

CITY OF PHILADELPHIA
MUNICIPAL RETIREMENT SYSTEM

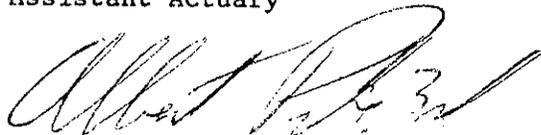
ACTUARIAL EXPERIENCE STUDY
FOR THE PERIOD
JULY 1, 1980 THROUGH JULY 1, 1985

Prepared by:

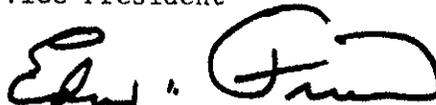
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PART I

INTRODUCTION AND SUMMARY OF FINDINGS

A. Introduction

This report sets forth the results of the Actuarial Experience Study for the City of Philadelphia Municipal Retirement System for the period July 1, 1980 through July 1, 1985. The purpose of this Actuarial Experience Study is to derive a set of actuarial assumptions to be used in the July 1, 1985 and future actuarial valuations of the City of Philadelphia Municipal Retirement System. The report reviews the actuarial experience of the Retirement System and compares the experience with the actuarial assumptions being utilized to determine the appropriateness of the current actuarial assumptions when measured against actual experience.

This Actuarial Experience Study is one of a series of such studies that the Board of Pensions and Retirement has had conducted. The most recent studies covered the periods July 1, 1976 through July 1, 1979 and July 1, 1979 through July 1, 1982. In addition to continuing this series of experience studies, this report has been prepared in accordance with the requirements of Act 205 of 1984 and the preliminary guidelines issued by the Public Employee Retirement Study Commission. This Act requires that the Board have an Actuarial Experience Study performed every 4 years with the first study covering the 5 years of experience ending July 1, 1985.

Act 205 requires that the actuarial valuation reports shall be prepared using actuarial assumptions selected jointly by the actuary and the Board. As actuary to the Retirement Board, our recommendations for the actuarial assumptions to be used in conjunction with the July 1, 1985 actuarial valuation are contained in this report. We look forward to discussing these

recommendations with the Board in order that we may jointly agree with the set of assumptions to be utilized for the July 1, 1985 actuarial valuation.

B. Summary of Findings

1. Non-Economic Assumptions

In reviewing the actuarial experience of the Retirement System for the 5-year period of the Study and, where appropriate, comparing these with the results of prior studies, certain findings were noted which resulted in our recommendations, as summarized below, to continue or modify existing non-economic assumptions. Analyses were made separately for deaths, disabilities, terminations (quits and discharges), and retirements. Separate studies were made for municipal members and police and fire members.

The study of mortality included active members, retired members, and disabled members. We found that the actual experience for male and female active members was substantially less than anticipated and that the experience for retired members and disabled members followed closely the assumptions used in the July 1, 1984 valuation. Accordingly, we recommend a one-third decrease in the mortality rates used for both males and females for all active members and no change in the mortality rates for retired members or disabled members.

In addition, we reviewed the proportion of deaths that are service-connected versus those which are ordinary deaths. Based on our analysis, we recommend that the assumed percentage of service-connected deaths for police and fire members be decreased from 20% to 10%.

The number of disabilities for municipal members during the period of study was significantly less than anticipated based upon the assumed rates. We, therefore, recommend that the rates of disabilities for municipal members be adjusted downward by 25%. For police and fire members, actual experience during the period followed expected experience quite closely. Accordingly, no change is recommended in the assumed rates of disability for police and fire members. In addition, our analysis of the proportion of disabilities that are service-connected versus those which are ordinary indicate no change in the assumed percentages used in the actuarial valuation.

Turnover for municipal members and police and fire members has been shown to be considerably less than anticipated during the 5-year period. Accordingly, we recommend a 20% reduction in the turnover rates for all groups.

The number of retirements during the study, in the aggregate, closely approximated the assumed rates. A closer review, however, indicates that change in the rates at specific ages is justified at this time. In particular, higher rates of retirement are assumed at the ages when the employees first become eligible for retirement (age 55 for municipal and age 45 for police and fire members) and lower rates at certain older ages.

2. Economic Assumptions

Economic assumptions covered by this report include investment return, rate of salary increase, and rate of covered payroll growth. Selection of these assumptions is somewhat limited by Act 205. Specifically, the Act provides that economic actuarial assumptions shall either be in the range of economic assumptions specified by the Public Employee Retire-

ment Study Commission or be accompanied in the actuarial valuation report with documentation justifying their selection.

The current investment return and rate of salary increase assumptions are 9% and 6% per annum, respectively. These assumptions fall within the guidelines issued by the Commission, although they are at the upper limit, and we recommend no changes in these assumptions at this time.

The current assumption for the rate of growth in covered payroll is 6% per annum. This assumption exceeds the Commission's guidelines of 4%; however, we believe that experience during the period of this Study justifies continued use of the 6% assumed payroll growth rate.

PART II

DISCUSSION OF NON-ECONOMIC EXPERIENCE RESULTS

This Part II presents a discussion of the results of the non-economic experience for the 5-year period July 1, 1980 through July 1, 1985. Separate analyses have been made for the rates of mortality, disability, turnover and retirement.

A. Annual Rates of Mortality

1. Active Member Mortality Experience

The mortality experience for active members is summarized in Tables 1 through 3 contained in Part IV of this report. This experience may be summarized as follows:

Mortality Experience for Active Members

<u>Year Ending June 30</u>	<u>Ratio of Actual to Expected Deaths</u>		
	<u>Municipal</u>		<u>Police and Fire</u>
	<u>Male</u>	<u>Female</u>	
1981	44%	45%	39%
1982	89	58	65
1983	57	65	90
1984	53	48	72
1985	<u>74</u>	<u>30</u>	<u>69</u>
1981 - 1985	64%	49%	66%

From the above, it is clear that the rate of actual deaths for active members is far less than expected. Based upon similar experience in the 1979 and 1982 experience studies, the assumed rates of active member mortality were substantially decreased effective with the 1982 actuarial valuation.

The comparison of the mortality experience reviewed under this experience study with the prior two studies is as follows:

<u>Periods Ending June 30</u>	<u>Ratio of Actual to Expected Deaths</u>		
	<u>Municipal</u>		<u>Police and Fire</u>
	<u>Male</u>	<u>Female</u>	
1977 - 1979	78%*	60%*	80%*
1980 - 1982	80%*	60%*	80%*
1981 - 1985	64%	49%	66%

* Adjusted for changes in expected rates following 1982 experience study.

It is possible that the continuing low rate of active member mortality is, in part, due to misreporting of deaths as terminations. Nonetheless, in view of the continued pattern of low mortality in this and prior studies, it appears that an additional substantial decrease in the rates of pre-retirement mortality rates is warranted. An analysis of Tables 1 through 3 indicates that the favorable mortality experience appears to be occurring at all age groups. Accordingly, we recommend that the expected rates of mortality be decreased by approximately one-third. The revised rates for male members will be 55% of the UP-84 Mortality Table (sex adjusted) and for female members will be 50% of the UP-84 Mortality Table (sex adjusted).

A comparison of current to proposed mortality rates is as follows:

<u>Attained Age</u>	<u>Previous Assumptions Used in July 1, 1984 Actuarial Valuation</u>		<u>Proposed Assumptions for Use in July 1, 1985 Actuarial Valuation</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
	22	.000969	.000944	.000642
32	.001003	.000762	.000664	.000529
42	.002339	.001290	.001550	.000896
52	.006261	.003337	.004149	.002318
62	.015509	.008541	.010277	.005932

In addition, the number of deaths during the period of the study was examined in order to review the assumptions regarding the percentage of

deaths that are service-connected. A comparison of the actual percentage of deaths that are service-connected with the expected percentage is as follows:

	<u>Number of Service-Connected Deaths</u>	<u>Percentage of Deaths that are Service-Connected</u>	
		<u>Expected</u>	<u>Actual</u>
Municipal Members	3	5%	2%
Police Members	2	20	4
Fire Members	1	20	7

Since the actual number of service-connected deaths is very small, the results of the 5-year experience of this factor is less significant than for other factors. Nonetheless, experience does tend to indicate that the assumed rate of service-connected deaths for police and fire members might be overstated. Accordingly, we would recommend the assumed percentage of service-connected deaths for police and fire members be decreased from 20% to 10%.

2. Retired Member Mortality Experience

Mortality experience for retired members and surviving spouses is presented in Tables 4 through 7 in Part IV. The experience for municipal members is presented in Tables 4 and 5 and is summarized as follows:

Retired Municipal Members and Surviving Spouses

<u>Year Ending June 30</u>	<u>Ratio of Actual to Expected Deaths</u>	
	<u>Male</u>	<u>Female</u>
1981	158%	116%
1982	126	96
1983	31	32
1984	91	62
1985	<u>91</u>	<u>162</u>
1981 - 1985	98%	94%

Corresponding results for police and fire members (and surviving spouses) are presented in Tables 6 and 7. This experience is summarized as follows:

Retired Police and Fire Members and Surviving Spouses

<u>Year Ending June 30</u>	<u>Ratio of Actual to Expected Deaths</u>	
	<u>Male</u>	<u>Female *</u>
1981	136%	81%
1982	89	69
1983	81	90
1984	114	82
1985	<u>102</u>	<u>67</u>
1981 - 1985	104%	78%

* Surviving spouses.

The above tables indicate that actual experience followed expected experience quite closely, although the rate of deaths for police and fire members has been about 6% higher than for municipal members. The rate of female deaths in the police and fire groups was below expected; however, this group represents primarily surviving spouses and when combined with the experience for females in the municipal group, the experience is fairly close to anticipated. Accordingly, we recommend no change in post-retirement mortality rates at this time.

3. Disabled Member Mortality Experience

Finally, Tables 8 through 10 in Part IV reflect the post-retirement mortality experience for disabled members. This experience for municipal members is as follows:

Disabled Municipal Members

<u>Year Ending June 30</u>	<u>Ratio of Actual to Expected Deaths</u>	
	<u>Male</u>	<u>Female</u>
1981	128%	217%
1982	127	100
1983	54	40
1984	114	92
1985	<u>96</u>	<u>67</u>
1981 - 1985	103%	90%

The corresponding experience for police and fire members is as follows:

Disabled Police and Fire Members

<u>Year Ending June 30</u>	<u>Ratio of Actual to Expected Deaths</u>	
	<u>Male</u>	<u>Female</u>
1981	98%	--
1982	92	--
1983	64	--
1984	107	--
1985	<u>87</u>	<u>--</u>
1981 - 1985	89%	--

Based upon the above, we find that the rate of actual mortality among the disabled members follows quite closely to the anticipated rates. Accordingly, we recommend no change in these assumptions at this time. If future experience studies continue to show experience at 90% or less, adjustment may be required in the future.

B. Annual Rates of Disability

The results of our analysis in the rates of disability are presented in Tables 12, 13, and 14 in Part IV. This study's experience, combined with the prior studies, indicates that a significant number of members who are eligible for age retirement elect to retire on a disability pension rather than a

retirement pension, although the amount of the pension is the same. This experience is probably at least partially due to possible tax advantages to choosing a disability pension as opposed to a retirement pension. However, these tax advantages were substantially reduced in 1984. Furthermore, in most instances it makes no difference to the Retirement System whether an employee who is eligible for an age retirement applies for a retirement benefit or a disability benefit. Accordingly, we have adjusted the experience to treat members who become disabled after their age retirement date (55 for municipal, 45 for police and fire) as retirements rather than disabilities. The results of the disability experience as modified is as follows:

Disability Experience for Active Members

<u>Year Ending June 30</u>	<u>Ratio of Actual to Expected Disabilities</u>		
	<u>Municipal</u>		<u>Police and Fire</u>
	<u>Male</u>	<u>Female</u>	
1981	91%	71%	159%
1982	99	95	116
1983	58	74	78
1984	71	29	94
1985	<u>59</u>	<u>95</u>	<u>66</u>
1981 - 1985	76%	72%	101%

As can be seen, the rates of disabilities among municipal members, although quite variable from one year to the next, have on the average been about 75% of expected. Accordingly, we recommend that the disability rates be modified by an overall reduction of 25%.

A comparison of the current and proposed rates is as follows:

(Illustration on following page)

<u>Attained Age</u>	<u>Previous Assumptions Used in July 1, 1984 Actuarial Valuation</u>		<u>Proposed Assumptions for Use in July 1, 1985 Actuarial Valuation</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
	22	.000014	.000016	.000011
32	.000718	.000439	.000539	.000329
42	.004549	.002465	.003412	.001849
52	.017309	.012334	.012982	.009251
62	.020000	.015000	.015000	.011250

The rates of disability for police and fire members show that experience has been quite close to expected. This appears to be true at all age groups. Accordingly, we recommend that no change be made to the rates of disability among police and fire members.

In addition to the number of disabilities during this period, we have also examined the proportion of disabilities that are service-connected. A comparison of the assumed proportion of service-connected disabilities with the actual proportion is as follows:

	<u>Proportion of Disabilities that are Service-Connected</u>	
	<u>Expected</u>	<u>Actual</u>
Municipal Members	10%	8%
Police and Fire Members	20%	21%

The above chart reflects all experience including those over retirement age. If the experience is limited to those under retirement age, the ratio decreases to 7% for municipal members and increases to 27% for police and fire members.

Based upon the above information, we recommend that no changes be made in the assumed proportion of disabilities that are service-connected.

C. Annual Rates of Turnover

The results of member turnover analysis are summarized in Tables 15, 16, and 17 in Part IV of this report. This experience may be summarized as follows:

Turnover Experience for Active Members

<u>Year Ending June 30</u>	<u>Ratio of Actual to Expected Turnover</u>		<u>Police and Fire</u>
	<u>Municipal</u>		
	<u>Male</u>	<u>Female</u>	
1981	86%	82%	87%
1982	67	73	74
1983	60	66	46
1984	60	60	50
1985	<u>51</u>	<u>44</u>	<u>54</u>
1981 - 1985	64%	65%	63%

As can be seen, the experience for each of the three groups of employees shown is substantially below that anticipated. A comparison of the results of the current experience study with the two previous studies is as follows:

<u>Periods Ending June 30</u>	<u>Ratio of Actual to Expected Turnover</u>		<u>Police and Fire</u>
	<u>Municipal</u>		
	<u>Male</u>	<u>Female</u>	
1977 - 1979	130%*	125%*	69%
1980 - 1982	75%*	76%*	102%
1981 - 1985	64%	65%	63%

* Adjusted for changes in expected rates following 1982 experience study.

It is clear from the above that there has been a steady decline in turnover rates for municipal members over the period 1977 through 1985. In order to reflect this decrease, we recommend that turnover rates be decreased by approximately 20% for both municipal male and female employees.

For police and fire members, the experience has been somewhat erratic. Nevertheless, the current trend warrants a decrease in the expected

rates of employee turnover. We recommend that the turnover rates for police and fire members also be reduced by approximately 20%. A comparison of current and proposed rates for active members is as follows:

Municipal Active Members

<u>Attained Age</u>	<u>Previous Assumptions Used in July 1, 1984 Actuarial Valuation</u>		<u>Proposed Assumptions for Use in July 1, 1985 Actuarial Valuation</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
	22	.135787	.131071	.108630
32	.054667	.078654	.043734	.062923
42	.026080	.040687	.020864	.032550
52	.016694	.026407	.013355	.021126

Police and Fire Active Members

<u>Attained Age</u>	<u>Previous Assumptions Used in July 1, 1984 Actuarial Valuation</u>	<u>Proposed Assumptions for Use in July 1, 1985 Actuarial Valuation</u>
	22	.025825
32	.017215	.013772
42	.005915	.004732

In addition to the above, we reviewed the turnover experience to determine the characteristics (age and service) of the terminating employees who are vested (completed 10 years of service) and have elected to receive a refund of employee contributions versus those employees who have elected to receive a pension payable at retirement age. Based upon prior analysis, we had determined that the assumption as to whether a terminating vested member elects a return of contributions as opposed to electing service pension be based upon a "Rule of 55." This Rule provides that any vested employee whose age and service at termination sums up to 55 or more will be assumed to elect a service pension. All other

terminating vested employees will be assumed to elect a refund of employee contributions. An analysis of actual experience during the 5-year period is as follows:

	Percentage of Vested Employees Electing a Deferred Vested Pension	
	Age Plus Service Less Than 55	Age Plus Service 55 or Greater
Municipal Members	45%	70%
Police and Fire Members	45%	100%

Based upon the above, we recommend a continuation of the current "Rule of 55" as a basis for predicting whether an employee will withdraw his employee contributions or elect to receive a service pension.

D. Annual Rates of Retirement

The retirement experience is summarized in Tables 18, 19, and 20 in Part IV in this report. The average age of retirement may be summarized as follows:

Retirement Experience for Active Members

Year Ending June 30	Average Retirement Age		
	Municipal		Police and Fire
	Male	Female	
1981	60.24	60.40	50.85
1982	60.68	61.51	51.65
1983	60.36	61.53	51.16
1984	59.91	60.59	50.52
1985	60.01	60.69	50.45
1981 - 1985	60.24	61.01	50.91

This experience tends to support a conclusion that the rates of retirement have been fairly stable over the period of the study.

A more meaningful way of summarizing actual experience is to summarize the ratio of actual versus expected experience by retirement age. This experience is summarized as follows:

(Illustration on following page)

Age	Average Retirement Age		
	Municipal		Police and Fire
	Male	Female	
45	--	--	122%
46	--	--	135
47	--	--	102
48	--	--	100
49	--	--	115
50	--	--	112
51	--	--	114
52	--	--	110
53	--	--	115
54	--	--	116
55	145%	145%	90
56	126	148	97
57	102	78	108
58	96	97	94
59	85	85	82
60	102	97	118
61	96	73	80
62	109	88	143
63	96	107	122
64	85	79	138
65+	<u>48</u> 94%	<u>43</u> 77%	<u>32</u> 107%

Experience indicates that although in the aggregate the assumed rates are reasonable, some modification appears appropriate at certain age groups. In particular, we recommend increasing the rates of retirement at the age the member first becomes eligible for retirement and decreasing the expected rates at age 65 and later. A comparison of the current and proposed retirement rates is as follows:

(Table on following page)

Age	Previous Assumption Used in July 1, 1984 Actuarial Valuation			Proposed Assumption for Use in July 1, 1985 Actuarial Valuation		
	Municipal		Police and Fire	Municipal		Police and Fire
	Male	Female		Male	Female	
45	--	--	.120	--	--	.150
46	--	--	.075	--	--	.090
47	--	--	.100	--	--	.100
48	--	--	.105	--	--	.105
49	--	--	.115	--	--	.115
50	--	--	.115	--	--	.120
51	--	--	.125	--	--	.125
52	--	--	.145	--	--	.145
53	--	--	.150	--	--	.150
54	--	--	.170	--	--	.170
55	.150	.130	.190	.175	.175	.180
56	.080	.070	.215	.090	.090	.200
57	.090	.085	.225	.090	.090	.225
58	.095	.095	.225	.090	.090	.225
59	.095	.110	.230	.090	.090	.225
60	.115	.125	.230	.115	.115	.230
61	.130	.135	.245	.115	.115	.230
62	.280	.320	.295	.300	.300	.300
63	.185	.190	.265	.180	.180	.300
64	.200	.195	.260	.180	.180	.300
65	.310	.305	1.000	.300	.300	.300
66	.235	.225	1.000	.225	.225	.300
67	.220	.200	1.000	.200	.200	.300
68	.220	.200	1.000	.200	.200	.300
69	.245	.220	1.000	.200	.200	.300
70	1.000	1.000	1.000	1.000	1.000	1.000

All the retirement experience presented in this report has been adjusted to treat disabilities after retirement age as retirements.

PART III

DISCUSSION OF ECONOMIC EXPERIENCE RESULTS

This Part III presents a discussion of the results of the economic experience for the 5-year period July 1, 1980 through July 1, 1985. Economic assumptions analyzed include the rate of investment return, the rate of individual salary growth, and the rate of total payroll growth. These three items should be considered as dependent upon one another. Accordingly, the economic actuarial assumptions should be considered together, rather than separately.

Act 205, adopted by the Commonwealth of Pennsylvania in 1984, provides that the economic assumptions shall either be within the range specified by the Public Employee Retirement Study Commission or shall be accompanied in the actuarial valuation report with documentation justifying their use.

In their preliminary guidelines, the Public Employee Retirement Study Commission has stipulated that the acceptable assumptions, without further justification, include an assumed rate of investment return not to exceed 9% per annum, a rate of individual salary increases not more than three percentage points less than the assumed rate of investment return, and a rate of covered payroll growth of not more than 4% per annum. Assumptions used in the July 1, 1984 actuarial valuation reflect a 9% interest rate, a 6% rate of salary growth, and a 6% rate of covered payroll growth. Accordingly, the 9% investment return and the 6% salary growth rates are at the upper limits of the Commission's guidelines. The current 6% assumed rate of covered payroll growth exceeds the Commission's 4% guidelines; however, as noted below, we believe that continued use is justified.

A. Investment Return

The Board determines rate of investment return on a yield-to-maturity basis. Under this approach, all assets are valued on an amortized cost basis, ignoring any realized or unrealized gains due to fluctuations of market value.

The rates of return for the recent past have been as follows:

<u>Year Ending June 30</u>	<u>Yield to Maturity</u>
1981	8.8%
1982	9.2
1983	8.8
1984	8.6
1985	8.7
1981 - 1985	8.8

Although the yield during the 5-year period has been slightly less than the assumed 9% investment return used in the actuarial valuation, recent experience has been stable.

More importantly, it is to be noted that for valuation purposes, assets are valued at adjusted market value, not amortized cost value. Accordingly, a more important measure is the market-to-market investment yield including all realized and unrealized gains. The Board has not maintained records of assets on a market-value basis and, accordingly, a market-value yield analysis is not readily available. Equally significant is the fact that the Board has recently undertaken a complete review of all of its investment policies, appointed a number of investment managers, and made major shifts from debt investments to equity investments. During the 5-year period ending December 31, 1985, the percentage of the fund invested in equities has increased from 0% to 40%.

We believe that the Board's major changes in investment managers and the shift from debt investments to equity investments makes any review of past performance meaningless in selecting future investment assumptions. In view of the above, we recommend continuation of the 9% assumption.

B. Rate of Salary Increase

Across-the-board wage increases for the organized groups of employees during the recent past can be summarized as follows:

Across-the-Board Wage Increase Rates

<u>Fiscal Year</u> <u>Ending June 30</u>	<u>Labor Group</u>			
	<u>D.C. 33</u>	<u>D.C. 47</u>	<u>F.O.P.</u>	<u>I.A.F.F.</u>
1981	0.0%	0.0%	5.0%	0.0%
1982	10.0	10.0	5.0	10.0
1983	0.0	0.0	0.0	0.0
1984	8.0	8.0	8.5	8.5
1985	0.0	0.0	0.0	0.0
1986	8.0	8.0	8.0	8.0
Average	4.3%	4.3%	4.4%	4.4%

The above, however, does not reflect increases due to merit, longevity, or productivity. Such increases are expected, on average, to exceed the across-the-board increases by 0.5% to 1.5% per annum.

Comparisons of total average wage increases for continuing members during the 5-year period are summarized in Tables 21 and 22. These indicate a 7.2% average increase for municipal members and a 6.6% increase for police and fire members. However, the 5-year period includes three biennial raises. If we adjust these results to remove one-half of the 8% increase effective July 1, 1985, the resulting rates are 6.3% for municipal members and 5.8% for police and fire members.

Accordingly, we recommend a continuation of the current 6% long-range individual salary increase assumption.

C. Rate of Covered Payroll Growth

In addition to projecting individual salary growth, the valuation projects the annual rate of growth for the total covered payroll. This is necessary since the unfunded actuarial accrued liability is funded as a level percent-

age of covered payroll. During the past 5 years, the rate of growth of covered payroll has averaged 7.5%. The above increase is reflective of three across-the-board increases, an increase in longevity pay scale and possible shifts in the amount of overtime.

The above number was determined by comparing the covered payroll (including overtime and longevity pay, but excluding shift differentials and other premium compensation) as of July 1, 1980 with the corresponding payroll as of July 1, 1985. During this period, the total number of included members increased from 30,536 to 32,486, a total increase of 6.4% or an average annual increase of 1.25%. Accordingly, the average pay for covered members increased at the rate of 6.2%.

Based on the above, we recommend the continuation of the current assumption that covered payroll grow at 6% per annum.

PART IV

TABULAR SUMMARY OF EXPERIENCE RESULTS

<u>Table</u>	<u>Division(s)</u>	<u>Description</u>
1	Municipal Active Members	Mortality for Males
2	Municipal Active Members	Mortality for Females
3	Police and Fire Active Members	Mortality for Males and Females Combined
4	Municipal Retired Members	Mortality for Males
5	Municipal Retired Members	Mortality for Females
6	Police and Fire Retired Members	Mortality for Males
7	Police and Fire Retired Members	Mortality for Females
8	Municipal Disabled Members	Mortality for Males
9	Municipal Disabled Members	Mortality for Females
10	Police and Fire Disabled Members	Mortality for Males
11	Police and Fire Disabled Members	Mortality for Females
12	Municipal Active Members	Disability for Males
13	Municipal Active Members	Disability for Females
14	Police and Fire Active Members	Disability for Males and Females Combined
15	Municipal Active Members	Turnover for Males
16	Municipal Active Members	Turnover for Females
17	Police and Fire Active Members	Turnover for Males and Females Combined
18	Municipal Active Members	Retirement for Males
19	Municipal Active Members	Retirement for Females
20	Police and Fire Active Members	Retirement for Males and Females Combined
21	Municipal Active Members	Annual Salary Increase for Males and Females Combined
22	Police and Fire Active Members	Annual Salary Increase for Males and Females Combined

DESCRIPTION OF SUMMARY TABLES

Expected Rate Per 1,000: The expected number of decrements (i.e., deaths, disabilities, turnover or retirements) for every 1,000 members for every year of service based upon the July 1, 1984 actuarial valuation.

Adjustments to Data: Employees who were classified as terminations but who had attained service retirement age were reclassified as retirements. Employees who became disabled after eligibility for a service pension were also classified as retirements.

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 1
MUNICIPAL DIVISION ACTIVE MEMBERS
MORTALITY FOR MALES

AGE	EXPECTED RATE PER 1,000	ACTUAL DEATHS					EXPECTED DEATHS					TOTAL
		1981	1982	1983	1984	1985	1981	1982	1983	1984	1985	
40 - 44	2.339	2	9	11	8	12	19	19	20	20	20	98
45 - 49	3.847	6	13	4	4	10	7	7	7	6	7	34
50 - 54	6.261	9	13	10	12	12	13	13	12	12	12	63
55 - 59	9.846	7	13	7	8	10	13	14	14	15	14	70
60 - 64	15.509	5	9	6	3	5	11	12	11	12	11	57
65 - 69	24.596	2	7	3	3	2	5	5	5	5	5	24
70+	36.938	0	0	0	0	3	2	2	3	3	3	13
TOTAL		31	64	41	38	54	70	72	72	73	72	359

RATIO OF ACTUAL TO EXPECTED DEATHS

1981	44%
1982	89
1983	57
1984	53
1985	74
1981-1985	64%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 2
MUNICIPAL DIVISION ACTIVE MEMBERS
MORTALITY FOR FEMALES

AGE	EXPECTED RATE PER 1,000	ACTUAL DEATHS					TOTAL	EXPECTED DEATHS					TOTAL	
		1981	1982	1983	1984	1985		1981	1982	1983	1984	1985		
40 - 44	1.290	2	2	5	5	1	15	5	5	6	6	6	6	28
45 - 49	2.029	0	0	2	1	0	3	1	2	2	2	2	2	9
50 - 54	3.337	1	2	1	1	1	6	3	3	3	3	3	3	15
55 - 59	5.431	2	4	4	1	1	12	4	3	3	4	4	4	18
60 - 64	8.541	3	1	0	2	3	9	4	3	3	4	4	4	18
65 - 69	13.453	1	1	0	1	1	4	2	2	2	2	2	2	10
70+	21.336	0	1	1	0	0	2	1	1	1	2	2	2	7
TOTAL		9	11	13	11	7	51	20	19	20	23	23	23	105

RATIO OF ACTUAL TO EXPECTED DEATHS

1981	45%
1982	58
1983	65
1984	48
1985	30
1981-1985	49%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 3
POLICE AND FIRE DIVISION ACTIVE MEMBERS
MORTALITY FOR MALES AND FEMALES COMBINED

AGE	EXPECTED RATE PER 1,000	ACTUAL DEATHS					TOTAL	EXPECTED DEATHS					TOTAL	
		1981	1982	1983	1984	1985		1981	1982	1983	1984	1985		
40 - 44	2.339	7	14	15	12	9	57	20	20	20	19	19	19	98
45 - 49	3.847	2	0	4	2	5	13	4	3	4	4	4	5	20
50 - 54	6.261	1	4	4	2	3	14	4	4	4	3	3	3	17
55 - 59	9.846	2	2	3	2	3	12	2	2	2	2	2	2	10
60 - 64	15.509	0	0	0	1	0	1	1	1	1	1	1	0	3
65 - 69	24.596	0	0	0	1	0	1	0	1	1	0	0	0	1
70+	36.938	0	0	0	1	0	1	0	0	0	0	0	0	0
TOTAL		12	20	26	21	20	99	31	31	31	29	29	29	149

RATIO OF ACTUAL TO EXPECTED DEATHS

1981	39%
1982	65
1983	90
1984	72
1985	69
1981-1985	66%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 4
MUNICIPAL DIVISION NONACTIVE MEMBERS
MORTALITY FOR RETIRED MALES

AGE	EXPECTED RATE PER 1,000	ACTUAL DEATHS					TOTAL	EXPECTED DEATHS					TOTAL		
		1981	1982	1983	1984	1985		1981	1982	1983	1984	1985			
35 - 39	1.792	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40 - 44	2.818	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45 - 49	4.635	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50 - 54	7.543	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55 - 59	11.863	6	4	1	6	12	29	8	8	8	9	8	8	8	41
60 - 64	18.685	20	12	7	24	30	93	19	20	20	21	22	21	22	102
65 - 69	29.634	53	45	11	34	32	175	32	33	35	38	38	38	38	176
70 - 74	44.504	67	56	14	43	40	220	40	41	44	47	47	47	47	219
75 - 79	68.628	74	62	15	47	44	242	43	45	48	52	52	52	52	240
80 - 84	104.310	59	51	12	38	36	196	36	37	39	42	42	42	42	196
85 - 89	155.147	41	35	8	26	25	135	25	26	28	30	30	30	30	139
90 - 94	232.983	18	15	4	12	11	60	11	11	11	12	11	12	12	57
95+	349.505	3	2	1	2	2	10	2	2	3	3	3	3	3	13
TOTAL		341	282	73	232	232	1,160	216	223	236	254	254	254	254	1,183

RATIO OF ACTUAL TO EXPECTED DEATHS

1981	158%
1982	126
1983	31
1984	91
1985	91
1981-1985	98%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 5
MUNICIPAL DIVISION NONACTIVE MEMBERS
MORTALITY FOR RETIRED FEMALES

AGE	EXPECTED RATE PER 1,000	ACTUAL DEATHS					TOTAL	EXPECTED DEATHS					TOTAL		
		1981	1982	1983	1984	1985		1981	1982	1983	1984	1985			
35 - 39	1.136	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40 - 44	1.684	0	0	0	1	0	2	0	0	0	0	0	0	0	0
45 - 49	2.649	0	0	1	1	0	2	0	0	1	0	1	0	0	1
50 - 54	4.357	0	1	0	3	1	5	0	0	1	0	1	1	1	3
55 - 59	7.090	6	2	0	2	5	15	3	4	3	4	4	4	4	18
60 - 64	11.151	5	5	1	11	14	36	9	10	11	11	11	10	10	51
65 - 69	17.564	19	17	6	11	33	86	18	19	20	21	21	22	22	100
70 - 74	27.856	26	24	8	15	45	118	27	29	32	32	32	34	34	154
75 - 79	41.834	38	34	12	22	65	171	33	35	37	39	39	41	41	185
80 - 84	64.510	42	37	13	24	73	189	32	34	36	38	38	39	39	179
85 - 89	98.051	31	28	10	18	53	140	24	25	27	28	28	30	30	134
90 - 94	145.838	18	16	6	11	32	83	13	14	14	15	15	16	16	72
95+	219.004	2	1	1	1	3	8	2	2	2	2	2	3	3	11
TOTAL		187	165	58	119	324	853	161	172	184	191	191	200	200	908

RATIO OF ACTUAL TO EXPECTED DEATHS

1981	116%
1982	96
1983	32
1984	62
1985	162
1981-1985	94%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 6
POLICE AND FIRE DIVISION NONACTIVE MEMBERS
MORTALITY FOR RETIRED MALES

AGE	EXPECTED RATE PER 1,000	ACTUAL DEATHS					EXPECTED DEATHS							
		1981	1982	1983	1984	1985	TOTAL	1981	1982	1983	1984	1985	TOTAL	
35 - 39	1.792	0	1	0	0	0	1	0	0	0	0	0	0	0
40 - 44	2.818	0	0	0	0	0	0	0	0	0	0	0	0	0
45 - 49	4.635	1	0	0	0	0	0	1	1	2	2	2	2	8
50 - 54	7.543	2	3	2	3	4	14	3	4	5	6	6	6	24
55 - 59	11.863	9	6	3	6	8	32	6	7	8	9	10	10	40
60 - 64	18.685	12	8	5	11	16	52	12	11	11	10	11	11	55
65 - 69	29.634	28	18	18	23	18	105	23	23	23	22	20	20	111
70 - 74	44.504	36	23	23	29	23	134	27	27	28	26	24	24	132
75 - 79	68.628	40	25	25	33	25	148	28	28	27	26	26	24	133
80 - 84	104.310	41	26	27	34	27	155	26	26	26	25	23	23	126
85 - 89	155.147	21	14	14	17	14	80	15	15	14	14	13	13	71
90 - 94	232.983	7	4	5	6	5	27	5	5	5	5	5	5	25
95+	349.505	1	0	0	0	0	1	0	0	1	0	0	0	1
TOTAL		198	131	122	165	141	757	146	147	150	145	138	138	726

RATIO OF ACTUAL TO EXPECTED DEATHS

1981	136%
1982	89
1983	81
1984	114
1985	102
1981-1985	104%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 7

POLICE AND FIRE DIVISION NONACTIVE MEMBERS
MORTALITY FOR RETIRED FEMALES

AGE	EXPECTED RATE PER 1,000	ACTUAL DEATHS					TOTAL	EXPECTED DEATHS					TOTAL		
		1981	1982	1983	1984	1985		1981	1982	1983	1984	1985			
35 - 39	1.136	1	0	0	0	0	1	0	0	0	0	0	0	0	0
40 - 44	1.684	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45 - 49	2.649	1	0	1	2	0	4	0	0	0	0	0	0	1	1
50 - 54	4.357	1	1	0	1	0	3	0	0	1	1	1	1	1	3
55 - 59	7.090	1	0	2	1	1	6	1	1	1	1	1	1	2	6
60 - 64	11.151	7	3	2	4	2	18	2	2	2	2	2	2	1	9
65 - 69	17.564	6	6	9	8	7	36	6	6	7	7	7	7	7	33
70 - 74	27.856	6	6	8	7	7	34	10	10	12	12	12	12	12	56
75 - 79	41.834	9	9	14	13	11	56	15	16	18	18	18	18	18	85
80 - 84	64.510	13	13	20	17	15	78	18	19	21	21	21	21	21	100
85 - 89	98.051	10	10	15	13	12	60	13	13	15	15	15	15	16	72
90 - 94	145.838	3	3	5	4	4	19	6	6	8	8	8	8	8	36
95+	219.004	0	0	1	1	1	2	1	1	1	1	1	2	2	7
TOTAL		58	51	77	71	60	317	72	74	86	87	89	87	89	408

RATIO OF ACTUAL TO EXPECTED DEATHS

1981	81%
1982	69
1983	90
1984	82
1985	67
1981-1985	78%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 8
MUNICIPAL DIVISION NONACTIVE MEMBERS
MORTALITY FOR DISABLED MALES

AGE	EXPECTED RATE PER 1,000	ACTUAL DEATHS					TOTAL	EXPECTED DEATHS					TOTAL	
		1981	1982	1983	1984	1985		1981	1982	1983	1984	1985		
35 - 39	9.677	0	0	0	1	1	2	0	0	0	0	0	1	1
40 - 44	15.217	1	2	0	0	0	3	1	1	1	1	1	1	1
45 - 49	25.029	4	4	1	2	0	11	4	3	3	3	3	2	2
50 - 54	24.032	11	7	2	5	5	30	6	6	7	7	7	7	7
55 - 59	23.062	11	14	0	13	12	50	9	9	8	8	8	8	8
60 - 64	29.261	14	7	3	8	9	41	8	9	10	11	11	11	11
65 - 69	39.046	4	8	8	11	9	40	6	6	8	8	8	8	8
70 - 74	52.871	3	5	5	7	5	25	4	4	5	6	6	6	6
75 - 79	74.118	2	3	3	5	4	17	2	2	2	3	3	3	3
80 - 84	112.655	1	2	3	3	3	12	1	1	1	1	1	2	2
85 - 89	167.559	0	0	0	1	0	1	0	0	1	1	1	1	1
90 - 94	251.622	0	0	0	0	0	0	0	0	0	0	0	0	0
95+	377.465	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		51	52	25	56	48	232	40	41	46	49	50	226	

RATIO OF ACTUAL TO EXPECTED DEATHS

1981	128%
1982	127%
1983	54
1984	114
1985	96
1981-1985	103%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 9
MUNICIPAL DIVISION NONACTIVE MEMBERS
MORTALITY FOR DISABLED FEMALES

AGE	EXPECTED RATE PER 1,000	ACTUAL DEATHS					EXPECTED DEATHS							
		1981	1982	1983	1984	1985	TOTAL	1981	1982	1983	1984	1985	TOTAL	
35 - 39	7.835	0	0	0	0	0	0	0	0	0	0	0	0	0
40 - 44	11.623	0	0	0	0	1	0	0	0	0	0	0	0	1
45 - 49	18.278	0	1	0	1	1	2	0	1	1	0	0	1	3
50 - 54	17.737	1	0	1	1	2	5	1	1	1	1	1	1	5
55 - 59	17.613	5	3	0	3	0	11	2	2	1	2	2	2	9
60 - 64	22.314	2	0	2	2	1	7	2	2	1	2	2	2	9
65 - 69	29.571	3	0	1	1	4	9	1	1	2	2	2	2	8
70 - 74	42.285	1	1	0	1	0	3	0	1	1	2	2	2	6
75 - 79	57.731	1	2	0	1	1	5	0	0	1	1	1	1	3
80 - 84	89.024	0	1	0	0	1	1	0	0	1	1	1	1	3
85 - 89	135.311	0	0	0	1	0	1	0	0	1	1	1	1	3
90 - 94	201.257	0	0	0	0	1	1	0	0	0	0	0	1	1
95+	302.226	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		13	8	4	11	10	46	6	8	10	12	15	51	

RATIO OF ACTUAL TO EXPECTED DEATHS

1981	217%
1982	100
1983	40
1984	92
1985	67
1981-1985	90%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 10
POLICE AND FIRE DIVISION NONACTIVE MEMBERS
MORTALITY FOR DISABLED MALES

AGE	EXPECTED RATE PER 1,000	ACTUAL DEATHS					TOTAL	EXPECTED DEATHS					TOTAL
		1981	1982	1983	1984	1985		1981	1982	1983	1984	1985	
35 - 39	9.677	4	1	0	1	0	6	2	2	1	2	2	9
40 - 44	15.217	3	1	4	2	4	14	3	3	4	5	5	20
45 - 49	25.029	3	1	2	2	1	9	8	8	8	7	7	38
50 - 54	24.032	7	1	4	5	5	22	11	10	10	10	10	51
55 - 59	23.062	7	10	5	8	14	44	9	9	11	11	11	51
60 - 64	29.261	8	9	2	6	8	33	7	7	8	8	9	40
65 - 69	39.046	6	8	6	12	7	39	6	7	8	8	9	37
70 - 74	52.871	5	7	5	11	6	34	2	3	3	3	3	14
75 - 79	74.118	3	5	4	7	4	23	1	1	1	1	2	6
80 - 84	112.655	1	2	2	3	2	10	0	0	1	1	1	3
85 - 89	167.559	1	1	1	2	1	6	0	0	0	0	1	1
90 - 94	251.622	0	0	0	1	0	1	0	0	0	0	0	0
95+	377.465	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		48	46	35	60	52	241	49	50	55	56	60	270

RATIO OF ACTUAL TO EXPECTED DEATHS

1981	98%
1982	92
1983	64
1984	107
1985	87
1981-1985	89%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 11
POLICE AND FIRE DIVISION NONACTIVE MEMBERS
MORTALITY FOR DISABLED FEMALES

AGE	EXPECTED RATE PER 1,000	ACTUAL DEATHS					EXPECTED DEATHS							
		1981	1982	1983	1984	1985	TOTAL	1981	1982	1983	1984	1985	TOTAL	
35 - 39	7.835	0	0	0	0	0	0	0	0	0	0	0	0	0
40 - 44	11.623	0	0	0	0	0	0	0	0	0	0	0	0	0
45 - 49	18.278	0	0	0	0	0	0	0	0	0	0	0	0	0
50 - 54	17.737	0	0	0	0	0	0	0	0	0	0	0	0	0
55 - 59	17.613	0	0	0	0	1	1	0	0	0	0	0	0	0
60 - 64	22.314	0	0	0	0	0	0	0	0	0	0	0	0	0
65 - 69	29.571	0	0	0	0	0	0	0	0	0	0	0	0	0
70 - 74	42.285	0	0	0	0	0	0	0	0	0	0	0	0	0
75 - 79	57.731	0	0	0	0	0	0	0	0	0	0	0	0	0
80 - 84	89.024	0	0	0	0	0	0	0	0	0	0	0	0	0
85 - 89	135.311	0	0	0	0	0	0	0	0	0	0	0	0	0
90 - 94	201.257	0	0	0	0	0	0	0	0	0	0	0	0	0
95+	302.226	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		0	0	0	0	1	1	0	0	0	0	0	0	0

RATIO OF ACTUAL TO EXPECTED DEATHS

1981	--
1982	--
1983	--
1984	--
1985	--
1981-1985	--

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 12
MUNICIPAL DIVISION ACTIVE MEMBERS
DISABILITY FOR MALES

AGE	EXPECTED RATE PER 1,000	ACTUAL DISABILITIES					EXPECTED DISABILITIES					TOTAL		
		1981	1982	1983	1984	1985	1981	1982	1983	1984	1985			
20 - 24	0.014	0	0	0	0	0	0	0	0	0	0	0	0	0
25 - 29	0.052	1	1	0	0	0	0	0	0	0	0	0	0	0
30 - 34	0.718	1	1	0	0	2	4	2	1	1	1	1	1	8
35 - 39	2.048	8	5	3	3	4	23	4	4	5	4	4	5	22
40 - 44	4.549	6	7	4	8	8	33	7	9	9	7	7	9	39
45 - 49	9.723	18	20	10	9	7	64	18	18	17	17	17	17	87
50 - 54	17.309	28	33	21	26	17	125	37	37	35	33	32	32	174
TOTAL		62	67	38	46	38	251	68	68	65	65	64	64	330

RATIO OF ACTUAL TO EXPECTED DISABILITIES

1981	91%
1982	99
1983	58
1984	71
1985	59
1981-1985	76%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 13
MUNICIPAL DIVISION ACTIVE MEMBERS
DISABILITY FOR FEMALES

AGE	EXPECTED RATE PER 1,000	ACTUAL DISABILITIES					EXPECTED DISABILITIES					TOTAL			
		1981	1982	1983	1984	1985	TOTAL	1981	1982	1983	1984		1985		
20 - 24	0.016	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25 - 29	0.109	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30 - 34	0.439	0	0	1	0	1	2	1	1	1	1	1	1	1	1
35 - 39	1.046	2	0	0	0	2	4	1	1	1	1	1	1	1	1
40 - 44	2.465	2	2	1	1	6	6	0	2	2	2	3	3	3	12
45 - 49	5.663	2	6	5	3	23	4	7	4	5	5	5	5	5	24
50 - 54	12.344	6	10	7	2	35	10	10	4	11	11	11	11	11	54
TOTAL		12	18	14	6	70	17	20	19	19	21	21	21	21	97

RATIO OF ACTUAL TO EXPECTED DISABILITIES

1981	71%
1982	95
1983	74
1984	29
1985	95
1981-1985	72%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 14
POLICE AND FIRE DIVISION ACTIVE MEMBERS
DISABILITY FOR MALES AND FEMALES COMBINED

AGE	EXPECTED RATE PER 1,000	ACTUAL DISABILITIES					EXPECTED DISABILITIES					TOTAL
		1981	1982	1983	1984	1985	1981	1982	1983	1984	1985	
20 - 24	0.994	0	0	0	0	0	0	0	1	0	0	1
25 - 29	1.370	3	0	0	1	1	2	1	1	1	1	7
30 - 34	2.861	12	5	7	9	3	8	7	6	5	33	
35 - 39	5.773	24	14	13	16	8	15	16	16	16	79	
40 - 44	10.598	31	33	15	19	19	19	22	25	25	111	
TOTAL		70	52	35	45	31	44	45	47	47	231	

RATIO OF ACTUAL TO EXPECTED DISABILITIES

1981	159%
1982	116
1983	74
1984	94
1985	66
1981-1985	101%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 15
MUNICIPAL DIVISION ACTIVE MEMBERS
TURNOVER FOR MALES

AGE	EXPECTED RATE PER 1,000	ACTUAL TURNOVERS					EXPECTED TURNOVERS					TOTAL
		1981	1982	1983	1984	1985	1981	1982	1983	1984	1985	
20 - 24	135.787	29	16	29	25	16	65	80	86	73	67	371
25 - 29	95.840	115	85	102	75	67	157	156	160	155	157	785
30 - 34	54.667	140	117	85	95	77	138	138	135	127	124	662
35 - 39	34.560	72	62	62	60	69	62	68	77	83	92	382
40 - 44	26.080	50	37	23	31	30	44	44	44	45	47	224
45 - 49	20.853	33	30	23	26	10	38	38	37	37	37	187
50 - 54	16.693	26	27	19	17	12	35	35	34	32	32	168
TOTAL		465	374	343	329	281	539	559	573	552	556	2,779

RATIO OF ACTUAL TO EXPECTED TURNOVERS

1981	86%
1982	67
1983	60
1984	60
1985	51
1981-1985	64%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 16

MUNICIPAL DIVISION ACTIVE MEMBERS
TURNOVER FOR FEMALES

AGE	EXPECTED RATE PER 1,000	ACTUAL TURNOVERS					EXPECTED TURNOVERS					TOTAL
		1981	1982	1983	1984	1985	1981	1982	1983	1984	1985	
20 - 24	131.071	23	22	31	28	11	47	55	62	54	54	272
25 - 29	109.877	84	81	67	56	37	105	102	100	94	99	500
30 - 34	78.654	77	73	72	60	51	89	92	90	89	88	448
35 - 39	53.267	53	48	32	34	41	51	53	57	59	65	285
40 - 44	40.687	25	26	25	25	18	36	39	40	42	43	200
45 - 49	32.810	25	17	21	19	14	27	27	28	29	30	141
50 - 54	26.407	23	19	14	12	7	22	23	23	24	24	116
TOTAL		310	286	262	234	179	377	391	400	391	403	1,962

RATIO OF ACTUAL TO EXPECTED TURNOVERS

1981	82%
1982	73
1983	66
1984	60
1985	44
1981-1985	65%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 17
POLICE AND FIRE DIVISION ACTIVE MEMBERS
TURNOVER FOR MALES AND FEMALES COMBINED

AGE	EXPECTED RATE PER 1,000	ACTUAL TURNOVERS					EXPECTED TURNOVERS					TOTAL
		1981	1982	1983	1984	1985	1981	1982	1983	1984	1985	
20 - 24	25.825	3	0	1	1	1	5	5	8	7	6	31
25 - 29	24.915	36	14	11	7	10	35	29	27	22	21	134
30 - 34	17.215	36	36	19	19	15	47	44	39	34	33	197
35 - 39	9.650	20	21	14	14	15	25	27	27	27	27	133
40 - 44	5.915	11	15	7	11	14	10	11	13	14	14	62
TOTAL		106	86	52	52	55	122	116	114	104	101	557

RATIO OF ACTUAL TO EXPECTED TURNOVERS

1981	87%
1982	74
1983	46
1984	50
1985	54
1981-1985	63%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 18
MUNICIPAL DIVISION ACTIVE MEMBERS
RETIREMENT FOR MALES

AGE	EXPECTED RATE PER 1,000	ACTUAL RETIREMENTS	EXPECTED RETIREMENTS	RATIO OF ACTUAL TO EXPECTED RETIREMENT
55	150	450	310	145%
56	80	167	133	126
57	90	134	131	102
58	95	118	123	96
59	95	94	110	85
60	115	128	125	102
61	130	122	127	96
62	280	268	246	109
63	185	110	114	96
64	200	84	99	85
65	310	136	123	111
66	235	60	60	100
67	220	50	45	111
68	220	29	36	81
69	245	39	35	111
70+	1,000	85	395	22
TOTAL		2,074	2,212	94%

AVERAGE AGE AT RETIREMENT

1981	60.24
1982	60.68
1983	60.36
1984	59.91
1985	60.01
1981-1985	60.24

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 19
MUNICIPAL DIVISION ACTIVE MEMBERS
RETIREMENT FOR FEMALES

AGE	EXPECTED RATE PER 1,000	ACTUAL RETIREMENTS	EXPECTED RETIREMENTS	RATIO OF ACTUAL TO EXPECTED RETIREMENT
55	130	162	112	145%
56	70	77	52	148
57	85	45	58	78
58	95	61	63	97
59	110	60	71	85
60	125	70	72	97
61	135	52	71	73
62	320	139	158	88
63	190	73	68	107
64	195	46	58	79
65	305	60	80	75
66	225	46	46	100
67	200	26	32	81
68	200	29	27	107
69	220	20	24	83
70+	1,000	57	344	17
TOTAL		1,023	1,336	77%

AVERAGE AGE AT RETIREMENT	
1981	60.40
1982	61.51
1983	61.53
1984	60.59
1985	60.69
1981-1985	61.01

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 20
 POLICE AND FIRE DIVISION ACTIVE MEMBERS
 RETIREMENT FOR MALES AND FEMALES COMBINED

<u>AGE</u>	<u>EXPECTED RATE PER 1,000</u>	<u>ACTUAL RETIREMENTS</u>	<u>EXPECTED RETIREMENTS</u>	<u>RATIO OF ACTUAL TO EXPECTED RETIREMENT</u>
45	120	225	185	122%
46	75	126	93	135
47	100	109	107	102
48	105	96	96	100
49	115	109	95	115
50	115	95	85	112
51	125	92	81	114
52	140	85	77	110
53	150	86	75	115
54	170	88	76	116
55	190	62	69	90
56	215	60	62	97
57	225	53	49	108
58	225	31	33	94
59	230	18	22	82
60	230	20	17	118
61	245	12	15	80
62	295	20	14	143
63	265	11	9	122
64	260	11	8	138
65	1,000	<u>25</u>	<u>78</u>	<u>32</u>
TOTAL		1,434	1,346	107%

AVERAGE AGE AT RETIREMENT

1981	50.85
1982	51.65
1983	51.16
1984	50.52
1985	50.45
1981-1985	50.91

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 21
MUNICIPAL DIVISION ACTIVE MEMBERS
ANNUAL SALARY INCREASES FOR MALES AND FEMALES COMBINED

BEGINNING AGE	07/01/80 TO 07/01/81	07/01/81 TO 07/01/82	07/01/82 TO 07/01/83	07/01/83 TO 07/01/84	07/01/84 TO 07/01/85	07/01/80 TO 07/01/85
20 - 24	14.938%	4.840%	15.326%	2.143%	15.528%	9.108%
25 - 29	13.614	3.639	13.784	1.626	13.861	8.420
30 - 34	12.430	3.015	12.498	1.422	12.518	7.646
35 - 39	11.407	2.074	11.380	1.109	11.845	7.084
40 - 44	11.253	1.539	10.621	0.827	11.681	6.779
45 - 49	10.880	1.219	10.012	0.778	11.449	6.557
50 - 54	11.027	1.263	9.971	0.665	11.299	6.560
55 - 59	11.308	1.230	9.761	0.692	11.299	6.498
60 - 64	11.363	1.358	10.320	0.727	11.005	6.562
65 - 69	11.530	0.395	8.555	1.790	10.531	3.584
70+	8.699	-3.343	5.312	5.173	9.217	6.066
AVERAGE ANNUAL RATE OF INCREASE FOR AGES 20 - 70+:	11.757%	2.074%	11.284%	1.071%	11.998%	7.139%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
RESULTS OF EXPERIENCE STUDY FOR FISCAL YEARS 1981-1985

TABLE 22

POLICE AND FIRE DIVISION ACTIVE MEMBERS
 ANNUAL SALARY INCREASES FOR MALES AND FEMALES COMBINED

BEGINNING AGE	07/01/80 TO 07/01/81	07/01/81 TO 07/01/82	07/01/82 TO 07/01/83	07/01/83 TO 07/01/84	07/01/84 TO 07/01/85	07/01/80 TO 07/01/85
20 - 24	13.385%	5.978%	16.759%	1.211%	13.634%	7.502%
25 - 29	11.228	1.181	12.212	0.583	12.517	6.664
30 - 34	11.028	0.737	11.483	0.258	11.129	6.611
35 - 39	10.914	0.511	11.580	0.209	10.662	6.553
40 - 44	10.854	0.363	11.758	0.119	10.210	6.524
45 - 49	10.655	0.301	12.065	0.143	10.037	6.535
50 - 54	10.680	0.333	12.281	0.339	9.801	6.533
55 - 59	10.260	0.543	12.473	0.732	9.451	6.332
60 - 64	10.333	0.209	11.933	0	9.294	6.220
65 - 69	8.521	0	11.536	0	9.555	6.054
70+	0	0	16.878	0	9.233	0
AVERAGE ANNUAL RATE OF INCREASE FOR AGES 20 - 70+:	11.018%	0.728%	11.904%	0.264%	10.701%	6.603%

PART V

ACTUARIAL ASSUMPTIONS USED
IN THE JULY 1, 1984 VALUATION

The actuarial cost method, factors and assumptions used in determining cost estimates are presented below.

1. Member Data: The member data used in the determination of cost estimates consists of pertinent information with respect to the active, retired, disabled and deferred vested municipal and uniformed members of the City of Philadelphia Municipal Retirement System as supplied by the Philadelphia Board of Pensions and Retirement to the actuary.
2. Valuation Date: July 1, 1984.
3. Actuarial Cost Method: The costs of the System have been determined in accordance with the projected unit credit actuarial cost method (prorated by service). The Bogen unfunded actuarial accrued liability is amortized in level dollar payments over 20 years ending June 30, 1992 and the Dombrowski unfunded actuarial accrued liability is amortized in level dollar payments over 40 years ending June 30, 2009 as ordered by the Court of Common Pleas of Philadelphia County. The remaining unfunded actuarial accrued liability is amortized over 40 years ending June 30, 2019 with payments increasing 6.0% per annum. Actuarial gains and losses and changes in the accrued liability due to changes in actuarial assumptions are amortized over the greater of the remaining portion of the 40-year period from the year in which first recognized and 30 years.
4. Annual Rate of Withdrawal Prior to Retirement: The assumed annual rates of withdrawal may best be illustrated by the following probabilities at quinquennial ages:

[Table on Following Page]

<u>Attained Age</u>	<u>Municipal</u>		<u>Uniformed</u>
	<u>Males</u>	<u>Females</u>	<u>Unisex</u>
20	.150027	.137134	.026250
25	.112907	.125631	.025375
30	.069387	.091404	.020680
35	.040267	.061880	.012310
40	.028853	.044654	.006990
45	.022720	.035700	.000000
50	.018293	.028843	.000000
55	.000000	.000000	.000000

In addition, it is assumed that a terminating employee who is vested (10 years of service) will elect a refund of employee contributions unless his age plus years of service at termination sum to 55 or more (rule of 55), in which event he will be assumed to elect a deferred pension commencing at service retirement age.

5. Annual Rate of Disability Prior to Retirement: The assumed annual rates of disability may best be illustrated by the following probabilities at quinquennial ages:

<u>Attained Age</u>	<u>Municipal</u>		<u>Uniformed</u>
	<u>Males</u>	<u>Females</u>	<u>Unisex</u>
20	.000014	.000016	.000994
25	.000037	.000072	.001220
30	.000452	.000307	.002265
35	.001516	.000803	.004608
40	.003549	.001897	.008668
45	.007653	.004384	.016239
50	.014275	.009666	.020000
55	.018924	.013934	.020000
60	.020000	.015000	.020000
65	.000000	.000000	.000000

In addition, it is assumed that 90% of all disabilities among municipal members are ordinary (10% are service connected) and that 80% of all disabilities among uniformed members are ordinary (20% are service connected).

6. Annual Rate of Mortality Prior to Retirement: It is assumed that deaths among active municipal male members may be represented by 83% of the UP-84 Mortality Table with ages set forward one year. Deaths among municipal female members are assumed to be represented by 72% of the UP-84 Mortality Table with ages set back four years. In addition, it is assumed that 95% of all deaths among active municipal members are ordinary (5% are service connected).

It is assumed that deaths among active uniformed members may be represented by 83% of the UP-84 Mortality Table with ages set forward one year. In addition, it is assumed that 80% of all deaths among active uniformed members are ordinary (20% are service connected).

7. Service Retirement: It is assumed that active members will retire in accordance with the following rates:

Attained Age	Municipal		Uniformed
	Males	Females	Unisex
45	--	--	.120
46	--	--	.075
47	--	--	.100
48	--	--	.105
49	--	--	.115
50	--	--	.115
51	--	--	.125
52	--	--	.140
53	--	--	.150
54	--	--	.170
55	.150	.130	.190
56	.080	.070	.215
57	.090	.085	.225
58	.095	.095	.225
59	.095	.110	.230
60	.115	.125	.230
61	.130	.135	.245
62	.280	.320	.295
63	.185	.190	.265
64	.200	.195	.260

[Table Continued on Following Page]

Attained Age	Municipal		Uniformed
	Males	Females	Unisex
65	.310	.305	1.000
66	.235	.225	--
67	.220	.200	--
68	.220	.200	--
69	.245	.220	--
70	1.000	1.000	--

8. Annual Rate of Mortality After Retirement: Post-retirement mortality has been assumed to follow the UP-84 Mortality Table with ages set forward one year for males and to follow 94% of the UP-84 Mortality Table with ages set back four years for females. Post-disablement mortality has been assumed to follow the above mentioned table with the following adjustment factors applied at each age.

Attained Age	Adjustment Factor		Attained Age	Adjustment Factor	
	Male	Female		Male	Female
47 & Before	5.40	6.90	62	1.57	2.00
48	4.59	5.87	63	1.51	1.93
49	4.10	5.24	64	1.46	1.86
50	3.78	4.83	65	1.40	1.79
51	3.46	4.42	66	1.35	1.73
52	3.19	4.07	67	1.32	1.68
53	2.86	3.66	68	1.30	1.66
54	2.59	3.31	69	1.30	1.66
55	2.38	3.04	70	1.24	1.59
56	2.16	2.76	71	1.19	1.52
57	1.94	2.48	72	1.19	1.52
58	1.84	2.35	73	1.13	1.45
59	1.73	2.21	74	1.10	1.41
60	1.67	2.14	75 & Later	1.08	1.38
61	1.62	2.07			

9. Salary Scale: It is assumed that salaries, including longevity and overtime, will increase at a compound annual rate of 6.0% per annum.

10. Rate of Investment Return: It is assumed that the assets of the fund will accumulate at a compound annual rate of 9% per annum.
11. Expenses: The administrative expenses of servicing the Retirement System are estimated based upon projections from the prior three year trend.
12. Value of Investments: Assets held by the fund exclusive of equity securities are valued at market value as reported by the City. Equity securities are determined based on the product of (i) the average of the ratio of the market value of the equity securities to their cost value as of the valuation date and the two immediately preceding July 1 dates (but not prior to July 1, 1984) and (ii) the corresponding cost value of the equity securities as of such valuation dates.
13. Family Composition: It is assumed that 70% of all active members and 60% of all nonactive members will be survived by a spouse and that female (male) spouses are four years younger (older) than members.
14. Form of Annuity: It is assumed that all members will elect Option 4 unless otherwise indicated in the participant's data.
15. Capitalized Value of Bonds: In order that both current assets and liabilities be valued on the same basis, the portion of the fixed income portfolio which can be matched with expected future payments is determined based on the valuation interest rate and the difference between this value of assets and the market value of assets is subtracted from the accrued liability.