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Minnesota Teachers Retirement Association

Actuarial Analysis of Minnesota State Colleges and Universities (MnSCU) Retirement Coverage by the Teachers Retirement Association

MERCER

MARSH MERCER KROLL
GUY CARPENTER OLIVER WYMAN

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Executive Summary

New faculty members of the Minnesota State Colleges and Universities System (MnSCU) currently have a one-year opportunity to choose between participation in the Individual Retirement Account Plan (IRAP) or the Teachers Retirement Association Fund (TRA).

Legislation passed in 2008 requires TRA to conduct an actuarial impact study addressing the following issues:

- The likely actuarial impact on TRA of permitting MnSCU employees in IRAP to elect retroactive and prospective TRA coverage upon attainment of tenure, with retroactive service credit effected by a service credit purchase
- An assessment of the likelihood that tenure track MnSCU faculty members would elect TRA coverage
- An assessment of the actuarial accrued liability that could be incurred by TRA from potential service credit purchases
- An assessment of the likely service purchase amounts
- An assessment of the impact on TRA's normal cost rate if IRAP members join TRA

For purposes of this study, we assumed faculty is everyone in the Minnesota State College Faculty (MSCF) and Inter Faculty Organization (IFO) bargaining units. We were unable to definitively determine which faculty members are on a tenure track, so for purposes of this study we assumed all faculty are on a tenure track.

MnSCU provided current employee census data to Mercer in September 2008. The analysis in this report is based on that information, as summarized in Section 6.

MnSCU also provided historical salary, termination, retirement, and retirement plan election information for the last 10 years. In our analysis of this historical data, we observed that MnSCU faculty have very low turnover rates. Salary experience was slightly lower than the salary increase rates assumed for TRA. MnSCU faculty retirement rate patterns were difficult to ascertain, as the number of career faculty retiring was not statistically credible, and the experience of second career, short term hires who are unlikely to be on a tenure track is not useful. We did evaluate the overall retirement patterns of all MnSCU employees, and finding that consistent with our experience at other higher education institutes, adopted it. The results of this experience analysis are shown in Section 3.

In Section 3, we also provide a summary of actual MnSCU employee elections into TRA or IRAP, and address the factors that would affect decisions regarding TRA coverage.

Section 5 includes an analysis of the current service purchase methodology. We compared service purchase prices for MnSCU IRAP faculty to the actuarial accrued liability that would be incurred by TRA through the purchase of service. For 55% of the group studied, the purchase price is at least as great as the liability. For the remaining 45%, the purchase price is less than the liability. In total, as of July 1, 2008, the total purchase amount for MnSCU IRAP faculty was $8.0 million more than (2.2% more than) the total actuarial accrued liability of $361.3 million (assuming no adverse selection by IRAP members).

No methodology exists that would produce an equitable result and a precise match of the actuarial accrued liability, so this should be considered a method that comes very close to actuarial equivalence with a small margin for adverse selection.

We determined liabilities and normal cost for active MnSCU employees under a number of different scenarios. First, we compared baseline TRA valuation results as of July 1, 2008 for active MnSCU employees in TRA and active K-12 employees in TRA. Currently, 4.5% of the active members are MnSCU employees, and 7.4% of the active actuarial accrued liability of TRA is attributable to MnSCU members. We also found that the normal cost as a percent of payroll is higher for MnSCU members in TRA (9.8% of pay) versus K-12 members in TRA (8.7% of pay).

Next, we determined the liability that could potentially be added to TRA due to addition of MnSCU faculty currently in IRAP. We also considered valuation results under the alternate assumptions developed in our experience analysis. These alternate results may be more representative of MnSCU costs since they are based on expected MnSCU faculty experience. Our results are summarized below:

MnSCU IRAP Faculty	**TRA Valuation Assumptions**	**MnSCU Alternate Assumptions**
Including Past Service in TRA		
Increase in accrued liability (millions)	$ 361	$ 363
Increase in annual normal cost (millions)	29	28
Normal cost as a % of pay (MnSCU IRAP Faculty Only)	9.97%	9.75%
Initial increase/(decrease) in TRA required contribution (% of pay) – no member charge		
Increase/(decrease) in TRA normal cost	0.08%	0.07%
Increase/(decrease) in TRA payment on unfunded liability	0.09%	0.09%
Total increase/(decrease) in TRA required contribution	0.17%	0.16%
Initial increase/(decrease) in TRA required contribution (% of pay) – member charge equals accrued liability		
Increase/(decrease) in TRA normal cost	0.08%	0.07%
Increase/(decrease) in TRA payment on unfunded liability	(0.42%)	(0.41%)
Total increase/(decrease) in TRA required contribution	(0.34%)	(0.34%)
Without Past Service in TRA		
Increase in accrued liability (millions)	$ 0	$ 0
Increase in annual normal cost (millions)	42	43
Normal cost as a % of pay (MnSCU IRAP Faculty Only)	14.40%	15.16%
Increase/(decrease) in TRA required contribution (% of pay)		
Increase/(decrease) in TRA normal cost	0.39%	0.44%
Increase/(decrease) in TRA payment on unfunded liability	(0.42%)	(0.41%)
Total increase/(decrease) in TRA required contribution	(0.03%)	(0.03%)

The inclusion of all MnSCU IRAP faculty in the TRA plan, with future service only, does not increase TRA's accrued liability but results in a larger increase in TRA's normal cost since there is a shorter TRA career to accumulate projected benefits. On the other hand, since there is a significant increase in payroll, the supplemental amortization of the unfunded liability decreases and the net result is a minimal change to the required contribution as a percent of pay.

Adverse selection creates a potential for additional costs. The liabilities in this report have been determined for all active IRAP faculty. In reality, given a choice, some IRAP members will choose to remain in IRAP, and some will choose to enter TRA. Adverse selection represents the additional liability that could occur as individuals make the choice that is most beneficial for them. For example, costs in a defined benefit plan are higher for older employees than for younger employees. Older employees tend to value defined benefit plans more than younger employees, while defined contribution plans may have more value to younger employees. If all employees make the "correct" choice – the one that has more financial value to the individual – then TRA's costs will rise due to this adverse selection. Accurately predicting the degree and financial affect of adverse selection is not possible, but significant adverse selection would have a measurable impact.

Key Points

- At current TRA contribution rates, allowing MnSCU tenure track faculty to transfer into TRA will not increase TRA's deficiency, ignoring adverse selection, as long as those members are required to purchase past service.

- At current TRA contribution rates, allowing MnSCU tenure track faculty to transfer into TRA without purchasing past service will create an approximately 3.4% of pay contribution shortfall for each transfer, ignoring adverse selection. However, because this shortfall is approximately equal to the current deficiency, the net result is a minimal change to TRA's required contribution.

- TRA is currently in a deficiency position. If employee / employer contributions are increased to cover the deficiency for current TRA members, then the addition of MnSCU members at these higher contribution rates will improve the overall sufficiency of TRA's contributions, again ignoring adverse selection.

- On average, the current service purchase methodology does not produce significant gains and losses. However, we are concerned about the effect of adverse selection. The method does tend to produce losses for TRA for individuals who purchase service after age 50. Typically the older the individual, the more significant the loss. We expect that older individuals are more likely to purchase service than younger individuals, assuming they can afford to do so.

- Again, we are concerned that significant adverse selection, if it occurs, could cause measurable losses. We encourage monitoring of any permitted election so as to assess the ongoing level of adverse selection.

Certification

This report has been prepared exclusively for the Teachers Retirement Association of Minnesota and the Legislative Commission on Pensions and Retirement to make the assessments described on the first page of this report under generally accepted actuarial standards. Mercer is not responsible for consequences arising from the use of any elements of this report for any other than their intended purpose. Determinations for other purposes may be significantly different from the results shown in this report.

Over time, a plan's total cost will depend on a number of factors, including the amount of benefits it pays, the number of people to whom it pays them, and the amount earned on any assets invested to pay the benefits. These amounts and others are uncertain and unknowable at the valuation date, but are predicted to fall within a reasonable range of possibilities. To prepare this report, *actuarial assumptions*, as described within, are used to select a single scenario from the range of possibilities. The results of that single scenario are included in this report as a baseline. However, the future is uncertain and the plan's actual experience will differ from those assumptions; these differences may be significant or material. In addition, different assumptions or scenarios may also be within the reasonable range and results based on those assumptions would be different. Actuarial assumptions may also be changed from valuation to valuation based on experience, changes in expectations about the future, and other factors. Evaluating the effect of changes in assumptions, other than those described herein, is beyond the scope of this assignment.

Because actual plan experience will differ from the assumptions, decisions about benefit changes, investment policy, funding amounts, benefit security and/or benefit related issues should be made only after careful consideration of alternative future financial conditions and scenarios, and not solely on the basis of a report.

We used and relied on financial data submitted by TRA without further audit. We have also used and relied on participant data supplied by TRA and by MnSCU; this data would customarily not be verified by TRA's actuary. TRA and MnSCU are solely responsible for the validity and completeness of this information.

All costs, liabilities and other factors for TRA were determined in accordance with generally accepted actuarial principles and procedures, in accordance with the provisions of current federal and state statutes and regulations issued thereunder. The economic assumptions are set in Minnesota Statutes, and the remaining assumptions are adopted by the Legislative Commission on Pensions and Retirement. We believe that these assumptions are reasonable. Substantial portions of the information provided in this report come from our July 1, 2008 valuation report.

Professional Qualifications

We are available to answer any questions on the material contained in the report, or to provide explanations or further details as may be appropriate. The undersigned credentialed actuaries meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report. We are not aware of any direct or material indirect financial interest or relationship, including investments or other services that could create a conflict of interest, that would impair the objectivity of our work.

The information contained in this document (including any attachments) is not intended by Mercer to be used, and it cannot be used, for the purpose of avoiding penalties under the Internal Revenue Code that may be imposed on the taxpayer.

James F. Verlautz

James F. Verlautz, FSA, EA, MAAA
Principal

Date 1/21/2009

Bonita J. Wurst

Bonita J. Wurst, ASA, EA, MAAA
Principal

Date 1/21/2009

Mercer
333 South 7th Street, Suite 1600
Minneapolis, MN 55402-2427
612 642 8600

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Background

The history of the relationship between MnSCU and TRA has been complex, and continues to evolve. The following history was provided to Mercer by TRA:

> Prior to 1989, State University and Community College faculty were covered by TRA. Technical College faculty were employed by K-12 districts and also covered by TRA. The State University System and the Community College Board Office were separate state agencies and the faculties of both organizations were covered by TRA.
>
> For employees hired on or after July 1, 1989, IRAP coverage was mandatory for State University and Community College faculty unless they had prior service with a teacher plan. Those with prior coverage with TRA could continue with TRA or elect IRAP.
>
> Beginning in 1989, however, State University and College faculty who had teaching service prior to July 1, 1989 were granted the option to elect to be covered under either TRA or a newly-created Individual Retirement Account Plan (IRAP) for prospective retirement coverage. Employees with less than 3 years of service could transfer their TRA employee contributions, plus interest to IRAP. If an employee had over 3 years of service, the employee contributions and service credit remained at TRA.
>
> The IRAP plan was expanded to include Technical College managerial employees in 1993, and Technical College faculty in 1994.
>
> The 1994 Legislature enacted a bill that required that all existing faculty elect retirement coverage, despite some faculty having already participated in an election. TRA, MnSCU, and MnSCU's third-party provider, Norwest Banks, worked jointly to conduct an election via certified mail to the employee's home. The election was conducted in late 1994 and early 1995. Faculty members had a 90 day period to elect their retirement coverage. During the election process, Community College and State University faculty not electing a retirement plan were defaulted to the IRAP plan. Technical College faculty not electing a retirement plan defaulted to TRA. Upon completion of the election, all existing State University, Community College and Technical College faculty had elected their choice of retirement coverage, or defaulted to the statutory plan defined by the Legislature.

On July 1, 1995, the Community Colleges, Technical Colleges and State Universities merged into Minnesota State Colleges and Universities (MnSCU). All faculty first hired beginning July 1, 1995 had a 90-day election period for choosing retirement coverage: IRAP or TRA. In 1995, the default was IRAP for the Community Colleges and State Universities. For Technical Colleges the default was TRA.

In 1997, the default for all faculty was changed to IRAP. This was somewhat due to the fact that many faculty work at more than one campus (Technical College and Community College, etc.).

In 2001, a bill was passed that allowed any TRA member with an IRAP account, who had less than 10 years of TRA service credit, the option of transferring their TRA member contributions – not employer contributions – to their IRAP account with 6 percent interest. This law expired on July 1, 2004.

In 2005, the election period for new faculty to choose between TRA and IRAP increased from 90 days to 1 year.

In 2008, proposed legislation was considered which would have allowed tenured faculty in IRAP another opportunity (1 year) to elect TRA coverage. If a member elected TRA coverage under this proposed legislation, the member would be required to purchase TRA service credit for all years covered by IRAP. IRAP funds could be used to make the purchase. The proposed legislation was not enacted. However, this actuarial impact study was mandated.

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Experience Analysis

The purpose of this experience analysis is to evaluate whether there are any significant differences between MnSCU faculty and TRA members in some of the behavior and experience that drives retirement plan costs. We evaluated turnover patterns, retirement patterns, and salary experience. Differences were used to formulate a set of alternate actuarial assumptions for MnSCU faculty, which serve as the basis for the alternate liability estimates in Section 4.

We also summarize historical elections into TRA or IRAP, and address factors that would impact decisions regarding TRA coverage.

The individuals included in this study were members of MnSCU during the period from July 1, 1999 through June 30, 2008. In addition, census information gathered for the last five actuarial valuations of TRA was included in our analysis, as appropriate.

Actual terminations, either due to withdrawal or retirement, were reported by MnSCU. A number of members who were reported early in the ten year period were not reported by the end of the period, with no termination date provided. For these members, we assumed a termination or retirement occurred in the first year not reported. For example, if a member was reported as an active member on July 1, 1999, 2000, 2001, and then not reported in 2002-2008, we assumed this member terminated on January 1, 2002. In total, there were 1,840 reported terminations and 3,425 assumed terminations during the ten year time period.

Results – Withdrawal Decrement

The TRA valuation assumes members with less than three years of service will terminate at a higher rate than those at the same age with more than 3 years of service. The TRA valuation assumptions are turnover rates of 40% to 45% in the first year, 10% to 12% in the second year, and 6% to 8% in the third year. We found much lower rates of turnover in the first 3 years in our MnSCU member analysis. MnSCU members with less than 5 years of service terminated at a slightly higher rate than those with 5 or more years of service.

We analyzed the experience of the members of the MSCF bargaining unit. The turnover experience for this group was marginally lower than TRA's ultimate turnover rates.

	MN State College Faculty Females			TRA Females	MN State College Faculty Males			TRA Males
Age	Actual Terms	Potential Terms	Rate of Turnover	Rate of Turnover	Actual Terms	Potential Terms	Rate of Turnover	Rate of Turnover
< 20	0	0	0.0%	4.5%	0	1	0.0%	3.5%
20-24	0	18	0.0%	4.5%	2	33	6.1%	3.5%
25-29	3	143	2.1%	4.5%	14	210	6.7%	3.0%
30-34	14	559	2.5%	4.4%	16	695	2.3%	2.6%
35-39	21	989	2.1%	3.5%	29	1,158	2.5%	2.5%
40-44	22	1,489	1.5%	2.3%	26	1,471	1.8%	2.3%
45-49	30	2,035	1.5%	2.0%	33	1,905	1.7%	2.0%
50-54	38	2,453	1.5%	1.8%	43	2,248	1.9%	1.8%
Total	**128**	**7,686**	**1.7%**	**3.3%**	**163**	**7,721**	**2.1%**	**2.5%**

Conclusions – Withdrawal Decrement

In our experience analysis, we saw little differences in turnover over different years of service. Turnover beyond the 3-year select period (i.e. the ultimate rate) for both TRA and MnSCU faculty is quite low. For purposes of this analysis, we do not believe this data justifies an adjustment to the TRA ultimate rates. As such, for the alternate assumption set used in Section 4, we removed TRA's select period on the withdrawal assumption, and used TRA's ultimate turnover rates without adjustment.

Results – Non Rule of 90 Retirement Decrement

For retirement, we assumed the behavior for MnSCU employees eligible for TRA's Rule of 90 retirement provision would follow the same pattern as TRA members eligible for Rule of 90. Therefore, for purposes of this analysis, we excluded TRA members who were hired prior to July 1, 1989, and focused on the MnSCU employees in IRAP and in TRA if hired on July 1, 1989 or later.

For ages 60 and under, we found that MnSCU retirement rates are very similar to Tier II TRA members, i.e. those hired post-July 1, 1989. However, beyond age 60, MnSCU members retire at a fairly steady rate and there are no retirement "spikes" at age 65 or other ages.

	Results of Analysis – MnSCU			**TRA Assumption**
Age	Actual Retirements	Potential Retirements	Rate of Retirement	Non Rule of 90 Rate of Retirement
55	162	2,302	7%	7%
56	146	2,023	7%	7%
57	159	1,779	9%	7%
58	124	1,497	8%	8%
59	126	1,294	10%	10%
60	120	1,131	11%	12%
61	99	936	11%	18%
62	115	739	16%	20%
63	75	573	13%	20%
64	72	454	16%	20%
65	57	361	16%	45%
66	43	306	14%	35%
67	36	215	17%	35%
68	25	154	16%	35%
69	13	128	10%	35%
70	14	88	16%	35%
71+	44	258	17%	100%

The data set used to analyze retirement patterns includes a broad group of MnSCU employees. We also reviewed retirement patterns specifically for MnSCU faculty, but found that the amount of retirement experience data available for this group was too small to allow statistically credible conclusions to be drawn.

Conclusions – Retirement Decrement

For the alternate assumption set used in Section 4, for non-Rule of 90 rates, we used TRA's retirement assumption for ages 60 and under; for ages beyond 60, we assumed 15% would retire each year, with an exception of 12% at age 61, 25% at age 65 and 100% at age 71. We used TRA's Rule of 90 rates without adjustment.

Salary Scale

Currently, TRA uses an age-related salary increase assumption with rates ranging from 5.5% to 4.5%. In addition, members are assumed to earn an additional productivity increase in the first ten years of employment.

The salary increase study examined fiscal year pay for each year from July 1, 1999 through June 30, 2008. For each faculty member who was active on two consecutive valuation dates, with at least two years of service, we calculated the salary increase as a percentage of the prior year's pay. These actual salary increases were summarized in five-year age and service groupings. We also reviewed the salary increases during the first ten years of membership.

For purposes of comparing actual salary increases to assumed salary increases, we excluded all individuals whose pay increased or decreased 20% or more. While this was a relatively small group, their salary increases distorted the experience of the overall group of continuing active members.

We reviewed the salary data by both age and service. The first table listed below shows, by five-year age groups, the average salary increase over the entire study period and the average salary increase for each year in the study period. The table also shows the total average salary increase for each year in the experience study. The table on the next page shows the salary experience by service groups.

Salary Scale by Age for Faculty

	Average Salary Increases									
Age	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**50-54**	**55-59**	**60-64**	**65+**	**Total**
1999-2000	3.2%	3.0%	3.9%	1.9%	2.7%	3.1%	2.7%	1.9%	0.5%	2.8%
2000-2001	4.3%	4.3%	5.1%	4.6%	5.5%	4.4%	4.6%	4.0%	3.4%	4.8%
2001-2002	1.1%	3.2%	3.2%	2.9%	3.9%	3.2%	2.7%	2.4%	2.9%	3.1%
2002-2003	4.5%	6.5%	6.1%	5.2%	6.3%	6.0%	6.2%	6.4%	7.3%	6.0%
2003-2004	-0.7%	-0.6%	-0.1%	-0.4%	0.5%	0.7%	-0.2%	0.8%	1.4%	0.2%
2004-2005	5.2%	4.0%	3.0%	2.9%	2.8%	2.2%	1.3%	1.8%	0.5%	2.3%
2005-2006	2.6%	1.9%	1.9%	1.3%	0.9%	0.2%	-0.4%	-0.8%	-2.2%	0.4%
2006-2007	4.4%	4.8%	4.0%	4.3%	4.1%	4.0%	4.5%	4.3%	3.3%	4.2%
2007-2008	4.5%	4.3%	3.4%	4.1%	4.8%	4.6%	4.9%	5.3%	4.6%	4.6%
All Years	**3.3%**	**3.5%**	**3.2%**	**2.9%**	**3.3%**	**2.9%**	**2.7%**	**3.0%**	**2.4%**	**3.0%**
Observed TRA Rates*	**7.2%**	**6.2%**	**5.9%**	**4.6%**	**4.3%**	**3.5%**	**3.4%**	**3.9%**	**4.5%**	**N/A**

Salary Scale by Service for Faculty

	Average Salary Increases									
Years	**<2**	**3**	**4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30+**	**Total**
1999-2000	4.9%	3.4%	2.9%	2.3%	2.8%	1.5%	3.6%	2.8%	-8.3%	2.8%
2000-2001	3.9%	4.3%	4.7%	5.2%	4.9%	4.1%	5.1%	4.6%	2.6%	4.8%
2001-2002	3.2%	3.0%	3.2%	3.7%	2.8%	2.9%	2.6%	1.5%	3.7%	3.1%
2002-2003	4.7%	5.4%	5.2%	5.6%	6.5%	6.9%	6.9%	7.4%	8.6%	6.0%
2003-2004	0.8%	-0.2%	-0.4%	-0.7%	0.6%	0.9%	2.1%	-0.7%	2.6%	0.2%
2004-2005	3.6%	2.2%	3.3%	3.1%	2.0%	1.9%	1.7%	0.8%	2.3%	2.3%
2005-2006	2.4%	1.4%	1.8%	1.6%	1.0%	0.0%	-2.0%	-3.9%	-3.5%	0.4%
2006-2007	2.8%	2.8%	4.0%	4.2%	3.9%	4.1%	5.4%	6.1%	5.7%	4.2%
2007-2008	3.0%	3.9%	4.8%	3.6%	4.8%	4.5%	5.7%	6.6%	7.3%	4.6%
All Years	**3.1%**	**2.6%**	**3.3%**	**3.0%**	**3.2%**	**2.7%**	**3.0%**	**2.7%**	**3.7%**	**3.0%**

Conclusions – Salary Scale

In our experience analysis, we saw little difference in a member's early career in the rate of salary growth. Salary increase experience does not seem to be related to years of service. While the salary increases for the most significant years (age 40-65) are somewhat less for MnSCU than for TRA, we note that the study periods are different and the TRA observed rates are slightly increased as a result of including select period increases. We are not sure why MnSCU would continue to sustain lower compensation increases than for teachers as a whole, unless the rates have been skewed by data for non-tenured adjunct faculty, and are unconvinced that such low rates for tenured faculty would be sustainable or consistent with the 8.5% return on assets assumption. As such, for the alternate assumption set used in Section 4, we removed TRA's select period on the salary scale assumption and used TRA's ultimate salary increase rates without adjustment.

* *Actual TRA experience for the period July 1, 2000 through June 30, 2004 as provided on the experience study prepared by the Segal Company.*

TRA/IRAP Elections

MnSCU provided the following historical information regarding actual participant elections into TRA or IRAP.

Year	Total Eligible Employees	Elected TRA	% Elected TRA	Elected IRAP	% Elected IRAP	Defaulted to IRAP	% Defaulted to IRAP
1999	946	153	16.17%	492	52.01%	301	31.82%
2000	900	148	16.44%	499	55.44%	253	28.11%
2001	1040	180	17.31%	428	41.15%	432	41.54%
2002	1070	198	18.50%	376	35.14%	496	46.36%
2003	998	228	22.85%	348	34.87%	422	42.28%
2004	951	210	22.08%	312	32.81%	429	45.11%
2005*	167	54	32.34%	78	46.71%	35	20.96%

* *Data available for first three months only. Effective 7/1/05, eligible participants are all placed into IRAP and have up to one year to elect TRA*

The chart above shows that between 1999 and 2005, a range of 16% to 32% of eligible participants elected TRA, a range of 32% to 55% elected IRAP, and a significant number, 21% to 46% of eligible participants, did not make an election and therefore defaulted to IRAP.

The elections summarized above were made by MnSCU employees during their first year of employment. Election decisions are difficult to predict, but if MnSCU participants are given an opportunity to choose between IRAP and TRA at the time tenure is attained, we would expect somewhat higher numbers to elect TRA than the elections made during the first year of employment. Some considerations that could affect retirement plan decisions are as follows:

- Defined benefit plans may be more appealing to employees who expect to be long service employees.
- When stock market investment returns are "good", defined contribution plans may be more appealing
- When stock market investment returns are "poor", defined benefit plans are appealing because the investment risk is borne by the plan instead of the employee
- Individual tolerance for risk
- Individual comfort level and knowledge regarding investments
- If employees are required to purchase past service, the affordability of the required service purchase amount (perhaps relative to the IRAP account level) will affect election decisions

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Valuation Results as of July 1, 2008

Current TRA Members

TRA Plan Baseline (000's)	**MnSCU College & University**	**K-12**	**Total**
Active Actuarial Accrued Liability	$ 591,349	$ 7,397,409	$ 7,988,758
Normal Cost	21,783	315,498	337,281
Projected Pay	222,395	3,623,795	3,846,190
Normal Cost as a Percent of Pay	9.79%	8.71%	8.77%
Number of Members	3,460	73,055	76,515

As of July 1, 2008, 4.5% of TRA's active members are MnSCU employees, and 7.4% of the active actuarial accrued liability of TRA is attributable to MnSCU members. We also found that the normal cost as a percent of payroll is higher for MnSCU members in TRA (9.8% of pay) versus K-12 members in TRA (8.7% of pay).

Current IRAP Faculty

Next, we examined the affect on TRA if current IRAP faculty are granted membership in TRA. For both the tables below, we assumed that all IRAP faculty entered TRA on July 1, 2008. For purposes of this study, faculty is everyone in the MSCF and IFO bargaining units. A total of 5,317 faculty members were valued.

We evaluated the affect on the TRA plan under TRA's current actuarial assumptions. We also looked at the affect if these members were valued under the alternate assumption set that better reflected the experience of this group. As shown below, the revised assumptions did not have a major effect on the results.

MnSCU IRAP Faculty Including Past Service (000's)	**TRA Valuation Assumptions**	**MnSCU Alternate Assumptions**
Active Actuarial Accrued Liability	$ 361,307	$ 363,207
Normal Cost	28,802	27,874
Projected Pay	288,816	285,968
Normal Cost as a Percent of Pay (MnSCU IRAP Faculty Only)	9.97%	9.75%
Initial increase/(decrease) in TRA required contribution* (% of pay) – no member charge		
Increase/(decrease) in TRA normal cost	0.08%	0.07%
Increase/(decrease) in TRA payment on unfunded liability	0.09%	0.09%
Total increase/(decrease) in TRA required contribution	0.17%	0.16%
Initial increase/(decrease) in TRA required contribution* (% of pay) – member charge equals accrued liability		
Increase/(decrease) in TRA normal cost	0.08%	0.07%
Increase/(decrease) in TRA payment on unfunded liability	(0.42%)	(0.41%)
Total increase/(decrease) in TRA required contribution	(0.34%)	(0.34%)

MnSCU IRAP Faculty Future Service Only (000's)	**TRA Valuation Assumptions**	**MnSCU Alternate Assumptions**
Active Actuarial Accrued Liability	$ 0	$ 0
Normal Cost	41,596	43,349
Projected Pay	288,816	285,968
Normal Cost as a Percent of Pay (MnSCU IRAP Faculty Only)	14.40%	15.16%
Initial Increase / (decrease) in TRA required contribution*		
Increase/(decrease) in TRA normal cost	0.39%	0.44%
Increase/(decrease) in TRA payment on unfunded liability	(0.42%)	(0.41%)
Total increase/(decrease) in TRA required contribution	(0.03%)	0.03%

* *Impact on contribution deficiency will not be precisely identical to the change in required contribution since the statutory contributions as percent of pay would decrease slightly due to additional payroll.*

The effects on required contribution rates shown here assume all eligible individuals elect TRA coverage. The effect can be summarized as follows:

- At current TRA contribution rates, allowing MnSCU tenure track faculty to transfer into TRA will not increase TRA's deficiency, ignoring adverse selection, as long as those members are required to purchase past service.
- At current TRA contribution rates, allowing MnSCU tenure track faculty to transfer into TRA without purchasing past service will create an approximately 3.4% of pay contribution shortfall for each transfer, ignoring adverse selection. However, because this shortfall is approximately equal to the current deficiency, the net result is a minimal change to TRA's required contribution.
- TRA is currently in a deficiency position. If employee / employer contributions are increased to cover the deficiency for current TRA members, then the addition of MnSCU members at these higher contribution rates will improve the overall sufficiency of TRA's contributions, again ignoring adverse selection.

Adverse Selection

Adverse selection creates a potential for additional costs. The liabilities in this report have been determined for all active IRAP faculty. In reality, given a choice, some IRAP members will choose to remain in IRAP, and some will choose to enter TRA. Adverse selection represents the additional liability that could occur as individuals make the choice that is most beneficial for them. For example, costs in a defined benefit plan are higher for older employees than for younger employees. Older employees tend to value defined benefit plans more than younger employees, while defined contribution plans may have more value to younger employees. If all employees make the "correct" choice – the one that has more financial value to the individual – then TRA's costs will rise due to this adverse selection. Accurately predicting the degree and financial affect of adverse selection is not possible, but significant adverse selection would have a measurable impact.

We encourage monitoring of any permitted election to assess the ongoing level of adverse selection.

5

Analysis of Service Purchase Methodology

Minnesota Statutes Section 356.551, subdivision 2, provides a methodology to be used for the purchase of prior service credit. The method requires the following steps:

1. Determine the earliest age at which the member becomes eligible for an unreduced benefit with purchase of service.
2. Calculate projected benefits payable at earliest retirement age including the purchased service, assuming future service is earned and pay increases as assumed in the valuation.
3. Calculate projected benefits payable at earliest retirement age not including the purchased service, assuming future service is earned and pay increases as assumed in the valuation.
4. Calculate the present value at the earliest retirement age of the difference between the benefits determined in steps 2 and 3, assuming 6% interest and the mortality table used by TRA for administrative purposes (currently 1983 Group Annuity Mortality for males, set back 8 years).
5. Discount the present value determined in step 4 to the purchase date with interest at 8.5% and the mortality table used by TRA for administrative purposes.
6. Calculate the minimum service purchase amount, equal to the sum of the contributions that would have been made on behalf of member for the purchased years of service, plus interest at the rate of 8.5% annually.
7. The prior service credit purchase amount is the greater of the present value determined in step 5 and the minimum service purchase amount determined in step 6.

We performed an analysis of the service purchase methodology by comparing service purchase amounts for MnSCU IRAP faculty to the actuarial accrued liability that would be incurred by TRA through the purchase of service (using TRA's baseline actuarial assumptions). As of July 1, 2008, the total purchase amount for MnSCU IRAP faculty was $8.0 million (2.2%) more than the total actuarial accrued liability of $361.3 million.

In total, out of 5,317 MnSCU IRAP faculty, 2,933 (55%) have a purchase amount that is greater than the actuarial accrued liability, 2,320 (44%) have a purchase amount that is less than the actuarial accrued liability, and the remaining 64 employees (1%) are neutral because they are new employees who do not have any service to purchase (or any actuarial accrued liability). Distributions of these groups by age and service are shown in the following tables:

Number of IRAP Service Purchases Resulting in Gain to TRA

	Years of Service								
Age	**<5**	**5 - 9**	**10 - 14**	**15 - 19**	**20 – 24**	**25 - 29**	**30 - 34**	**35+**	**Total**
20 - 24	9								**9**
25 - 29	158	17		1					**176**
30 - 34	309	135	13						**457**
35 - 39	347	251	83	6					**687**
40 - 44	153	201	166	50	1				**571**
45 - 49	60	25	131	107	10	2	1		**336**
50 - 54	51		34	156	33	5			**279**
55 - 59	62	3	6	41	21	17	10	2	**162**
60 - 64	39	20	23	31	14	14	8	1	**150**
65 - 69	8	13	20	13	10		3	1	**68**
70 - 74	4	9	8	5	2	2	1	1	**32**
75+		3	1	1	1				**6**
Total	**1,200**	**677**	**485**	**411**	**92**	**40**	**23**	**5**	**2,933**

Number of IRAP Service Purchases Resulting in Loss to TRA

	Years of Service								
Age	**<5**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35+**	**Total**
20 - 24									
25 - 29	1								**1**
30 - 34	4	2	1						**7**
35 - 39	15	6							**21**
40 - 44	111	74	2	1	5				**193**
45 - 49	163	233	40	2	20	2			**460**
50 - 54	140	218	164	24	36	2	3		**587**
55 - 59	102	174	153	129	57	19	4		**638**
60 - 64	47	87	59	74	29	11	1		**308**
65 - 69	20	36	9	16	1		1		**83**
70 - 74	3	11	4	2					**20**
75+			1	1					**2**
Total	**606**	**841**	**433**	**249**	**148**	**34**	**9**	**0**	**2,320**

The vast majority of service purchases made by members age 40 and under result in gains to the Plan. Between ages 40 and 50, results are mixed with losses occurring in more significant numbers for members purchasing less than 10 years of service. At age 50 and up, more losses occur than gains. Some of those losses could be significant. We expect that older individuals are more likely to purchase service than younger individuals, assuming they can afford to do so. As in Section 4, this produces the possibility of adverse selection.

6

Summary of Participant Data

	College & University	K-12	Total
Active TRA Members			
– Number	3,460	73,055	76,515
– Projected annual earnings (000's)	222,395	3,623,795	$ 3,846,190
– Average annual earnings (projected)	64,276	49,604	$ 50,267
– Average age	51.3	42.5	43.4
– Average service	14.1	11.4	11.9

	IRAP	TRA	Total
MnSCU Active Employees			
– Number	6,910*	3,460	10,370
– Projected annual earnings (000's)	318,100	222,395	540,495
– Average annual earnings (projected)	46,035	64,276	52,120
– Average age	45.9	51.3	47.7
– Average service	7.5	14.1	9.7

* *Of these 6,910 MnSCU IRAP members, 5,317 are in the MSCF or IFO bargaining units and are considered "faculty" for the purpose of this study. The average age, service, and projected pay for this group is 46.8 years, 7.8 years, and $54,330, respectively, and projected annual earnings are $289 million.*

Distribution of Active Participants – TRA College and University

	Years of Service as of June 30, 2008									
Age	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 +**	**Total**
0 – 19										**0**
Avg. Earnings										
20 – 24	8									**8**
Avg. Earnings	18,785									**18,785**
25 – 29	50	7								**57**
Avg. Earnings	34,187	42,880								**35,255**
30 – 34	87	67	12							**166**
Avg. Earnings	33,799	48,764	61,759							**41,860**
35 – 39	102	88	61	7						**258**
Avg. Earnings	36,765	51,612	60,270	63,878						**48,122**
40 – 44	104	80	59	39	14					**296**
Avg. Earnings	37,112	58,836	67,660	64,699	62,423					**53,904**
45 – 49	118	98	96	71	76	17				**476**
Avg. Earnings	33,743	58,145	65,953	69,156	71,915	74,760				**58,105**
50 – 54	136	112	92	93	122	77	36			**668**
Avg. Earnings	31,773	58,064	65,436	68,869	72,922	77,814	83,680			**61,602**
55 – 59	119	106	98	124	143	159	112	12		**873**
Avg. Earnings	31,009	51,147	63,809	65,084	77,746	81,247	85,752	82,424		**66,512**
60 – 64	60	51	41	48	105	85	60	46	3	**499**
Avg. Earnings	28,818	53,085	61,052	67,553	78,974	81,437	88,367	100,843	82,162	**71,310**
65 – 69	20	9	20	12	22	14	14	17	3	**131**
Avg. Earnings	21,648	52,092	57,443	72,081	90,337	90,263	97,637	103,228	100,237	**73,200**
70 – 74	4	3	3			3	1	4	2	**20**
Avg. Earnings	6,108	53,066	85,105			87,066	111,417	100,166	87,969	**69,408**
75+	3			2				1	2	**8**
Avg. Earnings	1,843			44,701				104,530	95,806	**48,884**
Total	**811**	**621**	**482**	**396**	**482**	**355**	**223**	**80**	**10**	**3,460**
Avg. Earnings	**32,792**	**54,387**	**64,153**	**67,052**	**76,003**	**80,642**	**86,982**	**98,599**	**91,475**	**61,071**

Earnings in this exhibit represent actual pay for July 1, 2007 to June 30, 2008 fiscal year.

Distribution of Active Participants – TRA K – 12

	Years of Service as of June 30, 2008									
Age	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 +**	**Total**
0 – 19	3									**3**
Avg. Earnings	194									**194**
20 – 24	2,381									**2,381**
Avg. Earnings	21,117									**21,117**
25 – 29	7,656	1,736	1							**9,393**
Avg. Earnings	30,809	43,969	32,773							**33,241**
30 – 34	3,125	5,285	1,230							**9,640**
Avg. Earnings	29,419	46,130	55,390							**41,894**
35 – 39	2,180	2,672	4,314	893						**10,059**
Avg. Earnings	25,014	45,848	56,391	63,409						**47,414**
40 – 44	1,844	1,598	2,274	2,880	583					**9,179**
Avg. Earnings	22,020	44,897	58,808	63,175	66,702					**50,124**
45 – 49	1,711	1,486	1,418	1,822	2,251	484				**9,172**
Avg. Earnings	21,273	44,653	54,061	61,933	65,543	66,104				**51,437**
50 – 54	1,315	1,081	1,392	1,429	1,421	2,146	952			**9,736**
Avg. Earnings	18,075	42,451	53,741	60,262	64,887	66,499	68,386			**54,954**
55 – 59	1,011	826	1,035	1,294	1,215	1,338	2,340	489		**9,548**
Avg. Earnings	17,244	40,889	52,002	59,718	65,009	67,137	69,080	70,010		**57,290**
60 – 64	579	302	382	475	449	399	239	302	37	**3,164**
Avg. Earnings	11,001	34,216	48,928	57,729	63,599	65,467	71,724	72,360	72,472	**50,306**
65 – 69	257	76	47	48	41	34	22	21	19	**565**
Avg. Earnings	6,156	28,655	45,174	55,157	63,949	70,007	72,157	74,809	73,671	**32,019**
70 – 74	88	12	7	5	2	2	5	1	3	**125**
Avg. Earnings	4,181	14,010	26,179	39,686	48,988	47,796	68,267	148,441	52,722	**14,074**
75+	62	17	8	1	1	1				**90**
Avg. Earnings	13,020	41,034	60,524	68,229	36,950	36,374				**23,673**
Total	**22,212**	**15,091**	**12,108**	**8,847**	**5,963**	**4,404**	**3,558**	**813**	**59**	**73,055**
Avg. Earnings	**25,209**	**44,647**	**54,932**	**61,618**	**65,224**	**66,567**	**69,090**	**71,103**	**71,854**	**47,005**

Earnings in this exhibit represent actual pay for July 1, 2007 to June 30, 2008 fiscal year.

Distribution of Active Participants – MnSCU Active Employees

	Years of Service as of June 30, 2008									
Age	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 +**	**Total**
0 – 19										**0**
Avg. Earnings										
20 – 24	61	2								**63**
Avg. Earnings	20,282	19,109								**20,245**
25 – 29	444	42								**486**
Avg. Earnings	30,960	35,679								**31,368**
30 – 34	582	249	38							**869**
Avg. Earnings	37,608	45,174	40,597							**39,907**
35 – 39	622	413	182	17						**1,234**
Avg. Earnings	40,620	47,170	55,055	58,704						**45,190**
40 – 44	479	407	247	108	20					**1,261**
Avg. Earnings	39,681	51,030	61,219	64,939	60,031					**50,048**
45 – 49	446	427	299	213	100	19	1			**1,505**
Avg. Earnings	39,873	54,522	60,159	68,634	69,625	67,802	77,430			**54,484**
50 – 54	403	394	324	292	194	93	41			**1,741**
Avg. Earnings	36,458	52,335	57,558	67,622	72,626	76,033	78,584			**56,341**
55 – 59	352	328	276	318	208	198	129	14		**1,823**
Avg. Earnings	35,387	48,319	54,947	67,729	77,242	81,382	82,698	81,036		**59,786**
60 – 64	169	175	123	171	139	102	67	48	3	**997**
Avg. Earnings	35,040	42,919	52,592	69,348	76,926	80,902	89,565	98,431	82,162	**61,862**
65 – 69	60	54	53	44	30	18	17	18	4	**298**
Avg. Earnings	27,702	38,935	42,612	55,801	85,413	83,861	100,376	99,849	93,932	**55,133**
70 – 74	15	24	17	7	1	4	1	5	2	**76**
Avg. Earnings	15,039	21,562	31,910	53,076	17,520	66,425	111,417	83,135	87,969	**34,780**
75+	3	3	3	4	1			1	2	**17**
Avg. Earnings	1,843	28,004	6,433	42,901	5,996			104,530	95,806	**34,269**
Total	**3,636**	**2,518**	**1,562**	**1,174**	**693**	**434**	**256**	**86**	**11**	**10,370**
Avg. Earnings	**36,823**	**48,848**	**56,193**	**67,096**	**74,456**	**79,493**	**85,102**	**95,077**	**89,979**	**52,120**

Earnings in this exhibit represent actual pay for July 1, 2007 to June 30, 2008 fiscal year.

Distribution of Active Participants – MnSCU Active Employees with IRAP Coverage

	Years of Service as of June 30, 2008									
Age	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 +**	**Total**
0 – 19										
Avg. Earnings										
20 – 24	53	2								**55**
Avg. Earnings	20,508	19,109								**20,457**
25 – 29	394	35								**429**
Avg. Earnings	30,550	34,239								**30,851**
30 – 34	495	182	26							**703**
Avg. Earnings	38,278	43,853	30,830							**39,446**
35 – 39	520	325	121	10						**976**
Avg. Earnings	41,376	45,967	52,426	55,082						**44,415**
40 – 44	375	327	188	69	6					**965**
Avg. Earnings	40,393	49,120	59,197	65,074	54,448					**48,866**
45 – 49	328	329	203	142	24	2	1			**1,029**
Avg. Earnings	42,078	53,443	57,419	68,373	62,375	8,663	77,430			**52,810**
50 – 54	267	282	232	199	72	16	5			**1,073**
Avg. Earnings	38,844	50,060	54,433	67,039	72,125	67,462	41,895			**53,065**
55 – 59	233	222	178	194	65	39	17	2		**950**
Avg. Earnings	37,623	46,968	50,068	69,419	76,133	81,931	62,578	72,707		**53,606**
60 – 64	109	124	82	123	34	17	7	2		**498**
Avg. Earnings	38,465	38,738	48,362	70,049	70,603	78,225	99,835	42,955		**52,396**
65 – 69	40	45	33	32	8	4	3	1	1	**167**
Avg. Earnings	30,729	36,303	33,623	49,696	71,871	61,453	113,158	42,410	75,016	**40,960**
70 – 74	11	21	14	7	1	1		1		**56**
Avg. Earnings	18,287	17,061	20,511	53,076	17,520	4,500		15,010		**22,413**
75+		3	3	2	1					**9**
Avg. Earnings		28,004	6,433	41,100	5,996					**21,279**
Total	**2,825**	**1,897**	**1,080**	**778**	**211**	**79**	**33**	**6**	**1**	**6,910**
Avg. Earnings	**37,981**	**47,035**	**52,641**	**67,118**	**70,921**	**74,331**	**72,396**	**48,124**	**75,016**	**47,638**

Earnings in this exhibit represent actual pay for July 1, 2007 to June 30, 2008 fiscal year.

7

Summary of Assumptions and Methods

Actuarial Cost Method

Liabilities and contributions in this report are computed using the Individual Entry Age Normal Cost Method, unless a different method is described elsewhere in this report. This method is prescribed by Minnesota Statutes.

The objective under this method is to fund each participants' benefits under the Plan as payments which are level as a percentage of salary, starting at original participation date (or employment date), and continuing until the assumed retirement termination, disability or death.

At the time the funding method is introduced, there will be a liability which represents the contributions which would have been accumulated if this method of funding had always been used. The difference between this liability and the assets (if any) which are held in the fund is the unfunded liability which is typically funded over a chosen period in accordance with the amortization schedule.

A detailed description of the calculation follows:

The normal costs for each active participant under the assumed retirement age is determined by applying to earnings the level percentage of salary which, if contributed each year from date of entry into the Plan until the assumed retirement (termination, disability or death) date, is sufficient to provide the full value of the benefits expected to be payable.

- The present value of present value of future normal costs is the total of the discounted values of all active participants' normal cost, assuming these to be paid in each case from the valuation date until retirement (termination, disability or death) date.
- The present value of projected benefits is calculated as the value of all benefit payments expected to be paid to the Plan's current participants, including active and retired members, beneficiaries, and terminated members with vested rights.
- The accrued liability is the excess of the present value of projected benefits over the present value of future normal cost.

- The unfunded liability is the excess of the accrued liability over the assets of the fund, and represents that part of the accrued liability which has not been funded by accumulated past contributions.

Amortization Method

The unfunded liability is amortized as a level percentage of payroll each year to the statutory amortization date of July 1, 2037 assuming payroll increases of 4.5% per year. If the unfunded Actuarial Accrued Liability is negative, the surplus amount is amortized over 30 years as a level percentage of payroll.

Asset Valuation Method

MPRIF Reserve: Market Value

Non-MPRIF Assets: The assets are valued based on a five-year moving average of expected and market values (five-year average actuarial value) determined as follows:

- At the end of each plan year, an average asset value is calculated as the average of the market asset value at the beginning and end of the fiscal year net of investment income for the fiscal year;
- The investment gain or (loss) is taken as the excess of actual investment income over the expected investment income based on the average asset value as calculated above;
- The investment gain or (loss) so determined is recognized over five years at 20% per year;
- The asset value is the sum of the expected asset value plus the scheduled recognition of investment gains or (losses) during the current and the preceding four plan years.

Valuation and Accounting Procedures

Financial and census data: We used financial data submitted by the Fund and the Fund's auditor and participant data submitted by the Fund without further audit. This information would customarily not be verified by a plan's actuary. We have reviewed the information for internal consistency and we have no reason to doubt its substantial accuracy.

Supplemental Contributions

The City of Minneapolis, the Minneapolis School District, and the State of Minnesota are scheduled to make the following supplemental contributions to the Fund:

1993 Legislation:	Supplemental contributions of $5,000,000 annually are assumed to be made until the amortization date of June 30, 2037. Amount is fixed in statute.
1996 Legislation:	Supplemental contributions of $3,716 ,000 annually are assumed to be made until the amortization date of June 30, 2037. Amount is variable as described in Minnesota Statutes, Section 423A. Assumed amount is based on actual amount received in most recent fiscal year, and information provided by the Teachers Retirement Association.
1997 Legislation:	Supplemental contributions of $12,954,000 annually are assumed to be made until the amortization date of June 30, 2037. Amount is fixed in statute.

Summary of Actuarial Assumptions

The following assumptions were used in valuing the liabilities and benefits under the plan.

Investment return	6.0% compounded annually post-retirement 8.5% compounded annually pre-retirement
Benefit increases after retirement	Payment of benefit increases after retirement accounted for by 6.00% post-retirement assumption.
Salary increases	Reported salary for prior fiscal year, with new hires annualized, increased according to the ultimate table shown in the rate table to current fiscal year and annually for each future year. During a ten-year select period, 0.30 x (10-T), where T is completed years of service is added to the ultimate rate. See table of sample rates.
Mortality Pre-retirement	1983 Group Annuity Mortality for males set back 12 years 1983 Group Annuity Mortality for females set back 10 years
Post-retirement	1983 Group Annuity Mortality for males set back 6 years 1983 Group Annuity Mortality for females set back 3 years
Post-Disability	1965 Railroad Retirement Board (RRB) rates through age 54. For ages 55 to 64, graded rates between 1965 RRB and the Healthy Post-retirement mortality table. For ages 65 and later, the Healthy Post-retirement mortality table.
Disability	Age-related rates based on experience; see table of sample rates
Withdrawal	Select and ultimate rates based on actual plan experience. Ultimate rates after the third year are shown in the rate table. Select rates are as follows:

	First Year	Second Year	Third Year
Male	45%	12%	6%
Female	40%	10%	8%

Expenses	Prior year administrative expenses expressed as percentage of prior year payroll.
Retirement age	Graded rates beginning at age 55 as shown in rate table. Members who have attained the highest assumed retirement age will retire in one year.
Percentage married	85% of male members and 65% of female members are assumed to be married. Members are assumed to have no children.
Age difference	Females three years younger than males.
Allowance for Combined Service Annuity	Liabilities for active members are increased by 1.40% and liabilities for former members are increased by 4.00% to account for the effect of some Participants having eligibility for a Combined Service Annuity.

Summary of Actuarial Assumptions

Refund of contributions	All employees withdrawing after becoming eligible for a deferred benefit are assumed to take the larger of their contributions accumulated with interest or the value of their deferred benefit.
Interest on member contributions	Members and former members who are eligible for the money purchase annuity are assumed to receive interest credits equal to the Pre-Retirement interest rate. All other members and former members receive the interest crediting rate as specified in statutes.
Form of payment	Married members are assumed to elect subsidized joint and survivor form of annuity as follows: Males: 15% elect 50% J&S option 25% elect 75% J&S option 55% elect 100% J&S option Females: 20% elect 50% J&S option 10% elect 75% J&S option 30% elect 100% J&S option
Unknown data for members	We used membership data as supplied by the plan sponsor as of July 1, 2008. Customarily, this information would not be verified by a plan's actuary. We have reviewed the information for internal consistency and we have no reason to doubt its substantial accuracy. In cases where submitted data was missing or incomplete, the following assumptions were applied: Data for active members missing a date of birth: Date of birth: July 1, 1964 Data for terminated members: Date of birth: July 1, 1964 Average salary: $28,731 Allowable service: 7.50 years Age at termination: Age 40, or current age if younger than 40
MnSCU Tenure Track Faculty Assumptions	We assumed faculty is everyone in the MSCF and IFO bargaining units. We assumed all faculty are on a tenure track.

Summary of Actuarial Assumptions

	Rate (%)						
	Pre-Retirement Mortality		Ultimate Withdrawal		Disability		
Age	Male	Female	Male	Female	Male	Female	Salary Increases
20	0.03	0.01	3.70	4.50	0.00	0.00	5.5%
25	0.03	0.01	3.20	4.50	0.00	0.00	5.5%
30	0.04	0.02	2.70	4.50	0.00	0.00	5.5%
35	0.04	0.03	2.50	3.90	0.01	0.01	5.5%
40	0.05	0.03	2.35	2.75	0.03	0.03	5.2%
45	0.07	0.05	2.10	2.10	0.05	0.05	4.7%
50	0.10	0.07	1.85	1.85	0.11	0.10	4.5%
55	0.17	0.10	0.00	0.00	0.22	0.16	4.5%
60	0.31	0.16	0.00	0.00	0.33	0.25	4.8%
65	0.52	0.25	0.00	0.00	0.00	0.00	5.2%
70	0.77	0.42	0.00	0.00	0.00	0.00	5.2%
71	0.84	0.47	0.00	0.00	0.00	0.00	5.2%

Summary of Retirement Rates

	Rate %				
Age	All Non-MTRFA and MTRFA Coordinated Members Eligible for Rule of 90	All Non-MTRFA and MTRFA Coordinated Members Not Eligible for Rule of 90	Age	MTRFA Basic Members Eligible for 30 and Out Provision	MTRFA Basic Members Not Eligible for 30 and Out Provision
55 & Under	50	7	55 & under	40	5
56	60	7	56	40	5
57	55	7	57	40	5
58	50	8	58	40	5
59	50	10	59	40	5
60	50	12	60	25	25
61	50	18	61	25	25
62	50	20	62	25	25
63	50	20	63	25	25
64	50	20	61	25	25
65	50	45	65	40	40
66	35	35	66	40	40
67	35	35	67	40	40
68	35	35	68	40	40
69	35	35	69	40	40
70	35	35	70-74	60	60
71 & Over	100	100	75-79	60	100
			80 & Over	100	100

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Summary of TRA Plan Provisions

Coordinated

This summary of provisions reflects our interpretation of applicable Statutes for purposes of preparing this valuation. This interpretation is not intended to provide a basis for administering the Plan.

Plan year	July 1 through June 30
Eligibility	A public school or MnSCU teacher who is not covered by the Social Security Act, except for teachers employed by St. Paul or Duluth public schools or by the University of Minnesota. Effective July 1, 2002, charter school teachers employed by St. Paul or Duluth public schools are covered by this fund. No MnSCU teacher will become a new Member unless that person elects coverage as defined by Minnesota Statutes under Chapter 354B.
Contributions	Member: 5.50% of Salary Employer: 5.50% of Salary plus Supplemental of 3.64% of Salary (MTRFA members only).
Teaching service	A day of credit is earned if five hours are taught that day. A year is earned if 170 days of service are credited. Credit may also be provided for certain leaves of absence if employee contributions are paid into the fund.
Salary	Compensation used for contribution purposes excluding lump sum annual or sick leave payments, severance payments, any payments made in lieu of employer paid fringe benefits or expenses, and employer contributions to a Section 457 deferred compensation plan.
Average salary	Average of the five highest successive years of Salary. Average Salary is based on all Allowable Service if less than five years.

Retirement

Normal retirement

Age/Service requirements	First hired before July 1, 1989: (a.) Age 65 or three years of Allowable Service. (b.) Age 62 and 30 years of Allowable Service. Proportionate Retirement Annuity is available at age 65 and one year of Allowable Service. First hired after June 30, 1989: The greater of (a.) or (b.): (a.) Age 65. (b.) The age when first eligible for full Social Security retirement benefits (but not to exceed age 66) and three years of Allowable Service. Proportionate Retirement Annuity is available at normal retirement age and one year of Allowable Service.

Coordinated

Retirement *(continued)*

Early retirement

Age/Service requirements	Age 55 and three years of Allowable Service. First hired before July 1, 1989: (a.) Age 55 and three years of Allowable Service. (b.) Any age and 30 years of Allowable Service. (c.) Rule of 90: Age plus Allowable Service totals 90. First hired after June 30, 1989: (a.) Age 55 with three years of Allowable Service.
Amount	First hired before July 1, 1989: The greater of (a.), (b.) or (c.): (a.) 1.20% of Average Salary for each of the first ten years of Allowable Service. 1.70% of Average Salary for each year of Allowable Service in excess of 10 prior to July 1, 2006, and 1.90% of Average Salary for years of Allowable Service after July 1, 2006 . No actuarial reduction if age plus years of service totals 90. Otherwise reduction of 0.25% for each month the member is under age 65 (or 62 if 30 years of Allowable Service) at time of retirement. (b.) 1.70% of Average Salary for each year of Allowable Service prior to July 1, 2006 and 1.90% for each year of Allowable Service beginning July 1, 2006, assuming augmentation to age 65 at 3.00% per year and actuarial reduction for each month the member is under age 65. (c.) For eligible former members: the monthly benefit that is actuarially equivalent to 2.2 times the former members' accumulated deductions plus interest thereon. First hired after June 30, 1989: 1.70% of Average Salary for each year of Allowable Service prior to July 1, 2006 and 1.90% for each year of Allowable Service beginning July 1, 2006, assuming augmentation to age 65 at 3.00% per year and actuarial reduction for each month the member is under the full Social Security benefit retirement age (not to exceed age 66).

Coordinated

Retirement *(continued)*	
Form of payment	Life annuity. Actuarially equivalent options are: (a.) 50%, 75% or 100% Joint and Survivor with free bounce back feature (option is canceled if member is predeceased by beneficiary). (b.) 15 year Certain and Life (c.) Guaranteed Refund.
Benefit Increases	The inflation-based benefit increase provided by the Minnesota Post Retirement Investment Fund (Post Fund) to benefit recipients is equal to 100 percent of CPI-W, but not to exceed 2.5 percent. An additional benefit increase may be provided to any individuals who have lost purchasing power compared to the value of the benefit they initially received when their benefit first commenced. This additional benefit increase can only be paid if the Post Fund composite funding ratio is at least 90 percent, if the rate return earned on Post Fund assets exceeds 8.5 percent for the year, and if the inflation rate certified for the year is less than 2.5 percent. Should the Post Fund ever exceed a funding ratio of 100 percent, an additional inflation component could be paid should CPI-W inflation exceed 2.5 percent. An overall cap of 5.0 percent annually on benefit recipient adjustments is effective June 30, 2010. A member who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Members receiving benefits for at least one full month but less than 12 full months will receive a pro rata increase.
Disability	
Age/service requirement	Total and permanent disability before Normal Retirement Age with three year of Allowable Service.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at disability without reduction for commencement before Normal Retirement Age unless an optional annuity plan is selected. Payments stop at Normal Retirement Age or the five year anniversary of the effective date of the disability benefit, whichever is later. Payments stop earlier if disability ceases or death occurs. Benefits may be reduced on resumption of partial employment.
Form of payment	Same as for retirement.
Benefit increases	Adjusted by TRA to provide same increase as MPRIF.
Retirement after disability	
Age/service requirement	Normal Retirement Age or the five year anniversary of the effective date of the disability benefit, whichever is later.

Coordinated

Disability *(continued)*	
Retirement after disability (continued)	
Age/service requirement	Normal Retirement Age or the five year anniversary of the effective date of the disability benefit, whichever is later.
Amount	Any optional annuity continues. Otherwise, the larger of the disability benefit paid before Normal Retirement Age or the normal retirement benefit available at Normal Retirement Age, or an actuarially equivalent optional annuity.
Benefit increases	Same as for retirement.
Surviving spouse optional annuity	
Age/service requirement	Member or former member with three years of Allowable Service who dies before retirement or disability benefits commence.
Amount	Survivor's payment of the 100% Joint and Survivor benefit or an actuarial equivalent term certain annuity. If commencement is prior to age 65 (age 62 if 30 years of service), the benefit is reduced for early retirement with half the applicable reduction factor used from age 55 to actual commencement age. If no surviving spouse, then an actuarial equivalent dependent child benefit is paid to age 20 or for five years if longer.
Benefit increases	Same as normal retirement.
Withdrawal	
Refund of contributions	
Age/service requirement	Thirty days following termination of teaching service.
Amount	Member's contributions with 6.00% interest compounded annually if termination occurred on or after May 16, 1989. A deferred annuity may be elected in lieu of a refund.
Deferred annuity	
Age/service requirement	Vested at date of termination. Current requirement is three years of Allowable Service.

Coordinated

***Withdrawal** (continued)*	
<u>Deferred annuity</u> (continued)	
Age/service requirement	Vested at date of termination. Current requirement is three years of Allowable Service.
Amount	For members first hired prior to July 1, 2006, the benefit is computed under law in effect at termination and increased by the following percentage compounded annually: (a.) 3.00% therefore until January 1 of the year following attainment of age 55; and (b.) 5.00% thereafter until the annuity begins: Amount is payable as a normal or early retirement. A member who terminated service before July 1, 1997 whose benefit does not commence until after June 30, 1997 shall receive an actuarially equivalent increase to reflect the change from 5.00% to 6.00% in the post-retirement interest assumption; or For eligible former members; the monthly benefit that is actuarially equivalent to 2.2 times the formers members' accumulated deductions plus interest thereon. For members first hired July 1, 2006 and after, the benefit computed under law in effect at termination is increased by 2.50% compounded annually until the annuity begins.

MERCER

MARSH MERCER KROLL
GUY CARPENTER OLIVER WYMAN

Mercer (US) Inc.
333 South 7th Street, Suite 1600
Minneapolis, MN 55402-2427
612 642 8600

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