State of Alaska

Public Employees' Retirement System
Study of Actuarial Assumptions

October 1996

Contents

Section 1

Introduction and Summary

Role of Assumptions in Funding the Retirement Plans

THE ULTIMATE COST OF A PENSION PLAN CAN BE REPRESENTED BY THE FORMULA $B + E - I$, where:

B = the actual benefits paid to participants with respect to retirement, termination from service, death, disability, and health insurance,

E = the costs of administration and advisory services, and

I = the investment returns generated by the fund's assets.

While none of these factors will be known exactly until the last benefit is paid, they can be estimated and measured in an actuarial valuation. One of the primary functions of an actuarial valuation is to determine an annual contribution amount that is expected to adequately provide for future benefit payouts and that is expected to remain relatively stable as a percent of salaries from year to year. To determine the annual contribution amount, assumptions must first be made that estimate the amount and incidence of future benefit payouts and the economic value of those payouts as of the valuation date.

There are two general categories of assumptions, demographic and economic. Demographic assumptions relate to the Systems' populations and how they are expected to change over time. Examples of demographic assumptions include rates of retirement, disability, termination and death.

Economic assumptions refer to the expected long-term financial experience of the Systems, and include:

- total inflation (as measured by the CPI)
- investment return on the Systems' assets
- salary increases
- retiree health premium inflation

The assumptions chosen for the actuarial valuation are central to funding the plan in an orderly way and with assurance that the funds accumulated through annual contributions and investment returns will provide participants with promised benefit payouts. Since economic and demographic factors change over time, periodic studies of the assumptions and their relation to past and expected future experience are undertaken to determine whether they continue to be valid or if changes should be made. These studies are usually done every four or five years.

The current assumptions have been used since their approval by the Public Employees' Retirement System Board in 1991 and 1994.

Summary of Recommended Changes

The following chart summarizes the recommended changes in actuarial assumptions for the June 30, 1996 valuation of the System and their estimated effect on the financial status of the System.

|	Current Assumption	Proposed Assumption	Change in: Funding Ratio	Contrib. Rates
Total Inflation	4%	4%	No change	No change
Annual Investment Return	8%	8.25%	+3.1%	(1.89%)
Annual Salary Increase - Inflation Productivity Merit (first 5 years)	4.0% 0.5% 1.0%	4.0% 0.5% 1.0%	No change	No change
Health Premium Trend - FY96 FY97 FY98 FY99 & later	8.5% 7.5% 6.5% 5.5%	8.5% 7.5% 6.5% 5.5%	No change	No change
Total Turnover	See Table 4 on page 37.	See Table 1 on page 31. Patterns vary by age and service, but proposed rates are generally lower in the first five years and higher thereafter than the current assumption.	+.2%	(.02%)
Disability	See Table 5 on page 38.	See Table 2 on page 32. Proposed rates are lower than current rates.	+.4%	(.35%)
Retirement	See Table 6 on page 39.	See Table 3 on page 33. Proposed rates are lower at younger ages.	+.4%	(.21%)
Mortality	1984 Unisex Pension Mortality Table.	1984 Unisex Pension Mortality Table.	No change	No change
Cost-of-Living Adjustment	71% of retirees receive COLA.	71% of retirees receive COLA.	No change	No change
Total Change due to Proposed Assumptions			+4.1%	(2.47%)

Section 2

Analysis of Economic Assumptions

T HE ECONOMIC ASSUMPTIONS ARE:

- Total Inflation (as measured by the CPI)
- Annual Investment Return
- Annual Salary Increase
- Inflation in post-retirement medical rates

Total Inflation

Inflation		
Investment Return	Salary Increases	Medical Cost Increases
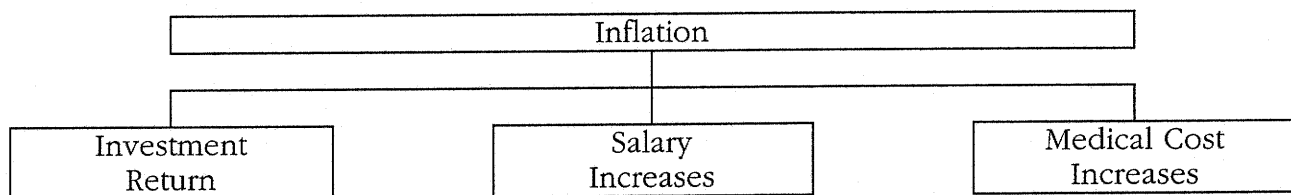
As depicted in the diagram above, the assumed rate of future inflation is a component of each economic assumption. The inflation assumption adopted for the System is therefore crucial to proper funding.

While each of the economic assumptions has an inflation component, changes in the assumptions as a result of a change in assumed inflation will affect plan liabilities in different ways. Changes in the assumed rate of investment return will affect System liabilities in the opposite direction. In other words, decreasing the investment return rate will increase System liabilities and contribution requirements, since System assets would be expected to grow at a slower rate. In contrast to this, changes in each of the other economic assumptions will affect liabilities in the same direction. For example, decreases in the salary increase assumption and the medical cost assumption will lower System liabilities and contribution requirements. This would have the effect of offsetting the increases resulting from a lower investment return rate.

This analysis is based on employee census information provided annually by the State of Alaska to perform the actuarial valuation of the System. Generally acceptable actuarial methods and techniques were used to analyze the data, derive the proposed assumptions and evaluate the financial effect on the system. The undersigned are available to answer any questions with respect to this report.

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The following table indicates the direction in which liabilities would move for given changes in the assumed inflation rate.

Effect on Plan Liabilities		
	Inflation	
	↑	↓
Investment Return	↓	↑
Salary Increases	↑	↓
Medical Cost Increases	↑	↓

The inflation assumption currently being used is 4% per year and was adopted by the Board in 1994. Inflation is typically measured by the Consumer Price Index (CPI) for urban wage earners and clerical workers. This statistic is published by the U.S. Department of Labor, Bureau of Labor Statistics.

The Consumer Price Index is a measure of the average change in prices over time of a defined basket of goods and services. It is based on prices of food, clothing, shelter, fuels, transportation, medical fees and other day-to-day living expenses. The index is created by calculating price changes for the various items. A weighted average of these price changes is then used to create the index. The index is calculated for selected individual cities and then averaged to create the national index.

The following schedule summarizes annualized national CPI data since 1936.

1936-95 (60 years)	4.1%
1966-95 (30 years)	5.4%
1976-95 (20 years)	5.1%
1986-95 (10 years)	3.6%
1991-95 (5 years)	2.7%

These data confirm that inflation, as measured by the CPI, has been trending lower since the latter half of the 1970s and the early 1980s. Average long-term inflation is 4.1%.

There may be some justification for adopting two inflation assumptions for the Systems, one for Anchorage (as a proxy for the State) and the other for the country as a whole. The rationale behind this approach is that the inflation component of investment return should reflect inflationary expectations for the U.S. in general, whereas the inflation component of the salary scale and the PRPA should reflect inflation expectations for Alaska. Recent history shows some differences between the inflation rates of Anchorage and the U.S. and this could be attributed primarily to the recession in Alaska caused by the oil price decline. As we cannot reasonably anticipate that a similar divergence could occur in the future, we recommend that one inflation assumption be adopted.

As with the other elements of the actuarial basis, historical inflation statistics can only be used as a guide in determining appropriate assumptions which reflect reasonable expectations of future inflation levels.

In summary, we believe that a long-term 4% inflation assumption continues to be appropriate. Inflation rates will vary from time to time as the U.S. moves through the natural expanding and contacting economic cycles but, in deciding on a stable long-term rate, we recommend a 4% inflation assumption be adopted for the Systems. This is consistent with the average inflation rate during the past 10 years, the long term 60-year rate, as well as with the outlook for the future.

Annual Investment Return

The investment return assumption is one of the most important elements of the actuarial basis in that it covers the entire lifetime of System participants, making the results of the valuation extremely sensitive to this assumption. The investment return assumption represents the average long-term rate of return expected to be realized on the investment portfolio of the System over the System's future lifetime. Current System liabilities and recommended contribution rates are determined by discounting all future benefits payable to current and future retirees and their beneficiaries at this rate of interest. It is important not to overestimate the expected future investment returns, otherwise actuarial losses could occur resulting in unanticipated contribution rate increases. However, it should be remembered that short-term expectations of interest rate levels should have little influence on the determination of a valuation assumption which should rather represent best estimates of the long-term average return which can be anticipated for the System assets.

The annual investment return is comprised of three major components:

- The increase in overall productivity
- The risk premium associated with each investment class
- Inflation

The first two of these represent the "real" rate of return. Since 1994, the real rate of return implicit in the investment rate has been 4% for PERS. The real rate of return expected on investments is a function of the time period over which results are measured and the types of investments chosen.

A relatively long time frame should be measured when choosing a retirement system investment return expectation given that system liabilities can span 50-plus years. Therefore, the real investment return assumption for actuarial valuations may differ from the real return expectations often measured over shorter durations.

Generally, the more risk accepted in the asset classes chosen for investment, the higher expected real rate of return. Given the above discussion of time frame, the actuarial assumption for real return should be based on historic observations of real returns in the capital markets as well as expectations about the future.

In developing the basic assumptions used for this study, we have used long-term returns for various asset classes along with projections based on the current economic environment. A large portion of the data represents information for periods beginning in 1926.

Based on the average asset allocation for PERS over the last four years, a simple mathematical average can be applied to determine a long-term rate expectation:

Asset Class	Long-Term Real Return Expectation	Average PERS Allocation	Product
Cash and Receivables	0.00%	2.00%	0.00%
Marketable Debt	3.00%	48.00%	1.44%
Domestic Equity	6.75%	40.00%	2.70%
International Equity	6.75%	7.00%	0.47%
Emerging Markets	9.00%	1.00%	0.09%
Real Estate	3.00%	2.00%	0.06%
Total			**4.76%** *real*

Considering that the actual year-by-year returns achieved by PERS will be volatile, reflecting the risk associated with each asset class, it is often prudent to set the real return assumption below the full expectation. We believe a real return assumption between 4.00% and 4.50% would be appropriate, and we are recommending that the Board consider 4.25%. When added to the 4.00% inflation assumption, this produces an 8.25% investment return assumption.

The effect of a higher investment return assumption would, when considered alone, decrease system liabilities as the assets would be expected to accrue at a faster rate.

Annual Salary Increase

As System benefits are based on participants' salaries, an assumption needs to be made of future salary increases while an employee is a participant of the System. Anticipated salary increases should not be underestimated as this could generate unanticipated additional liabilities which would result in increasing contribution levels.

The salary scale can be separated into three major components:

- Merit
- Productivity
- Inflation

The merit and productivity increase components represent that portion of future salary increases relating to an employee's increasing responsibility and efficiency but, in terms of impact on funding the System, the inflation component is far more important. The System currently assumes a 4% inflation component, a ½% productivity component, and a 1% merit component during the first five years of service.

Over the past few years, there have been small gains to the System from actual salary increases less than expected from the assumption. However, most of these gains occurred when the inflation assumption was 5% and the corresponding salary increase assumption was higher. When the inflation assumption was reduced to 4%, the salary

increase assumption came down accordingly and should better reflect salary expectations. Therefore, we recommend that the current assumption continue.

Health Premium Trend

A unique feature of the PERS is the fact that it provides major medical insurance coverage to certain participants receiving benefits from the System and to their spouses and dependent children. Assumptions, therefore, need to be made for the rate of increase of future medical premiums. In recent years, the System has experienced small actuarial gains or losses as health premiums have been relatively stable.

It is well known that, during the 1980s and early 1990s, medical inflation significantly exceeded the general CPI, due in part to improving medical technology and increased utilization of services. The increase in the State's health care premiums has averaged 12.3% over the last 20 years, 7.8% over the last 10 years and 7.5% over the last five years. This is recognized in the funding of the System as the assumed increase in retiree medical premiums is significantly greater than the assumed inflation rate of 4%. However, it is not reasonable to assume that medical inflation can exceed general price inflation by a significant margin indefinitely and the PERS assumptions recognize this by trending the excess down over time.

Currently, the health cost trend assumption, which comprises inflation and other factors such as utilization, is:

FY96:	8½% per year
FY97:	7½% per year
FY98:	6½% per year
FY99 & later:	5½% per year

This assumption was adopted in 1994. The System therefore currently assumes that the excess of health inflation over general price inflation will remain consistent at 1½% per year after FY98. This current pattern of assumptions is based on the following reasoning:

- Current trend rates should be related to past experience and representative of trend rates currently being experienced in the market.

- As we project further into the future, we have less certainty about the outcome. Thus, the long-term rate should be more conservative than current rates.

- In general, trend rates are expected to decline over time as society's tolerance for expanding health care costs diminishes, as employers take more aggressive steps to control health care costs and as health care expenditures consume a larger and larger percentage of GNP.

Whether the assumption is reasonable in the longer term will depend to a large extent on how health reform emerges in Alaska or the nation. As the population ages, we expect that the health cost trend will continue to increase faster than general price inflation due to increased utilization of services. We recommend that the assumptions adopted in 1994 be continued.

Section 3

Analysis of Demographic Assumptions

Total Turnover

USING DATA COLLECTED FOR THE ANNUAL ACTUARIAL VALUATIONS FOR THE YEARS 1990 through 1995, we have determined the rates of total turnover by age and service for the five-year period. By total turnover, we mean retirement, termination, disability and mortality combined.

A separate analysis of turnover was performed this year to determine if there was a significant difference between the demographic experience of State employees and that of employees from political subdivisions. Total turnover was measured separately for four groups: the total PERS population, State employees, other political subdivision employees and Municipality of Anchorage employees. The results of this analysis are shown in the graphs on pages 12 through 15.

The graphs use four vertical lines (three for police/fire) for each age and service group to depict the observed experience. The mid-point of each line shows the average turnover rate. The length of the line represents the 90% confidence interval for observed results. In other words, we are 90% confident that the true rate falls within the vertical line. A long line means that there was less data, so the results are less credible. As you can see, Anchorage has longer lines, and all police/fire lines are longer due to fewer participants. Also, there is no Anchorage police/fire data yet, since this group only recently entered PERS.

The results for both police/fire and other employees shows a somewhat lower turnover pattern for State employees during the first few years of service and for younger employees, but there is little measurable difference after two years and age 35. The police/fire differences appear more pronounced, but with the smaller population, the longer vertical lines still intersect after a couple years.

Given that system liabilities for younger and short-service employees are relatively small, the different turnover patterns would have an immaterial effect on system liabilities and costs. We recommend that the same demographic assumptions be used for all PERS members.

We have plotted total PERS turnover results against the rates of total turnover as currently assumed in the valuation (old rate) and the proposed change (new rate) on the graphs in Section 4 on pages 16 through 21.

We continue to see a pattern of turnover during the first several years of service which is independent of attained age. In the past, this "select" turnover pattern has spanned the first ten years of service. We are now seeing the trend shorten to closer to five years. For both others and police/fire, these "select" turnover rates vary for hire ages 20-29 and

30+. These graphs are shown separately and are identified as select turnover rates in the first five years.

"Ultimate" turnover rates, those for employees with five or more years of service, are lower for both police/fire and other employees. These rates vary by age, and are shown separately as ultimate turnover rates after five years.

The observed rates of total turnover for PERS are generally lower during the five-year select period than the current assumption, but are higher during the ultimate period, for participants with more than five years of service. We have adjusted the assumption to reflect this change in turnover pattern.

The proposed total turnover assumption is presented in Section 5, Table 1 on page 31. The actual proposed rates of termination will be determined by taking the proposed total turnover rate and subtracting the sum of the other rates of decrement. This change in total turnover rates will slightly decrease system liabilities and contribution rates.

Disability

Observed disability rates for PERS members were lower than assumed. The graphs in Section 4 on pages 22 and 23 illustrate this. We propose new rates of disability, consistent with this experience, which can be found in Section 5, Table 2 on page 32. The new rates actually return to the assumption pattern used prior to the last experience study. However, liabilities from disability are relatively small, and this change in assumptions will produce a small decrease in plan liabilities and contribution rates.

Retirement

Retirement experience was reviewed by excluding years during which the RIP was in effect. Observed rates were slightly lower at younger ages than those predicted by the current assumption. This pattern is consistent with Tier II system plan design. This is illustrated on the graphs in Section 4 on pages 24 and 25. We propose new rates of retirement consistent with this experience, which can be found in Section 5, Table 3 on page 33. The change in this assumption produces a small decrease in liabilities and contribution rates.

Mortality

While overall population mortality trends are improving, mortality patterns for both police/fire and others were generally consistent with expectations from the current mortality assumption. This is illustrated in the graphs on page 26 and 27. We recommend that the mortality assumption remain unchanged.

COLA (Cost-of-Living Adjustment)

In the past, we assumed that 71% of all retirees would receive COLA. The current data shows that 71% of the dollar-weighted average benefit continues to be increased with COLA. Thus, we propose to keep our assumption the same.
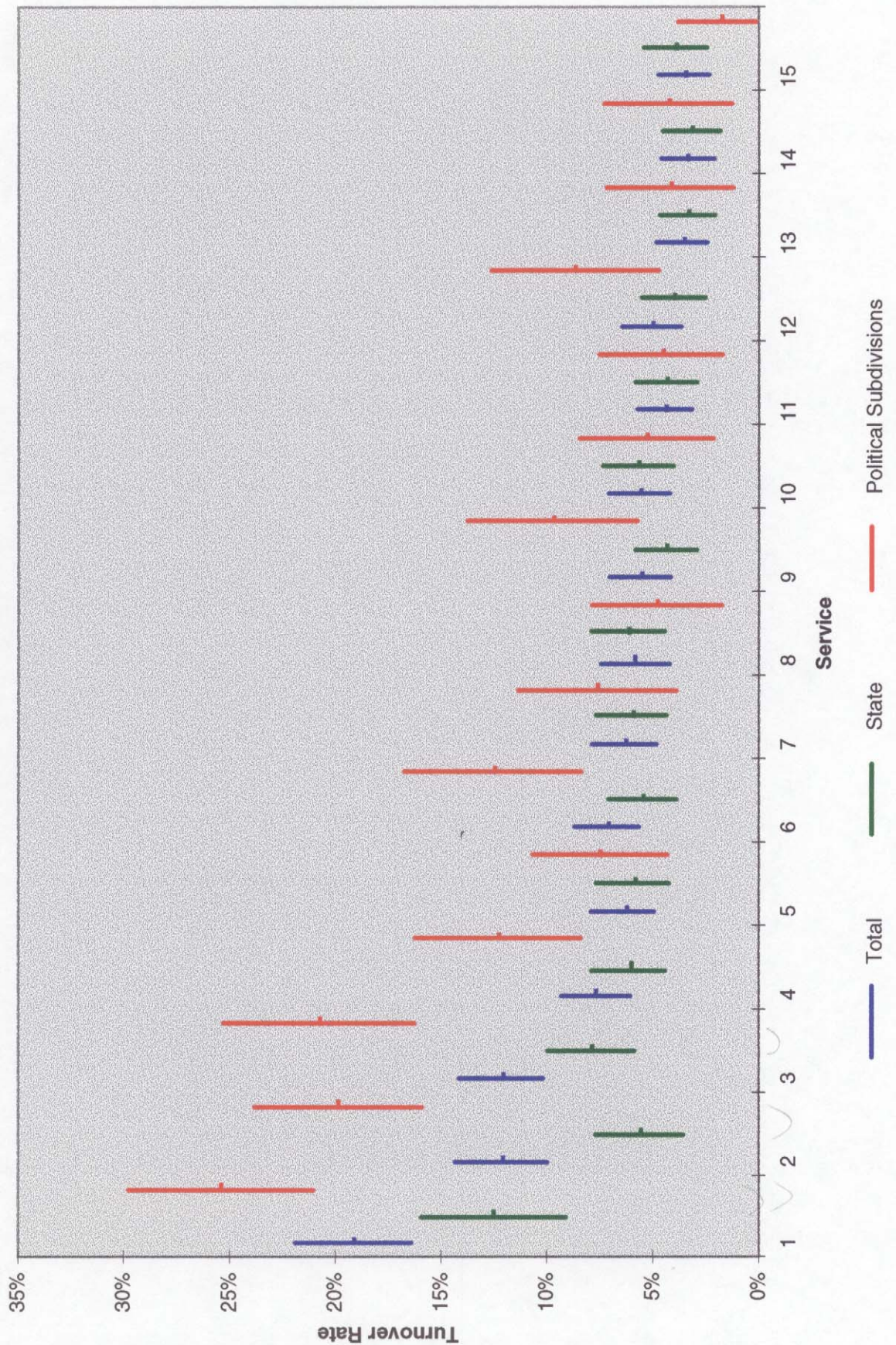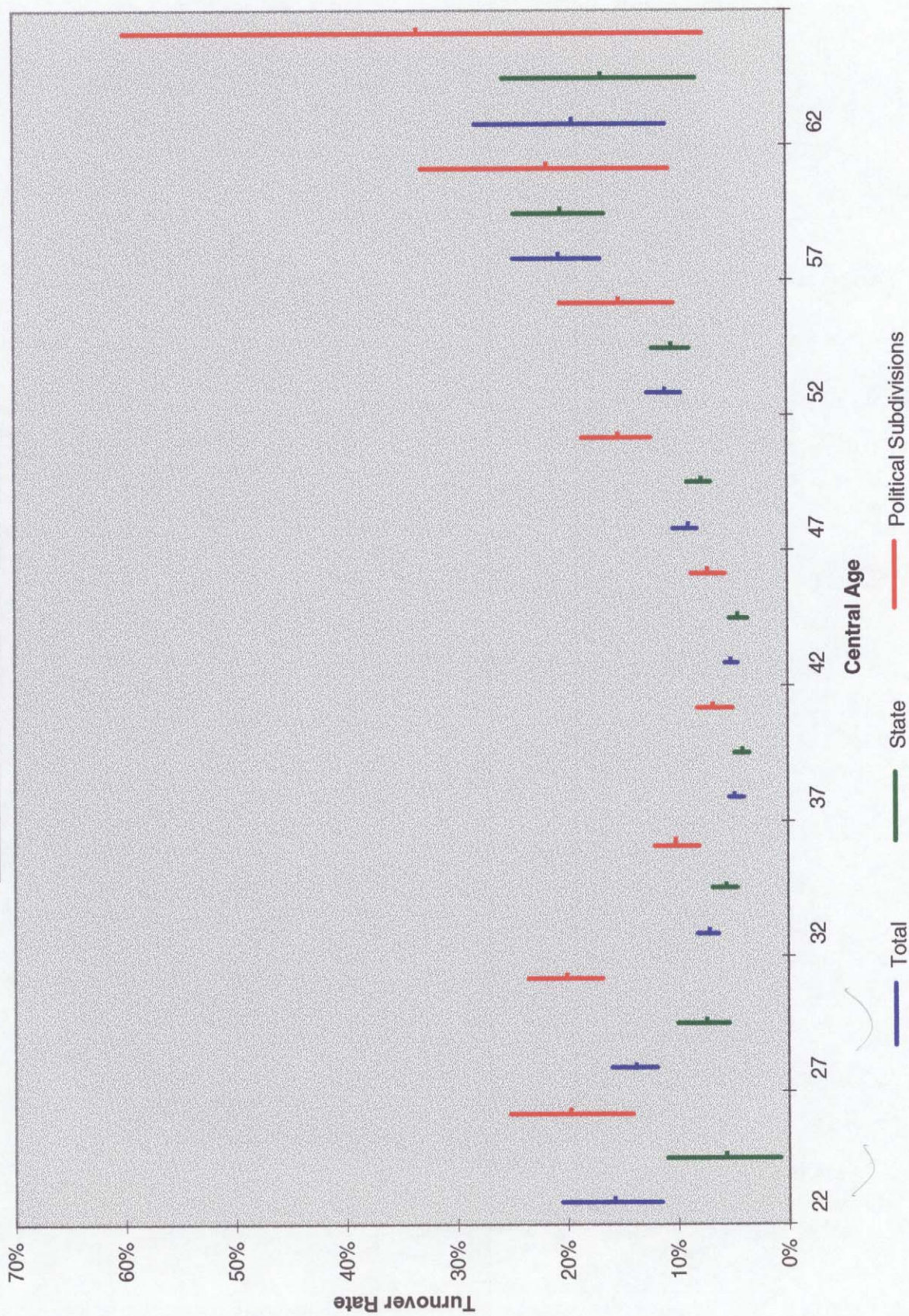
Section 4

Statistical Analysis

Total Turnover Experience
Police/Fire by Service

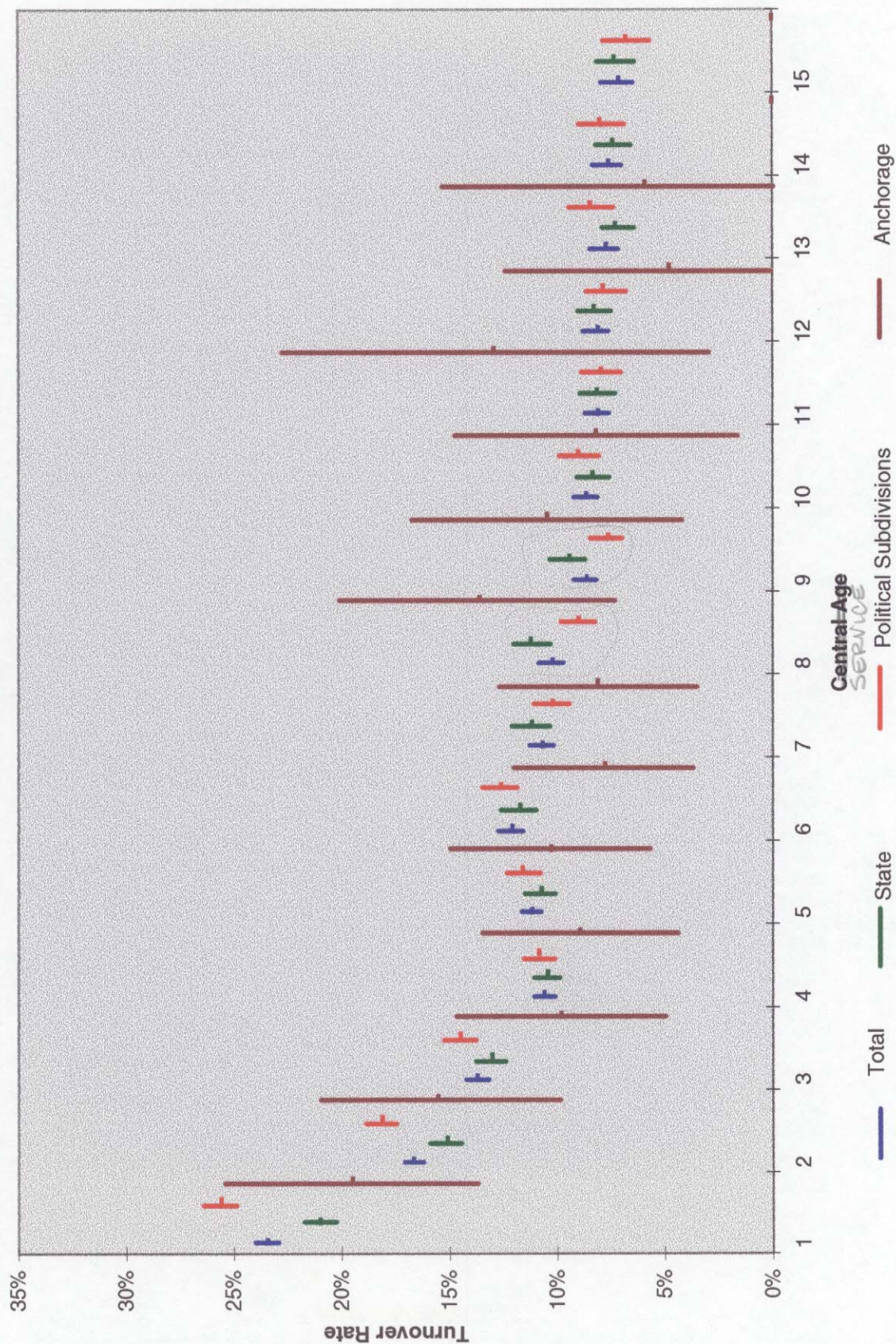Legend: Total (blue), State (green), Political Subdivisions (red)

X-axis: Service (1–15)
Y-axis: Turnover Rate (0% – 35%)

Total Turnover Experience
Police/Fire by Age

Turnover Rate

70%
60%
50%
40%
30%
20%
10%
0%

22   27   32   37   42   47   52   57   62

Central Age

—— Total   —— State   —— Political Subdivisions

13

Total Turnover Experience
Others by Service

Central Age
SERVICE

Total — State — Political Subdivisions — Anchorage

Total Turnover Experience
Others by Age

Turnover Rate

Central Age

Total   State   Political Subdivisions   Anchorage

TOTAL TURNOVER ASSUMPTION
POLICE/FIRE
AGE AT HIRE, 20-29

Select Turnover Rates in First Five Years

Service

— Old Rate Assumption

— New Rate Proposed Assumption

▪ Actual Experience

TOTAL TURNOVER ASSUMPTION
POLICE/FIRE
AGE AT HIRE, 30 +

Select Turnover Rates in First Five Years

Service

— Old Rate   — New Rate   ■ Actual Experience

TOTAL TURNOVER ASSUMPTION
POLICE/FIRE

Ultimate Turnover Rates After Five Years vs **Central Age**

— Old Rate   — New Rate   - Actual Experience

TOTAL TURNOVER ASSUMPTION
OTHERS
AGE AT HIRE, 20-29

Select Turnover Rates in First Five Years

Service

—— Old Rate   —— New Rate   - Actual Experience

TOTAL TURNOVER ASSUMPTION
OTHERS
AGE AT HIRE, 30+

SERVICE

Select Turnover Rates in First Five Years

— Old Rate   — New Rate   - Actual Experience

20

TOTAL TURNOVER ASSUMPTION
OTHERS

Central Age (x-axis: 27, 32, 37, 42, 47, 52)

Ultimate Turnover Rates After First Five Years (y-axis: 0%, 2%, 4%, 6%, 8%, 10%, 12%, 14%)

— Old Rate   — New Rate   - Actual Experience

DISABILITY ASSUMPTION
POLICE/FIRE

Chart: Disability Rate vs. Central Age

- Old Rate
- New Rate
- Actual Experience

X-axis: Central Age (37, 42, 47, 52)
Y-axis: Disability Rate (.00% to 1.00%)

22

DISABILITY ASSUMPTION
OTHERS

Disability Rate

Central Age

— Old Rate   — New Rate   ▪ Actual Experience
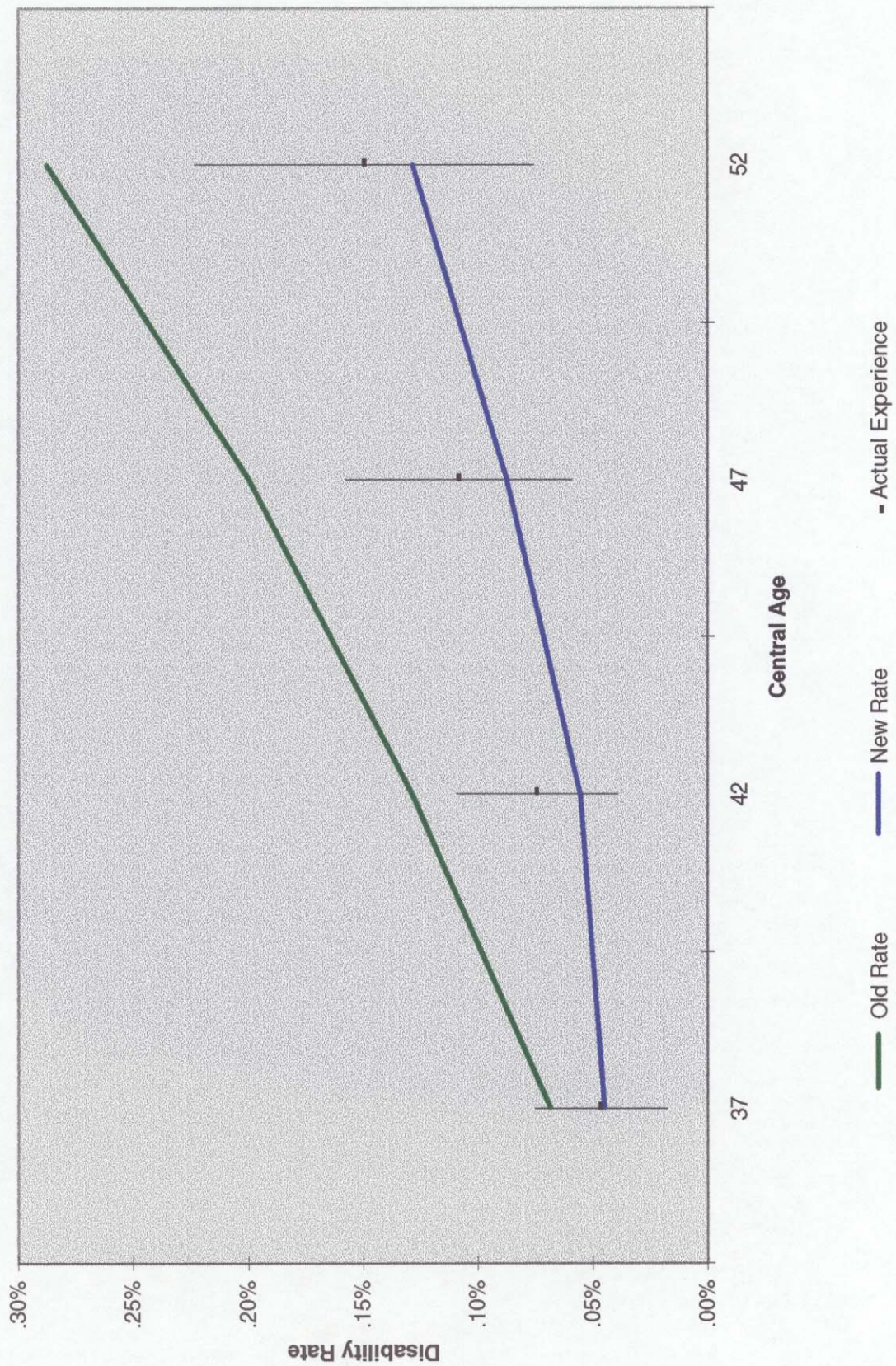
RETIREMENT ASSUMPTION
POLICE/FIRE

—— Old Rate   —— New Rate   - Actual Experience

24

RETIREMENT ASSUMPTION
OTHERS

Retirement Rate (y-axis): 0%, 20%, 40%, 60%, 80%, 100%

Age (x-axis): 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66

Legend: — Old Rate   — New Rate   - Actual Experience
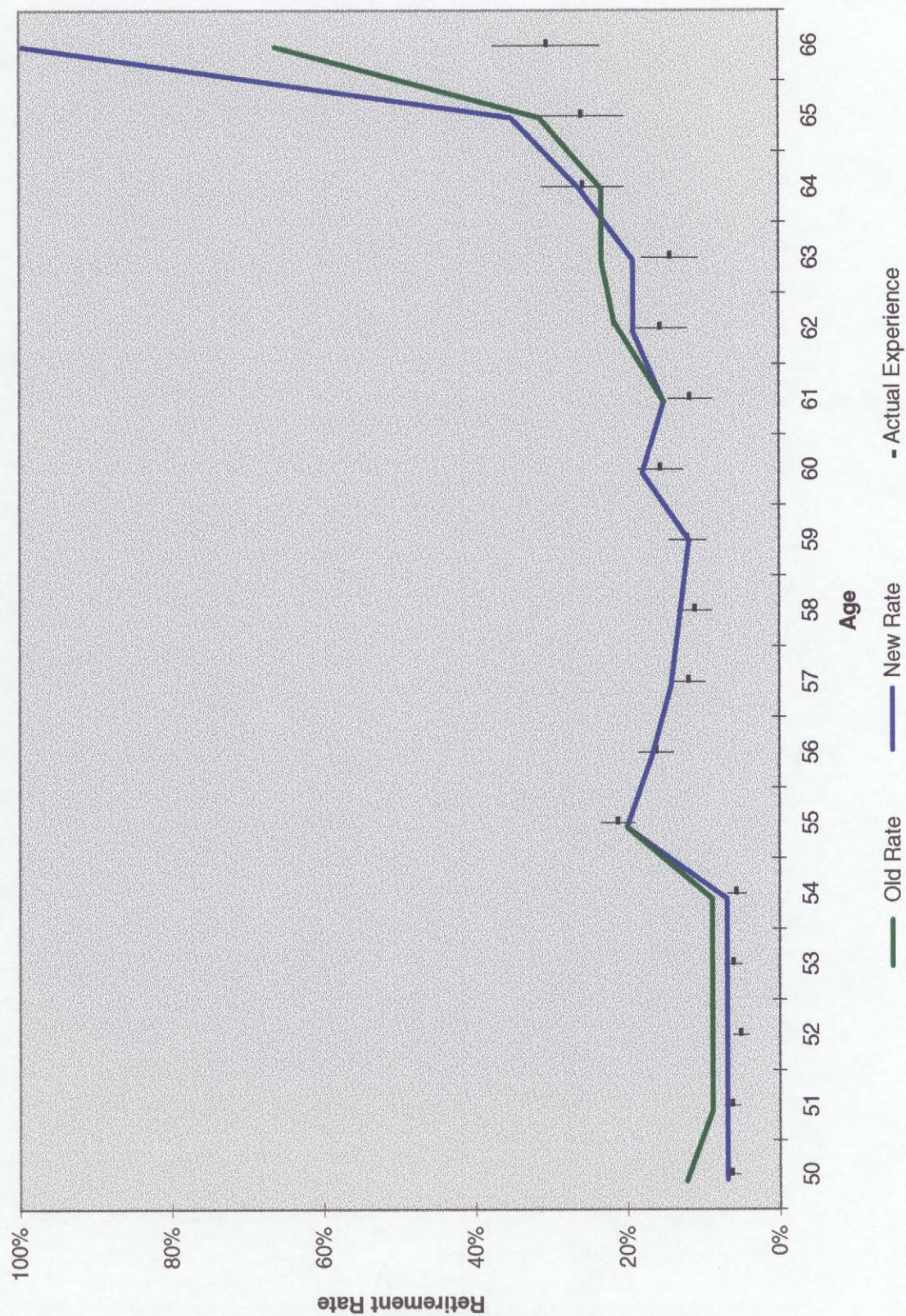
MORTALITY ASSUMPTION
POLICE/FIRE

Mortality Rate

50%   40%   30%   20%   10%   0%

Central Age

52   57   62   67   72   77   82

—— Old and New Rate   · Actual Experience

MORTALITY ASSUMPTION
OTHERS

Mortality Rate

Central Age

— Old and New Rate   - Actual Experience
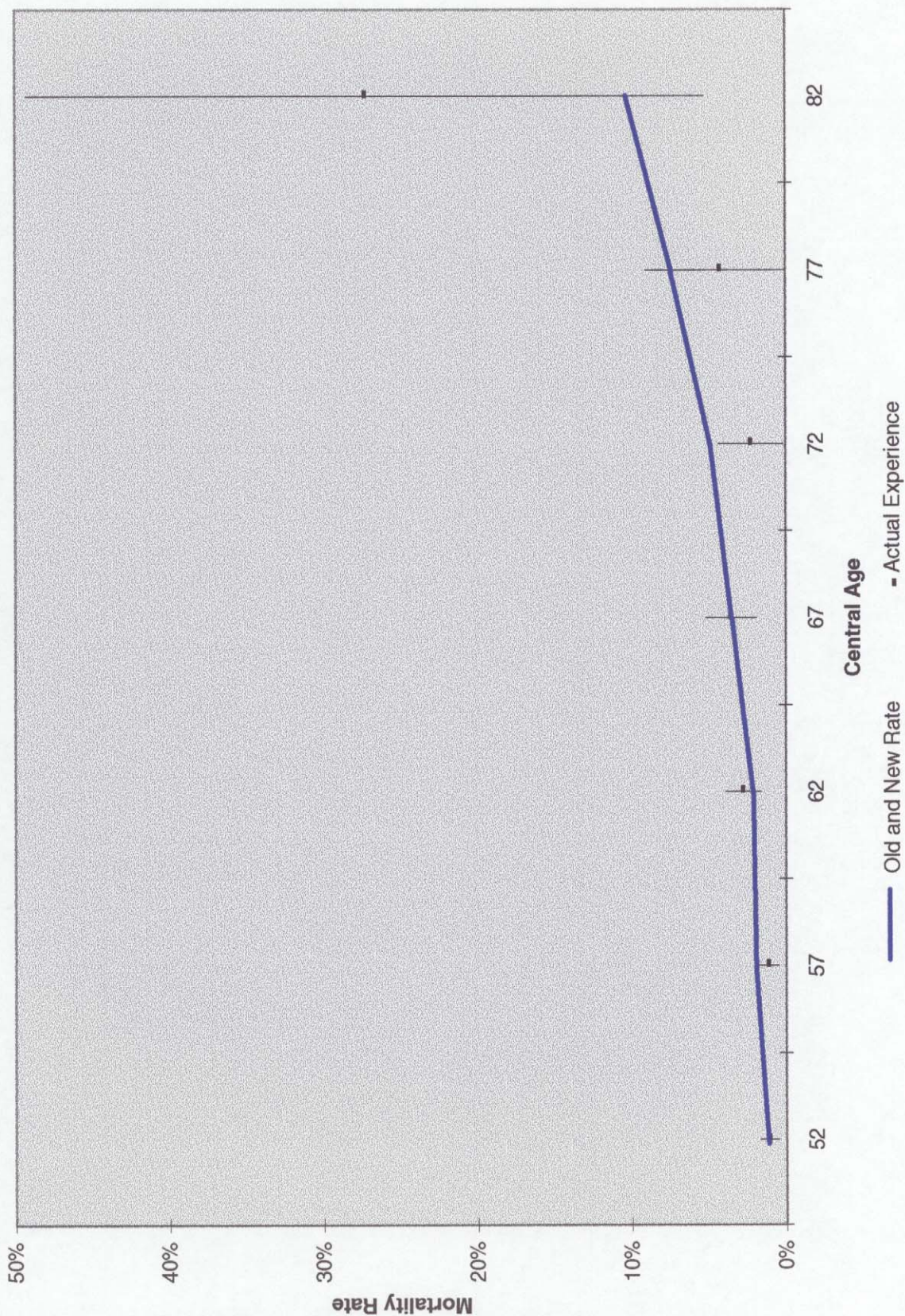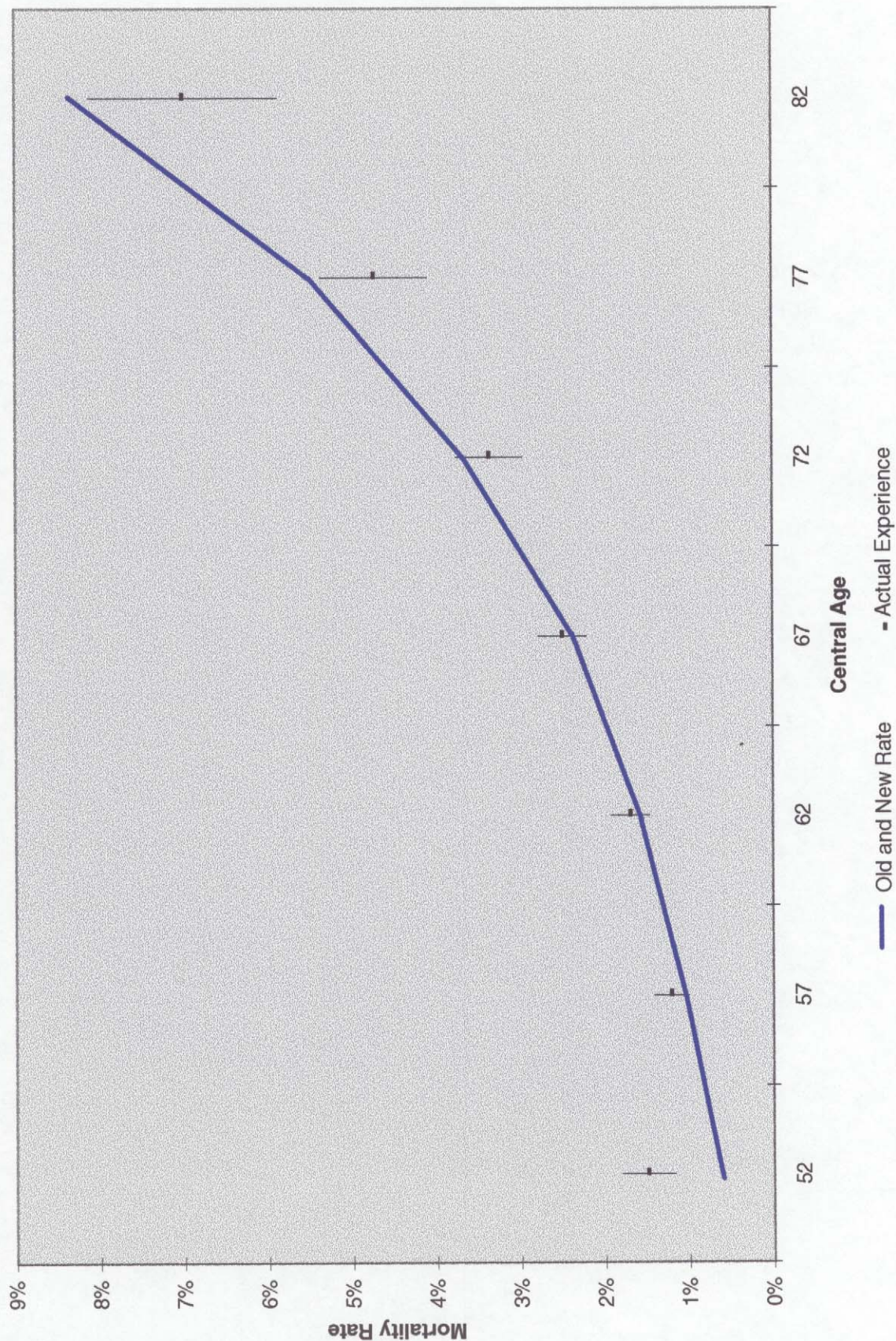
Section 5

Statement of Proposed Actuarial Assumptions and Methods

Valuation of Liabilities

A. **Actuarial Method** - Projected Unit Credit (no change). Liabilities and contributions shown in the report are computed using the Projected Unit Credit method of funding. The unfunded accrued liability is amortized over 25 years. Any funded surpluses are amortized over five years.

The objective under this method is to fund each participant's benefits under the plan as they accrue. Thus, each participant's total pension projected to retirement with salary scale is broken down into units, each associated with a year of past or future service. The principle underlying the method is that each unit is funded in the year for which it is credited. Typically, when the method is introduced there will be an initial liability for benefits credited for service prior to that date, and to the extent that this liability is not covered by Assets of the Plan there is an Unfunded Liability to be funded over a chosen period in accordance with an amortization schedule.

An <u>Accrued Liability</u> is calculated at the valuation date as the present value of benefits credited with respect to service to that date.

The <u>Unfunded Liability</u> at the valuation date is the excess of the Accrued Liability over the Assets of the Plan. The level annual payment to be made over a stipulated number of years to amortize the Unfunded Liability is the <u>Past Service Cost</u>.

The <u>Normal Cost</u> is the present value of those benefits which are expected to be credited with respect to service during the year beginning on the valuation date.

Under this method, differences between the actual experience and that assumed in the determination of costs and liabilities will emerge as adjustments in the Unfunded Liability, subject to amortization.

B. Actuarial Assumptions -

1.	Investment Return	8.25% per year, compounded annually, net of expenses.
2.	Salary Scale	Inflation - 4.0% per year Productivity - 0.5% per year Merit (first 5 years of employment) - 1.0% per year

3.   Total Inflation

Total inflation as measured by the Consumer Price Index for urban and clerical workers for Anchorage is assumed to increase 4% annually.

4.   Health Cost Trend

FY96 -	8.5%
FY97 -	7.5%
FY98 -	6.5%
FY99 & later -	5.5%

5.   Mortality

1984 Unisex Pension Mortality Table, set forward one year for male and Police/Fire members, and set backward four years for female members. Deaths are assumed to be occupational 85% of the time for Police/Fire, 35% for "Others".

6.   Turnover

Based upon the 1991-95 actual total turnover experience. (See Table 1).

7.   Disability

Incidence rates, based upon the 1991-95 actual experience, in accordance with Table 2. Post-disability mortality in accordance with rates published by the Pension Benefit Guaranty Corporation to reflect mortality of those receiving disability benefits under Social Security. Disabilities are assumed to be occupational 85% of the time for Police/Fire, 35% for "Others".

8.   Retirement Age

Retirement rates based upon the 1991-95 actual experience in accordance with Table 3.

9.   Spouse's Age

Wives are assumed to be four years younger than husbands.

10.   Dependent Children

Benefits to dependent children have been valued assuming members who are not single have one dependent child.

11.   Contribution Refunds

100% of those terminating after age 35 with five or more years of service will leave their contributions in the fund and thereby retain their deferred vested benefit. All others who terminate are assumed to have their contributions refunded.

12.	C.O.L.A.	Of those benefit recipients who are eligible for the C.O.L.A., 71% are assumed to remain in Alaska and receive the C.O.L.A.
13.	New Entrants	Growth projections are made for the active PERS population under three scenarios:

Pessimistic:	1% per year
Median:	3% per year
Optimistic:	5% per year

14.	Expenses	Expenses are covered in the investment return assumption.

Valuation of Assets

Effective June 30, 1994, the asset valuation method recognizes 20% of the investment gain or loss in each of the current and preceding four years. All assets are valued at market value. Assets are accounted for on an accrued basis and are taken directly from audited financial statements provided by KPMG Peat Marwick. Valuation assets cannot be outside a range of 80% to 120% of the market value of assets.

Valuation of Medical Benefits

Medical benefits for retirees are provided by the payment of premiums from the fund. A pre-65 cost and lower post-65 cost (due to Medicare) are assumed such that the total rate for all retirees equals the present premium rate assumption. These medical premiums are then increased with the health inflation assumption. The actuarial cost method used for funding retirement benefits is also used to fund health benefits.

For FY97, the pre-65 monthly premium is $497.12 and the post-65 premium is $189.37, based on an assumed total blended premium of $380.29. For FY97, the actual blended premium is $350.50. The FY97 blended premium was provided by the State of Alaska Division of Retirement and Benefits.

Table 1

Alaska PERS
Total Turnover Assumptions

Select Rates of Turnover During the First 5 Years of Employment			Ultimate Rates of Turnover After the First 5 Years of Employment	

Police and Fire:

| Year of Employment | ----- Age at Hire ----- | | Age | Rate |
	20-29	30+		
1	.22	.22	20-29	.06
2	.15	.14	30+	.04
3	.15	.12		
4	.10	.08		
5	.07	.06		

Others:

| Year of Employment | ----- Age at Hire ----- | | Age | Rate |
	20-29	30+		
1	.30	.20	20-29	.10
2	.20	.15	30-39	.08
3	.15	.12	40+	.06
4	.12	.10		
5	.12	.10		

Table 2
Alaska PERS
Disability Rates
Annual Rates Per 1,000 Employees

Age	Police & Fire Rate	"Other" Member Rate
20	.88	.28
21	.89	.28
22	.90	.29
23	.91	.29
24	.93	.30
25	.94	.30
26	.95	.30
27	.98	.31
28	1.00	.32
29	1.03	.33
30	1.05	.34
31	1.08	.34
32	1.10	.35
33	1.13	.36
34	1.16	.37
35	1.20	.38
36	1.24	.40
37	1.29	.41
38	1.34	.43
39	1.39	.44
40	1.44	.46
41	1.50	.48
42	1.59	.51
43	1.70	.54
44	1.85	.59
45	2.03	.65
46	2.20	.70
47	2.39	.76
48	2.59	.83
49	2.79	.89
50	3.00	.96
51	3.25	1.04
52	3.58	1.14
53	3.98	1.27
54	4.44	1.42
55	5.00	1.60
56	5.74	1.84
57	6.68	2.14
58	7.63	2.44
59	9.00	2.88
60	10.54	3.37
61	12.19	3.90
62	14.13	4.52
63	16.31	5.22
64	18.63	5.96

Table 3

Alaska PERS
Retirement Rates

Age	Police & Fire Rate	"Other" Member Rate
50	.10	.06
51	.10	.06
52	.10	.06
53	.12	.06
54	.12	.06
55	.25	.19
56	.25	.16
57	.10	.13
58	.10	.12
59	.10	.11
60	.40	.17
61	.40	.14
62	1.00	.18
63	1.00	.18
64	1.00	.25
65	1.00	.35
66 & Up	1.00	1.00

For ages less than 50, employees are assumed to retire two years after the earliest age they are eligible to retire.

Section 6

Statement of Current Actuarial Assumptions and Methods

Valuation of Liabilities

A. **Actuarial Method** - Projected Unit Credit. Liabilities and contributions shown in the report are computed using the Projected Unit Credit method of funding. The unfunded accrued liability is amortized over 25 years. Any funded surpluses are amortized over five years.

The objective under this method is to fund each participant's benefits under the plan as they accrue. Thus, each participant's total pension projected to retirement with salary scale is broken down into units, each associated with a year of past or future service. The principle underlying the method is that each unit is funded in the year for which it is credited. Typically, when the method is introduced there will be an initial liability for benefits credited for service prior to that date, and to the extent that this liability is not covered by Assets of the Plan there is an Unfunded Liability to be funded over a chosen period in accordance with an amortization schedule.

An <u>Accrued Liability</u> is calculated at the valuation date as the present value of benefits credited with respect to service to that date.

The <u>Unfunded Liability</u> at the valuation date is the excess of the Accrued Liability over the Assets of the Plan. The level annual payment to be made over a stipulated number of years to amortize the Unfunded Liability is the <u>Past Service Cost</u>.

The <u>Normal Cost</u> is the present value of those benefits which are expected to be credited with respect to service during the year beginning on the valuation date.

Under this method, differences between the actual experience and that assumed in the determination of costs and liabilities will emerge as adjustments in the Unfunded Liability, subject to amortization.

B. Actuarial Assumptions -

1.	Investment Return	8.00% per year, compounded annually, net of expenses.
2.	Salary Scale	Inflation - 4.0% per year. Productivity - 0.5% per year. Merit (first 5 years of employment) - 1.0% per year.

3.	Total Inflation	Total inflation as measured by the Consumer Price Index for urban and clerical workers for Anchorage is assumed to increase 4% annually.

4. **Health Cost Trend**

FY96 - 8.5%
FY97 - 7.5%
FY98 - 6.5%
FY99 & later - 5.5%

5. **Mortality**

1984 Unisex Pension Mortality Table, set forward one year for male and Police/Fire members, and set backward four years for female members. Deaths are assumed to be occupational 85% of the time for Police/Fire, 35% for "Others".

6. **Turnover**

Based upon the 1986-90 actual total turnover experience. (See Table 4).

7. **Disability**

Incidence rates, based upon the 1986-90 actual experience, in accordance with Table 5. Post-disability mortality in accordance with rates published by the Pension Benefit Guaranty Corporation to reflect mortality of those receiving disability benefits under Social Security. Disabilities are assumed to be occupational 85% of the time for Police/Fire, 35% for "Others".

8. **Retirement Age**

Retirement rates based upon the 1986-90 actual experience in accordance with Table 6.

9. **Spouse's Age**

Wives are assumed to be four years younger than husbands.

10. **Dependent Children**

Benefits to dependent children have been valued assuming members who are not single have one dependent child.

11. **Contribution Refunds**

100% of those terminating after age 35 with five or more years of service will leave their contributions in the fund and thereby retain their deferred vested benefit. All others who terminate are assumed to have their contributions refunded.

12.	C.O.L.A.	Of those benefit recipients who are eligible for the C.O.L.A., 71% are assumed to remain in Alaska and receive the C.O.L.A.
13.	New Entrants	Growth projections are made for the active PERS population under three scenarios:

		Pessimistic:	1% per year
		Median:	3% per year
		Optimistic:	5% per year

14.	Expenses	Expenses are covered in the investment return assumption.

Valuation of Assets

Effective June 30, 1994, the asset valuation method recognizes 20% of the investment gain or loss in each of the current and preceding four years. All assets are valued at market value. Assets are accounted for on an accrued basis and are taken directly from audited financial statements provided by KPMG Peat Marwick. Valuation assets cannot be outside a range of 80% to 120% of the market value of assets.

Valuation of Medical Benefits

Medical benefits for retirees are provided by the payment of premiums from the fund. A pre-65 cost and lower post-65 cost (due to Medicare) are assumed such that the total rate for all retirees equals the present premium rate assumption. These medical premiums are then increased with the health inflation assumption. The actuarial cost method used for funding retirement benefits is also used to fund health benefits.

For FY97, the pre-65 monthly premium is $497.12 and the post-65 premium is $189.37, based on an assumed total blended premium of $380.29. For FY97, the actual blended premium is $350.50. The FY97 blended premium was provided by the State of Alaska Division of Retirement and Benefits.

Table 4

Alaska PERS
Total Turnover Assumptions

Select Rates of Turnover During the First 10 Years of Employment	Ultimate Rates of Turnover After the First 10 Years of Employment

Police and Fire:

| Year of Employment | ----- Age at Hire ----- | | | Age | Rate |
	20-29	30-39	40+		
1	.22	.18	.10	20-39	.03
2	.19	.13	.10	40+	.01
3	.13	.12	.10		
4	.12	.12	.10		
5	.10	.10	.10		
6	.08	.08	.08		
7	.07	.07	.07		
8	.06	.06	.06		
9	.05	.05	.05		
10	.04	.04	.04		

Others:

| Year of Employment | ----- Age at Hire ----- | | Age | Rate |
	20-29	30+		
1	.30	.23	20-29	.065
2	.23	.18	30-34	.060
3	.20	.14	35-44	.055
4	.16	.13	45+	.050
5	.16	.13		
6	.14	.13		
7	.12	.12		
8	.11	.11		
9	.09	.09		
10	.08	.08		

Table 5
Alaska PERS
Disability Rates
Annual Rates Per 1,000 Employees

Age	Police & Fire Rate	"Other" Member Rate
20	.85	.14
21	.87	.14
22	.90	.14
23	.94	.15
24	.98	.15
25	1.03	.15
26	1.08	.15
27	1.13	.15
28	1.19	.16
29	1.25	.16
30	1.31	.16
31	1.37	.17
32	1.43	.17
33	1.44	.25
34	1.48	.34
35	1.55	.44
36	1.65	.53
37	1.78	.64
38	1.94	.75
39	2.13	.87
40	2.35	.99
41	2.60	1.12
42	2.88	1.25
43	3.19	1.39
44	3.53	1.53
45	3.90	1.68
46	4.30	1.84
47	4.73	2.00
48	5.19	2.17
49	5.68	2.34
50	6.20	2.52
51	6.75	2.70
52	7.33	2.89
53	7.94	3.08
54	8.58	3.29
55	9.25	3.49
56	9.95	3.70
57	10.68	3.92
58	11.44	4.14
59	12.23	4.37
60	13.05	4.61
61	13.90	4.84
62	14.78	5.09
63	15.69	5.34
64	16.63	5.60

Table 6

Alaska PERS
Retirement Rates

Age	Police & Fire Rate	"Other" Member Rate
50	.25	.11
51	.14	.08
52	.14	.08
53	.15	.08
54	.15	.08
55	.30	.19
56	.25	.16
57	.21	.13
58	.21	.12
59	.20	.11
60	.20	.17
61	.40	.14
62	1.00	.21
63	1.00	.22
64	1.00	.22
65	1.00	.31
66	1.00	.61
67 & Up	1.00	1.00

For ages less than 50, employees are assumed to retire two years after the earliest age they are eligible to retire.