MPERS
Supplemental Actuarial Valuation
as of June 30, 2016

REQUESTED BY: Ms. Greta Bassett-Seymour, General Counsel
Missouri Department of Transportation and
Highway Patrol Employees' Retirement System

DATE: April 7, 2017

SUBMITTED BY: Kenneth G. Alberts and Heidi G. Barry, ASA, MAAA
Gabriel, Roeder, Smith & Company

This report contains the results of a supplemental actuarial valuation of a proposed change to RSMo 104.110 which would increase a disabled member's rate of pay used for calculating the normal retirement benefit by any increases in the consumer price index, as requested by MPERS.

This report may be shared with other parties, but only in its entirety and only with the permission of MPERS. GRS is not responsible for unauthorized use of this report. The purpose of this report is to measure the financial effect on MPERS' funded status and computed employer contributions of the proposed system change. This report should not be relied on for any other purpose.

Supplemental valuations do not predict the result of future actuarial valuations. (Future activities can affect future valuation results in an unpredictable manner.) Rather, supplemental valuations give an indication of the probable effect of the **change only** on future valuations without comment on the complete end result of the future valuations.

Heidi G. Barry is a Member of the American Academy of Actuaries (MAAA) and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. The signing individuals are independent of the plan sponsor.

The valuation was based upon data furnished by MPERS for the June 30, 2016 actuarial valuation. Actuarial methods and assumptions, except where otherwise noted, were the same as those used in the last regular annual actuarial valuation as of June 30, 2016. In particular:

- The assumed rate of interest was 7.75%.
- The valuation method was the entry-age actuarial cost method.
- The amortization period was 8 years for unfunded retiree liabilities and 23 years for unfunded active liability; amortizations were calculated assuming payroll would increase 3.50% per year before the changes.
- Price inflation is assumed to be 3.00% per year.

A brief summary of the data used in this valuation is presented on the next page.

Active Members in Closed Plan

Group	Number	Covered Payroll	Average in Years Age	Average in Years Service
Civilian Patrol	358	$16,914,802	51.7	23.0
MoDOT	1,916	95,929,116	50.5	22.7
Uniformed Patrol	601	47,698,276	47.9	22.8
Total	2,875	$160,542,194	50.1	22.8
Disabled Members in Closed Plan	108	N/A	56.7	N/A

The proposed changes do not apply to any members (active, retired, disabled, etc.) in the Year 2000 Plan or Year 2011 Tier. It does however apply to Closed plan members currently in receipt of disability benefits.

See the Appendix for a summary of all current MPERS members as of June 30, 2016.

Proposed Changes to Retirement Provisions

Current Provision Affected:

Disability Benefit for Closed Plan: Normal retirement benefits become payable at the time a disabled member becomes eligible for normal retirement, and are computed based on: i) the service that would have accrued to the member if active employment had continued; and ii) the member's rate of pay at the time of disability.

Proposed Provisions Under Consideration:

Disability Benefit for Closed Plan: Normal retirement benefits become payable at the time a disabled member becomes eligible for normal retirement, and are computed based on: i) the service that would have accrued to the member if active employment had continued; and ii) the member's rate of pay at the time of disability, **increased by the increase in the consumer price index from the date of disability to the date of normal retirement.**

Results

	Impact on MPERS Employer Contributions		
	Present Provisions	**Proposed Provisions**	**Increase/ (Decrease)**
FY 2018 Contribution			
Normal Cost	11.72 %	11.80 %	0.08 %
Unfunded Liability	44.55	44.71	0.16
Expenses	1.20	1.20	0.00
Disability Insurance	0.53	0.53	0.00
Subtotal Employer Contribution Rate	58.00 %	58.24 %	0.24 %
Change in Stabilization Reserve Contributions*	0.00	(0.24)	(0.24)
Total Employer Contribution Rate	58.00 %	58.00 %	0.00 %
Employer Normal Cost ($ millions)	$ 42.7	$ 43.0	$ 0.3
Estimated Employer Contribution ($ millions)	$ 211.1	$ 211.1	$ -
Valuation Results as of June 30, 2016 ($ millions)^			
Market Value of Assets (MVA)	$ 1,992.1	$ 1,992.1	$ -
Actuarial Accrued Liability (AAL)	3,761.7	3,765.1	3.4
Actuarial Value of Assets (AVA)	2,086.7	2,086.7	-
Unfunded Actuarial Accrued Liability (UAAL)	$ 1,675.1	$ 1,678.4	$ 3.4
Percent Funded	55.5 %	55.4 %	(0.1)

* *At the September 25, 2014 Board Meeting, the Board adopted the use of a contributions stabilization reserve that would result in a MPERS employer contribution of 58% of payroll.*

^ *May not add due to rounding.*

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Fiscal Year	Current Provisions (Beginning of Year) Projected AAL	Projected AVA	Funded Ratio	Projected MVA	Proposed Provisions (Beginning of Year) Projected AAL	Projected AVA	Funded Ratio	Projected MVA	Projected Employer Contributions: Current Rate	Current Dollars	Est. Impact Rate	Est. Impact Dollars	Proposed Rate	Proposed Dollars
2017	$ 3,761,733	$ 2,086,654	55.5%	$ 1,992,074	$ 3,765,101	$ 2,086,654	55.4%	$ 1,992,074						
2018	3,841,344	2,146,085	55.9%	2,098,028	3,845,265	2,146,085	55.8%	2,098,028	58.00%	$ 211,121	0.00%	$ -	58.00%	$ 211,121
2019	3,919,572	2,216,765	56.6%	2,211,839	3,924,099	2,216,765	56.5%	2,211,839	52.75%	198,731	0.19%	716	52.94%	199,447
2020	3,996,197	2,315,097	57.9%	2,313,601	4,001,348	2,315,840	57.9%	2,314,344	53.58%	208,923	0.18%	702	53.76%	209,625
2021	4,070,824	2,425,810	59.6%	2,425,606	4,076,617	2,427,340	59.5%	2,427,136	53.27%	214,984	0.17%	686	53.44%	215,671
2022	4,142,978	2,544,165	61.4%	2,544,116	4,149,472	2,546,527	61.4%	2,546,478	52.89%	220,922	0.17%	710	53.06%	221,632
2023	4,212,220	2,669,270	63.4%	2,669,262	4,219,434	2,672,552	63.3%	2,672,544	52.49%	226,925	0.15%	648	52.64%	227,573
2024	4,278,025	2,801,374	65.5%	2,801,372	4,286,022	2,805,584	65.5%	2,805,582	52.07%	232,988	0.15%	671	52.22%	233,659
2025	4,339,771	2,940,790	67.8%	2,940,789	4,348,621	2,946,023	67.7%	2,946,023	51.63%	239,105	0.16%	741	51.79%	239,846
2026	4,396,868	3,087,868	70.2%	3,087,868	4,406,596	3,094,277	70.2%	3,094,277	51.20%	245,412	0.14%	671	51.34%	246,083
2027	4,448,575	3,243,126	72.9%	3,243,126	4,459,256	3,250,728	72.9%	3,250,728	50.75%	251,769	0.14%	695	50.89%	252,464
2028	4,494,178	3,406,965	75.8%	3,406,965	4,505,842	3,415,878	75.8%	3,415,878	50.29%	258,219	0.13%	667	50.42%	258,887

Projection results are before applying the contribution stabilization reserve fund or the minimum Employer Contribution Rate of 58% for FY 2019 and beyond.

Projections show the Employer rate adopted by the Board for FY 2018 before and after the proposed change. Employer rates for the proposed change are effective with FY 2019. The actual timing of rates based on the proposed changes would be a matter of Board Policy.

Comments

Comment 1: Chapter 105 Section 684 prohibits MPERS from adopting or implementing a plan change if the enhancement increases the plans accrued liability and the plan is not at least 80% funded before the plan change. MPERS is 55.5% funded before the plan change. The proposed change results in an increase in accrued liabilities of approximately $3.4 million.

Comment 2: We understand that the application of this proposal to current members on disability would result in a retroactive increase to their FAP (from date of disability to the valuation date). The date of disability is not provided for members with fully insured disability benefits. For purposes of calculating prior increases in consumer price index for these members, a year of retirement of 2010 was assumed. This is the approximate midpoint between the implementation of the fully insured program (2003) and the valuation date.

Comment 3: The simplified projections on page 5 show the possible total contributions in each of the next ten years before and after the proposed change. These projections also account for the market gains and losses prior to June 30, 2016 that are scheduled to be recognized in the next two years. Due to time constraints, the simplified projection methods are based on:

- the June 30, 2016 covered payroll projected with wage inflation;
- a closed group payroll population projection to determine the payroll;
- computed contributions based on funding value and market value as of June 30, 2016;
- closed amortization periods that are the equivalent single amortization period for the specific group (Non-Uniform – 14.5 years on a valuation asset basis; Uniform – 19.9 years on a valuation asset basis);
- no future gains or losses (beyond the market gains and losses already experienced); and
- an additional 5% of payroll each year being covered by the 2011 Tier.

The projections do not reflect the Board's minimum Employer Contribution Rate or the Contribution Stabilization Reserve Fund after FY 2019.

Comment 4: It was assumed that the proposed change in benefits would not result in a change in average member behavior (such as accelerating or delaying patterns of retirement). If such a change emerges, cost implications will be different than shown herein.

Comments

Comment 5: The supplemental valuation results assume that the proposed change would be effective on the valuation date (with retroactive application to current closed plan disabled members). Results of this supplemental valuation would not be materially different if a delayed effective date were modeled.

Comment 6: The Board has adopted a contribution policy that includes a Contribution Stabilization Reserve Fund. If the Contribution Stabilization Reserve Fund is maintained so as to keep the employer contribution level, then the proposed plan change may result in an acceleration of the funded status of the plan.

Comment 7: This calculation is based upon assumptions regarding future events, which may or may not materialize. It is also based upon present and proposed plan provisions that are outlined in the report. If you have reason to believe that the assumptions that were used are unreasonable, that the plan provisions are incorrectly described, that important plan provisions relevant to this proposal are not described, or that conditions have changed since the calculations were made, you should contact the authors of this report prior to relying on information in the report.

Comment 8: This report is intended to describe the financial effects of the proposed plan changes. No statement in this report is intended to be interpreted as a recommendation in favor of or in opposition to the proposed changes.

Comment 9: We recommend legal counsel perform a compliance review of the proposed change to confirm compliance with State and Federal laws and regulations.

Comment 10: In the event that more than one plan change is being considered, it is very important to remember that the results of separate actuarial valuations cannot generally be added together to produce a correct estimate of the combined effect of all of the changes. The total can be considerably greater than the sum of the parts due to the interaction of various plan provisions with each other, and with the assumptions that must be used.

Comments

Comment 11: If you have reason to believe that the information provided in this report is inaccurate, or is in any way incomplete, or if you need further information in order to make an informed decision on the subject matter of this report, please contact the authors of the report prior to making such decision.

Comment 12: This report includes a measure of the AVA as a percent of AAL. Unless otherwise indicated, with regard to any such measurements in this report:

(1) This measurement is inappropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations.
(2) The measurement is inappropriate for assessing the need for or amount of future employer contributions.

Comment 13: A determination regarding the ability of the Plan sponsor to make contributions necessary to fund the plan is not required by actuarial standards, is not within the actuarial skill set and is out of scope for this project. Consequently, the actuary performed no such determination.

Appendix

A summary of the data used in the June 30, 2016 actuarial valuation is shown below:

	Non-Uniformed				
	Civilian Patrol Employees	**MoDOT Employees**	**Non-Uniformed Total**	**Uniformed Patrol**	**Total**
Participants					
Active Members					
Closed Plan	358	1,916	2,274	601	2,875
Year 2000 Plan (also closed)	457	1,800	2,257	395	2,652
Year 2011 Tier (open)	333	1,323	1,656	258	1,914
Total Active Members	1,148	5,039	6,187	1,254	7,441
Total Active Members Prior Year	*1,115*	*4,999*	*6,114*	*1,244*	*7,358*
Retiree -- Regular Pensioners					
Closed Plan	471	3,541	4,012	898	4,910
Year 2000 Plan (also closed)	526	3,090	3,616	4	3,620
Year 2011 Tier (open)	0	0	0	0	0
Total Regular Pensioners	997	6,631	7,628	902	8,530
Self Insured Disability Pensioners	3	50	53	3	56
Fully Insured Disability Pensioners	12	82	94	4	98
Terminated Vested Members	242	1,927	2,169	165	2,334
Total	**2,402**	**13,729**	**16,131**	**2,328**	**18,459**
Active Member Valuation Payroll	$ 46,345,740	$ 210,473,695	$ 256,819,435	$ 82,979,944	$ 339,799,379
Active Mem. Val. Payroll Prior Year	*$44,500,074*	*$207,314,457*	*$251,814,531*	*$82,586,449*	*$334,400,980*
Unfunded Actuarial Accrued Liability	N/A	N/A	$ 1,251,609,457	$ 423,469,199	$ 1,675,078,656