



TO: Members of the Legislative Commission on Pensions and Retirement
 FROM: Lawrence A. Martin, Executive Director *JAM*
 RE: Minneapolis Police Relief Association; Proposed Mortality Assumption Change
 DATE: March 3, 2008

Summary of the Proposed Change

The consulting actuarial firm retained by the Minneapolis Police Relief Association, Van Iwaarden Associates, and the board of trustees of the Minneapolis Police Relief Association are requesting approval by the Commission under Minnesota Statutes, Section 356.215, Subdivision 18, of a change in the mortality table used in preparing its annual actuarial valuation from the UP-1984 mortality table, set forward two years for males and set back three years for females, to the 1983 GAM mortality table, set forward one year for females and set back two years for males.

Background Information

- A. Minneapolis Police Relief Association. Background information on the Minneapolis Police Relief Association is presented in Attachment A.
- B. Actuarial Reporting Requirements. Background information on the actuarial reporting requirements generally applicable to Minnesota public pension plans is set forth in Attachment B.
- C. Demographic Actuarial Assumptions. Background information on the establishment and revision of demographic actuarial assumptions is set forth in Attachment C.
- D. Mortality Actuarial Assumptions for Closed Membership Defined Benefit Plans. Background information on revising mortality actuarial assumptions for closed membership defined benefit retirement plans is set forth in Attachment D.

Summary of the Minneapolis Police Relief Association Mortality Experience Studies

- a. 2003 Mortality Experience Study. In November 2003, Mark Meyer, FSA, and Paul D. Krueger, EA, consulting actuaries with the actuarial firm of Van Iwaarden Associates, prepared a joint mortality experience study of the Minneapolis Firefighters Relief Association and the Minneapolis Police Relief Association, dated November 2003, and received by the Legislative Commission on Pensions and Retirement office on January 15, 2004. The study covered participants of the two retirement plans for the four-year period from 1999 through 2002. The report ultimately included a recommendation that the 1983 GAM mortality table, set forward two years for females, be the mortality table for each relief association.

The 2003 joint mortality experience study found that actual mortality was 93 percent of the predicted female mortality overall and 78 percent of the predicted male mortality overall for the four-year period 1999-2002 for the combined population of the two plans, and 92 percent of the predicted female mortality and 83 percent of the predicted male mortality for the four-year period 1999-2002 for the Minneapolis Police Relief Association alone. The following compares this experience in more detail:

Joint Female Member Experience					MPRA Female Member Experience				
Age	Exposure	Actual Deaths	Expected Deaths	Actual/Expected	Age	Exposure	Actual Deaths	Expected Deaths	Actual/Expected
40-44	11	0	0.0	0%	40-44	8	0	0.0	0%
45-49	18	0	0.1	0%	45-49	11	0	0.0	0%
50-54	52	0	0.3	0%	50-54	31	0	0.2	0%
55-59	82	0	0.7	0%	55-59	54	0	0.5	0%
60-64	94	1	1.3	80%	60-64	51	0	0.7	0%
65-69	154	2	3.3	62%	65-69	84	2	1.8	113%
70-74	248	10	8.1	123%	70-74	168	8	5.5	146%
75-79	324	15	16.0	94%	75-79	213	11	10.6	104%
80-84	405	26	30.7	85%	80-84	207	8	15.6	51%
85-89	295	30	32.8	92%	85-89	137	15	15.2	99%
90-94	112	20	18.3	109%	90-94	51	12	8.4	142%
95+	47	11	11.9	93%	95+	29	5	7.6	66%
Total	1,842	115	123.3	93%	Total	1,044	61	66.0	92%

Joint Male Member Experience					MPRA Male Member Experience				
Age	Exposure	Actual Deaths	Expected Deaths	Actual/Expected	Age	Exposure	Actual Deaths	Expected Deaths	Actual/Expected
40-44	0	0	0.0	0%	40-44	0	0	0.0	0%
45-49	1	0	0.0	0%	45-49	1	0	0.0	0%
50-54	521	3	4.6	65%	50-54	372	1	3.3	30%
55-59	694	8	9.1	88%	55-59	489	4	6.3	63%
60-64	781	8	16.1	50%	60-64	559	5	11.5	43%
65-69	719	12	23.3	52%	65-69	391	9	12.4	72%
70-74	636	20	31.3	64%	70-74	305	11	15.1	73%
75-79	455	23	32.9	70%	75-79	249	15	18.1	83%
80-84	263	34	30.1	113%	80-84	169	22	19.2	114%
85-89	202	32	32.6	98%	85-89	90	15	14.4	104%
90-94	50	9	12.3	73%	90-94	15	2	3.6	56%
95+	7	3	2.5	119%	95+	3	3	1.1	284%
Total	4,329	152	194.8	78%	Total	2,643	87	105.0	83%

The proposed mortality table, the 1983 GAM mortality table, set forward two years for females, would have resulted in actual mortality equaling 107 percent of the predicted female mortality overall for both plans and equaling 111 percent of the predicted male mortality for both plans overall and equaling 107 percent of the predicted female mortality for the Minneapolis Police Relief Association and equaling 119 percent of the predicted male mortality for the Minneapolis Police Relief Association for the four-year period 1999-2002. The following compares the actual deaths with the proposed mortality table results in more detail:

Joint Female Member Experience					MPRA Female Member Experience				
Age	Exposure	Actual Deaths	Expected Deaths	Actual/Expected	Age	Exposure	Actual Deaths	Expected Deaths	Actual/Expected
40-44	11	0	0.0	0%	40-44	8	0	0.0	0%
45-49	18	0	0.0	0%	45-49	11	0	0.0	0%
50-54	52	0	0.1	0%	50-54	31	0	0.1	0%
55-59	82	0	0.3	0%	55-59	54	0	0.2	0%
60-64	94	1	0.6	161%	60-64	51	0	0.3	0%
65-69	154	2	1.8	114%	65-69	84	2	1.0	208%
70-74	248	10	5.4	184%	70-74	168	8	3.7	219%
75-79	324	15	12.7	118%	75-79	213	11	8.4	130%
80-84	405	26	26.2	99%	80-84	207	8	13.3	60%
85-89	295	30	29.5	102%	85-89	137	15	13.6	110%
90-94	112	20	17.9	112%	90-94	51	12	8.3	145%
95+	47	11	12.6	87%	95+	29	5	8.2	61%
Total	1,842	115	107.3	107%	Total	1,044	61	57.0	107%

Joint Male Member Experience					MPRA Male Member Experience				
Age	Exposure	Actual Deaths	Expected Deaths	Actual/Expected	Age	Exposure	Actual Deaths	Expected Deaths	Actual/Expected
40-44	0	0	0.0	0%	40-44	0	0	0.0	0%
45-49	1	0	0.0	0%	45-49	1	0	0.0	0%
50-54	521	3	2.6	114%	50-54	372	1	1.9	53%
55-59	694	8	5.0	160%	55-59	489	4	3.5	114%
60-64	781	8	8.8	91%	60-64	559	5	6.3	80%
65-69	719	12	14.5	83%	65-69	391	9	7.7	117%
70-74	636	20	21.5	93%	70-74	305	11	10.4	106%
75-79	455	23	24.0	96%	75-79	249	15	13.2	114%
80-84	263	34	23.8	143%	80-84	169	22	15.2	145%
85-89	202	32	26.0	123%	85-89	90	15	11.4	131%
90-94	50	9	9.3	97%	90-94	15	2	2.7	73%
95+	7	3	1.8	169%	95+	3	3	0.8	401%
Total	4,329	152	137.3	111%	Total	2,643	87	73.1	119%

- b. 2007 Mortality Experience Study. In 2007, Mark Meyer, FSA, and Paul D. Krueger, EA, of Van Iwaarden Associates, prepared another mortality experience study of the Minneapolis Police Relief Association, which was filed with the Legislative Commission on Pensions and Retirement on March 2, 2007. The study covered participants of the Minneapolis Police Relief Association for the five-year period from 2002 to 2006. The report also included a recommendation that the 1983 GAM mortality table, set forward one year for females and set back two years for males, replace the UP-1984 mortality table, set forward two years for males and set back three years for females, as the mortality table for the Minneapolis Police Relief Association.

The 2007 mortality experience study found that actual mortality was 87 percent of the predicted female mortality and 63 percent of the predicted male mortality for the five-year period 2002-2006. The following compares this experience in more detail:

Female Member Experience					Male Member Experience				
Age	Exposure (5 years)	Actual Deaths	Expected Deaths	Actual/Expected	Age	Exposure (5 years)	Actual Deaths	Expected Deaths	Actual/Expected
40-44	4	0	0.0	0%	40-44	0	0	0.0	0%
45-49	9	0	0.0	0%	45-49	3	0	0.0	0%
50-54	34	0	0.2	0%	50-54	241	0	2.2	0%
55-59	70	1	0.6	169%	55-59	724	7	9.5	74%
60-64	84	0	1.1	0%	60-64	689	7	14.4	49%
65-69	97	2	2.0	98%	65-69	613	11	19.6	56%
70-74	156	7	5.2	135%	70-74	382	10	18.4	55%
75-79	225	7	11.1	63%	75-79	342	15	25.6	59%
80-84	290	16	21.7	74%	80-84	182	18	20.0	90%
85-89	195	20	21.7	92%	85-89	120	13	20.0	65%
90-94	80	12	12.8	94%	90-94	31	4	7.3	55%
95+	36	10	9.6	104%	95+	2	2	0.7	310%
Total	1,280	75	86.0	87%	Total	3,329	87	137.6	63%

The proposed mortality table, the 1983 GAM mortality table, set forward one year for females and set back two years for males, would have resulted in actual mortality equaling 110 percent of the predicted female mortality and equaling 110 percent of the predicted male mortality for the five-year period 2002-2006. The following compares the actual deaths with the proposed mortality table results in more detail:

Female Member Experience					Male Member Experience				
Age	Exposure	Actual Deaths	Expected Deaths	Actual/Expected	Age	Exposure	Actual Deaths	Expected Deaths	Actual/Expected
40-44	4	0	0.0	0%	40-44	0	0	0.0	0%
45-49	9	0	0.0	0%	45-49	3	0	0.0	0%
50-54	34	0	0.1	0%	50-54	241	0	1.0	0%
55-59	70	1	0.3	403%	55-59	724	7	4.5	157%
60-64	84	0	0.5	0%	60-64	689	7	6.5	109%
65-69	97	2	1.0	205%	65-69	613	11	93.6	115%
70-74	156	7	3.1	229%	70-74	382	10	10.3	97%
75-79	225	7	7.9	89%	75-79	342	15	15.4	98%
80-84	290	16	16.9	95%	80-84	182	18	13.1	138%
85-89	195	20	17.8	113%	85-89	120	13	13.6	95%
90-94	80	12	11.3	107%	90-94	31	4	4.8	83%
95+	36	10	9.4	106%	95+	2	2	0.4	493%
Total	1,280	75	68.1	110%	Total	3,329	87	79.1	110%

Discussion and Analysis

The Minneapolis Police Relief Association and its consulting actuaries, Mark Meyer and Paul D. Krueger of Van Iwaarden Associates, are requesting approval by the Legislative Commission on Pensions and Retirement of a change in the relief association's mortality table from the UP-1984 mortality table, set forward two years for males and set back three years for females, to the 1983 GAM mortality table with a one-year set forward for females and a two-year set back for males. Resolution 08-1, attached, would approve the mortality table change for the Minneapolis Police Relief Association.

The requested mortality table change approval raises several pensions and related policy issues that may merit consideration and discussion by the Commission, as follows:

1. Sufficiency of the Evidence of a Need for a Mortality Table Change. The policy issue is the sufficiency of the evidence presented by the Minneapolis Police Relief Association and its actuarial consulting firm, Van Iwaarden Associates, that a need exists for a change of mortality tables for the Minneapolis Police Relief Association. The Minneapolis Police Relief Association has filed two mortality experience studies with the Commission, one done jointly with the Minneapolis Firefighters Relief Association based on four-year (1999-2002) data as of November 2003, and one for the Minneapolis Police Relief Association solely based on five-year (2002-2006) data as of July 2007. The reports make implicit and explicit arguments that the current mortality table is no longer appropriate for the Minneapolis Police Relief Association, arguing that:
 - a. The UP-1984 Table is Dated. The UP-1984 mortality table was completed in the early 1970s.

- b. The UP-1984 Table Over-Predicted Female Deaths. The two experience studies found that the actual deaths of female Minneapolis Police Relief Association members were less than 100 percent of those expected, with the actual-to-expected number at 92 percent in the 2003 study and at 87 percent in the 2007 study.
- c. The UP-1984 Table Greatly Over-Predicted Male Deaths. The two experience studies found that the actual deaths of male Minneapolis Police Relief Association members were less than 100 percent of those expected, with the actual-to-expected number at 83 percent in the 2003 study and at 63 percent in the 2007 study.

The suggestion that the UP-1984 mortality table is dated and hence obsolete is not completely accurate, since the 1983 GAM mortality table is also based on group annuitant experience from 1964-1968 and is projected to 1983, while the UP-1984 mortality table uses data of a similar vintage, projected to 1984. If more recent tables were the true criterion, these are the 1994 Uninsured Pensioner Mortality Table (UP-1984) and the 1994 Group Annuity Mortality Table (1994 GAM). The actual deaths to expected death percentages, however, indicate that the Minneapolis Police Relief Association mortality experience is somewhat variable over a short period of time. The two experience studies suggest some disparity in female death expectations for the largest component groups and much greater disparities in male death expectations for the largest component groups.

- 2. Appropriate Fit of the Recommended Actuarial Assumption. The policy issue is whether or not the new mortality table recommended by the relief association and its consulting actuaries is a good fit for the recent mortality experience and for the likely future mortality experience. The two experience studies filed by the Minneapolis Police Relief Association with the Legislative Commission on Pensions and Retirement in 2003 and 2007 make the following arguments for the recommended mortality table as the appropriate mortality for the Minneapolis Firefighters Relief Association:
 - a. Recommended Table is Standard Table and is More Recent. The consulting actuaries indicate that the 1983 GAM mortality table is a standard mortality table and is more recent than the UP 1984 table currently used.
 - b. Recommended Table is the PERA-P&F Mortality Table. The consulting actuaries argue that the 1983 GAM mortality table is the mortality table utilized by the Public Employees Police and Fire Retirement Plan (PERA-P&F), although with one-year set backs for both females and males.
 - c. Recommended Table Produces a Desirable Prediction Margin. The consulting actuaries indicate that the recommended table produces a mortality margin (fewer expected deaths than actual deaths) that is appropriate and that the recommended table will give a greater allowance for mortality improvement, will have a longer shelf life consequently, and is desirable because of the small population covered by the retirement plan.

A national survey of defined benefit retirement plans does indicate that the 1983 GAM mortality table is widely used and is more common than the UP-1984 mortality table. The argument that the 1983 GAM mortality table is considerably less obsolete than the UP-1984 mortality table is probably overstated, since both tables use data from the same vintage and are not the most recent tables available. The contention that PERA-P&F uses the 1983 GAM mortality table is correct, but the Minneapolis Police Relief Association generally does not premise its practices on PERA-P&F features. The mortality table margin contention deserves more analysis. As the bounce in the actual versus expected results under the current mortality table between the 2003 study and the 2007 study indicates, a small population is subject to considerable variability in demographic occurrences over time. While the current mortality table does not appear to be the best fit for males for the periods covered, the recommended table is not necessarily a good predictor of future mortality because the Minneapolis Police Relief Association membership is not large enough in number to average out the results and replicate more general experience. Since the relief association is a closed group, with a small number of active members and an aging retired population, it also is not clear that "shelf life" considerations should be a major consideration.

- 3. Appropriateness of the Lack of Experience Study Results for Other Actuarial Assumptions. The policy issue is the appropriateness of handling this one actuarial assumption change request when the relief association has not also pursued a review of the other relevant actuarial assumptions. While not binding on the Legislative Commission on Pensions and Retirement or the Minneapolis Police Relief Association Board, Actuarial Standard of Practice 35, governing the selection of demographic and other non-economic assumptions for measuring pension obligations for pension actuaries, requires that

demographic assumptions be selected from the appropriate assumption universe and indicates that assumptions should be evaluated for reasonableness, must be individually reasonable, and, for mortality assumptions, should differentiate between different subgroups or factors where appropriate. Evaluating only one assumption when there are other important actuarial assumptions can leave the assumptions as a totality potentially unreasonable. While the Actuarial Standards of Practice potentially require less scrutiny and review when economic actuarial assumptions are specified in law or in some comparable fashion, the interest and salary actuarial assumptions in Minnesota Statutes, Sections 356.215, Subdivision 8, and 356.216, Paragraph (b) for the Minneapolis Firefighters Relief Association and the Minneapolis Police Relief Association are essentially unique to those plans, replicated only for the Minneapolis Employees Retirement Fund in 1993 and for the Bloomington Fire Department Relief Association in 2005. The statutory assumptions for the Minneapolis Police Relief Association were established separately for the plan when the 13th check post-retirement adjustment was enacted in 1989 (see Laws 1989, Chapter 319, Article 19). It may be better practice for the Commission to require the Minneapolis Police Relief Association to conduct a full experience study, including interest and salary increases, of the Minneapolis Police Relief Association and to consider any additional assumption changes for all three assumptions that may be appropriate.

4. Opposition to the Recommended Change by the City of Minneapolis. The policy issue is the appropriateness of Commission acting on an actuarial assumption change request from the Minneapolis Police Relief Association in light of likely opposition to the recommended change by the City of Minneapolis. In 2005, the City of Minneapolis opposed a similar mortality actuarial assumption change for the Minneapolis Firefighters Relief Association and can be expected to oppose this proposed change. Representatives of the City of Minneapolis should be accorded an opportunity to present to the Commission their views and concerns along with the representatives of the Minneapolis Police Relief Association and its consulting actuaries.

Attachment A

Background Information on the Minneapolis Police Relief Association

- a. Minneapolis Police Relief Association Establishment and Operation. The Minneapolis Police Relief Association was established as an organization in 1890, initially to provide relief to disabled police officers and to the families of deceased police officers. The relief association was incorporated under Minnesota law in 1905. Membership in the Minneapolis Police Relief Association was closed to newly employed police officers as of June 15, 1980, when pension coverage for new hires shifted to the statewide Public Employees Police and Fire Plan (PERA-P&F).

The Minneapolis Police Relief Association is managed by a governing board of nine members, of which seven are elected by the relief association membership and two are representatives of the City of Minneapolis. In addition to maintaining records and determining benefit amounts, the Minneapolis Police Relief Association governing board is the investment authority for the assets of the special (pension) funds of the relief association.

In calendar year 2005, the Minneapolis Police Relief Association received total contributions of \$31.6 million (79.2 percent from the city and 20.8 percent from the State), received net investment income of \$20.1 million, paid total retirement benefits of \$33.8 million, and paid administrative expenses of \$590,000 (for which the relief association provided no itemization in its annual financial report).

- b. Nature of the Benefit Plan; Benefit Coverage. The Minneapolis Police Relief Association provides from its special fund a salary-related service pension to police officers retiring at age 50 or older with at least five years of service, a disability benefit to temporarily or permanently disabled police officers, a survivor benefit to the surviving family of a deceased active, retired, or disabled police officer, and a return of contributions to the estate of deceased active, retired, or disabled police officers on whose behalf no survivor benefit is payable. Pensions and benefits are based on the salary of a top-grade police officer, irrespective of the actual rank of the police officer, and these pensions and benefits increase after retirement as the salary of a top-grade police officer increases (the "escalator" post-retirement adjustment mechanism) and also increase based on the investment performance of the special fund (the "thirteenth check" post retirement adjustment). Under Laws 1997, Chapter 233, Article 4, a joint-and-survivor optional annuity form can be elected in lieu of the automatic survivorship coverage otherwise provided by the fund.

Since 1992 (Laws 1992, Chapter 471, Article 1, Section 14), the contributions by any member (eight percent of the pay of a top-grade police officer) who has 25 or more years of service are not deposited in the special fund; but rather, the contribution is deposited in a health insurance account set up for the member. After retirement, in addition to the pension benefit paid from the association's special fund, the retiree receives distributions from the health insurance account, which the retiree can use toward health care costs or other expenses of the retiree.

When a Minneapolis police officer retires and begins drawing a service pension from the association's special fund, those benefits are eligible for increases annually through three different post-retirement increase mechanisms. Individually and as a package, these adjustment provisions are poorly designed and can produce increases which bear no relationship to inflation, and can produce erratic changes in the benefits over time. The mechanisms are:

1. Active Salary-Related Escalator. The first post-retirement adjustment is a standard escalator tied to increases in the salary of a top-grade police officer. This escalator increases retirement benefits by the same percentage increase as the percentage increase in top-grade police officer pay negotiated between the city and the Minneapolis Police Federation.
2. Thirteenth Check Adjustment. A second increase provision is based on the investment performance of the special fund of the relief association, and is referred to as the thirteenth check post-retirement adjustment. The thirteenth check post-retirement adjustment was enacted in 1989.
3. Additional Post-Retirement Adjustment. A third post-retirement increase mechanism was added to law in 2000 (Laws 2000, Chapter 461, Article 17). If the funding ratio (percentage of plan pension liabilities covered by plan assets) of the relief association exceeds 110 percent, the association is authorized to distribute a portion of the funding in excess of 110 percent of its liabilities to its benefit recipients.

- c. Actuarial and Financial Reporting. The Minneapolis Police Relief Association is required to prepare actuarial reporting under Minnesota Statutes, Sections 69.77, 356.215, 356.216, and 423B.15. The relief association is required to make financial reports under Minnesota Statutes, Sections 69.051 and 356.20.

Minnesota Statutes, Section 69.77, initially enacted in 1969 (Laws 1969, Chapter 223), and amended periodically thereafter, requires municipalities to fund their local relief associations on an actuarial basis. The basic provisions of the 1969 Local Police and Salaried Firefighters Relief Associations Financial Guidelines Act are as follows:

1. Each member of a local association is required to contribute at least eight percent of the salary used for calculating retirement benefits, with the contribution to be made by salary deduction.
2. The financial requirements of the associations must be calculated annually based on the most recent actuarial valuation. The financial requirements are to include normal cost and amortization of the unfunded accrued liability by the year 2010. The minimum obligation of the municipality to be raised by taxes each year is the financial requirements of the association, less member contribution amounts received under the police or fire state aid program, and amounts received under the local police and salaried firefighter relief associations' amortization aid programs for that year.
3. The levy required to meet the municipality's minimum obligation is outside statutory or charter levy limitations.
4. If a municipality fails to include an amount sufficient to meet the minimum obligation to the association, the relief association has the authority to certify the amount required to the county auditor for inclusion in the municipality's tax levy.
5. Investments of local associations must be in securities which are authorized investments under Minnesota Statutes, Chapter 356A.
6. Local associations are authorized to contract with outside investment advisors and are authorized to certify funds for investment by the State Board of Investment in the Minnesota Supplemental Investment Fund.
7. Actuarial valuations must be filed by the association with the State Auditor, the Legislative Commission on Pensions and Retirement, the Legislative Reference Library, and the municipality.
8. All articles of incorporation or bylaw amendments affecting benefits for a local relief association must be ratified by the municipality prior to becoming effective.
9. The penalty for a violation of the act is to make the transfer of funds received under the various state aid programs or the levying of taxes by the municipality unlawful.

Minnesota Statutes, Sections 356.215 and 356.215, require the preparation of actuarial valuations under the entry age normal cost actuarial method, using specified interest and salary rate actuarial assumptions, and calculating the actuarial requirements based on a specified amortization target date. Minnesota Statutes, Section 423C.15, provides for an adjustment to the city normal cost contribution, suspends city normal cost contributions in certain instances, provides 15-year amortization periods for actuarial losses after 2001, and limits the amortization target date revisions to the end of the average life expectancy of the relief association membership.

Minnesota Statutes, Section 69.051, a portion of the police state aid program, requires the preparation of a financial report and audit for qualification for police state aid, with the report filed with the State Auditor and with the Legislative Commission on Pensions and Retirement. Minnesota Statutes, Section 356.20, requires annual financial reporting by various Minnesota public pension plans, but grandparents financial reporting under Minnesota Statutes, Section 69.051, by local fire and police relief associations.

- d. Minneapolis Police Relief Association Funding Problems. Although not as poorly funded as the Minneapolis Firefighters Relief Association in the 1960s, the Minneapolis Police Relief Association was a poorly funded retirement plan historically, with a funding ratio (assets divided by accrued liability) of two percent in 1967, of almost 11 percent in 1972, and of just under 29 percent in 1982. The Minneapolis Police Relief Association was funded on a current disbursements/pay-as-you-go basis for almost a century, which greatly contributed to its general poor funding situation in the 1960s. Actuarial funding was phased in for the Minneapolis Police Relief Association in 1969 under the Local Police and Paid Fire Relief Associations Guidelines Act and the 1969 legislation caused the improved funding ratios in the 1970s. In 1980, the Minneapolis Police Relief Association was closed to new active members, a requirement to amortize the unfunded actuarial accrued liability by 2010

was added, and an amortization state aid program was created, with the Minneapolis Police Relief Association receiving about one-sixth of the \$6.5 million annual aid amount.

The 1969 and 1980 actuarial funding requirements, the addition of direct state aid programs in 1980, 1984, and 1996, combined with the periodically strong investment markets since 1980, have produced consistently improving funded ratios during the period 1982 to 1999, with the Minneapolis Police Relief Association becoming 50 percent funded in 1986, 75 percent funded in 1990, and 95 percent funded in 1999. The improved funding condition of the Minneapolis Police Relief Association over the period 1982-1999 caused the employer requirement to drop from a high of \$15 million in 1985 to a low of \$3.5 million in 1999. Various circumstances caused erosion in the Minneapolis Police Relief Association funded ratio since 1999, with a 2005 funded ratio of 77 percent. The circumstances causing the funded ratio to erode were the cumulative effect of various benefit increases, general investment underperformance, a significant loss in the relief association's large venture capital investment in Technomar, a board-driven redefinition of the salary level on which benefits are based, and the recent investment market decline. The funded ratio erosion has caused the employer contribution requirement to increase to \$32 million annually. The actuary for the Minneapolis Police Relief Association is currently recommending a strengthening of the post-retirement mortality assumption which, if approved by the Legislative Commission on Pensions and Retirement, will increase the actuarial accrued liability and unfunded actuarial accrued liability of the plan, will further reduce the plan's funded ratio, and will increase the employer contribution requirement.

Since 1969, when the Minneapolis Police Relief Association was first required to begin being funded on an actuarial basis, the Minneapolis Police Relief Association has sought and received numerous benefit increases, including a service pension and disability benefit change in 1969 (Laws 1969, Chapter 560), a medical insurance authorization in 1975 (Laws 1975, Chapter 428), the addition of a health and welfare benefit in 1980 (Laws 1980, Chapter 607, Article XV), a service pension vesting change in 1987 (Laws 1987, Chapter 372, Article 2), the addition of a second post-retirement adjustment in 1989 (Laws 1989, Chapter 319, Article 19), a survivor benefit change and the addition of a health insurance benefit in 1990 (Laws 1990, Chapter 589, Article 1), a survivor benefit change in 1993 (Laws 1993, Chapter 124), a survivor benefit change in 1994 (Laws 1994, Chapter 590), the addition of optional survivor benefit forms and a post-retirement adjustment change in 1997 (Laws 1997, Chapter 233, Article 4), and the addition of a third post-retirement adjustment in 2000 (Laws 2000, Chapter 461, Article 17). The Minneapolis City Council approved all of these benefit increases and the benefit increases increased the Minneapolis Police Relief Association actuarial accrued liability. Additionally, in 1994, without legislative action and without city approval, the Minneapolis Police Relief Association board of trustees unilaterally redefined the salary of a top-grade patrol officer, on which benefit amounts are based, to include additional compensation items (i.e., overtime pay, shift differentials, dog handler compensation, etc.). The 1994 salary redefinition produced an increase in the Minneapolis Police Relief Association actuarial accrued liability and unfunded actuarial accrued liability. The City of Minneapolis and the Minneapolis Police Relief Association again are litigating the issue of the proper determination of its covered salary figure.

During the period 1987-2004, the Minneapolis Police Relief Association also declined to consolidate with the Public Employees Police and Fire Plan (PERA-P&F) under Minnesota Statutes, Chapter 353A, as 44 other local police and paid firefighter relief associations did. The general thrust of the post-1987 benefit changes appears to have been to dissuade the Minneapolis Police Relief Association membership from pursuing a potential consolidation with PERA-P&F.

Attachment B

Background Information on Minnesota Public Pension Plan Actuarial Reporting Requirements Generally

1. Actuarial Reporting Requirements. With the creation of defined benefit public pension plan liabilities, there arises a need to provide financing to match the liabilities and to create a trust fund for the accumulated assets. The method of financing depends primarily on the nature of the benefit plan as either a defined contribution plan or a defined benefit plan and the liability which is undertaken as a consequence. Since the obligation undertaken with a defined benefit plan is to provide a benefit of a predetermined amount at and after the time of retirement, the financing method will be more complex and will allow more variations. There are a number of possible financing budget estimation methods which have been developed by actuaries which can be utilized.

The actual or ultimate cost of a pension plan is the total amount of any retirement annuities, disability benefits and survivor benefits plus the total amount of any administrative costs paid. The actual or ultimate cost will result no matter what method of financing is employed to fund pension benefits. The financing or actuarial funding method merely separates out the portion of the actual or ultimate cost that will be paid from investment returns from the portion to be funded from periodic contributions and affects the timing of the financing and the amount of the financing burden which will be borne by the pension plan employer or employers.

Virtually every public pension plan is required to make annual financial and actuarial reports under Minnesota Statutes, Sections 356.20 and 356.215. The Standards for Actuarial Work, issued by the Commission, specify the detailed contents and format requirements for both the actuarial valuation reports and the experience studies. The public pension plans which are included in this requirement are the General State Employees Retirement Plan of the Minnesota State Retirement System (MSRS-General), the Correctional State Employees Retirement Plan of the Minnesota State Retirement System (MSRS-Correctional), the General Employee Retirement Plan of the Public Employees Retirement Association (PERA-General), the Public Employees Police and Fire Retirement Plan (PERA-P&F), the Teachers Retirement Association (TRA), the State Patrol Retirement Plan, the Minneapolis Teachers Retirement Fund Association (MTRFA), the St. Paul Teachers Retirement Fund Association (SPTRFA), the Duluth Teachers Retirement Fund Association (DTRFA), the Minneapolis Employees Retirement Fund (MERF), the University of Minnesota Faculty Retirement Plan and Supplemental Retirement Plan, the Judges Retirement Plan, and the various local police and firefighters relief associations.

The annual actuarial valuation is required to include the determination of normal cost as a percentage of salary and accrued liability of the fund calculated according to the entry age normal cost method, with a prescribed pre- and post-retirement interest assumption, a prescribed salary assumption, and other assumptions as to mortality, disability, retirement, and withdrawal which are appropriate to the experience of the plan. A statement of administrative cost of the fund as a gross amount and as a percent of payroll is required. The actuary must also present an actuarial balance sheet, setting forth the accrued assets, the accrued liabilities (reserves for active members, deferred annuitants, inactive members without vested rights, and annuitants) and the unfunded actuarial accrued liability. The valuation is also to include a calculation of the additional rate of support required to amortize the unfunded accrued liability by the end of the applicable target full funding year. The actuary is required to provide an analysis of the increase or decrease in the unfunded accrued liability from changes in benefits, changes in actuarial assumptions, gains and losses from actual deviations from actuarial assumptions, amortization contribution, and changes in membership. An exhibit setting forth total active membership, additions and separations from active service during the year, total benefit recipients, additions to and separations from the annuity payroll, and a breakdown of benefit recipients into service annuitants, disabilitants, surviving spouses and children, and deferred annuitants is also required.

The quadrennial experience study periodically prepared for MSRS-General, PERA-General, and TRA is required to furnish experience data and an actuarial analysis which substantiates the actuarial assumptions upon which the annual valuations are based. The quadrennial experience study is required to contain an actuarial analysis of the experience of the largest retirement plans and a comparison of that plan experience with the actuarial assumptions in force for the most recent annual actuarial experience.

The purpose of the quadrennial experience studies is to provide the Commission and the retirement plan administrations with a periodic opportunity to review the accuracy of the current actuarial assumptions of the three largest retirement plans, compared to the experience for the most recent period and to revise those actuarial assumptions based on the recommendation of the retained consulting actuary and on input from plan administrators, their actuarial consultants, and others. The actuarial valuation process, as corrected or refined by the quadrennial experience process, is intended to provide policymakers and others with an accurate picture of the funded condition and financial requirements of a public pension plan and the process is not aided if it relies on incorrect or inadequate assumptions. If a trend line is established in recent experience, that trend line should be reflected in a plan's actuarial assumptions, even if those assumptions make the financing position of the plan appear worse than it would under different assumptions.

Minnesota public pension plan actuarial assumptions are specified in part in statute (the economic assumptions, interest/investment return, individual salary increase, and payroll growth) and are determined in part by other parties, with Commission approval (the balance of all actuarial assumptions, generally, the demographic assumptions). Economic assumptions are required to project the amount of benefits that will be payable. Demographic assumptions are required to project when benefits will be payable. Demographic assumptions are used to project the development of the population covered by the pension plan and hence when the benefits to be provided will be paid. The demographic assumptions project when a member is likely to progress between the various categories of membership (active, deferred, or retired) and how long the person stays in each category. The types of economic assumptions used to measure obligations under a defined benefit pension plan include the following:

- (i) inflation;
- (ii) investment return (sometimes referred to as the valuation interest rate);
- (iii) compensation progression schedule; and
- (iv) other economic factors (e.g., Social Security, cost-of-living adjustments, growth of individual account balances, and variable conversion factors).

The types of demographic assumptions used to measure pension obligations include, but are not necessarily limited to, the following:

- (i) retirement;
- (ii) mortality;
- (iii) termination of employment;
- (iv) disability and disability recovery;
- (v) election of optional forms of benefits; and
- (vi) other assumptions, such as administrative expenses; household composition; marriage, divorce, and remarriage; open group assumptions; transfers; hours worked; and assumptions regarding missing or incomplete data.

The actuarial assumption selection process should result in actuarial assumptions that are reasonable in light of the particular characteristics of the defined benefit plan that is the subject of the measurement. A reasonable actuarial assumption is one that is expected to appropriately model the contingency being measured and is not anticipated to produce significant cumulative actuarial gains or losses over the measurement period. For any given measurement, two or more reasonable actuarial assumptions may be identified for the same contingency.

2. Historical Development of Actuarial Reporting Requirements. Since the creation of the Legislative Commission on Pensions and Retirement as an interim commission in 1955, data has been required to be provided to the State by the various public pension plans in the State, as follows:
 - Laws 1957, Special Session, Chapter 11. The initial actuarial reporting law enacted by the Minnesota Legislature was Laws 1957, Special Session, Chapter 11. The 1957 actuarial reporting law was an uncoded temporary law that was applicable only to actuarial valuations prepared as of January 1, 1958. No prior generally applicable law required specific actuarial reporting to the Legislature or to any other public office or official. The 1957 actuarial reporting law required census tabulations of active members and benefit recipients, an actuarial balance sheet disclosing assets, liabilities and the actuarial full funding deficit, a statement of actuarial assumptions, an indication of the normal support rate for currently accruing liabilities and an indication of the 1997 target date amortization requirement. The 1957 actuarial reporting law was unspecific on the manner in which the actuarial calculation was to be prepared, leading to disputes when some funds

prepared valuations on a basis other than the entry age normal actuarial method. The 1957 actuarial reporting law was broadly applicable to all statewide general and public safety pension plans, all local general employee plans, all local police relief associations and all local salaried firefighters relief associations. Problems with the 1957 actuarial reporting law led the Commission to refine the actuarial reporting requirements and procedures and to recommend a general ongoing actuarial reporting law in the years between 1958 and 1965.

- Laws 1965, Chapters 359 and 751. Laws 1965, Chapter 359, was the initial codification of the general employee pension plan actuarial reporting law. Laws 1965, Chapter 751, was an uncoded temporary law applicable to local police and paid firefighters relief association actuarial valuations prepared as of December 31, 1964. The general employee pension plan actuarial reporting law required an indication of the level normal cost, an actuarial balance sheet disclosing assets, accrued liabilities and unfunded accrued liability as well as specific required reserve figures and an indication of the 1997 target date amortization requirement. The general employee pension plan actuarial reporting law required that the actuarial valuation normal cost and accrued liabilities to be prepared using the Entry Age Normal Cost (Level Normal Cost) Method, that the actuarial method be used to value all aspects of the benefit plan and known future benefit changes, that the actuarial valuation be prepared on the basis of a three percent interest assumption and other appropriate assumptions and that assets not include any present value of future amortization contributions. The general employee pension plan actuarial reporting law required annual actuarial valuations for the State Employees Retirement Fund, the Public Employees Retirement Fund, and the State Police Officers Retirement Fund. The general employee pension plan actuarial reporting law also required the preparation of an experience study validating the actuarial assumptions used in the valuation. The local police and paid fire actuarial reporting law was based on the 1957 actuarial reporting law with the additional clarification of a three percent interest rate assumption, the requirement of normal cost and accrued liabilities calculated on the basis of the entry age normal cost method and the reporting of the amount for the amortization of the unfunded accrued liability by the 1997 target date. The local police and paid fire actuarial reporting law was applicable to all police and paid firefighters relief associations.
- Laws 1967, Chapter 729, was a revision in the 1965 local police and paid fire actuarial reporting law. The 1967 local police and paid fire actuarial reporting law was a coded general statute requiring actuarial valuations as of December 31, 1967, and each four years thereafter. It was also made applicable volunteer firefighters relief associations and very small active membership police and paid firefighters relief associations. A three percent salary rate assumption was added. A 2007 target date amortization requirement replaced the prior 1997 target date amortization requirement for police and paid fire plans, leaving the 1997 requirement for volunteer and smaller active membership police and paid fire relief associations. An addition of a requirement to the calculated normal cost for amortizing net actuarial experience gains or losses was also added.
- Laws 1969, Chapter 289, revised the 1965 general employee pension plan actuarial reporting law by making the requirement applicable to the Minneapolis Employees Retirement Fund and to the three first class city teacher retirement fund associations. It also provided for an interest rate assumption to 3.5 percent as well as 3.0 percent for comparison purposes and added a salary assumption of 3.5 percent for funds with a final salary based benefit plan.
- Laws 1973, Chapter 653, Section 45, modified the general employee pension plan actuarial reporting law by increasing the interest assumptions from 3.5 percent to 5 percent.
- Laws 1975, Chapter 192, recodified the general employee pension plan actuarial reporting law, previously coded as Minnesota Statutes 1974, Sections 356.21, 356.211, and 356.212, as Minnesota Statutes, Section 356.215.
- Laws 1978, Chapter 563, Sections 9, 10, 11, and 31, repealed the separate local police and fire relief association actuarial reporting law, Minnesota Statutes 1976, Sections 69.71 to 69.76, and required the local police and fire relief associations to report under the general employee pension plan actuarial reporting law with specific adaptations, coded as Minnesota Statutes, Section 356.216. It also amended the actuarial reporting law by requiring specific reporting of entry age and retirement age assumptions and the provision of a summary of the benefit plan provisions on which the actuarial valuation is based.
- Laws 1979, Chapter 184, modified the actuarial reporting law by replacing the 1997 amortization target date with a 2009 amortization target date and establishing a procedure for extending that

target date in the event of substantial unfunded actuarial accrued liabilities resulting from benefit increases, actuarial cost method changes or actuarial assumption changes.

- Laws 1984, Chapter 564, Sections 43, substantially modified the actuarial reporting law. Actuarial valuations are required to comply with the Standards for Actuarial Work adopted by the Commission. The interest rate assumption was modified, with a post-retirement interest rate of five percent and a pre-retirement interest rate of eight percent for the major, statewide plans. The actuarial balance sheet requirement was also substantially modified, and was expanded to include reporting of current and expected future benefit obligations, current and expected future assets and current and expected future unfunded liabilities. The amortization contribution requirement was also modified, with a change from a level dollar annual amortization procedure to a level percentage of future covered payroll amortization procedure for the major, statewide and local general employee plans other than MERF.
- Laws 2000, Chapter 461, Article 1, again substantially modified the actuarial reporting law. Salary assumptions and post-retirement interest rate assumptions were reset, and the actuarial value of assets also was changed to an approach that approaches, but smoothes, market values.
- First Special Session Laws 2001, Chapter 10, Article 11, Section 18, exempted the General Employee Retirement Plan of the Public Employees Retirement Association (PERA-General) from the automatic amortization target date resetting provisions of Minnesota Statutes, Section 356.215, and sets a 2031 amortization target date for PERA-General.
- Laws 2000, Chapter 392, Articles 9 and 11, the select and ultimate salary increase assumptions (i.e., rates varying based on both age and length of service) for the General State Employees Retirement Plan of the Minnesota State Retirement System (MSRS-General), the General Employee Retirement Plan of the Public Employees Retirement Association (PERA-General), the Teachers Retirement Association (TRA), the Duluth Teachers Retirement Fund Association (DTRFA), the Minneapolis Teachers Retirement Fund Association (MTRFA) and the St. Paul Teachers Retirement Fund Association (SPTRFA) were revised based on the 2000 experience studies. The structure of Minnesota Statutes, Section 356.215, also was reorganized and revised as part of a recodification of Minnesota Statutes, Chapter 356.
- Laws 2004, Chapter 223, Section 7, replaced a single contracting consulting actuary retained by the Legislative Commission on Pensions and Retirement to prepare the annual actuarial valuations of the various statewide and major local retirement plans with a single contracting consulting actuary retained jointly by the administrators of the seven retirement systems with Commission ratification.

Attachment C

Background Information on Demographic Actuarial Assumption Establishment and Revision

1. In General. Actuarial valuations are budgeting tools for recognizing pension costs and involve projecting future benefit expenditures and forecasting future economic and non-economic, or demographic, events. In determining the annual cost of a defined benefit pension plan and its financial health actuarially, there are two important factors, the actuarial cost method and the actuarial assumptions. Minnesota has considered the question of the appropriate actuarial cost method since the mid-1960s and requires in Minnesota Statutes, Sections 69.77, 69.773, and 356.215, the use of the Entry Age Normal Actuarial Cost Method.

In order to gauge the adequacy of actuarial assumptions, quadrennial experience studies are performed automatically for the three major retirement plans and are performed for the remaining statewide and major local retirement plans based upon ad hoc Commission action. Additionally, each actuarial valuation of a statewide or major local retirement plan is required to contain an actuarial gain and loss analysis, focusing on the major economic and demographic experience items, to assist in determining the continued accuracy of the various actuarial assumptions.

Experience studies are intended to provide the Commission with an opportunity to review the accuracy of the current actuarial assumptions, compared to the experience for a recent period and to revise those actuarial assumptions based on the recommendation of a consulting actuary and on input from plan administrators and others. The actuarial valuation process, as corrected or refined by the quadrennial experience process, is intended to provide policymakers and others with an accurate picture of the funded condition and financial requirements of a public pension plan and the process is not aided if it relies on incorrect or inadequate assumptions. If a trend line is established in recent experience, that trend line should be reflected in a plan's actuarial assumptions, even if those assumptions make the financing position of the plan appear worse than it would under different assumptions.

Minnesota public pension plan actuarial assumptions are specified in part in statute (interest/investment return, individual salary increase, and payroll growth) and are determined in part by other parties, with Commission approval (the balance of all actuarial assumptions, generally, the demographic assumptions). Economic assumptions function to project the amount of benefits that will be payable. Demographic assumptions function to project when benefits will be payable. Demographic assumptions are used to project the development of the population of the pension scheme and hence when the benefits to be provided will be paid. The demographic assumptions project when a member is likely to progress between the various categories of membership (active, deferred, or retired) and how long the person stays in each category. The types of economic assumptions used to measure obligations under a defined benefit pension plan include the following:

- (i) inflation;
- (ii) investment return (sometimes referred to as the valuation interest rate);
- (iii) compensation schedule; and
- (iv) other economic factors (e.g., Social Security, cost-of-living adjustments, growth of individual account balances, and variable conversion factors).

The types of demographic assumptions used to measure pension obligations include, but are not necessarily limited to, the following:

- (i) retirement;
- (ii) mortality;
- (iii) termination of employment;
- (iv) disability and disability recovery;
- (v) election of optional forms of benefits; and
- (vi) other assumptions, such as administrative expenses; household composition; marriage, divorce, and remarriage; open group assumptions; transfers; hours worked; and assumptions regarding missing or incomplete data.

The actuarial assumption selection process should result in assumptions that are reasonable in light of the particular characteristics of the defined benefit plan that is the subject of the measurement. A reasonable assumption is one that is expected to appropriately model the contingency being measured

and is not anticipated to produce significant cumulative actuarial gains or losses over the measurement period. For any given measurement, two or more reasonable assumptions may be identified for the same contingency.

2. Interest/Investment Rate Actuarial Assumption. Because Minnesota public pension plan benefits are paid out over time and are paid from funds that are invested to obtain investment returns, future obligations are discounted for those future interest or investment earnings. In selecting the interest/investment rate actuarial assumption, the appropriate investment data should be reviewed, including the current yields to maturity of fixed income securities such as government securities and corporate bonds; any forecasts of inflation and of total returns for each asset class; historical investment data, including real risk-free returns, the inflation component of the return, and the real return or risk premium for each asset class; and the historical plan performance.

The interest/investment rate actuarial assumptions can be arrived at using one of two methods, either the building block method or the cash-flow matching method. Under the building-block method, the expected future investment return of each asset class is assembled as a combination of the components of investment return. These components are factors such as inflation and the real rate of return for the class. The best-estimate investment return range is determined by identifying a best-estimate range of expected future real returns for each broad asset class applicable to the plan, such as cash and cash equivalents, fixed income securities and equities, an average weighted real-return range reflecting the plan's expected asset class mix is computed and that range is combined with the expected inflation range. Under the cash flow matching method, the expected future investment return range is a combination of the internal rate of return on a bond portfolio with interest and principal payment approximately matching the plan's expected disbursements, and a risk adjustment range. The best-estimate investment return range is determined:

- by projecting the plan's benefit and expense disbursements to be valued in the measurement;
- by identifying a highly diversified portfolio available as of the measurement date of non-callable, high-quality corporate or U.S. government bonds with interest and principal payments approximately matching the projected disbursements;
- by computing the bond portfolio's internal rate of return;
- by establishing a risk adjustment range for the plan that reflects the uncertainties in the projected benefits and expenses, the expected returns on future contributions, the reinvestment of interest and principal payments not fully needed to pay current benefits, any mismatches between the benefit disbursement stream and the high-quality bond portfolio's interest and principal payment stream, and the current and expected future plan investments in equities or other asset classes besides high-quality bonds; and
- then by combining these figures.

3. Compensation/Salary Scale Actuarial Assumption. Compensation is a factor in determining participants' benefits in Minnesota public pension plans other than volunteer firefighter relief associations. Generally, a participant's compensation will change over the long term in accordance with inflation, productivity growth, and merit scale increases. The assumption used to measure the anticipated year-to-year change in compensation is referred to as the compensation or salary scale. It may be a single rate assumption, or, alternatively, it may be a select and ultimate rate assumption and vary by age and/or service, consistent with the merit scale component; or vary over future years, consistent with the inflation component.

In selecting the compensation or salary scale assumption, the appropriate compensation data should be reviewed, including the plan sponsor's current compensation practice and any anticipated changes in this practice; the current compensation distributions by age and/or service; historical compensation increases and the practices of the plan sponsor/sponsors; and historical national wage and productivity increases.

The compensation or salary scale assumption is generally constructed using a building-block method, which combines the best-estimate ranges for the components of compensation scale. These components include inflation, productivity growth, and merit scale.

4. Retirement Age Assumption. With only a few exceptions, where length of service is the determining factor, Minnesota public pension plan members are required to attain a specified minimum age at which retirement benefits are payable if the member also terminates active employment. The

retirement age assumptions relate to the specific age at which retirement benefits are likely to begin or the ages with a specific probability of retirement benefit commencement. In selecting the retirement age assumptions, in addition to data on the past experience of the plan membership, consideration should be given to the factors of the plan design, where specific incentives may influence when participants retire; the design of and the date of anticipated payment from Social Security and Medicare; and the availability of other employer-sponsored post-retirement benefit programs.

5. Turnover/Termination of Employment Assumptions. The termination of public employment by a Minnesota public pension plan member determines the amount of the person's accrued service credit. Minnesota public pension plans utilize service credit in determining retirement benefit amounts. The termination/withdrawal/turnover assumption predicts the amount of service credit to be acquired by plan members and also predicts the extent of any gain expected to be accrued from plan members who terminate without vesting. In selecting the termination assumption, in addition to data on the past experience of the plan, consideration should be given to the factors of employer-specific or job-related factors such as occupation, employment policies, work environment, unionization, hazardous conditions, and location of employment; and applicable plan provisions, such as any early retirement benefits, the vesting schedule, or the payout options.
6. Mortality Assumptions. Generally, Minnesota public retirement plan benefits terminate upon the death of the recipient, or if a joint and survivor optional annuity form was chosen, upon the death of the survivor. The mortality assumption is the measure of the expected lifetimes of active members, retired members, deferred retirees, disabilitants, and survivors. In addition to data on the past experience of the plan, in selecting the mortality assumptions, consideration should be given to the likelihood and extent of mortality improvement in the future.
7. Disability Assumption. Except for the Legislators Retirement Plan, the Elected State Officers Retirement Plan, and some volunteer firefighter relief associations, Minnesota public pension plans pay disability benefits. The disability assumption is a prediction of the occurrence of disabilities, which constitute a premature commencement of benefits. In selecting the disability assumption, in addition to analyzing the data on the past experience of the plan, consideration should be given to the plan's definition of disability and the potential for recovery.
8. Optional Annuity Form Election Assumption. Most statewide and major local Minnesota public pension plans provide optional annuity forms, whereby the number adjusts the timeframe over which the benefit will be paid in return for a modification in the amount of the benefit. Many of these plans have a subsidized bounce back joint and survivor optional annuity form, the selection of which will increase the liability of the plan. The optional annuity form election assumption implements expectations about the future selections of optional annuity forms. In addition to analyzing the data on the past experience of the plan, in selecting the optional annuity form election assumption, consideration should be given to the benefit forms and benefit commencement dates available under the plan and the degree to which particular benefit forms may be subsidized.
9. Time Horizon for Setting Actuarial Assumptions. The actuarial assumption selection or revision process should result in assumptions that are reasonable in light of the particular characteristics of the defined benefit plan that is the subject of the measurement. A reasonable assumption is one that is expected to appropriately model the contingency being measured and is not anticipated to produce significant cumulative actuarial gains or losses over the measurement period. For any given measurement, two or more reasonable assumptions may be identified for the same contingency. At a minimum, when a revision of an actuarial assumption is considered, the new actuarial assumption should be consistent with the recent experience in that area unless experience is in flux, and then the new actuarial assumption should attempt to reasonably anticipate the progression of any identifiable trend.

In particular with respect to mortality, in addition to data on the past experience of the plan, in selecting the mortality assumptions, consideration should be given to the likelihood and extent of mortality improvement in the future.

Where a retirement plan is closed to new members, such as the Minneapolis Employees Retirement Fund (MERF), the Minneapolis Firefighters Relief Association (MFRA), or the Minneapolis Police Relief Association (MPRA), the consideration of an appropriate mortality table may be different because of that fact. The consideration is shaped by the fact that the total covered population is known, that the population is somewhat less susceptible to developments in longevity compared to

plans with open active memberships due to a likely greater average age, and that any mortality losses will be required to be funded relatively quickly due to relatively short remaining amortization periods.

10. Context in Which Actuarial Assumptions are Set; Complications. Changing actuarial assumptions, when the quadrennial experience study indicates a need to do so, is not always an easy proposition. In the 1993-1995 round of experience studies, several assumptions that were identified for modification by the Commission actuary ultimately were not modified because of opposition from pension plan actuaries and administrators and several assumption changes were subject to dispute because of apparent stylistic disagreements among actuaries and because of the actuarial cost impact of the change on the potential for additional future benefit increases.

Frequently in the past, actuarial assumptions have been changed in combination with benefit improvements (principally 1973 and 1989 for the statewide plans) or in combination with contribution restructurings (1984 for the statewide and major local plans; 1991 for the Minneapolis Employees Retirement Fund (MERF)).

Attachment D

Background Information on Revising Mortality Actuarial Assumptions for Closed Membership Defined Benefit Retirement Plans

Minnesota has seven defined benefit retirement plans which have been closed to new members in the past. The retirement plans are the Legislators Retirement Plan, the Elective State Officers Retirement Plan, the Minneapolis Employees Retirement Fund Plan (MERF), the Fairmont Police Relief Association, the Minneapolis Firefighters Relief Association, the Minneapolis Police Relief Association, and the Virginia Fire Department Relief Association.

The Legislators Retirement Plan and the Elective State Officers Retirement Plan were closed to new members in 1997, the Minneapolis Employees Retirement Fund Plan was closed to new members in 1979, the Fairmont Police Relief Association was closed to new members in 1977, the Minneapolis Firefighters Relief Association and the Minneapolis Police Relief Association were closed to new members in 1980, and the Virginia Fire Department Relief Association was closed to new members in 1974. The Legislators Retirement Plan and the Elective State Officers Retirement Plan are not funded on an actuarial basis, although actuarial work for the plans are prepared annually, and the plans are funded on a current disbursements or "pay as you go" basis month to month from the State General Fund. The Minneapolis Employees Retirement Fund Plan is funded on an actuarial basis, with a 2020 amortization date but a legal obligation to fund each member's liability at the time of retirement. The Fairmont Police Relief Association and the Virginia Fire Department Relief Association are funded on an actuarial basis, with a 2010 amortization date. The Minneapolis Firefighters Relief Association is funded on an actuarial basis, with a 2020 amortization date, subject to extensions upon future actuarial losses. The Minneapolis Police Relief Association is also funded on an actuarial basis, with a 2020 amortization date, reset from 2010 by 2005 special legislation.

With a closed retirement plan and a membership that has an increasing average age and average length of service credit, several actuarial assumptions become largely or wholly unimportant, such as turnover. The mortality assumption, however, remains an important actuarial assumption, along with the interest assumption, and, especially with the local police and paid firefighter relief associations covered by active pay-related benefit escalator provisions, the salary increase assumption. The mortality assumption, which projects life expectancy for retirees, is a primary factor in determining the total amount of retirement benefits payable to the plan membership. The salary assumption is the basis for projecting the amount of the final compensation used to calculate the initial retirement benefit and, when salary related, the amount of the periodic increases in the benefit. The interest assumption is the discount rate used in calculating the present value of each retirement benefit, totaled as a significant component of the actuarial accrued liability of the retirement plan.

Mortality tables are typically constructed by insurance companies, the National Center for Health Statistics, and actuarial organizations.

For the statewide and major local general employee retirement plans, with the exception of the Minneapolis Employees Retirement Fund Plan (MERF), the mortality table in force for the active membership and non-disabled retired membership is the 1983 Group Annuity Mortality Table (1983 GAM) with specific set backs and set forwards. MERF uses the 1986 Projected Experience Mortality Table. The four remaining local police and salaried firefighter relief associations use the 1984 Uninsured Pensioner Mortality Table (UP-1984), with specific set backs and set forwards.

The 1983 GAM mortality table is based on group annuitant experience from the period 1964-1968, was constructed in 1985, and was developed after the Group Annuity Mortality-1971 (GAM-1971) mortality table was reviewed and the experience if insurance companies indicated that the GAM-1971 mortality table was inadequate, projected additional mortality improvements to 1983 based on 1966-1975 trends, and added a ten percent conservatism margin. The 1983 GAM mortality table has led to the development of a 1994 Group Annuity Mortality Table (1994 GAM) after a study of 1986-1990 annuitant experience indicated its weaknesses in predicting male mortality. The 1994 GAM mortality table is derived from the same underlying data as the 1983 GAM mortality tables, with the 1994 GAM adding a seven percent margin.

The UP-1984 mortality table was issued in 1974 and projected mortality improvements to 1984, based on experience from the late 1960s period. The UP-1984 mortality table was primarily designed to be a unisex table, although the Society of Actuaries Uninsured Pensioner Mortality Subcommittee in 1995

believed that sex-distinct tables are more appropriate for actuarial valuations. The UP-1984 mortality table has been replaced by the 1994 Uninsured Pensioner Mortality Table (UP-1994), which was developed by the Society of Actuaries as a result of a study of 1985-1989 mortality experience of 29 retirement plans which indicates a significant departure in the UP-1984 mortality table from actual mortality (actual mortality equal to 82 to 86 percent of predicted mortality).

The following compares the life expectancy or age at death results (current age plus expected future durations) for the three base tables for various sample ages and includes, for comparison, the 1994 Group Annuity Reserving Mortality Table (GAR-1994), an intended update of the 1983 GAM mortality table prepared by the Society of Actuaries projected to 1994 for the insurance industry, reflecting the constraints of insurance company reserve valuation laws:

Age	1983 GAM	UP-1984	UP-1994	GAR-1994
20	77.9	73.8	78.6	84.6
25	78.0	74.1	78.8	84.3
30	78.1	74.3	79.0	84.0
35	78.3	74.6	79.2	83.7
40	78.5	74.9	79.4	83.4
45	78.7	75.4	79.7	83.1
50	79.2	76.0	80.0	82.9
55	79.8	76.9	80.5	82.9
60	80.6	78.1	81.2	83.1
65	81.7	79.7	82.3	83.7
70	83.2	81.7	83.8	84.9
75	85.2	84.0	85.7	86.4
80	87.6	86.8	88.0	88.5
85	90.7	90.0	90.9	91.3
90	94.3	93.5	94.2	94.4
95	98.2	97.4	97.9	98.2

**Statewide and Major Local Retirement Plans:
Comparison of Mortality Tables Used for the July 1, 2007, Actuarial Valuations**

A. General Employee Retirement Plans

1. General State Employees Retirement Plan of the Minnesota State Retirement System (MSRS-General)

<i>Healthy Pre-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set back five years.
	Female:	1983 Group Annuity Mortality Table for females set back two years.
<i>Healthy Post-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set back two years.
	Female:	1983 Group Annuity Mortality Table for females set back one year.
<i>Disabled:</i>	Male:	1965 RRB rates through age 54. For ages 55 to 64, graded rates between 1965 RRB rates and the Healthy Post-Retirement mortality table. For ages 65 and later, the Healthy Post-Retirement mortality table.
	Female:	1965 RRB rates through age 54. For ages 55 to 64, graded rates between 1965 RRB rates and the Healthy Post-Retirement mortality table. For ages 65 and later, the Healthy Post-Retirement mortality table.

2. General Employee Retirement Plan of the Public Employees Retirement Association (PERA-General)

<i>Healthy Pre-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set back eight years.
	Female:	1983 Group Annuity Mortality Table for females set back seven years.
<i>Healthy Post-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set back one year.
	Female:	1983 Group Annuity Mortality Table for females set back one year.
<i>Disabled:</i>	Male:	1965 RRB 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.
	Female:	1965 RRB 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.

3. Teachers Retirement Association (TRA)

<i>Healthy Pre-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set back 12 years
	Female:	1983 Group Annuity Mortality Table for females set back 10 years
<i>Healthy Post-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set back 6 years
	Female:	1983 Group Annuity Mortality Table for females set back 3 years
<i>Disabled:</i>	Male:	1965 Railroad Retirement Board (RRB) rates through age 54. For ages 55 to 64, graded rates between 1965 RRB rates and the Healthy Post-Retirement mortality table. For ages 65 and later, the Healthy Post-Retirement mortality table.
	Female:	1965 Railroad Retirement Board (RRB) rates through age 54. For ages 55 to 64, graded rates between 1965 RRB rates and the Healthy Post-Retirement mortality table. For ages 65 and later, the Healthy Post-Retirement mortality table.

4. Duluth Teachers Retirement Fund Association (DTRFA)

<i>Healthy Pre-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for Males set back 10 years
	Female:	1983 Group Annuity Mortality Table for Females set back 7 years
<i>Healthy Post-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for Males set back 2 years
	Female:	1983 Group Annuity Mortality Table for Females
<i>Disabled:</i>	Male:	1977 Railroad Retirement Board Mortality Table for Disabled Lives
	Female:	1977 Railroad Retirement Board Mortality Table for Disabled Lives

5. St. Paul Teachers Retirement Fund Association (SPTRFA)

<i>Healthy Pre-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set back 7 years
	Female:	1983 Group Annuity Mortality Table for females set back 5 years
<i>Healthy Post-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set back 3 years
	Female:	1983 Group Annuity Mortality Table for females set back 1 year
<i>Disabled:</i>	Male:	1977 Railroad Retirement Board Mortality Table for Disabled Lives
	Female:	1977 Railroad Retirement Board Mortality Table for Disabled Lives

6. Minneapolis Employees Retirement Fund (MERF)

<i>Healthy:</i>	Average of male and female rates of 1986 Projected Experience Table with a 1-year age setback
<i>Disabled:</i>	Average of male and female rates of 1986 Projected Experience Table with a 1-year age setback

B. Public Safety Employee Retirement Plans

1. State Patrol Retirement Plan

<i>Healthy Pre-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set back one year.
	Female:	1983 Group Annuity Mortality Table for females.
<i>Healthy Post-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set forward two years.
	Female:	1983 Group Annuity Mortality Table for females set forward two years.
<i>Disabled:</i>	Male:	Combined Annuity Mortality.
	Female:	Combined Annuity Mortality.

2. Public Employees Police and Fire Retirement Plan (PERA-P&F)

<i>Healthy Pre-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set back six years.
	Female:	1983 Group Annuity Mortality Table for females set back six years.
<i>Healthy Post-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set back one year.
	Female:	1983 Group Annuity Mortality Table for females set back one year.
<i>Disabled:</i>	Male:	1965 RRB rates up to age 40. For ages 41 to 59, graded rates between 1965 RRB and the Healthy Post-Retirement Mortality Table. For ages 60 and later, the Healthy Post-Retirement Mortality Table.
	Female:	1965 RRB rates up to age 40. For ages 41 to 59, graded rates between 1965 RRB and the Healthy Post-Retirement Mortality Table. For ages 60 and later, the Healthy Post-Retirement Mortality Table.

3. Correctional State Employees Retirement Plan of the Minnesota State Retirement System (MSRS-Correctional)

<i>Healthy Pre-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set back one year.
	Female:	1983 Group Annuity Mortality Table for females.
<i>Healthy Post-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set forward two years.
	Female:	1983 Group Annuity Mortality Table for females set forward two years.
<i>Disabled:</i>	Male:	Combined Annuity Mortality Table.
	Female:	Combined Annuity Mortality Table.

4. Local Government Correctional Employees Retirement Plan of the Public Employees Retirement Association (PERA-Correctional)

<i>Healthy Pre-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set back one year.
	Female:	1983 Group Annuity Mortality Table for females.
<i>Healthy Post-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set forward two years.
	Female:	1983 Group Annuity Mortality Table for females set forward two years.
<i>Disabled:</i>	Male:	Combined Annuity Mortality Table.
	Female:	Combined Annuity Mortality Table.

C. Specialty Retirement Plans

1. Elective State Officers Retirement Plan

<i>Healthy Pre-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set back four years.
	Female:	1983 Group Annuity Mortality Table for females set back two years.
<i>Healthy Post-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males.
	Female:	1983 Group Annuity Mortality Table for females.
<i>Disabled:</i>	Male:	N/A
	Female:	N/A

2. Legislators Retirement Plan

<i>Healthy Pre-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set back four years.
	Female:	1983 Group Annuity Mortality Table for females set back two years.
<i>Healthy Post-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males.
	Female:	1983 Group Annuity Mortality Table for females.
<i>Disabled:</i>	Male:	N/A
	Female:	N/A

3. Judges Retirement Plan

<i>Healthy Pre-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males set back four years.
	Female:	1983 Group Annuity Mortality Table for females set back two years.
<i>Healthy Post-Retirement:</i>	Male:	1983 Group Annuity Mortality Table for males.
	Female:	1983 Group Annuity Mortality Table for females.
<i>Disabled:</i>	Male:	Combined Annuity Mortality Table.
	Female:	Combined Annuity Mortality Table.

VAN IWAARDEN

Retirement planning for employers

February 22, 2008

Rep. Mary Murphy
Legislative Commission on
Pensions and Retirement
343 State Office Building
100 Rev. Dr, Martin Luther King Jr. Blvd.
St. Paul, MN 55155-1206

Sen. Don Betzold
Legislative Commission on
Pensions and Retirement
111 Capitol
75 Rev. Dr. Martin Luther King Jr. Blvd.
St. Paul, MN 55155-1606

**Re: Minneapolis Police Relief Association
Request for Change in Mortality Assumption**

Dear Rep. Murphy and Sen. Betzold:

On February 28, 2007 we submitted a request, pursuant to Minnesota Statutes §356.215, subd. (18), as the approved actuary for the Minneapolis Police Relief Association, for the approval of the Legislative Commission on Pensions and Retirement to change the actuarial assumptions used in the annual valuation of the retirement plan.

We enclosed with that request a copy of a mortality experience study we had prepared that covered the period from 2002 to 2006. Based on that study we requested approval to change the mortality assumption used in the annual valuation reports from the current table based on UP84 mortality to the 1983 Group Annuity Mortality including a one-year set forward for females and two-year set back for males (83GAM F+1 M-2).

We have now reviewed the updated data from 2007 and compared the additional results with the results of our earlier study. Based on the 2007 data, we again request approval to change to the 83GAM F+1 M-2 table. In our professional opinion, the current table does not adequately represent reasonable actuarial expectations for future mortality experience.

We would be happy to answer any questions regarding our report or to provide any additional information.

Sincerely,

Mark D. Meyer, FSA, MAAA
Consulting Actuary

c: Distribution

Resolution 08-1

_____ moves that the Legislative Commission on Pensions and Retirement approve under Minnesota Statutes, Section 356.215, Subdivision 18, a change in the mortality table for the Minneapolis Police Relief Association from the UP-1984 Mortality Table, set forward two years for males and set back three years for females, to the 1983 GAM mortality table, set forward one year for females and set back two years for males.