



Cavanaugh Macdonald

CONSULTING, LLC

The experience and dedication you deserve

April 28, 2017

Ms. Laurie Hacking
Executive Director
Teacher Retirement Association of Minnesota
60 Empire Drive, Suite 400
St. Paul, MN 55103

Re: Cost Study on Package of Plan and Funding Changes

Dear Laurie:

As you requested, we have determined both the short term and long term impact on the required contribution rate and funded status of a proposed legislative package of plan and funding changes for the Teachers Retirement Association of Minnesota (TRA) plan. They include:

- 1% COLA effective January 1, 2018 (permanent).
- First COLA paid at the later of 18 months after retirement or the January 1 following normal retirement age, effective for retirements after December 31, 2017.
- Eliminate deferred augmentation for current or future deferred vested members, effective July 1, 2018.
- Eliminate the augmentation component in all early retirement factors, effective July 1, 2019.
- Increase the employee contribution rate by 1%, phased-in over four years.
- Increase the employer contribution rate by 1%, phased-in over four years.

In addition, the investment return assumption will be changed to 7.5% in the July 1, 2017 valuation. Consequently, the baseline results shown on the exhibits are not consistent with the results in the July 1, 2016 valuation report as that report reflects a different investment return assumption. Furthermore, the legislative package does not extend the current amortization period because the provisions in current law do not result in a recalculated amortization period that differs from the current 23 years remaining. Under the baseline results (with the change in the investment return assumption to 7.5%), the current law results in an extension of the amortization period by one year, making the amortization period 24 years.

Attached to this letter are two exhibits that show certain key funding measures from the July 1, 2016 valuation (snapshot measurement) under the baseline (current provisions and funding) and the cost study (described earlier). The results shown in Exhibit I are based on the actuarial value of assets and results in Exhibit II are based on the market value of assets. Exhibit III provides an analysis of the respective contributions of different membership groups to the total savings in the proposed package. We have also attached a graph from the projection model showing the long-term funded ratio under the baseline and proposed plan changes, using the 7.5% investment return assumption.

3906 Raynor Pkwy, Suite 106, Bellevue, NE 68123

Phone (402) 905-4461 • Fax (402) 905-4464

www.CavMacConsulting.com

Offices in Englewood, CO • Kennesaw, GA • Bellevue, NE



The proposed package of plan changes would permanently reduce the annual cost of living adjustment to 1% for current and future retirees, and eliminate the current language that provides for an increase in the COLA when certain funded levels are met (COLA trigger). Furthermore, the commencement of the COLA would be extended for some members with the addition of the requirement that the COLA start at the later of 18 months after retirement (current provision) or the January 1 following normal retirement age (age 65 or 66 depending on the member's tier and date of birth). The other key plan change, the prospective elimination of the augmentation provisions, will ultimately reduce the retirement benefits payable to current and future inactive vested members as well as reduce the benefits paid to members who elect to retire before their normal retirement age. Lastly, both the employee and employer contribution rate will increase by 1%, with the increase being phased-in over four years, beginning July 1, 2017.

For purposes of this cost study, we assumed that the proposed plan changes will not result in any behavioral changes by members, and so all current demographic assumptions have been retained. However, the package eliminates the augmentation of benefits in the future, most notably for those retiring under the early retirement provision. We believe that the proposed changes could substantially alter retirement behavior at certain ages, resulting in a reduction in the early retirement rates especially at the younger ages. While early retirement is not utilized heavily with the current benefit structure, the decline of its use in the future could reduce the projected cost savings from the change in plan provisions shown in this study. It is also possible that the elimination of augmentation for inactive vested members may impact the behavior of that group, with more members electing to either take a refund of employee contributions or start receiving benefits at an earlier age. Such action could also have an impact on the projected cost savings shown in this study. However, because the changes with augmentation are only part of the total proposed changes, modest behavior changes over time will likely not result in significant changes in plan costs or funding progress.

In the near-term, there could also be situations in which members accelerate their retirements to take advantage of current provisions rather than wait until a later date and receive smaller benefits. In particular, active members who are eligible for early retirement may realize that by retiring ahead of the effective date of the plan changes, they will receive augmented benefits and a COLA with an earlier effective date. Inactive vested members who are eligible for early retirement may also start benefits to avoid the loss of value from the provision changes. If members make these choices, the plan will experience an actuarial loss which will reduce some of the anticipated savings from the proposed changes.

Disclaimers, Caveats, and Limitations

The projection results associated with this cost study is based upon the July 1, 2016 actuarial valuation results and the projection model prepared by the Fund's actuary, Cavanaugh Macdonald Consulting. One exception is that the liabilities and costs have been determined assuming that a 7.5% investment return assumption is effective after the July 1, 2016 valuation. Alternative benefit provisions were also valued as noted earlier in the description of the studies. Significant items are noted below:

- Future investment returns (beginning July 1, 2016) are assumed to be 7.5% and apply to the market value of assets.
- All demographic assumptions regarding mortality, disability, retirement, salary increases, and termination of employment are assumed to be met exactly in each year in the future. Please note that the actuarial assumption assumes that mortality will improve in the future (i.e. people will live longer).
- Changes in other programs may have an effect on future retirement patterns. For example, if changes in Social Security and/or Medicare are implemented to reduce benefits or delay eligibility for those



Ms. Laurie Hacking
April 28, 2017
Page 3

programs, retirements from TRA are likely to also be delayed, thereby lowering the cost of the plan. However, because such changes cannot be reasonably anticipated, they are not reflected in this analysis.

- The number of active members covered by TRA in the future is assumed to remain level (neither growth nor decline in the active membership count). As active members leave employment, they are assumed to be replaced by new employees who have a similar demographic profile as recent new hires. With the departure of current active members who were hired before July 1, 1989, whose benefit structure has different retirement eligibility provisions from those of members hired since then, the demographic composition of the membership will gradually change over time and is reflected in these projections.
- Plan provisions are assumed to remain unchanged from current law, unless explicitly noted. In particular, the contribution stabilizer could be used to adjust the contribution rate, but because it is discretionary, we have not reflected its usage.
- The funding methods, including the entry age normal cost method, the asset smoothing method, and the amortization method and period, are as set out in statute, unless otherwise noted.
- The current supplementary contributions made by the state are assumed to continue to be paid at approximately the same dollar amount.
- The actuaries relied upon the membership data provided by TRA for the July 1, 2016 actuarial valuation. The numerical results depend on the integrity of this information. If there are material inaccuracies in this data, the results presented herein may be different and the projections may need to be revised.

Models are designed to identify anticipated trends and to compare various scenarios rather than predicting some future state of events. These projections are based on TRA's estimated financial status on July 1, 2016, and anticipate future events using one set of assumptions out of a range of many possibilities. While the future is not expected to unfold exactly as shown in the model projections, we still believe the comparison of the current and proposed plan changes is a fair representation of how actual differences would likely unfold.

We, Patrice A. Beckham and Brent A. Banister, are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. We are available to answer any questions on the material in this letter or to provide explanations or further details as appropriate. We also meet the requirements of "approved actuary" under Minnesota Statutes, Section 356.215, Subdivision 1, Paragraph (c).

Sincerely,

A handwritten signature in cursive script that reads "Patrice Beckham".

Patrice A. Beckham, FSA, EA, FCA, MAAA
Principal and Consulting Actuary

A handwritten signature in cursive script that reads "Brent A. Banister".

Brent A. Banister, PhD, FSA, EA, FCA, MAAA
Chief Pension Actuary



EXHIBIT I

7.50% Investment Return Assumption using Actuarial Value of Assets (AVA)

ACTUARIAL COST STUDIES OF TRA PROPOSED PLAN CHANGES

Based on July 1, 2016 Actuarial Valuation and 7.50% Investment Return Assumption

(Dollars in Thousands)

	(0)	(1)
	Baseline	Proposed Legislative Package
Remaining Amortization Period	24 years	23 years
Ongoing COLA	2.00%	1.00%
Additional Employer Contribution	0.00%	1.00%
Additional Employee Contribution	0.00%	1.00%
COLA Delay	None	Delayed to NRA
SNAPSHOT RESULTS		
Actuarial Accrued Liability (AAL)		
Active	10,492,281	8,771,378
Retiree/beneficiary	18,581,643	17,287,648
Inactive	<u>786,407</u>	<u>631,170</u>
Total	29,860,331	26,690,196
Market Value of Assets	19,420,131	19,420,131
Actuarial Value of Assets	20,194,279	20,194,279
Unfunded AAL	9,666,052	6,495,917
Difference		(3,170,135)
Funded Ratio	67.63%	75.66%
Required Contribution Rate		
Normal cost	11.48%	9.66%
Difference		(1.82)%
Supplemental Contribution (UAAL)	12.92%	8.91%
Difference		(4.01)%
Administrative expenses	<u>0.23%</u>	<u>0.23%</u>
Total	24.63%	18.80%
Statutory Contribution	<u>15.94%</u>	<u>17.94%</u>
Contribution (Deficiency)/Sufficiency	(8.69)%	(0.86)%
Difference		7.83%
PROJECTION RESULTS*		
Funded Ratio - 2046	36.68%	99.24%
Normal Cost Rate - 2046	11.72%	9.86%

This exhibit should only be considered with the accompanying letter from Cavanaugh Macdonald Consulting dated April 28, 2017.

* Assumes all assumptions are met including the 7.50% investment return assumption. See July 1, 2016 valuation for more details.



EXHIBIT II

7.50% Investment Return Assumption using Market Value of Assets (MVA)

ACTUARIAL COST STUDIES OF TRA PROPOSED PLAN CHANGES

Based on July 1, 2016 Actuarial Valuation and 7.50% Investment Return Assumption
(Dollars in Thousands)

	(0)	(1)
	Baseline	Proposed Legislative Package
Remaining Amortization Period	24 years	23 years
Ongoing COLA	2.00%	1.00%
Additional Employer Contribution	0.00%	1.00%
Additional Employee Contribution	0.00%	1.00%
COLA Delay	None	Delayed to NRA
SNAPSHOT RESULTS		
Actuarial Accrued Liability (AAL)		
Active	10,492,281	8,771,378
Retiree/beneficiary	18,581,643	17,287,648
Inactive	<u>786,407</u>	<u>631,170</u>
Total	29,860,331	26,690,196
Market Value of Assets (MVA)	19,420,131	19,420,131
Actuarial Value of Assets	20,194,279	20,194,279
Unfunded AAL (AAL - MVA)	10,440,200	7,270,065
Difference		(3,170,135)
Funded Ratio (MVA / AAL)	65.04%	72.76%
Required Contribution Rate		
Normal cost	11.48%	9.66%
Difference		(1.82)%
Supplemental Contribution (UAAL)	13.95%	9.98%
Difference		(3.97)%
Administrative expenses	<u>0.23%</u>	<u>0.23%</u>
Total	25.66%	19.87%
Statutory Contribution	<u>15.94%</u>	<u>17.94%</u>
Contribution (Deficiency)/Sufficiency	(9.72)%	(1.93)%
Difference		7.79%
PROJECTION RESULTS*		
Funded Ratio - 2046	36.68%	99.24%
Normal Cost Rate - 2046	11.72%	9.86%

This exhibit should only be considered with the accompanying letter from Cavanaugh Macdonald Consulting dated April 28, 2017.

* Assumes all assumptions are met including the 7.50% investment return assumption. See July 1, 2016 valuation for more details.



EXHIBIT III

7.50% Investment Return Assumption

ALLOCATION OF COST SAVINGS BY GROUP - TRA PROPOSED PLAN CHANGES

Based on July 1, 2016 Actuarial Valuation and 7.50% Investment Return Assumption

(Dollars in Thousands)

	(1)
	Proposed Legislative Package
Remaining Amortization Period	23 years
Ongoing COLA	1.00%
Additional Employer Contribution	1.00%
Additional Employee Contribution	1.00%
COLA Delay	Delayed to NRA
<u>Change in Present Value of Benefits:</u>	
Current actives	3,278,270
Current in-pay	1,293,995
Current inactives	155,237
Future actives*	781,931
Employers*	836,312
<u>Change in Present Value of Benefits:</u>	
Current actives	51.7%
Current in-pay	20.4%
Current inactives	2.4%
Future actives*	12.3%
Employers*	13.2%

* Over 30 year timeframe

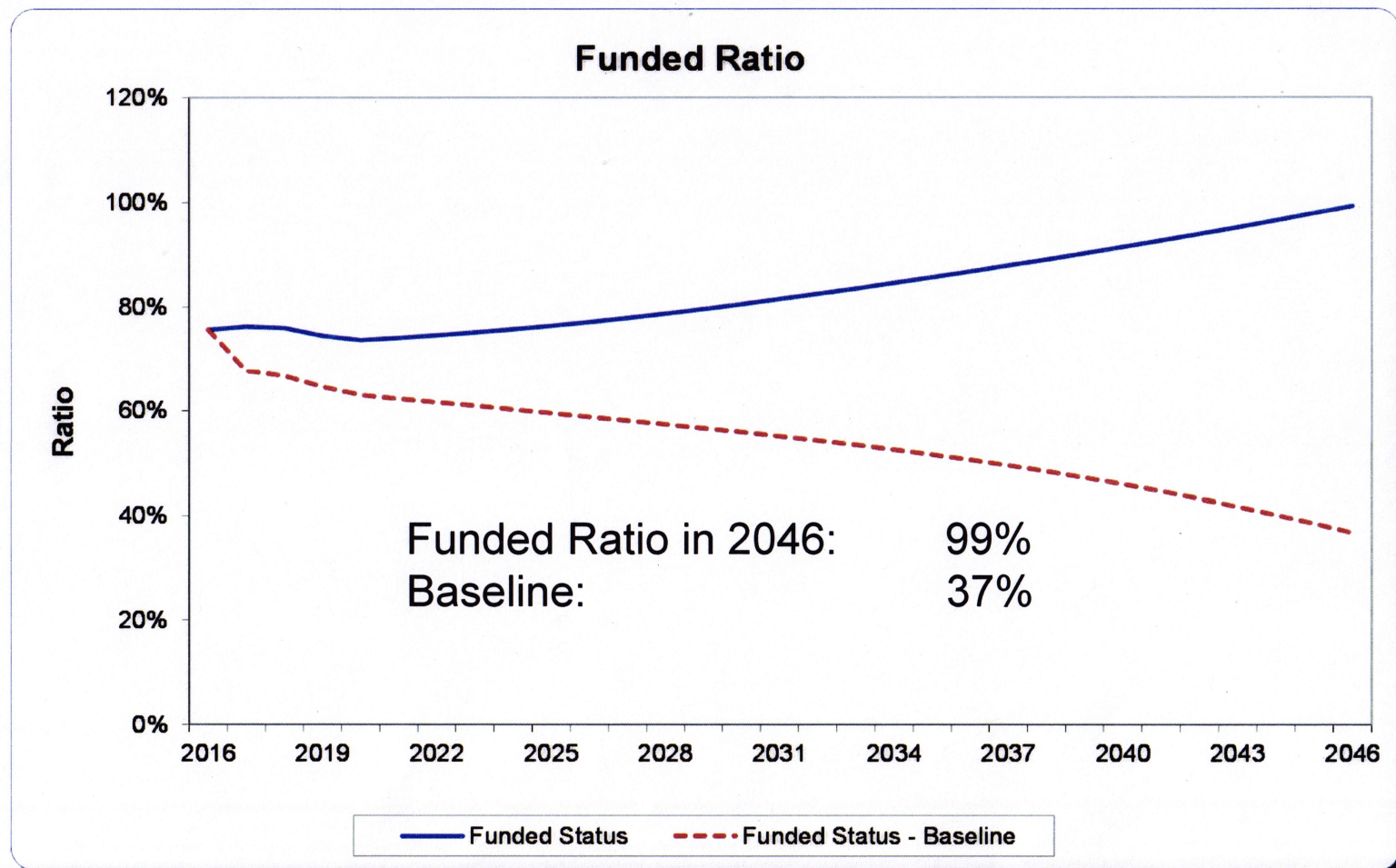
This exhibit should only be considered with the accompanying letter from Cavanaugh Macdonald Consulting dated April 28, 2017.



Proposed Legislative Package



Assumed Rate of Return: 7.5%



This exhibit should only be considered with the accompanying letter from Cavanaugh Macdonald Consulting dated April 28, 2017.