rounding.

Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution

Risk measures help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that results from the differences between actual plan experience and the actuarial assumptions. Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

Ratio of Market Value of Assets to Payroll	0.5
Ratio of Actuarial Accrued Liability to Payroll	0.5
Ratio of Actives to Retirees and Beneficiaries	N/A
Net Cash Flow as a Percentage of Market Value of Assets	13.1%
Duration of Liabilities	22.6
Change in Contribution Rate with 10% Decline in Assets (Smoothed)	0.06%
Change in Contribution Rate with 10% Decline in Assets (Unsmoothed)	0.61%

Ratio of Market Value of Assets to Payroll - The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 4.0 times the payroll, a return on assets 5% different than assumed would equal 20% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in city contributions as a percentage of payroll.

Ratio of Actuarial Accrued Liability to Payroll - The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 5.0 times the payroll, a change in liability 2% other than assumed would equal 10% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also city contributions) as a percentage of payroll.

The relationship between the actuarial accrued liability and payroll is a useful indicator of the potential longer term asset-related volatility once the current UAAL is fully amortized. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

Ratio of Actives to Retirees and Beneficiaries - A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

Net Cash Flow as a Percentage of Market Value of Assets - A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified

trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

Duration of Liabilities - The duration of the present value of future benefits may be used to approximate the sensitivity to a 1% change in the assumed rate of return. For example, duration of 10 indicates that the present value of future benefits would increase approximately 10% if the assumed rate of return were lowered 1%.

Change in Contribution Rate with 10% Decline in Assets (Smoothed) - This shows the rate impact in one year if the actuarial value of assets (AVA) was 10% lower than in the current actuarial valuation with the asset loss smoothed over a 10 year period as is done in the system-wide calculation of the AVA.

Change in Contribution Rate with 10% Decline in Assets (Unsmoothed): This shows the rate impact if the actuarial value of assets was 10% lower than in the current actuarial valuation with the full asset loss recognized in the current valuation.