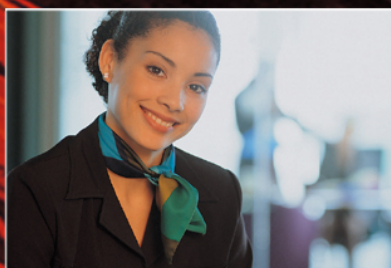


Office of the Vermont State Treasurer

Report of the Actuary
December 2006

Study of the Pension and Post-retirement Medical Benefits of VSERS and VSTRS





December 15, 2006

Mr. George B. Spaulding
State Treasurer
State of Vermont
109 State Street
Montpelier, Vermont 05609-6200

RE: Review and evaluation of benefits provided by VSERS and VSTRS

Dear Mr. Spaulding:

As requested in your letter of August 22, we are submitting the results of our review and evaluation of pension and retiree health plan provisions and design, as well as benefit and contribution levels, for Vermont state employees and teachers. Our recommendations for changes to the pension and retiree health plan provisions are based upon goal-setting sessions attended by various representatives of state government, state employees and teachers, and reflect recent and anticipated demographic trends and comparisons to neighboring states.

The directive of the General Assembly referred to in your letter stated that its aim was a retirement program with the following characteristics:

- Adequate, sustainable, and actuarially sound
- Consistent with demographic and workforce trends
- Fair and affordable to both employees and taxpayers

We trust that our findings and recommendations will form the basis for a long and productive discussion of the appropriate level and nature of benefits provided by Vermont's statewide retirement systems, and we look forward to informing and facilitating that discussion.

Respectfully submitted,

Daniel W. Sherman, A.S.A.
Director, Consulting Actuary

David L. Driscoll, F.S.A.
Principal, Consulting Actuary

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Highlights

Based upon our review and analysis, we recommend that the State consider making the following modifications to the retirement programs **for Vermont state employees and teachers hired on and after July 1, 2007**:

VSERS

For new employees who would otherwise be subject to the current provisions of Group F:

- The Normal Retirement Date (NRD) will be defined as the earlier of age 65 or the attainment of 90 points. Points are equal to the sum of an employee's age and years of service at retirement.
- The maximum pension benefit will be increased to 60% of average final compensation.
- If the employee's commencement of benefits precedes his or her attainment of the Normal Retirement Date, the benefit shall be reduced based on the following table:

| <u>Year of Service at Retirement</u> | <u>Monthly % Reduction from NRD</u> |
|--------------------------------------|-------------------------------------|
| 35+ | 1/8 th of 1% |
| 30 – 34 | 1/4 th of 1% |
| 25 – 29 | 1/3 rd of 1% |
| 20 – 24 | 5/12 th of 1% |
| <20 | 5/9 th of 1% |

- Participants terminating with at least 20 years of service will be eligible for recapture upon later retirement of subsidized post-retirement medical benefits.
- The percentage of retiree medical premiums covered by the state shall be based on the following table:

| <u>Years of Service</u> | <u>Percent covered by the State</u> |
|-------------------------|-------------------------------------|
| 25+ | 80% |
| 20 – 24 | 50% |
| 15 – 19 | 40% |
| 10 – 14 | 30% |
| < 10 | 0% |

For new employees who would otherwise be subject to the current provisions of Group C:

- The Normal Retirement Date shall continue to be age 55. However, the mandatory retirement age will be increased to age 60.
- The period for the computation of average final compensation will be three years instead of the present two.
- The maximum pension benefit will be increased to 65% of average final compensation. Benefit accrual for years of service in excess of 20 shall be at a rate of 1% of average final compensation per year.
- If the employee's commencement of benefits precedes his or her attainment of the Normal Retirement Date, the benefit shall be reduced based on the following table:

| <u>Year of Service at Retirement</u> | <u>Monthly % Reduction from NRD</u> |
|--------------------------------------|-------------------------------------|
| 35+ | 1/8 th of 1% |
| 30 - 34 | 1/4 th of 1% |
| 25 - 29 | 1/3 rd of 1% |
| 20 - 24 | 5/12 th of 1% |
| <20 | 5/9 th of 1% |

- Participants terminating with at least 20 years of service will be eligible for recapture upon later retirement subsidized post-retirement medical benefits.
- The joint-and-survivor form of payment will no longer be fully subsidized.
- The percentage of retiree medical premiums covered by the state shall be based on the following table:

| <u>Years of Service</u> | <u>Percent covered by the State</u> |
|-------------------------|-------------------------------------|
| 25+ | 80% |
| 20 - 24 | 50% |
| 15 - 19 | 40% |
| 10 - 14 | 30% |
| < 10 | 0% |

VSTRS

For new employees who would otherwise be subject to the current provisions of Group C:

- The Normal Retirement Date will be defined as the earlier of age 65 or the attainment of 90 points. Points are equal to the sum of an employee's age and years of service at retirement.
- The maximum pension benefit will be increased to 60% of average final compensation.

- If the employee’s commencement of benefits precedes his or her Normal Retirement Date, the benefit shall be reduced based on the following table:

| <u>Year of Service at Retirement</u> | <u>Monthly % Reduction from NRD</u> |
|--------------------------------------|-------------------------------------|
| 35+ | 1/8 th of 1% |
| 30 - 34 | 1/4 th of 1% |
| 25 - 29 | 1/3 rd of 1% |
| 20 - 24 | 5/12 th of 1% |
| <20 | 5/9 th of 1% |

- The number of years of service required for a terminating teacher to be eligible for recapture upon later retirement of subsidized post-retirement medical benefits will be increased from 10 to 20.
- The system will provide unsubsidized spousal access to retiree medical care.
- The percentage of retiree medical costs covered by the state shall be based on the following table:

| <u>Years of Service</u> | <u>Percent covered by the State</u> |
|-------------------------|-------------------------------------|
| 25+ | 80% |
| 20 – 24 | 50% |
| 15 - 19 | 40% |
| 10 - 14 | 30% |
| < 10 | 0% |

Cost Projections

This study also includes forecasts of costs under the current programs and the various alternatives. The detailed results of these forecasts are included in the appendices of this report. Since the changes will only affect new hires, the initial savings or cost for adopting these changes is zero. As more employees come on board, the differences will increase. For the post-retirement medical benefits comparisons we assumed the state would begin funding the obligations in the near future. On a pay-as-you-go basis, no savings will be realized until after the first new hire retires – at least 10 to 15 years from now.

If the potential savings are insufficient to meet the financial needs of the state, we would suggest increasing the employee contribution rate to bridge the gap. This report includes a forecast of active payroll by year, split by current actives and new hires, to assist with determining what an increase in the employee contribution rate might generate in additional savings.

The potential savings, in \$millions, of adopting all of our recommendations are shown for representative years in the following table:

| | <u>VSERS – F</u> | <u>VSERS – C</u> | <u>VSTRS – C</u> | <u>Total</u> |
|----------|------------------|------------------|------------------|--------------|
| FYE 2010 | 2.1 | .0 | .9 | 3.0 |
| FYE 2014 | 10.3 | .1 | 5.5 | 15.9 |
| FYE 2020 | 23.1 | .4 | 13.3 | 36.8 |
| FYE 2030 | 42.2 | 1.2 | 20.4 | 63.8 |

Other Considerations

Our analysis also included the examination of many other scenarios that had the potential to meet the goals and objectives of this study. In the debates that will follow the acceptance of this report, consideration should be given to the alternatives outlined in the appendix of this report. We also examined a defined contribution plan design that would provide adequate retirement income for those hired between 25 and 35. However, for those hired after age 40, it is unlikely that the objective of benefit adequacy could be achieved through a defined contribution plan alone.

Background

The 2006 actuarial valuations of the VSERS and VSTRS were the basis of our study and comparisons. All actuarial assumptions used were the same as those used in the 2006 actuarial valuations, except for retirement rates, which were necessarily altered in some calculations to reflect the impact of certain proposed changes on participants' retirement decisions. Various retirement rate assumption tables were developed for each of the proposed changes in the Normal Retirement Date.

The forecasts of plan costs presented assume a constant active population. Although modifications would probably be effective July 1, 2007, we assumed an effective date of July 1, 2006, in our calculations to facilitate comparisons to the current programs. Potential changes to pension and post-retirement medical benefits (OPEB) were examined on a coordinated basis. For example, Scenario 1 assumes that the Normal Retirement Date is changed in the same manner for both the pension and OPEB.

Goals and Objectives

The General Assembly issued a directive to the Treasurer to use the assistance of an independent consultant to recommend potential modifications to the pension and post-retirement medical plans. The goal is to have plans that are:

- adequate, sustainable, and actuarially sound;
- consistent with demographic and workforce trends; and
- fair and affordable to both employees and taxpayers

To meet these directives, Buck Consultants developed a plan to determine the criteria required to evaluate alternative plan designs. We conducted discussion sessions for both VSERS and VSTRS in early October to solicit opinions from state officials, legislators and representatives of plan participants. The goal of the sessions was to determine the most important traits desired in the retirement programs.

We also examined the retirement programs offered by neighboring states, which compete with Vermont for talent. Finally, we examined trends in the state employee workforce as well as national trends on retirement and benefit adequacy.

On the pages that follow, we show the results of the discussion sessions. The dominant opinion of the groups is that the programs must provide adequate benefits upon retirement. For VSTRS, this requirement was slightly bested by the desire for a program that encourages employee retention. Interestingly, the VSTRS group placed competitive benefits at the bottom of the preferred scale, contrary to the need to encourage retention. These discussions led us to analyze alternative plan designs that provided benefit adequacy for those working a full career.

Our analysis of workforce trends included an examination of the recent hiring practices of the state and teachers. New hires in the last two years are on average about 2 years older at hire than current active population:

- VSERS C: 30.1 versus 27.6
- VSERS F: 35.7 versus 34.3
- VSTRS C: 35.2 versus 33.2

In addition, new mortality tables and surveys of employment practices reveal that people are living and working longer. Because of these trends, we are recommending a change in the Normal Retirement Date for new members of VSERS Group F and VSTRS Group C, and a change in the mandatory retirement age for VSERS Group C from 55 to 60. Because of individual circumstances, we are not recommending a change in the minimum age and service requirements for early retirement. To be fair to the employees and taxpayers, we are recommending that a service-based early retirement reduction replace the present age-based tables used by VSERS and VSTRS for new members. We selected the early retirement reduction formula used by the State of New Hampshire. This formula provides a subsidy to

those completing more than 20 years of service – a reward for long service. However, for those not completing 20 years, the state will no longer subsidize early commencement. This helps accomplish the focus group’s goals of not encouraging early retirements and reducing the pension plan’s influence in an employee’s decision to stay or leave. Similarly, adding a tiered approach to the post-retirement medical benefits formula discourages early departures.

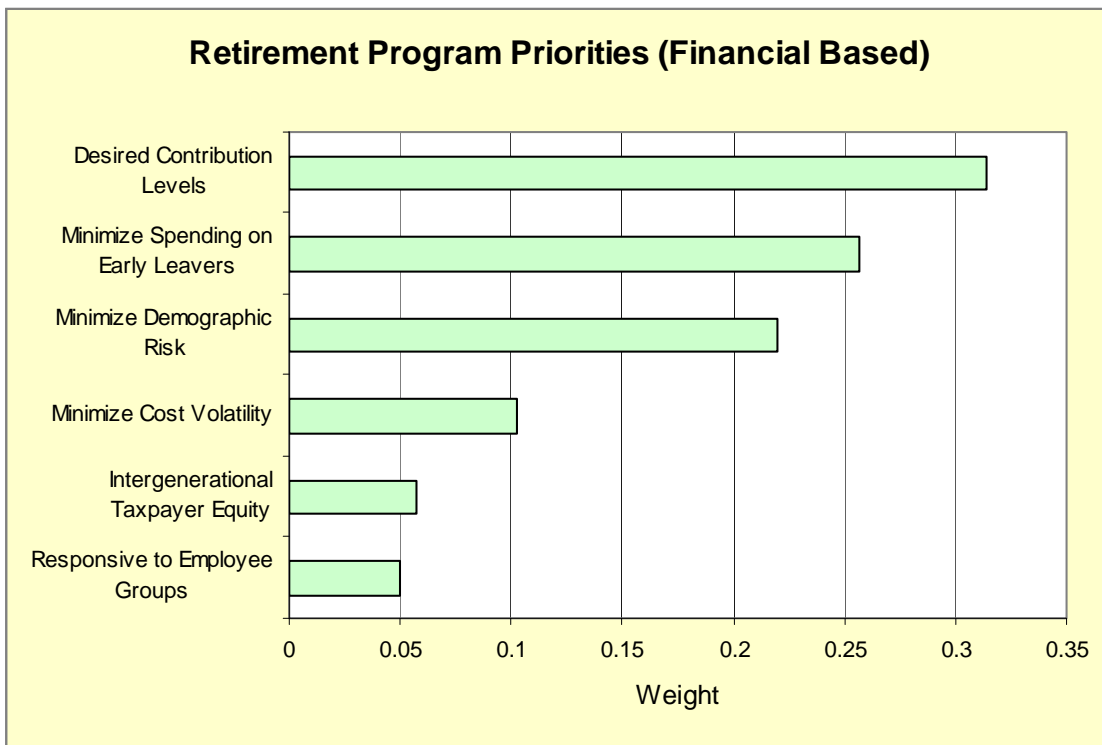
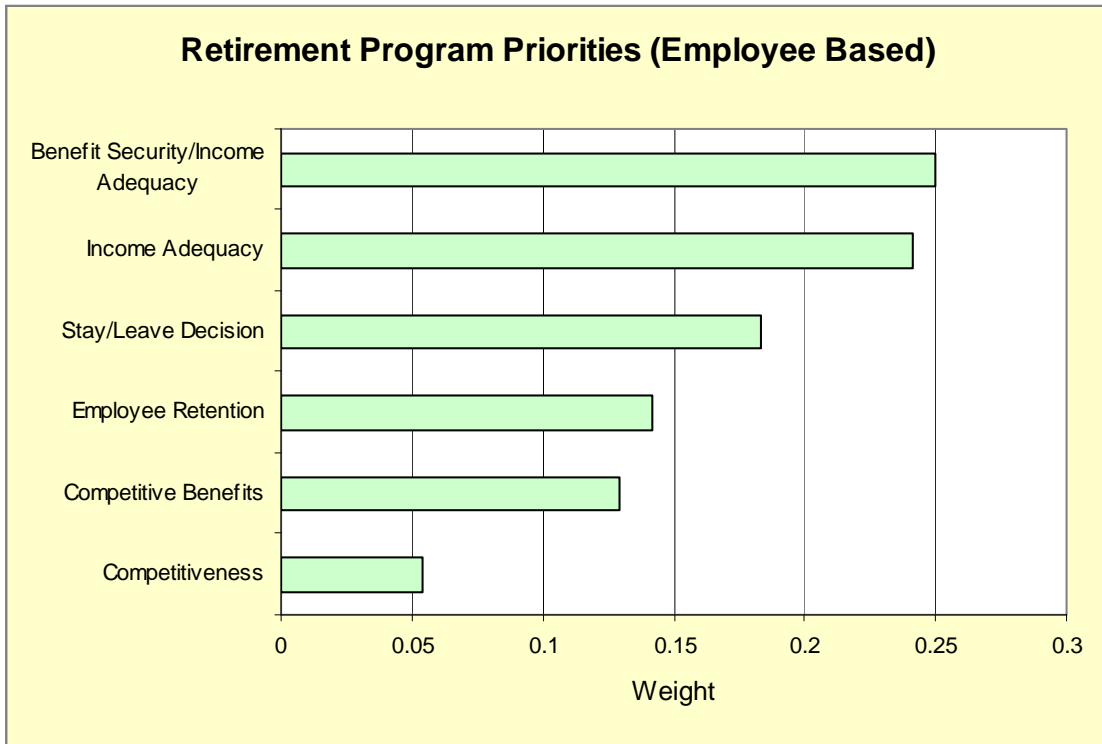
To make Vermont’s retirement benefits competitive with those of the retirement systems of neighboring states, we are recommending an increase in the maximum benefit attainable (as a percentage of average final compensation) for retiring employees. However, to reach the increased maximums, employees will need to work longer and to older ages.

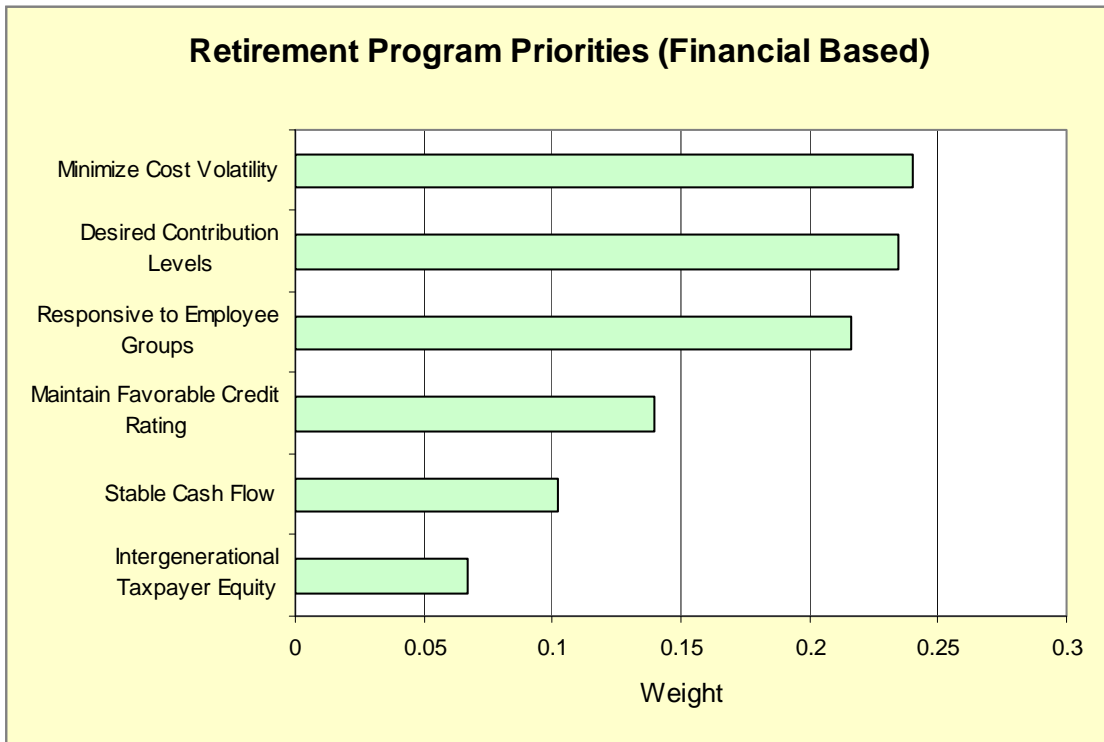
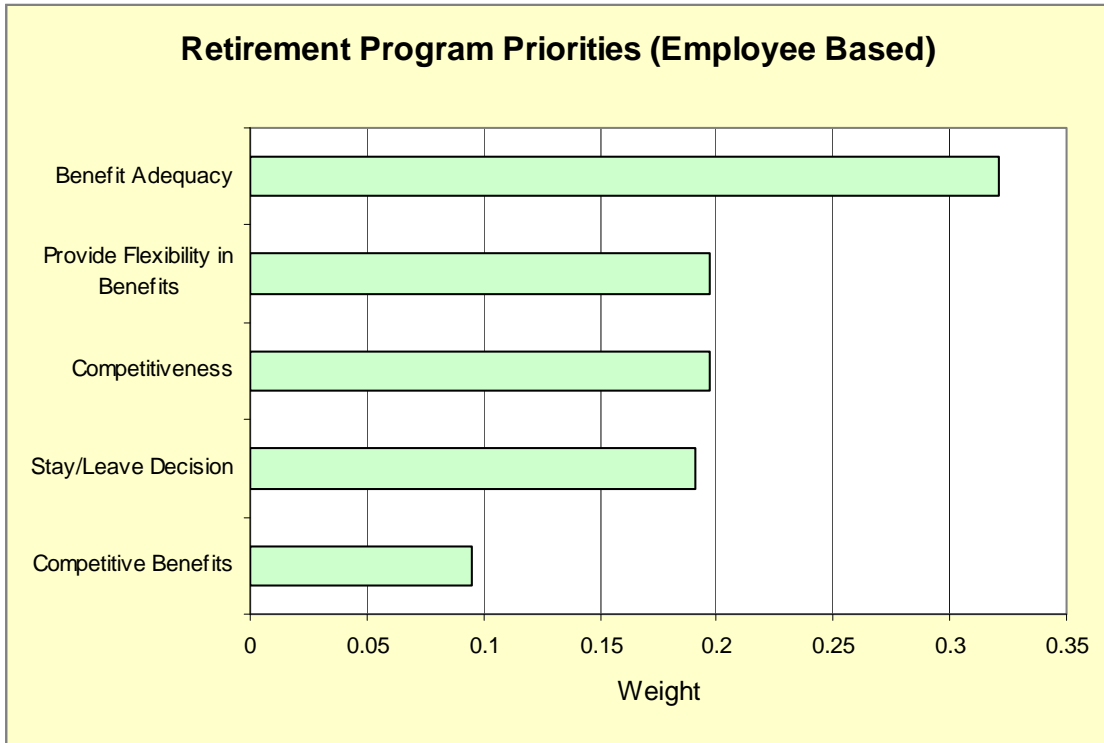
For VSERS Group C we are also recommending a change in the final average years from 2 to 3. This will have the affect of reducing end-of-career adjustments to enhance benefits. Although it is not part of our recommendations, the state may increase the rate of benefit accrual to partially make up for the reduction in benefits due to this change.

Although we examined a defined contribution alternative, the results of the discussion groups have also caused us to conclude that the objectives set forth by the General Assembly are best met by a defined benefit plan. Unquestionably, defined benefit plans are the most efficient vehicles for providing benefit adequacy and encouraging retention.

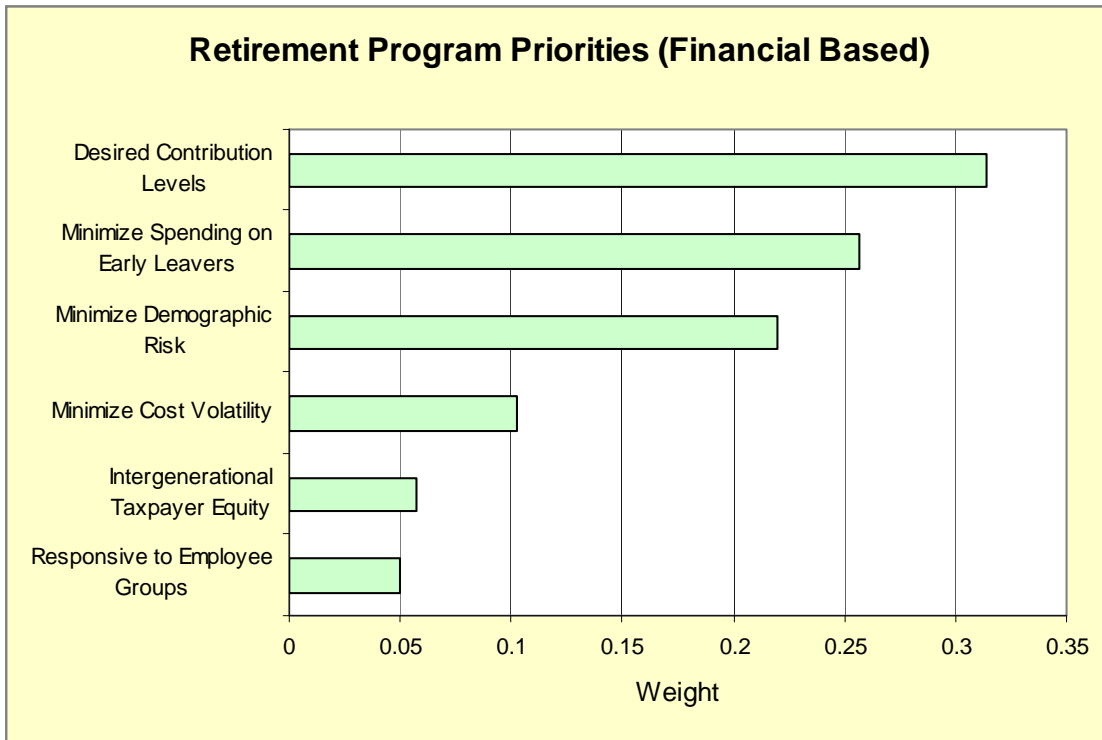
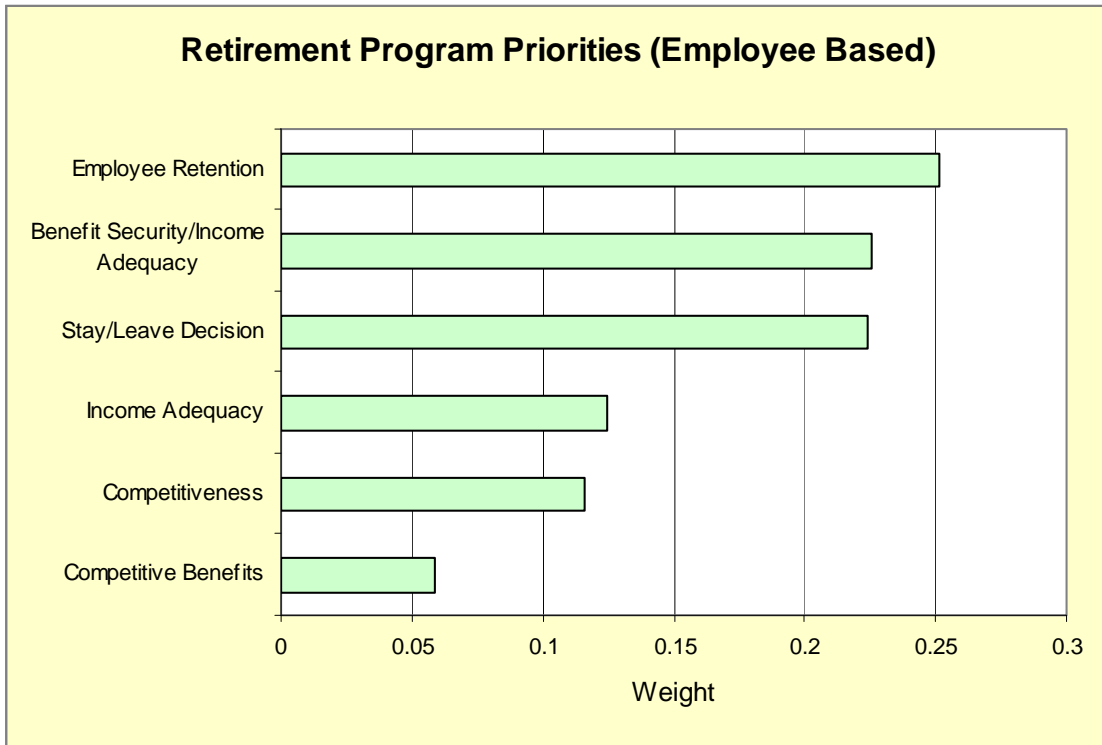
To recognize significant service to the state, we are recommending that all employees who complete more than 20 years of service be entitled to receive some subsidy of the cost of post-retirement medical benefits. We recommend that new employees who provide services to the state for a period of time that is clearly less than what constitutes a full career receive coverage of post-retirement medical premiums that is reduced from the current 80% that applies to all retirees regardless of the length of their service.

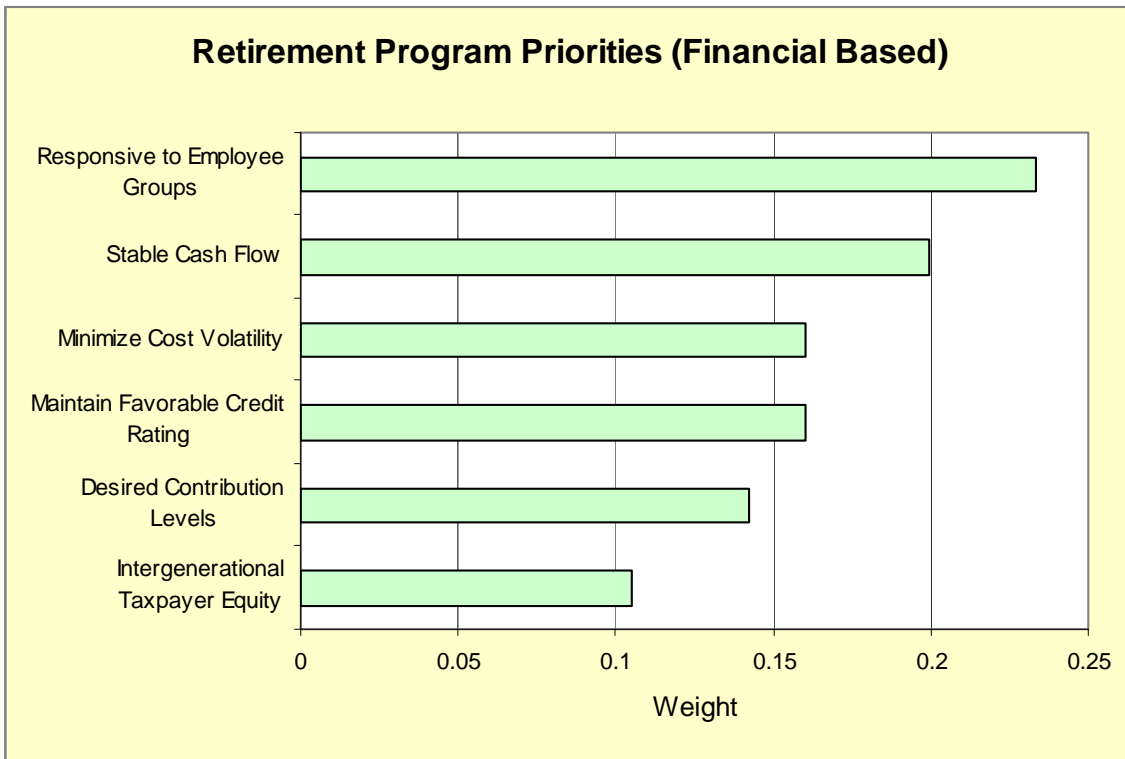
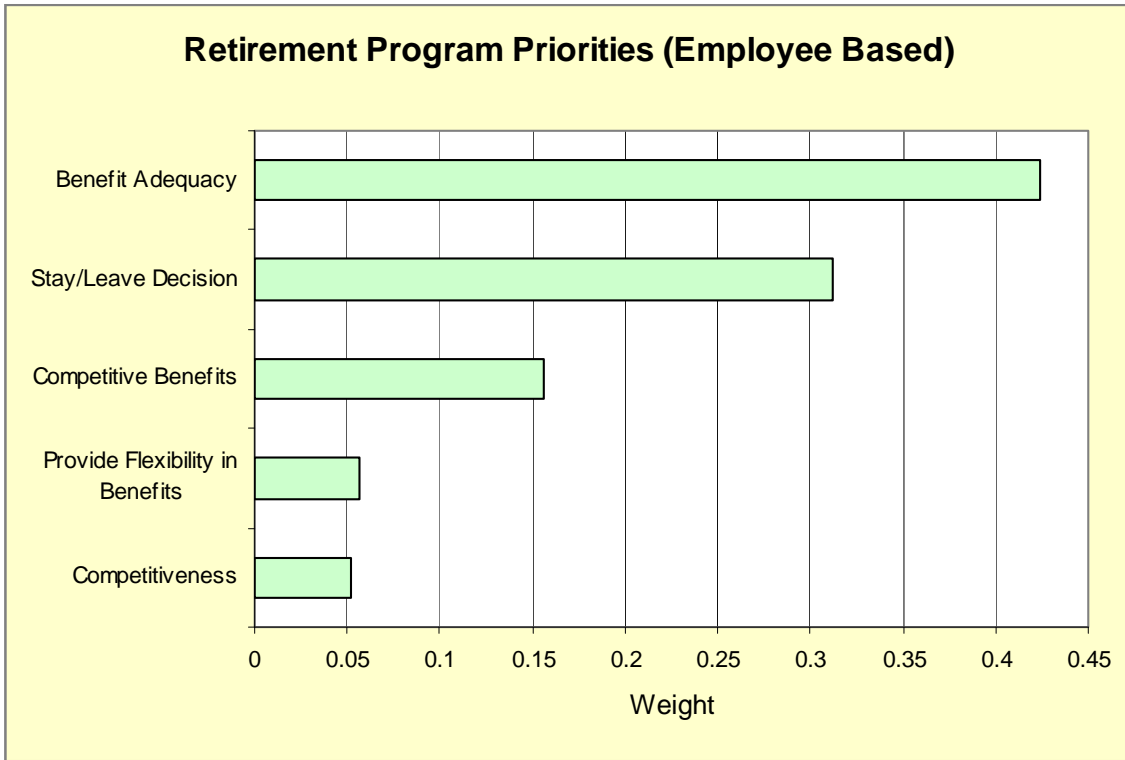
VSERS - Pension





VSTRS – Pension





VSERS Group F

The current key program features are as follows:

- Maximum retirement allowance is 50% of Average Final Compensation (AFC).
- Retirement allowance equals 1.67% of AFC times service.
- The normal allowance is reduced by 6% for each year commencement precedes age 62. For members with 30 years of service, there is no reduction.
- Normal Retirement Date is attainment of age 62 or completion of 30 years of service
- Member Contributions: 3.35% of earnings
- Post-retirement Medical: 80% employer share for all retirees regardless of service.

In the pages that follow, we compare the VSERS Group F pension program to retirement benefit programs offered to similarly situated employees in neighboring states. Graphs are used to show the relative values of benefits under the current Group F plan and those provided under plans maintained by neighboring states. We examine the accrual patterns of hypothetical new employees hired at ages 25 and 35. Group F benefit accruals, as a percentage of final pay, are plotted against those earned under comparable plans offered by Massachusetts, New Hampshire and New York. We also show the relative value of employee contributions (EEC).

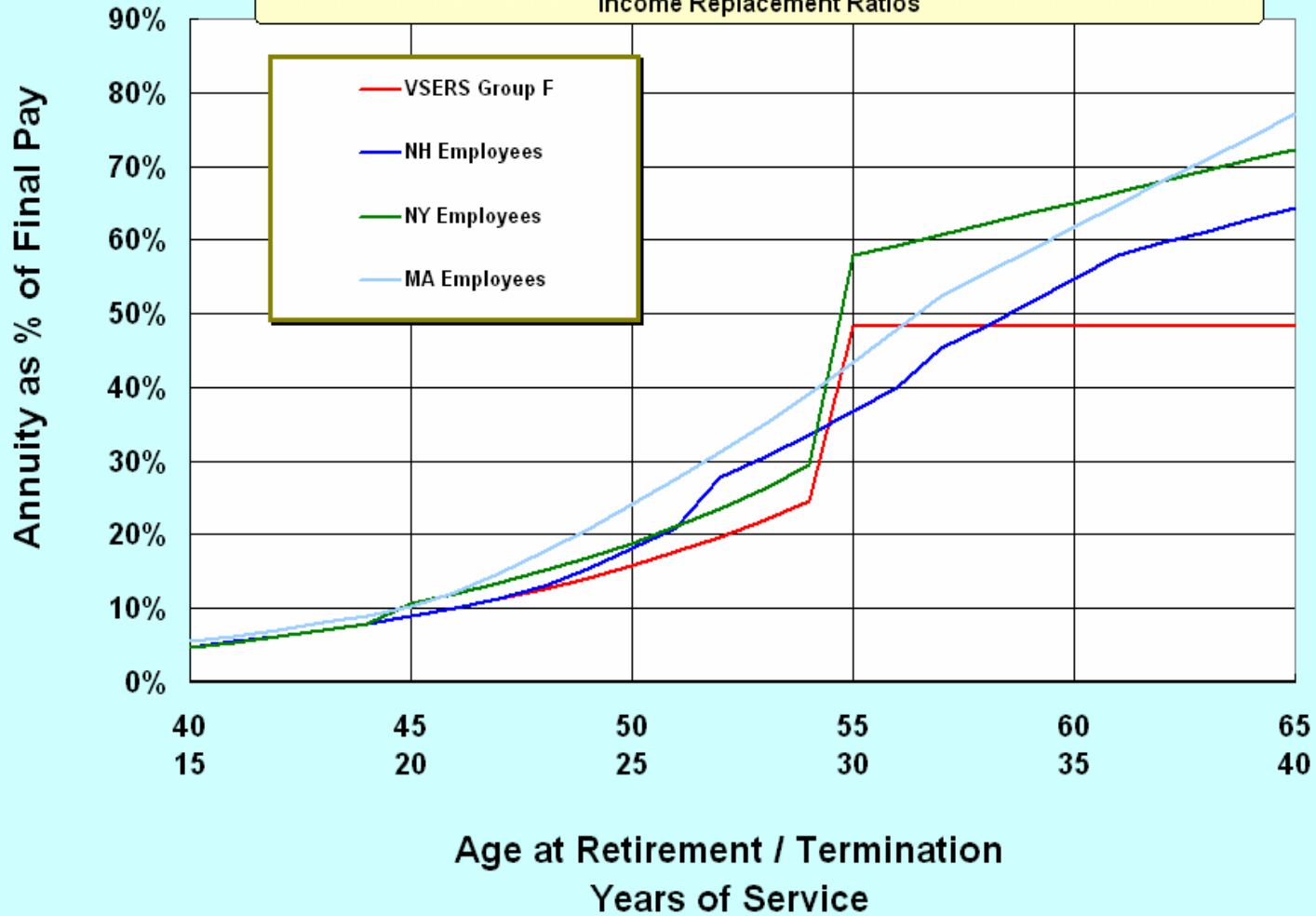
The following points are noteworthy:

- Massachusetts' system provides for both higher benefits and higher employee contributions, but participants are not covered by Social Security.
- New York employee contributions are quite low relative to those required in the three other states.
- The other states do not cap the benefit at 50% of final average pay.

VSERS - Group F

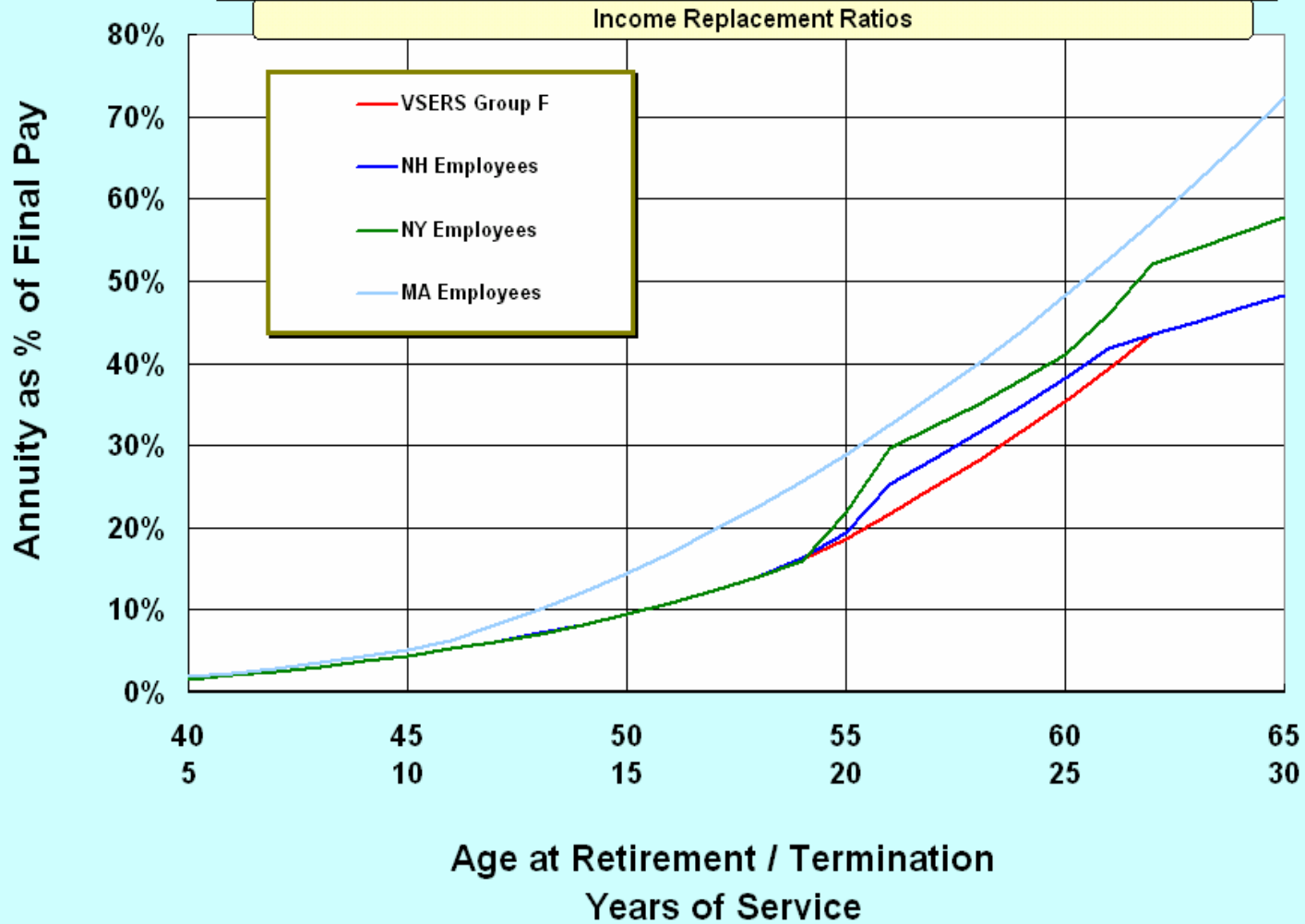
Current Age: 25, Past Service: 0
 Current Pay: \$40,000, Salary Increase Rate: 3.75%

Income Replacement Ratios



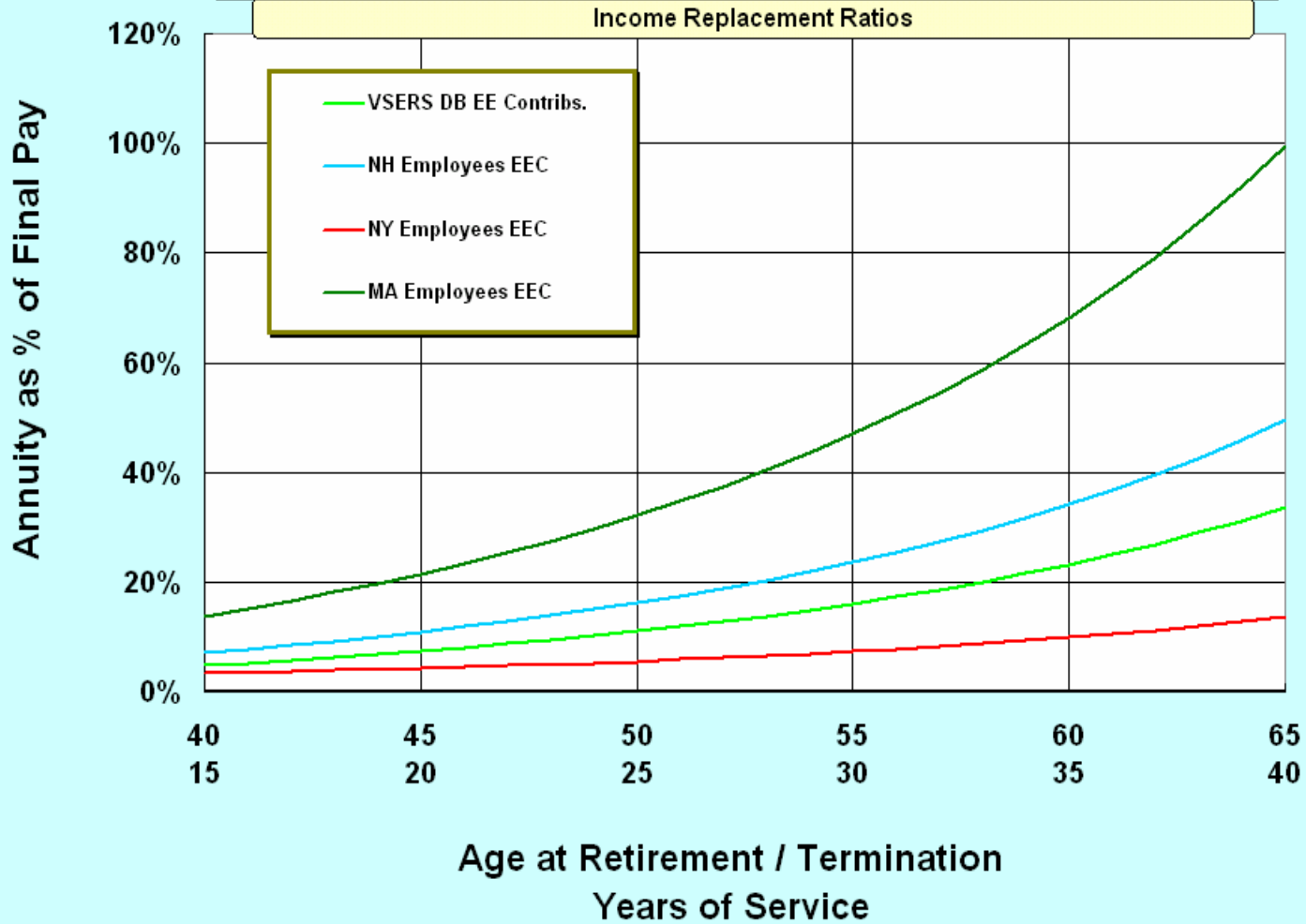
VSERS - Group F

Current Age: 35, Past Service: 0
 Current Pay: \$40,000, Salary Increase Rate: 3.75%



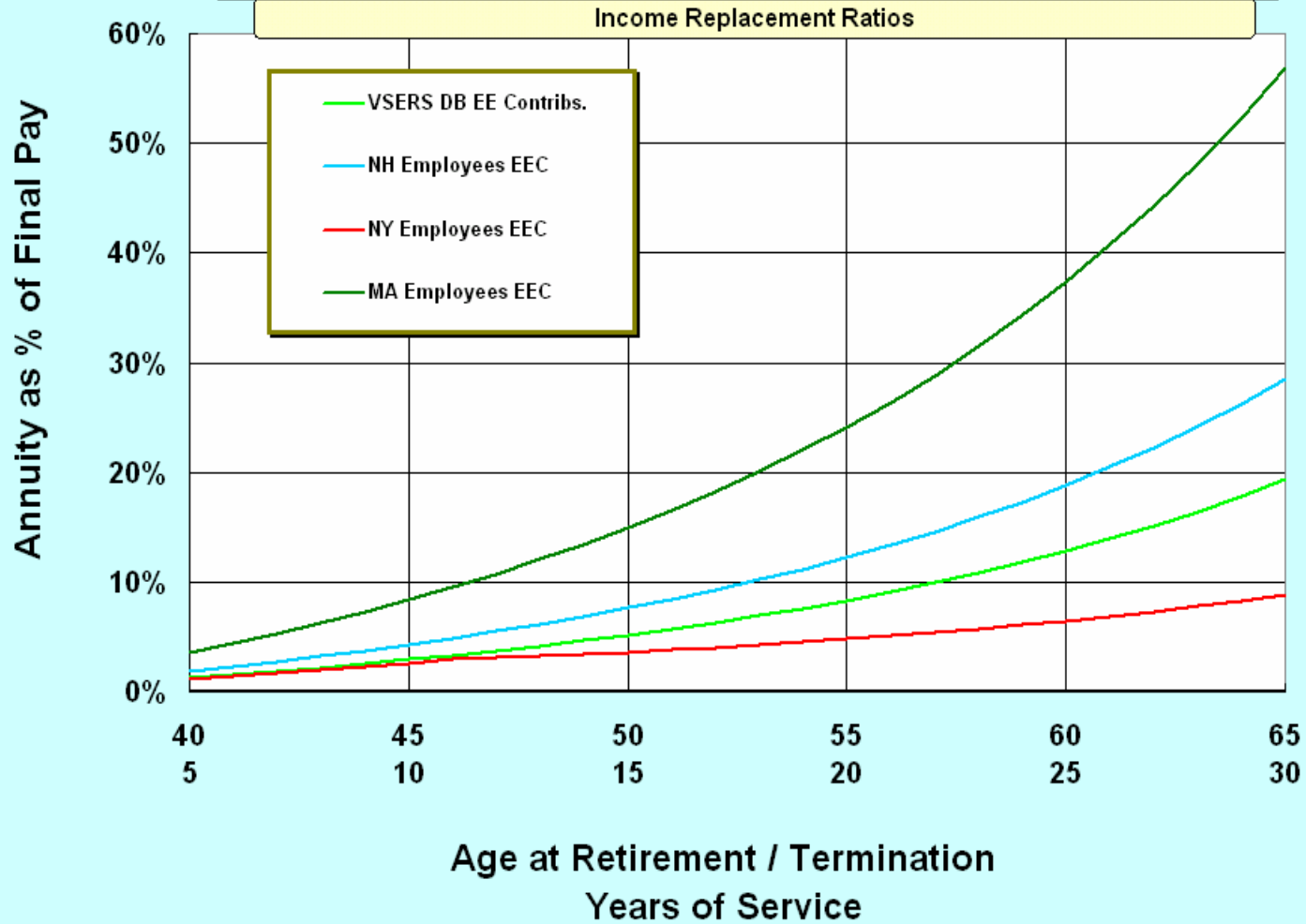
VSERS - Group F

Current Age: 25, Past Service: 0
 Current Pay: \$40,000, Salary Increase Rate: 3.75%



VSERS - Group F

Current Age: 35, Past Service: 0
 Current Pay: \$40,000, Salary Increase Rate: 3.75%



Based on the goals and objectives developed, we selected the following program changes to consider for new employees:

- **Increase the cap from 50% of AFC to 60%.**
- **Modify the early retirement subsidy formula to one that increases the subsidy for long service, and decreases the subsidy for short service**
- Increase the employee contribution rate.
- Change the Normal Retirement Date (NRD): three possibilities were examined:
 - Age 65
 - **Age 65 or 90 Points (i.e. sum of age and service = 90)**
 - Age 62 and completion of 20 years of service
- Defined Contribution arrangement, with contributions totaling 9% of pay to be split between the state and the employee
- **Move to a tiered approach (based on service) for the retiree medical subsidy**

| <u>Years of Service</u> | <u>Percent covered by the State</u> |
|-------------------------|-------------------------------------|
| 25+ | 80% |
| 20 – 24 | 50% |
| 15 - 19 | 40% |
| 10 - 14 | 30% |
| < 10 | 0% |

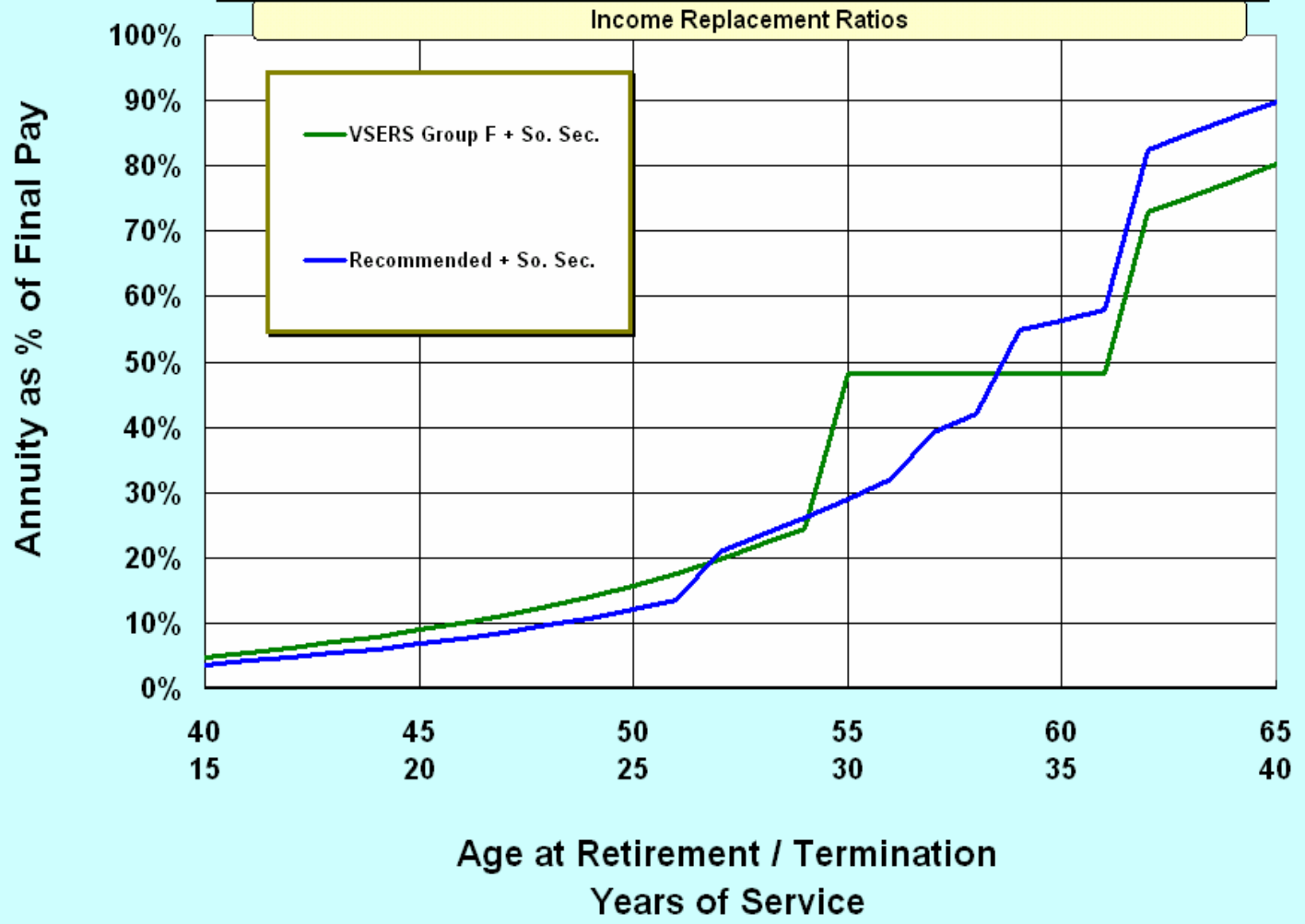
- **Include post-retirement medical recapture for those who complete at least 20 years of service**

The features above shown in boldface type are those we are recommending.

In the pages that follow, we compare the recommended design for new Group F members to the current pension program. Essentially, the large subsidy available at 30 years of service is recommended for reduction. Employees working to their NRD will receive an adequate benefit and there is a retention incentive. Subsequent slides compare the value of benefit accruals under the current design to those under some of the alternatives. The changes we are recommending meet the most important goal of the program - to maintain an adequate level of benefits. The results for all of the scenarios examined that meet the goals and objectives are shown in Appendix A.

VSERS - Group F

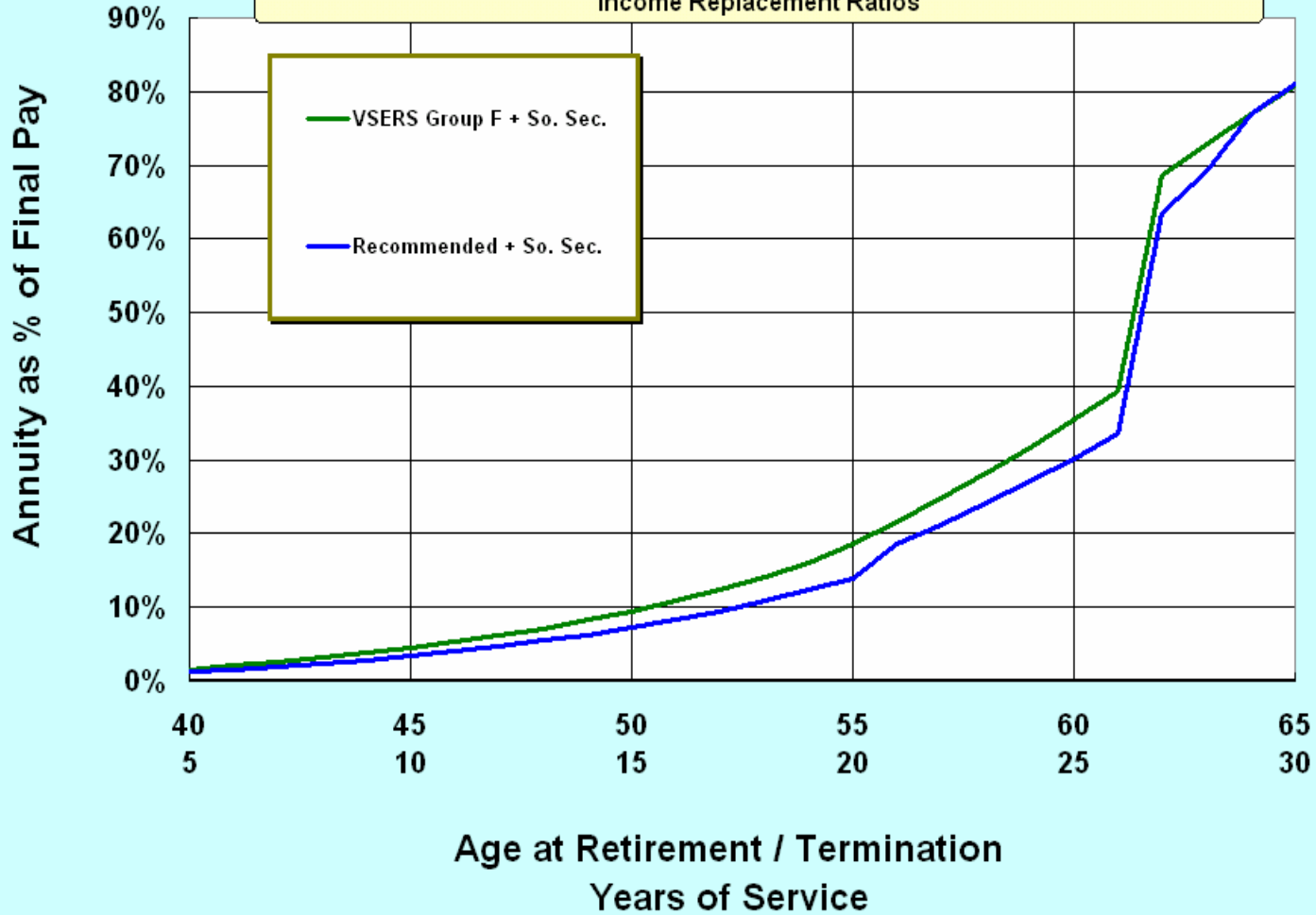
Current Age: 25, Past Service: 0
 Current Pay: \$40,000, Salary Increase Rate: 3.75%



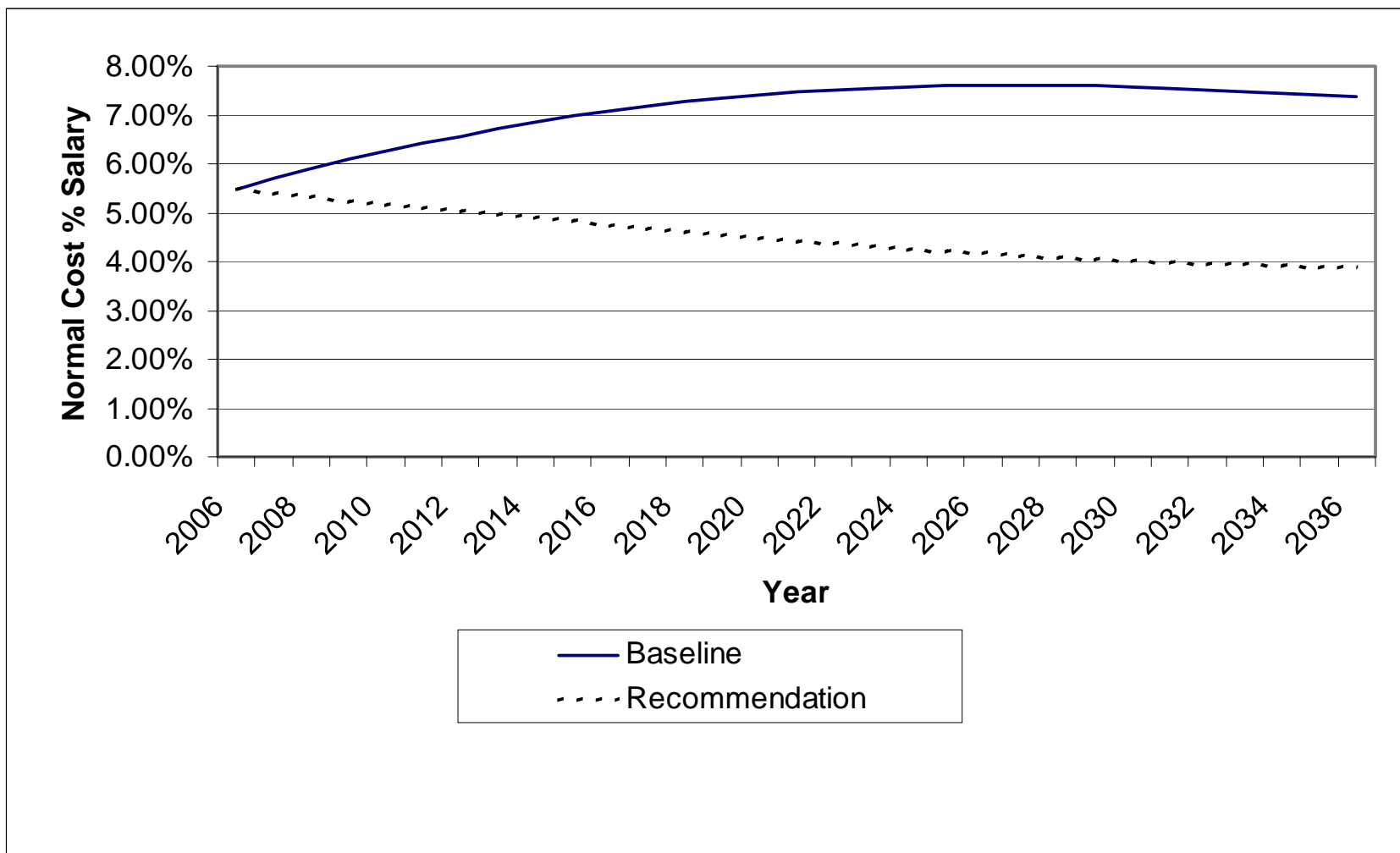
VSERS - Group F

Current Age: 35, Past Service: 0
Current Pay: \$40,000, Salary Increase Rate: 3.75%

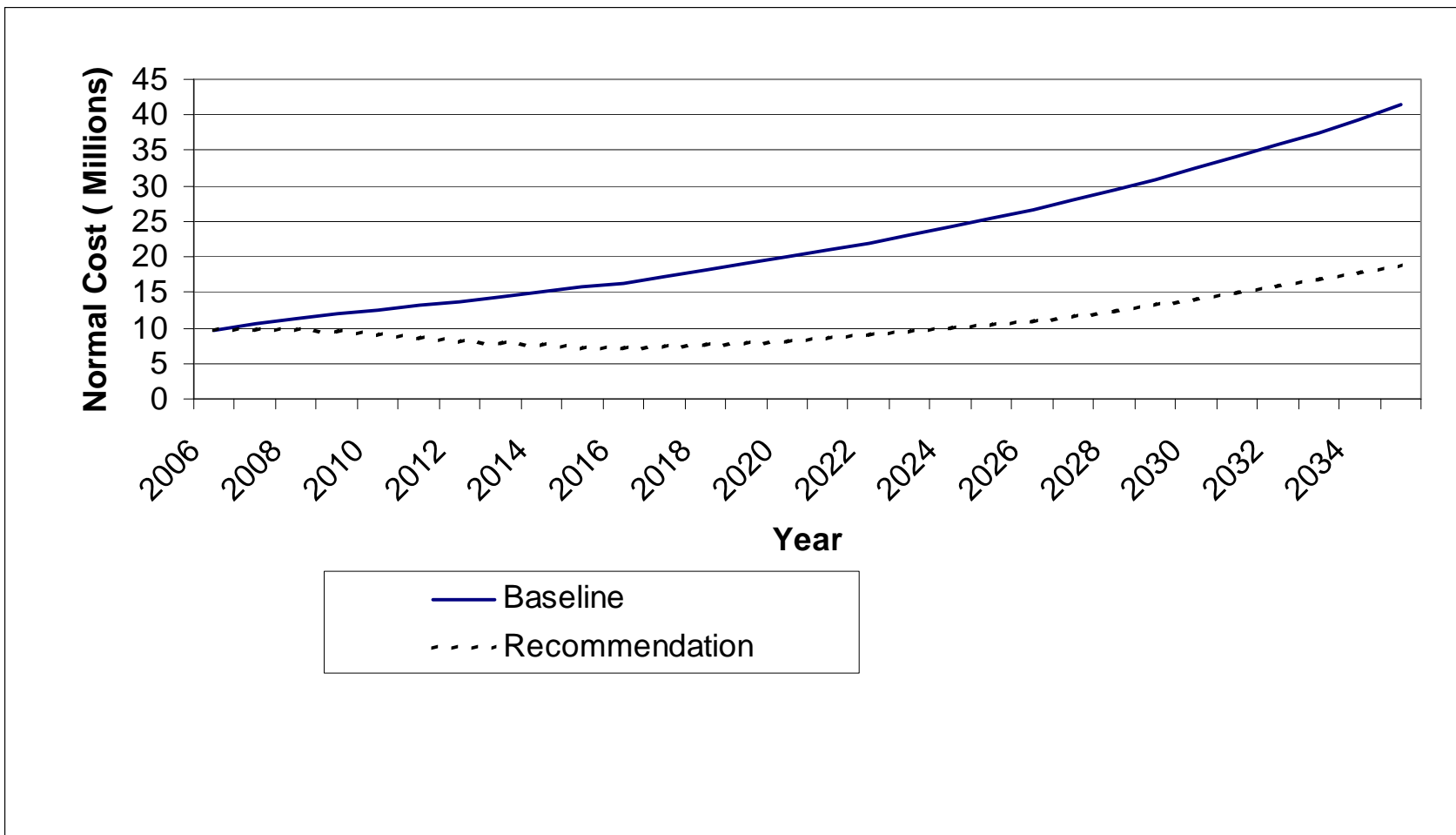
Income Replacement Ratios



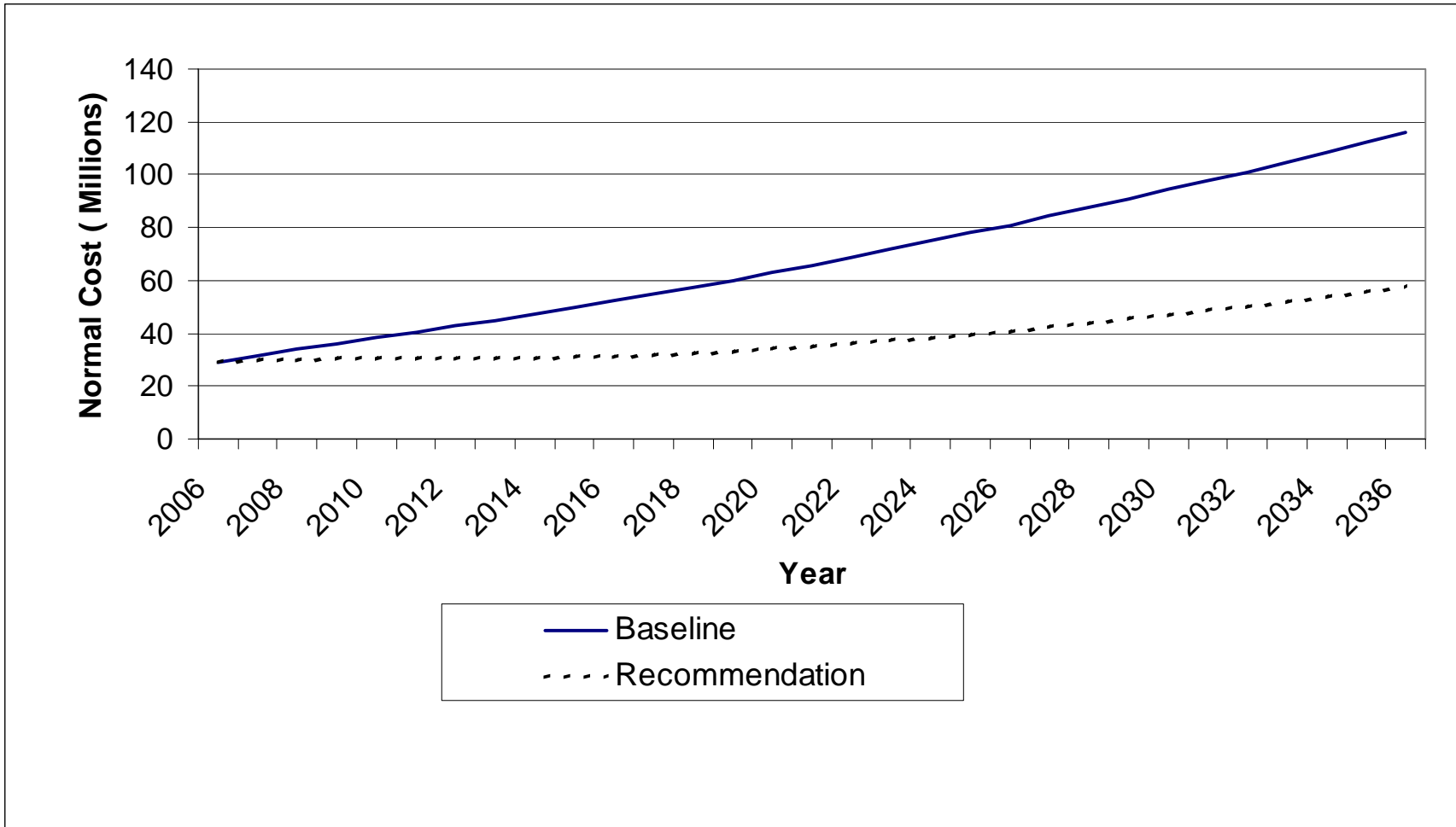
The graph below shows the comparison of the projected Normal Cost as a percentage of payroll under the current Group F plan and the recommended Group F plan. The Normal Cost is the value of benefits accruing in the coming year, as determined under the Entry Age Normal actuarial cost method, and represents the best means of measuring the difference in cost between plans. The Baseline is the projected Normal Cost if no changes are made to Group F.



The graph below shows the comparison of the projected Normal Cost under the current post-retirement medical plan and the recommended plan. The Normal Cost is the value of benefits accruing in the coming year, as determined under the Projected Unit Credit actuarial cost method, and represents the best means of measuring the difference between plans. The Baseline is the projected Normal Cost if no changes are made to the plan.



The graph below shows the comparison of the projected Normal Cost between the sum of the current Group F pension plan and the post-retirement medical plan, and the recommended programs. The Normal Cost is the value of benefits accruing in the coming year and represents the best means of measuring the difference between plans. The Baseline is the projected Normal Cost if no changes are made to the plan.



VSERS Group C

The current key program features are as follows:

- Average Final Compensation (AFC) is based on highest 2 consecutive years of pay
- Retirement allowance equals 2.5% of AFC times service up to 20 years.
- No Reduction for Early Retirement: participants may retire with an unreduced benefit at age 50 with 20 years of service.
- Normal Retirement Date: Age 55
- Member Contributions: 6.28% of earnings
- Subsidized 70% Joint and Survivor benefit
- Post-retirement Medical: 80% employer share for all retirees regardless of service.

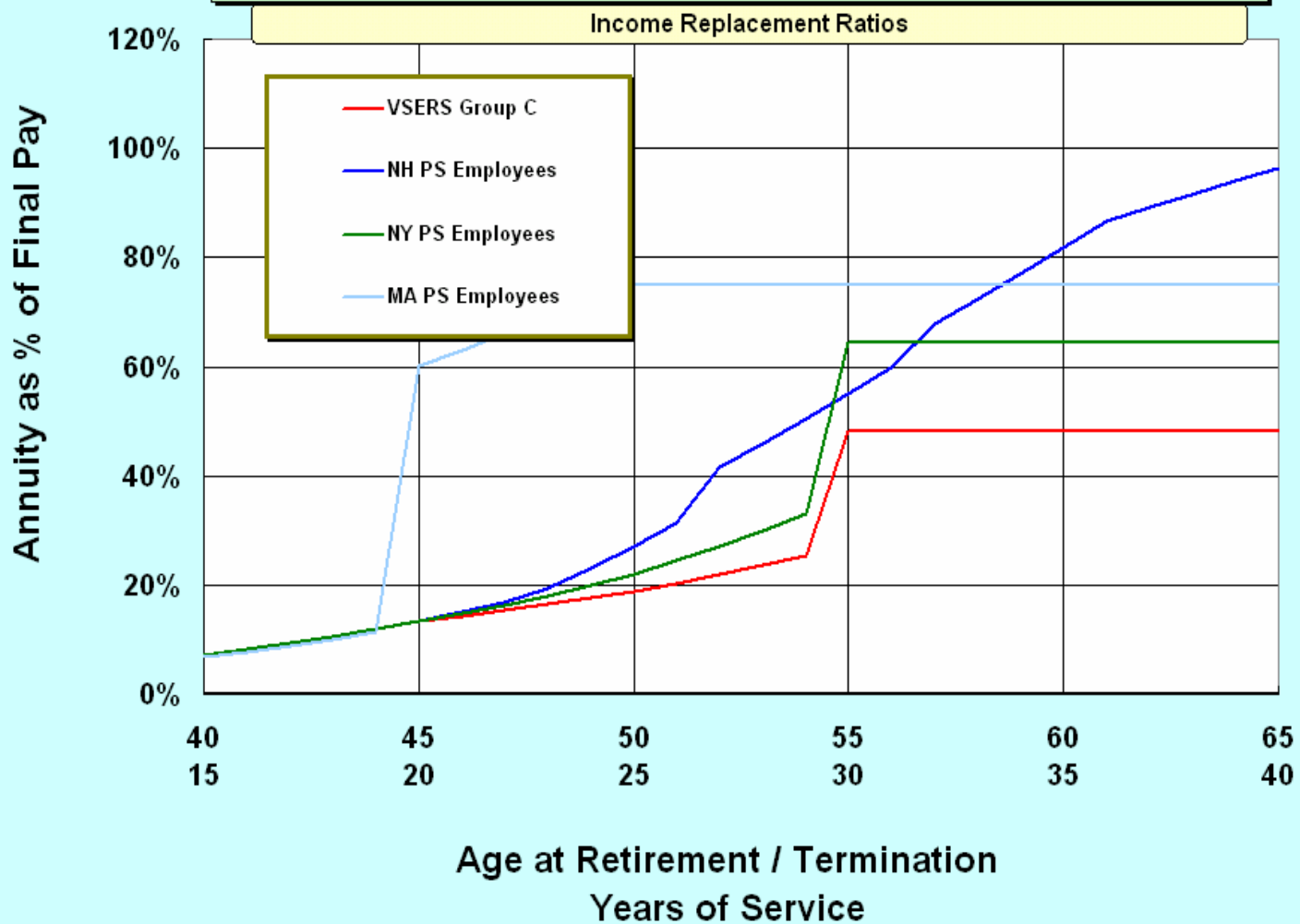
In the pages that follow, we compare the VSERS Group C pension program to retirement benefit programs offered to similarly situated employees in neighboring states. Graphs are used to show the relative values of benefits under the current Group C plan and those provided under plans maintained by neighboring states. We examined the accrual patterns of hypothetical new employees hired at ages 25 and 35. The comparison of value of benefit accrual, as a percentage of final pay, is shown against Massachusetts, New Hampshire and New York. Group C benefit accruals, as a percentage of final pay, are plotted against those earned under comparable plans offered by Massachusetts, New Hampshire and New York. We also show the relative value of employee contributions (EEC).

The following points, which are quite similar to those identified in our examination of VSERS Group F, are noteworthy:

- Massachusetts' system provides for both higher benefits until about age 60 and higher employee contributions, but participants are not covered by Social Security.
- New York employee contributions are quite low relative to those required by the three other states.
- The other states do not cap the benefit at 50% of final average pay.

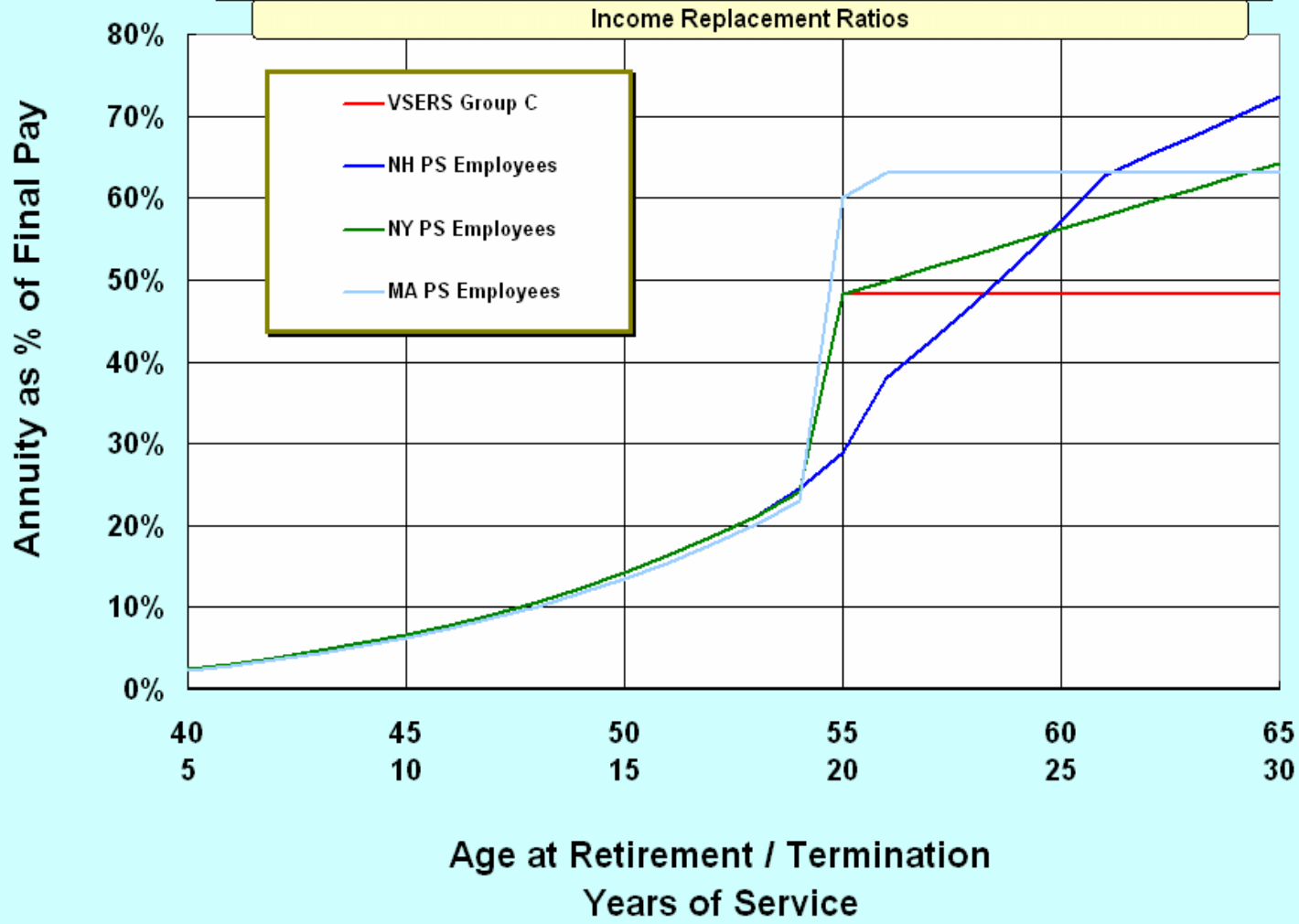
VSERS - Group C

Current Age: 25, Past Service: 0
Current Pay: \$50,000, Salary Increase Rate: 3.75%



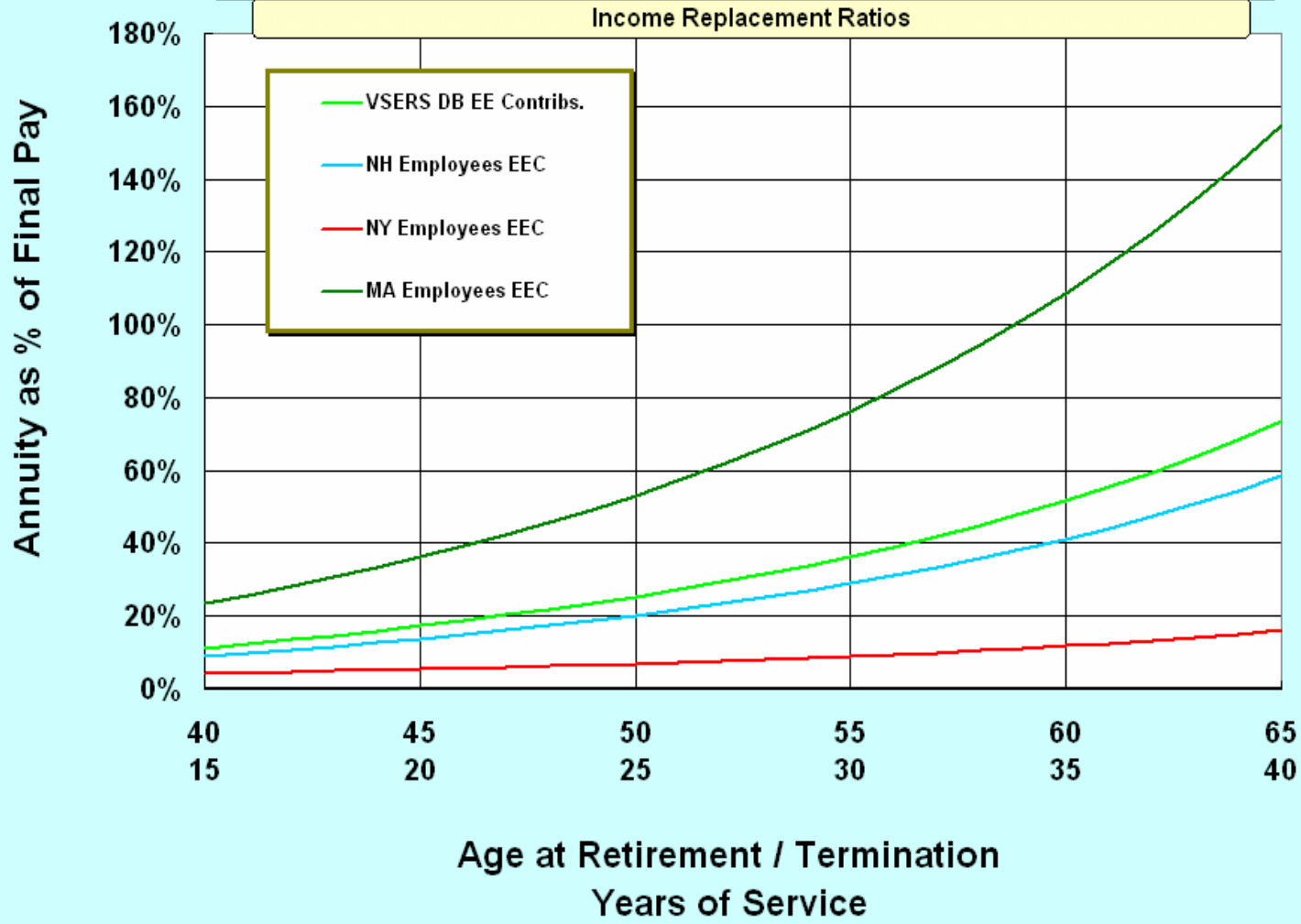
VSERS - Group C

Current Age: 35, Past Service: 0
 Current Pay: \$50,000, Salary Increase Rate: 3.75%



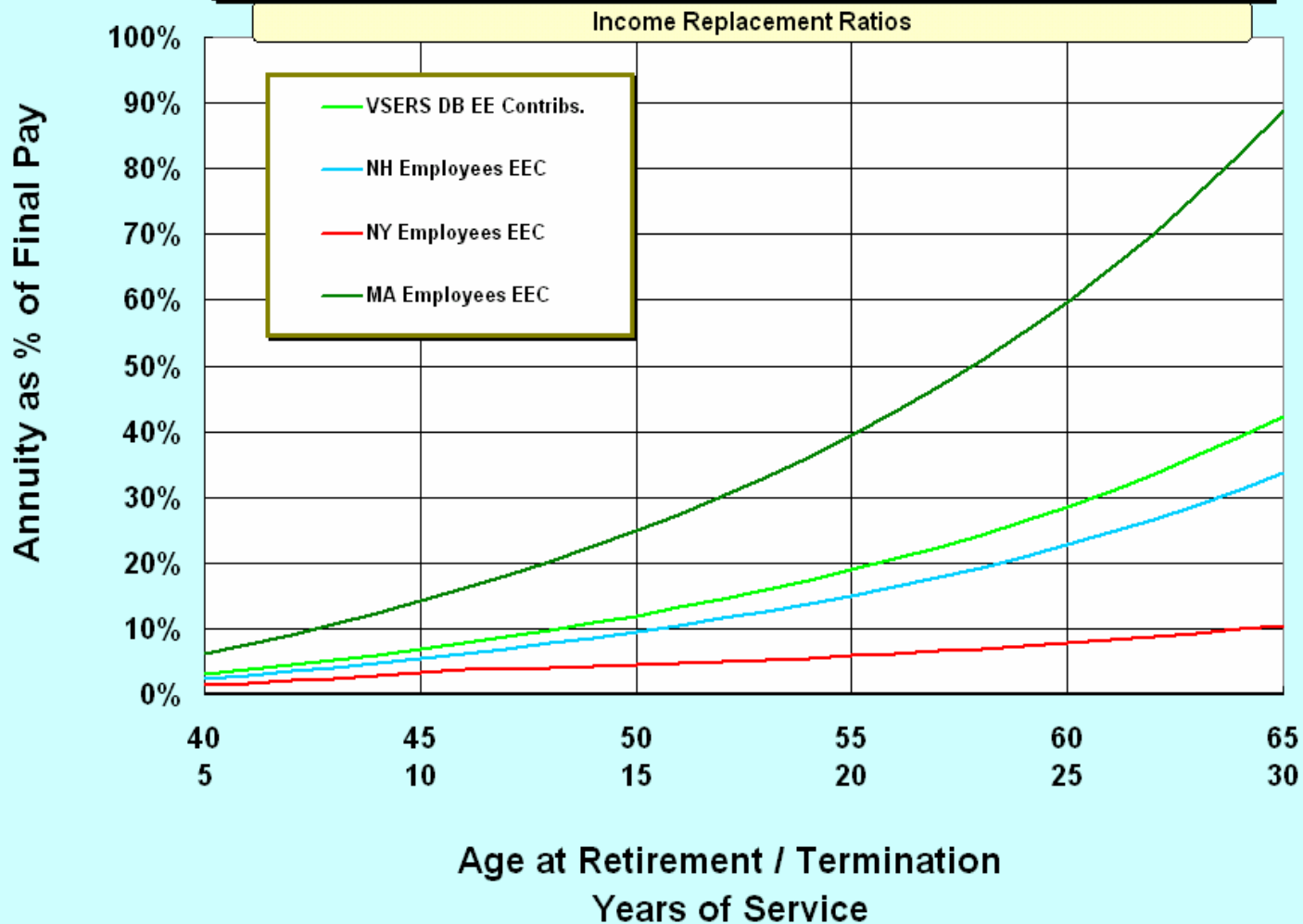
VSERS - Group C

Current Age: 25, Past Service: 0
 Current Pay: \$50,000, Salary Increase Rate: 3.75%



VSERS - Group C

Current Age: 35, Past Service: 0
Current Pay: \$50,000, Salary Increase Rate: 3.75%



Based on the goals and objectives developed we selected the following program changes to consider:

- **Increase the cap from 50% of AFC to 65%.**
- **Modify the early retirement subsidy formula to one that increases the subsidy for long service, and decreases the subsidy for short service**
- Increase the employee contribution rate.
- Change the Normal Retirement Date (NRD): two possibilities were examined:
 - Age 65
 - **Age 60**
- **Change the period for the computation of AFC from 2 years to 3 years.**

- **Allow additional accruals of 1% of AFC for years of service in excess of 20.**
- **Eliminate the complete subsidy of the 70% Joint and Survivor form of payment.**
- Institute Defined Contribution arrangement, with contributions totaling 9% of pay to be split between the state and the employee
- **Move to a tiered approach (based on service) for the retiree medical subsidy**

| <u>Years of Service</u> | <u>Percent covered by the State</u> |
|-------------------------|-------------------------------------|
| 25+ | 80% |
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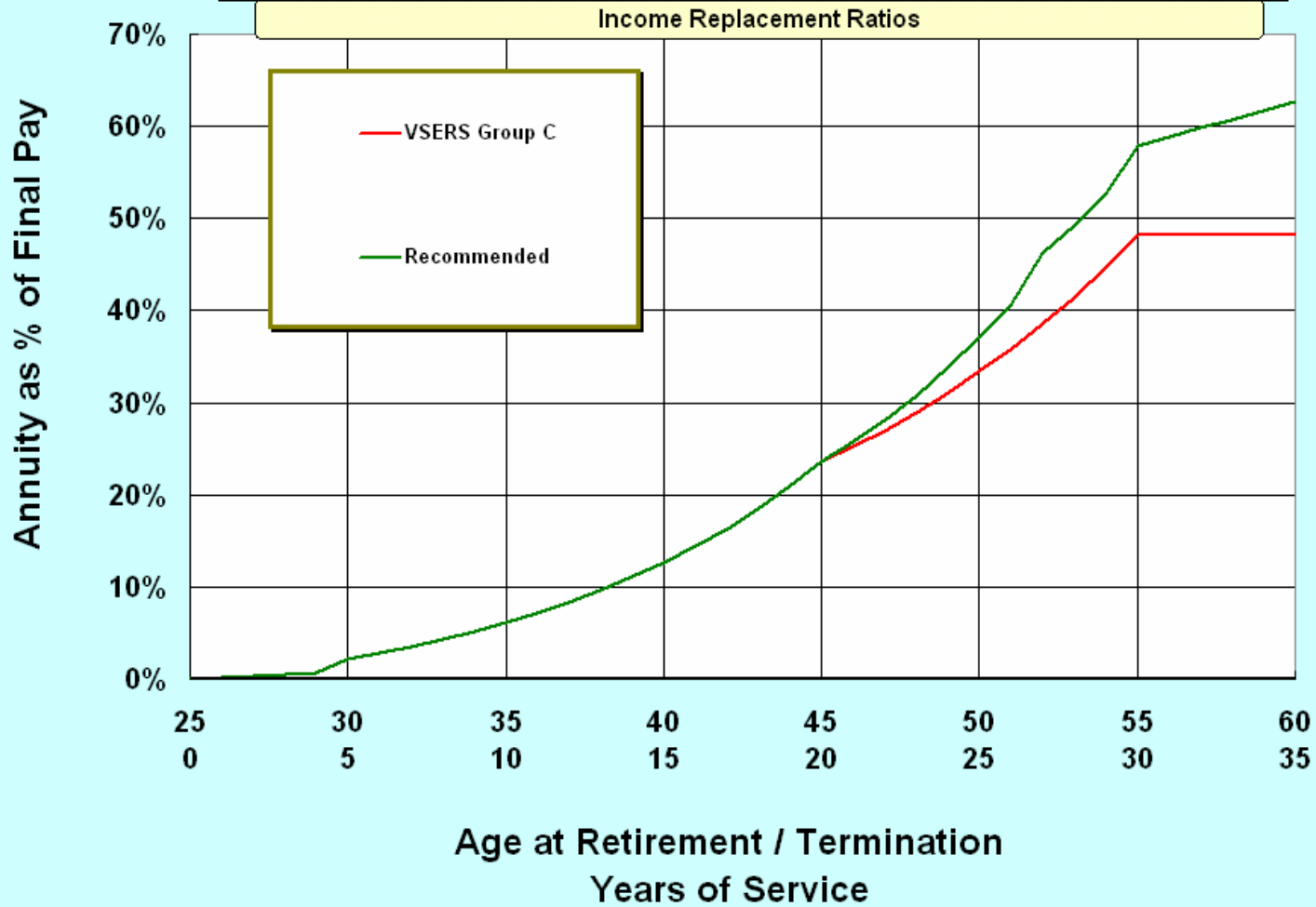
- **Include post-retirement medical recapture after 20 years of service**

The features above shown in boldface type are those that we are recommending.

In the pages that follow, we compare the recommended design for new Group C members to the current pension program. As in the case of Group F, the subsidy of early retirement (which has been 100% for Group C members) is recommended for reduction. Employees working to their NRD will receive an adequate benefit, and there is a retention incentive in the form of larger incremental increases in benefits for additional years of service. Subsequent slides compare the value of the benefit accruals under the current design to those under some of the alternatives. The recommended changes meet the most important goal of the program - to maintain an adequate level of benefits. The results for all of the scenarios examined that meet the goals and objectives are shown in Appendix B.

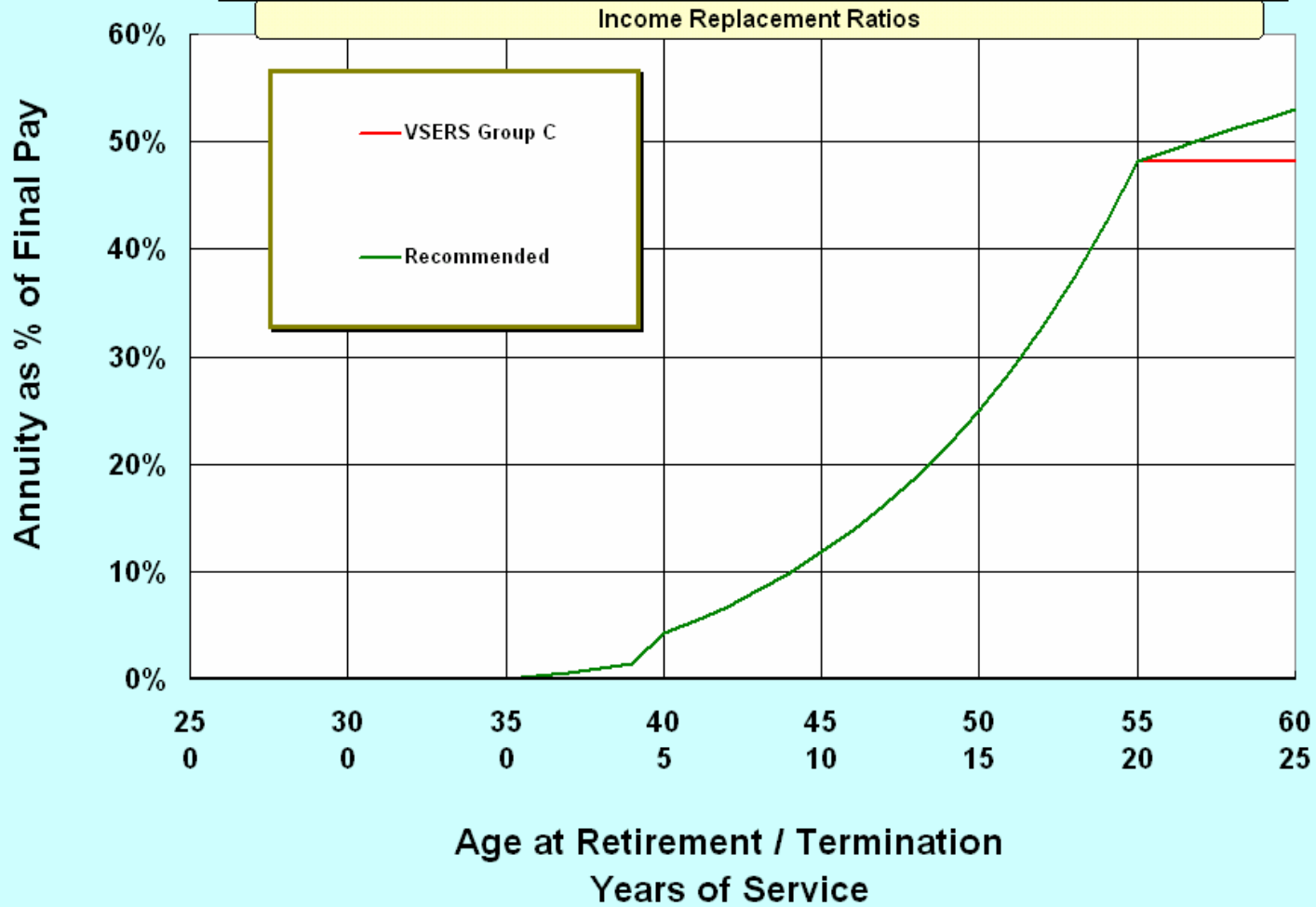
VSERS - Group C

Current Age: 25, Past Service: 0
Current Pay: \$50,000, Salary Increase Rate: 3.75%

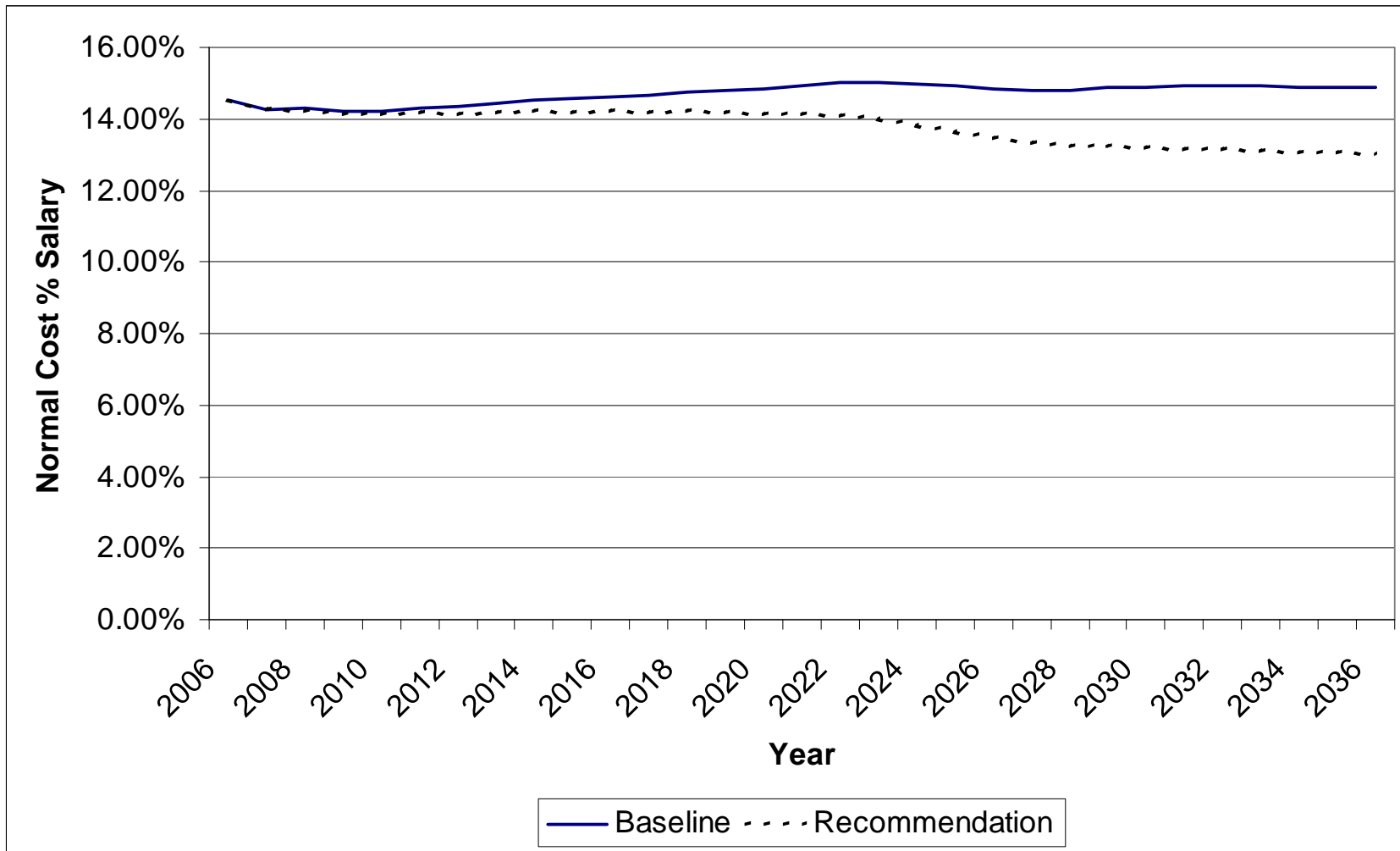


VSERS - Group C

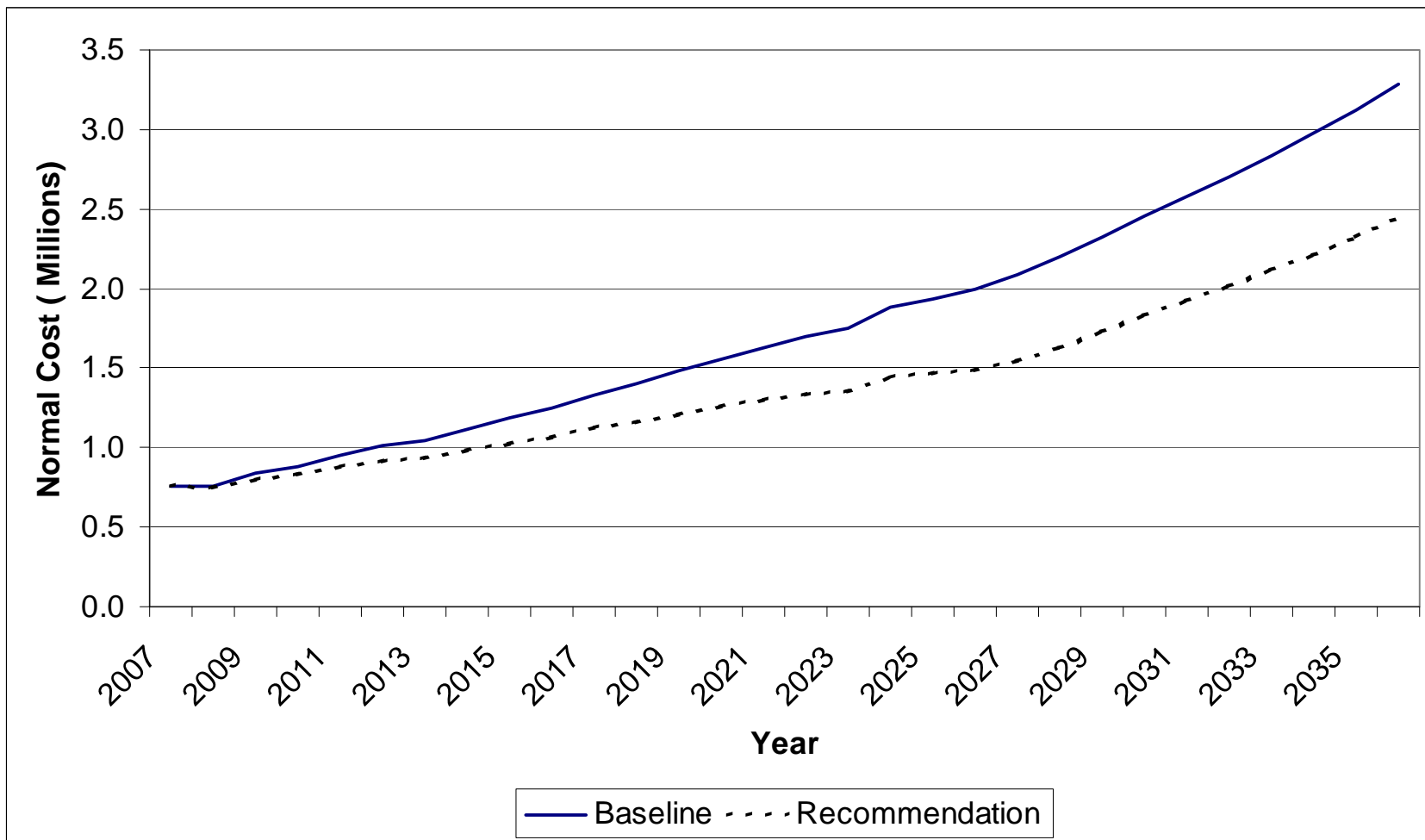
Current Age: 35, Past Service: 0
Current Pay: \$50,000, Salary Increase Rate: 3.75%



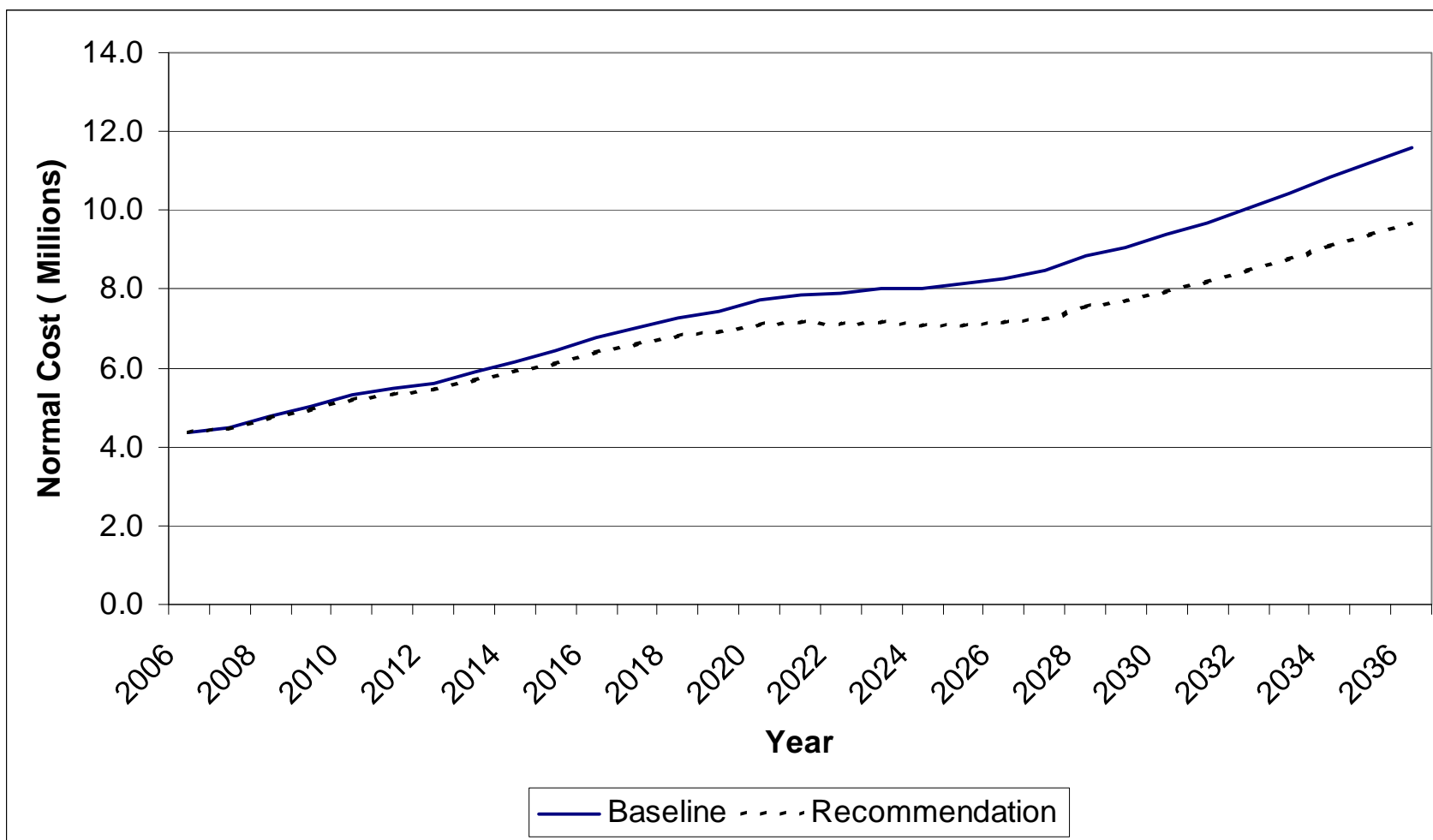
The graph below shows the comparison of the projected Normal Cost as a percentage of payroll under the current Group C plan and the recommended Group C plan. The Normal Cost is the value of benefits accruing in the coming year, as determined under the Entry Age Normal actuarial cost method, and represents the best means of measuring the difference in cost between plans. The Baseline is the projected Normal Cost if no changes are made to Group C.



The graph below shows the comparison of the projected Normal Cost under the current post-retirement medical plan and the recommended plan. The Normal Cost is the value of benefits accruing in the coming year, as determined under the Projected Unit Credit actuarial cost method, and represents the best means of measuring the difference between plans. The Baseline is the projected Normal Cost if no changes are made to the plan.



The graph below shows the comparison of the projected Normal Cost between the sum of the current Group F pension plan and the post-retirement medical plan, and the recommended programs. The Normal Cost is the value of benefits accruing in the coming year and represents the best means of measuring the difference between plans. The Baseline is the projected Normal Cost if no changes are made to the plan.



VSTRS Group C

The current key program features are as follows:

- Maximum retirement allowance is 50% of Average Final Compensation (AFC)
- Retirement allowance equals 1.67% of AFC times service
- Normal allowance reduced by 6% for each year commencement precedes age 62. For members with 30 years of service, there is no reduction.
- Normal Retirement Date is attainment of 62 or completion of 30 years of service
- Member Contributions: 3.4% of earnings, adjusted each year for changes in the cost of retiree medical insurance
- Post-retirement Medical: 80% employer share for all retirees regardless of service.
- Recapture of retiree medical coverage is possible upon completion of 10 years of service

In the pages that follow, we compare the VSTRS Group C pension program to retirement benefit programs offered to teachers in the public schools of neighboring states. Graphs are used to show the relative values of benefits under the current plan and those provided under plans maintained by neighboring states. We examined the accrual patterns of hypothetical new teachers hired at ages 25 and 35. VSTRS Group C benefit accruals, as a percentage of final pay, are plotted against those earned under comparable plans offered by Massachusetts, New Hampshire and New York. We also show the relative value of employee contributions (EEC).

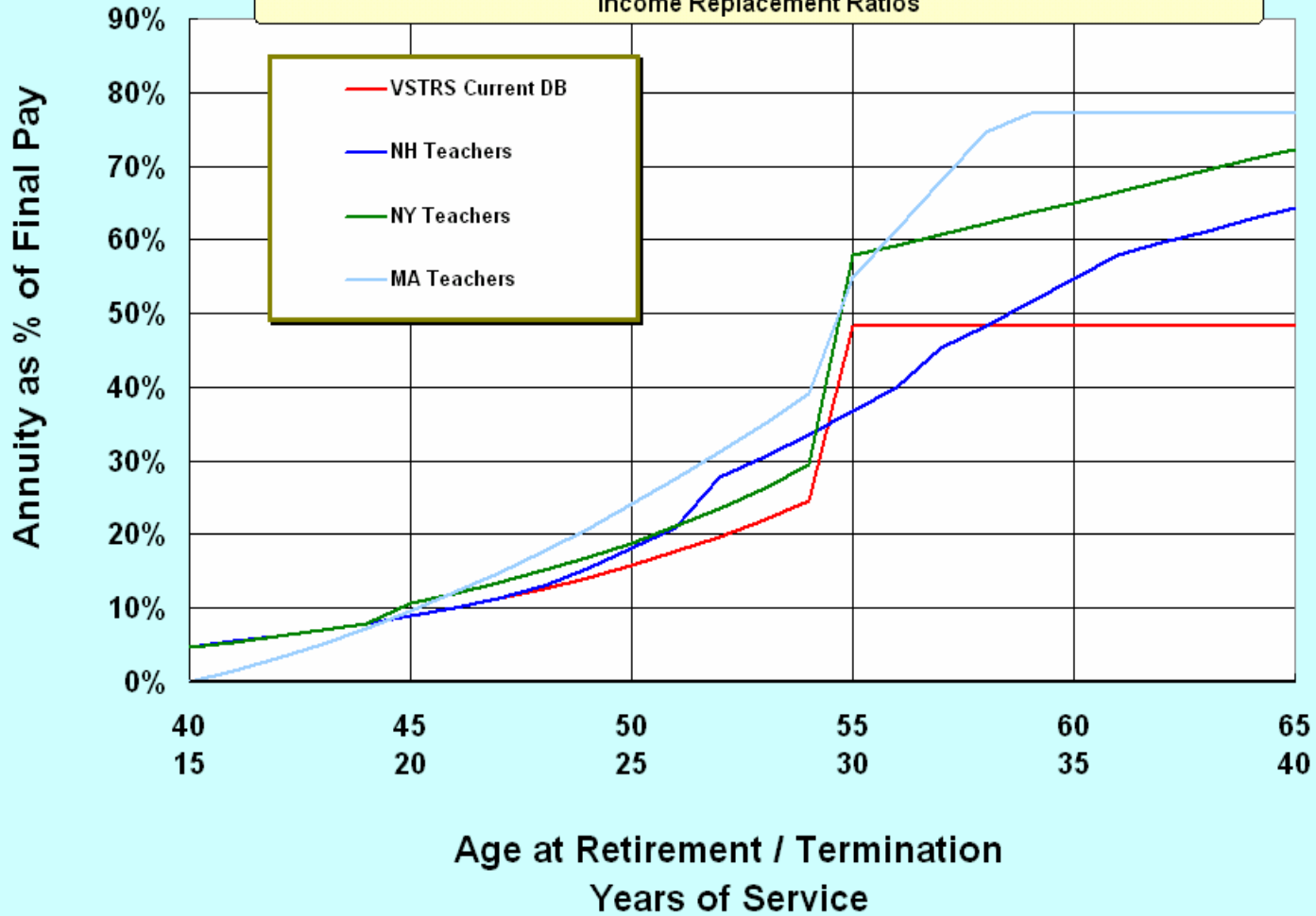
As in our comparisons of VSERS benefits to those offered by analogous retirement systems in neighboring states, the following points are noteworthy:

- Massachusetts' system provides for both higher benefits and higher employee contributions, but participants are not covered by Social Security.
- New York employee contributions are quite low.
- The other states do not cap the benefit at 50% of final average pay.

Vermont State Teachers' Retirement System

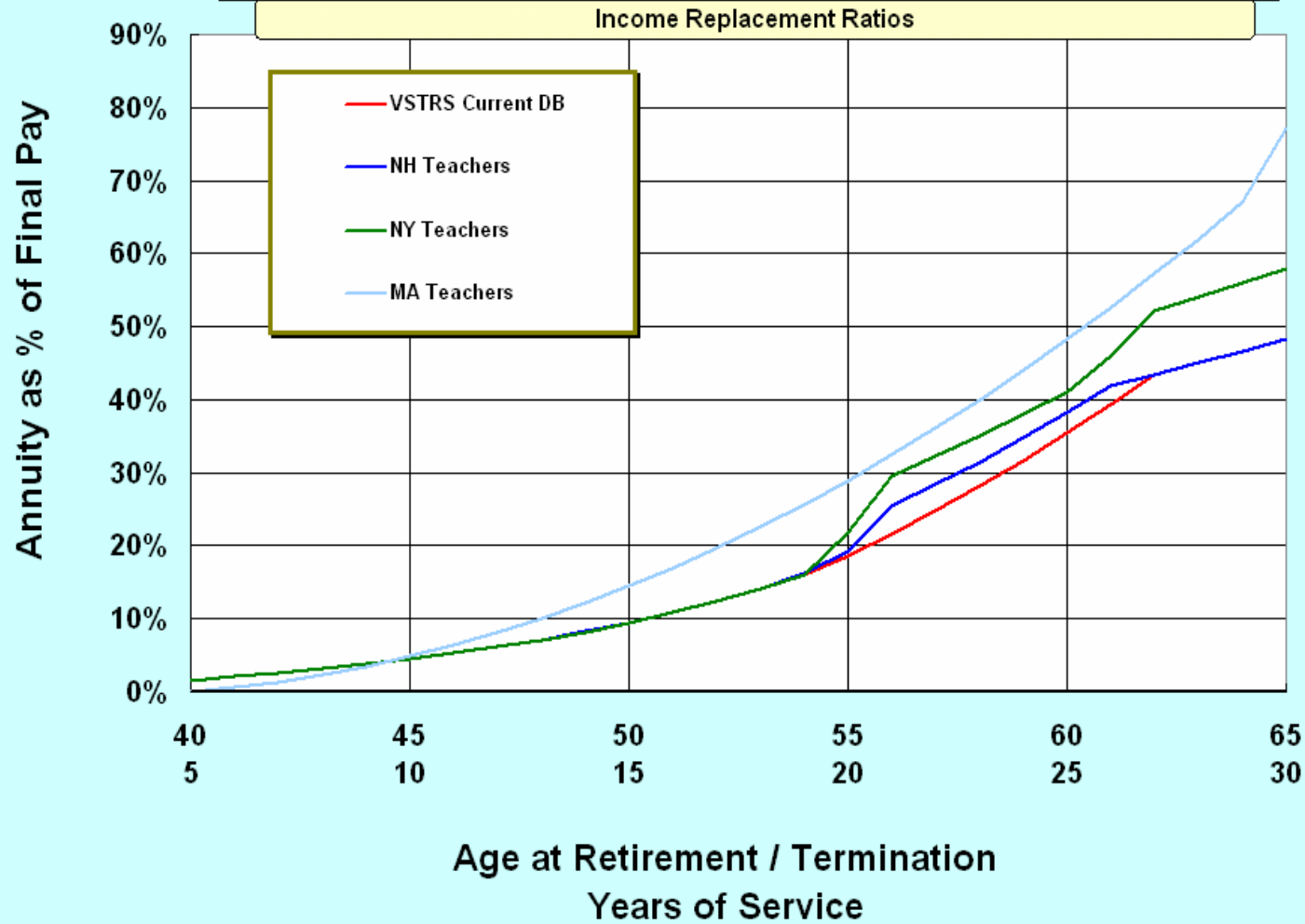
Current Age: 25, Past Service: 0
 Current Pay: \$40,000, Salary Increase Rate: 3.75%

Income Replacement Ratios



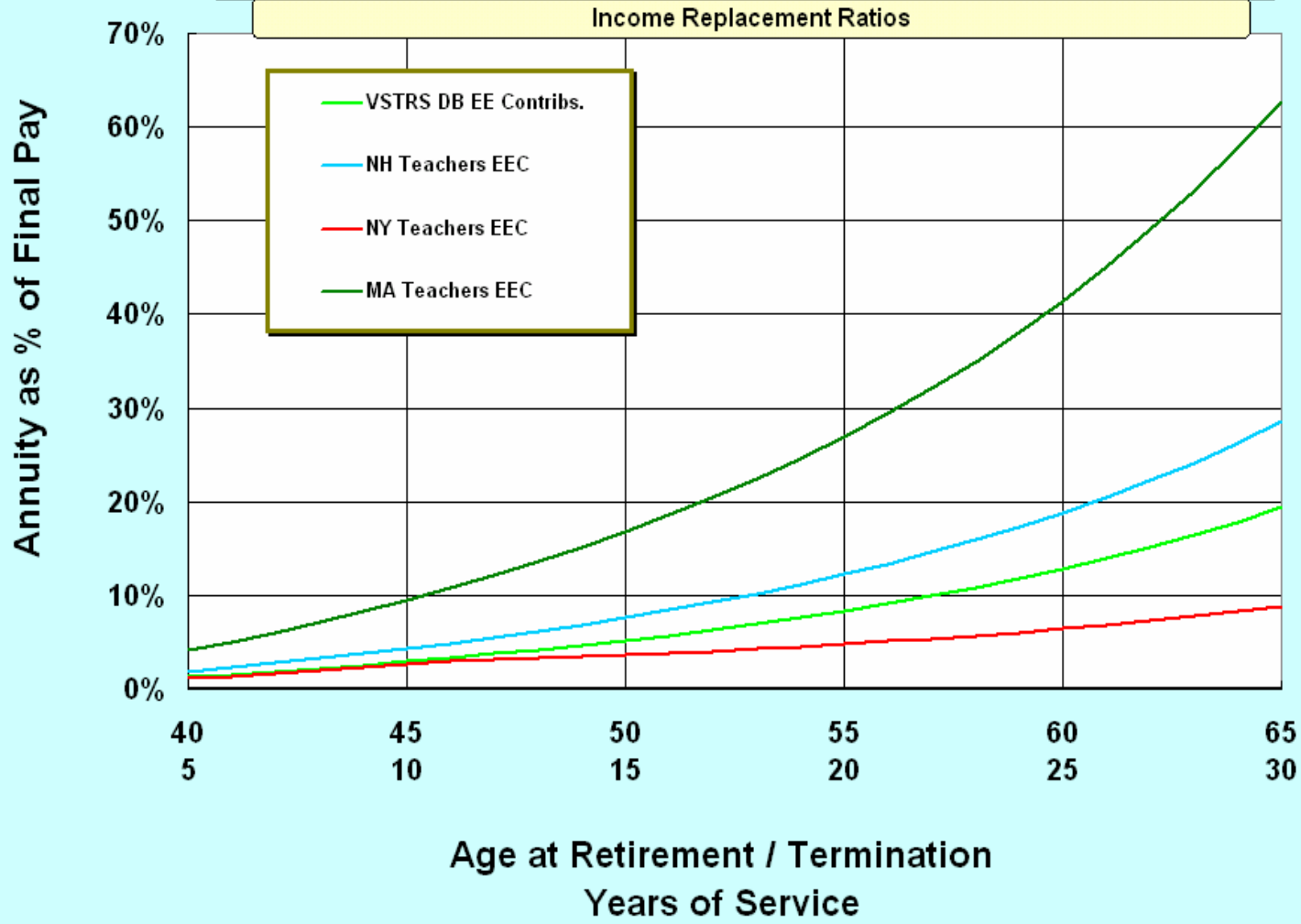
Vermont State Teachers' Retirement System

Current Age: 35, Past Service: 0
 Current Pay: \$40,000, Salary Increase Rate: 3.75%



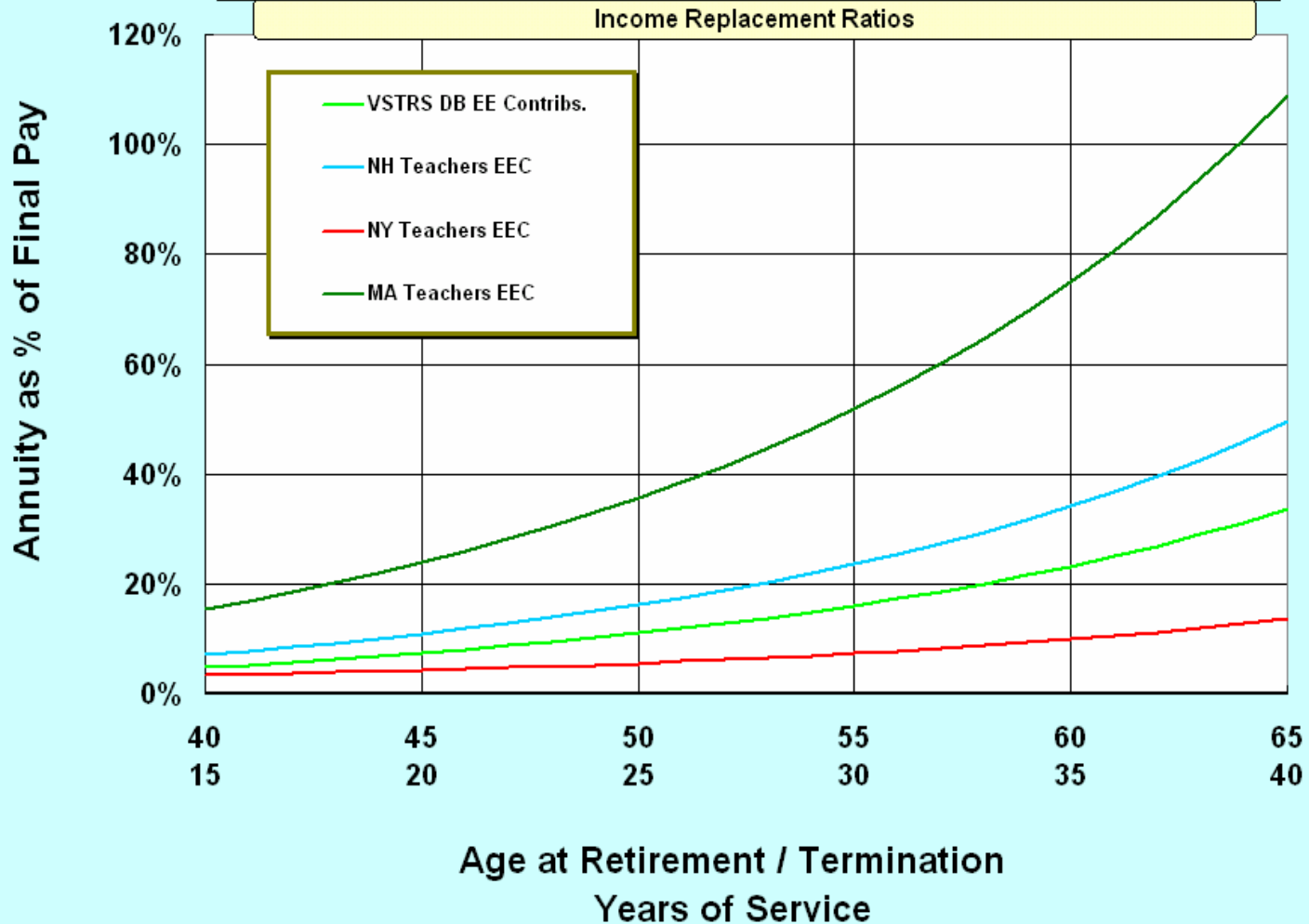
Vermont State Teachers' Retirement System

Current Age: 35, Past Service: 0
 Current Pay: \$40,000, Salary Increase Rate: 3.75%



Vermont State Teachers' Retirement System

Current Age: 25, Past Service: 0
 Current Pay: \$40,000, Salary Increase Rate: 3.75%



Based on the goals and objectives developed we selected the following program changes to consider:

- **Increase the cap from 50% of AFC to 60%.**
- **Modify the early retirement subsidy formula to one that increases the subsidy for long service, and decreases the subsidy for short service.**
- Increase the employee contribution rate
- Change the Normal Retirement Date (NRD): three possibilities were examined
 - Age 65
 - **Age 65 or 90 Points (i.e., sum of age and service = 90)**
 - Age 62 and completion of 20 years of service
- Institute a defined contribution arrangement, with contributions totaling 9% of pay to be split between the state and the employee.
- **Move to a tiered approach (based on service) for the retiree medical subsidy**

| <u>Years of Service</u> | <u>Percent covered by the State</u> |
|-------------------------|-------------------------------------|
| 25+ | 80% |
| 20 – 24 | 50% |
| 15 - 19 | 40% |
| 10 - 14 | 30% |
| < 10 | 0% |

- **Raise the amount of service needed for post-retirement medical recapture from 10 years to 20 years.**
- **Provide unsubsidized spousal access to retiree medical care.**

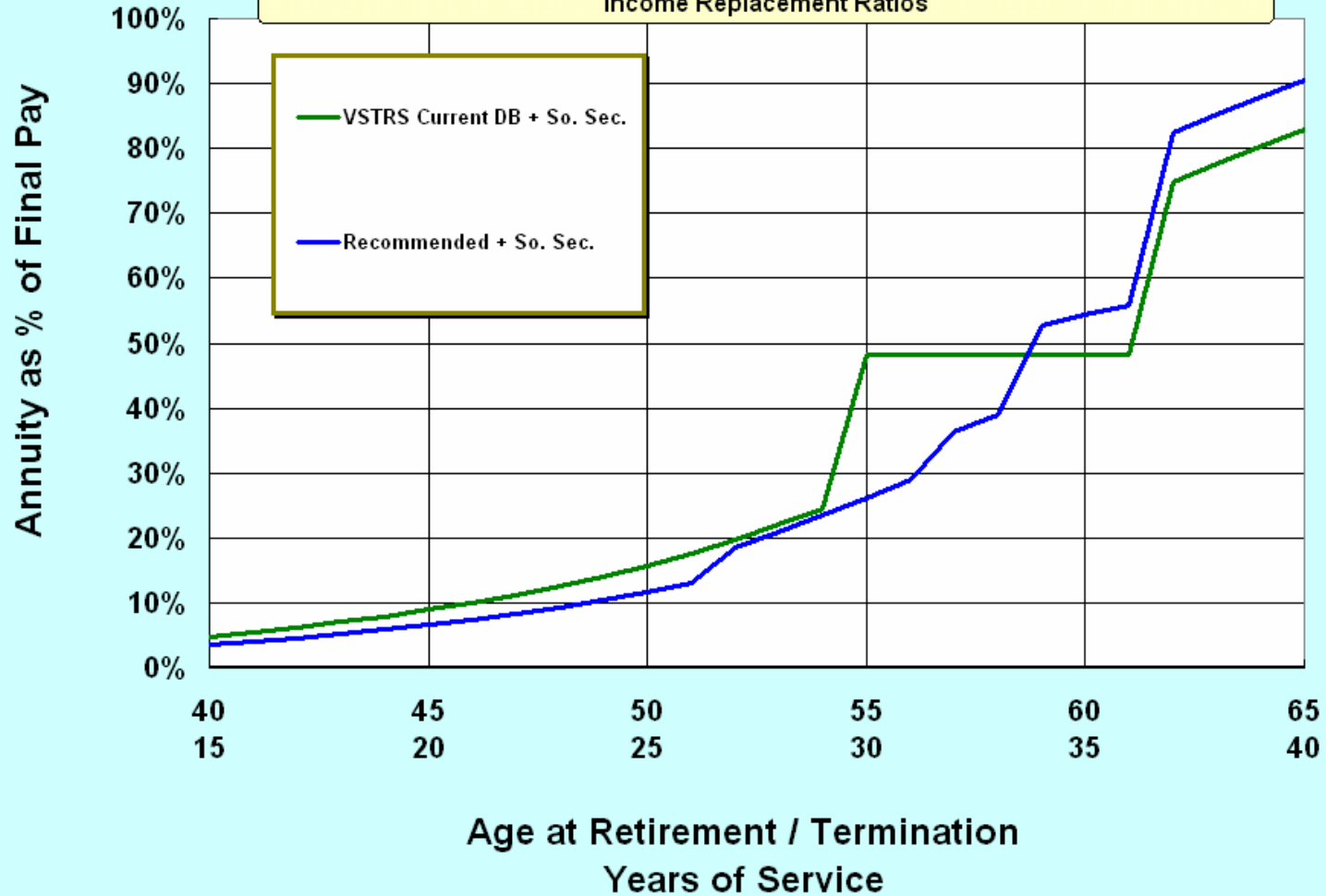
The features above shown in boldface type are those we are recommending.

In the pages that follow we show a comparison of the recommended design to the current pension program. Essentially, the large subsidy available at 30 years of service has been eliminated. Employees working to their NRD will receive an adequate benefit and there is a retention incentive. The following slides compare the value of the benefit accrual under the current design to some of the alternatives. The designs considered the recommended plan meet the most important goal of the program - to maintain an adequate level of benefits. The results for all of the scenarios examined that meet the goals and objectives are shown in Appendix C.

Vermont State Teachers' Retirement System

Current Age: 25, Past Service: 0
 Current Pay: \$30,000, Salary Increase Rate: 3.75%

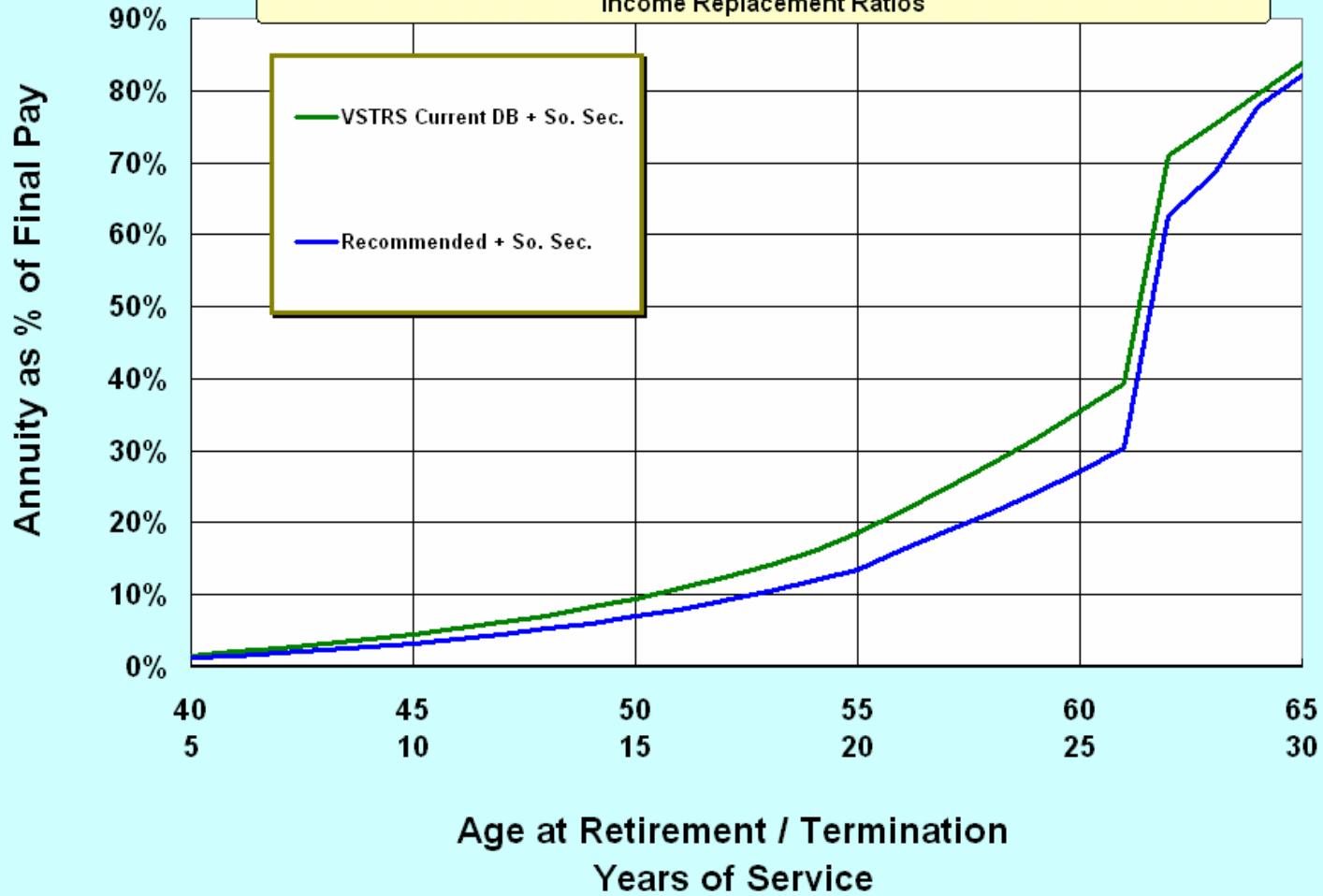
Income Replacement Ratios



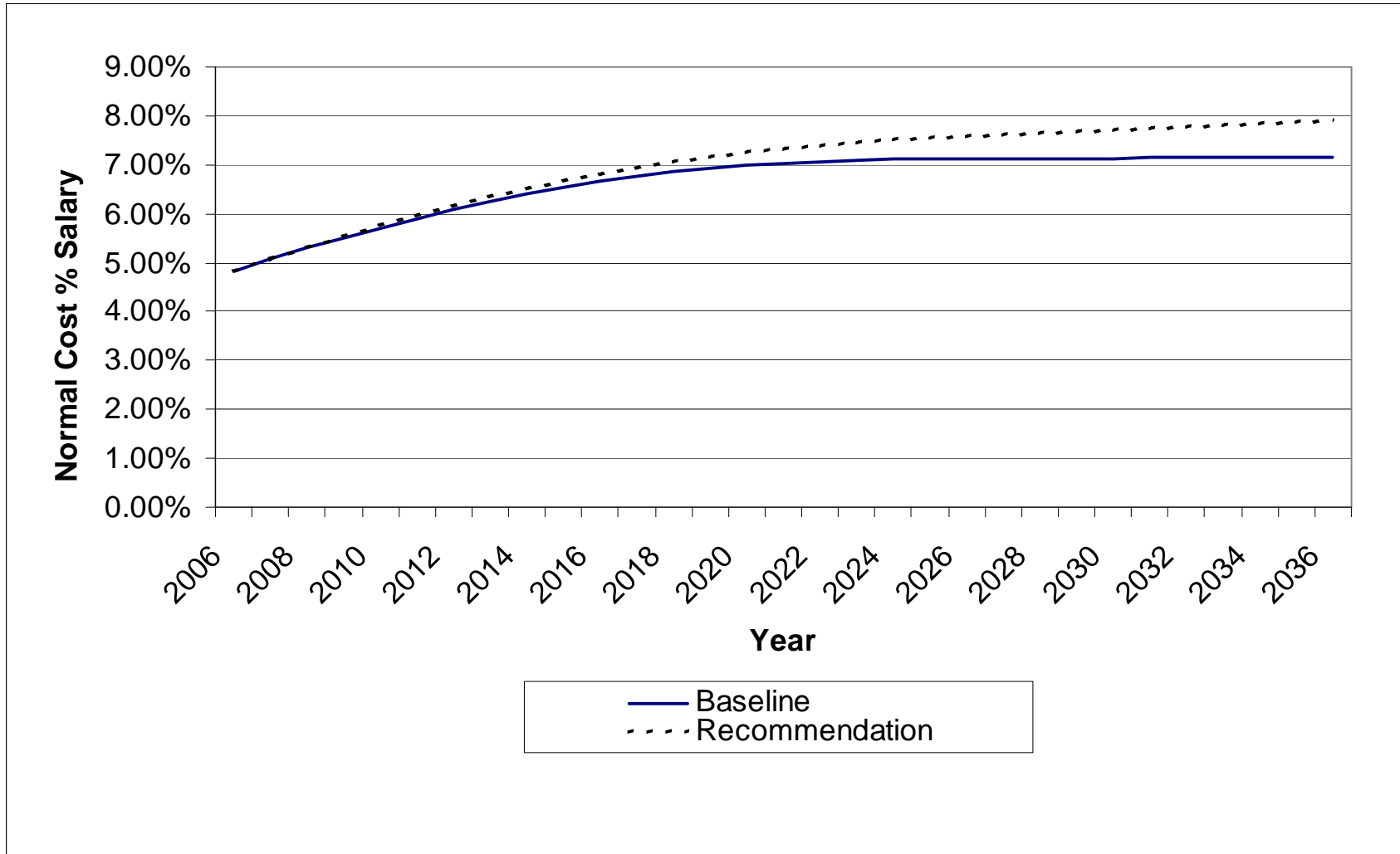
Vermont State Teachers' Retirement System

Current Age: 35, Past Service: 0
 Current Pay: \$30,000, Salary Increase Rate: 3.75%

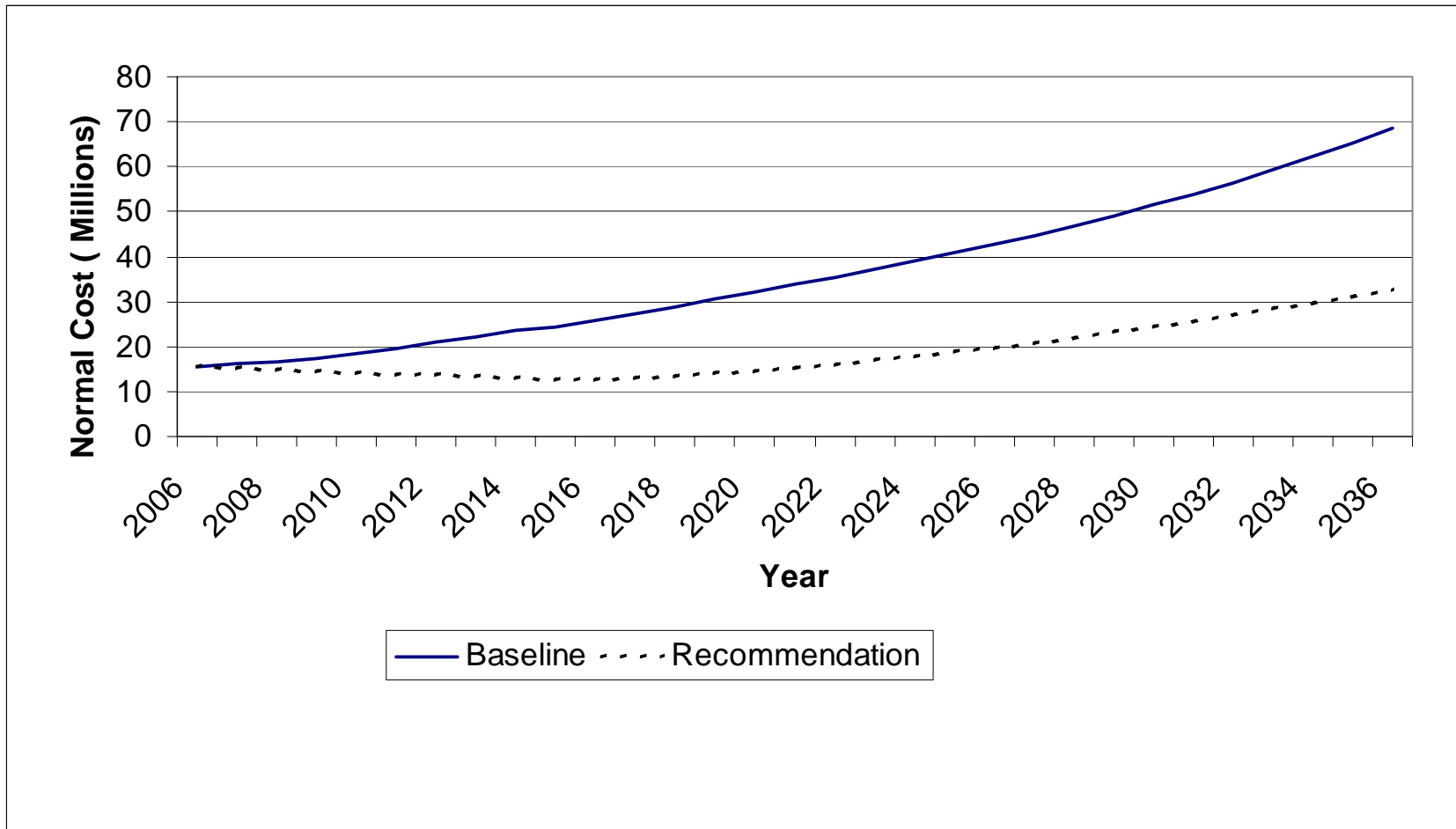
Income Replacement Ratios



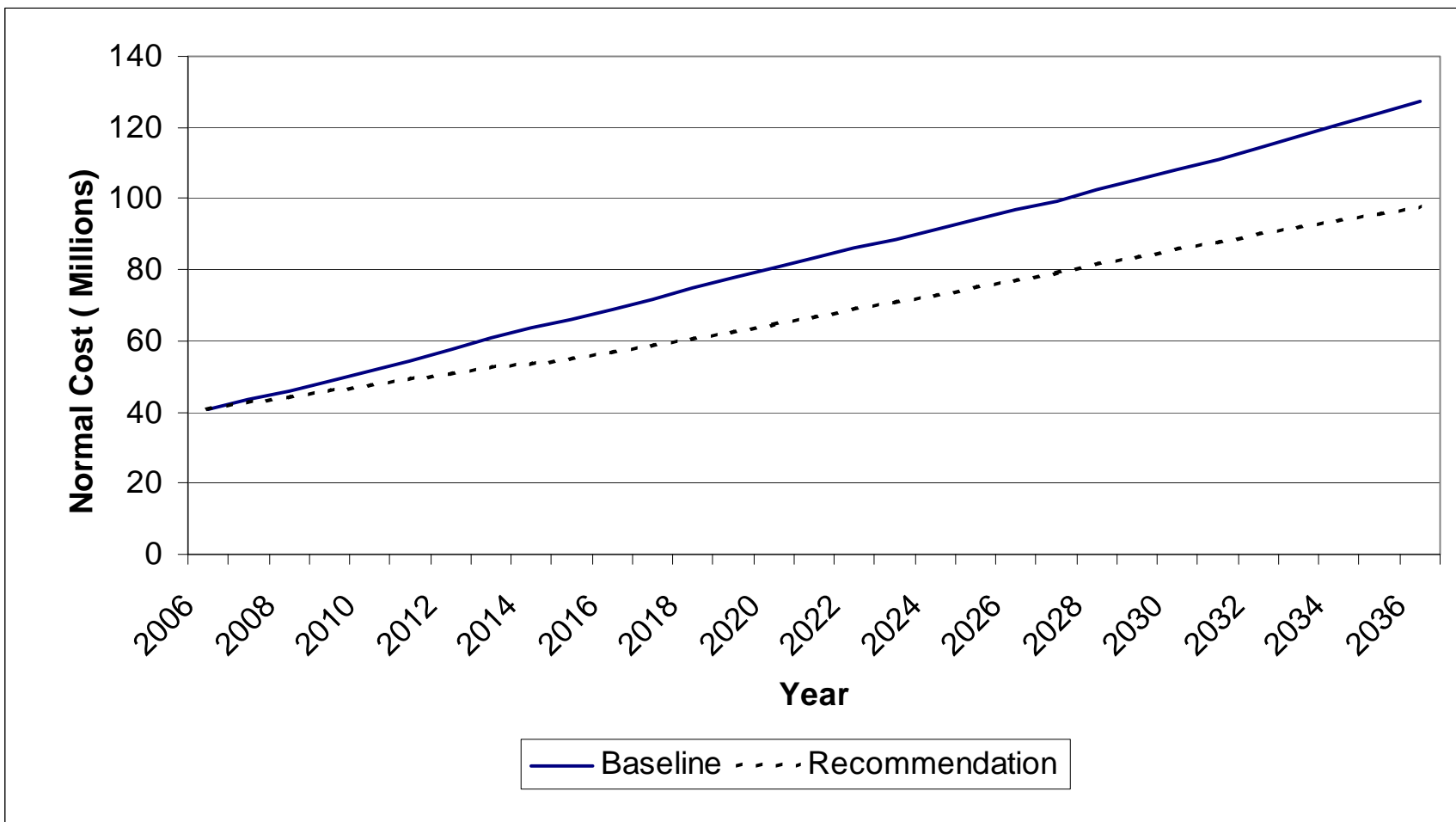
The graph below shows the comparison of the projected Normal Cost as a percentage of payroll between the current pension plan and the recommended plan. The Normal Cost is the value of benefits accruing in the coming year and represents the best means of measuring the difference between plans. The Baseline is the projected Normal Cost if no changes are made to the plan.



The graph below shows the comparison of the projected Normal Cost between the current post-retirement medical plan and the recommended plan. The Normal Cost is the value of benefits accruing in the coming year and represents the best means of measuring the difference between plans. The Baseline is the projected Normal Cost if no changes are made to the plan.



The graph below shows the comparison of the projected Normal Cost as a percentage of payroll between the sum of the current pension plan and the post-retirement medical plan, and the recommended program. The Normal Cost is the value of benefits accruing in the coming year and represents the best means of measuring the difference between plans.



Appendix A

VSEERS F

In the pages that follow, we show the program scenarios examined and the financial forecasts. We believe the state should also consider these alternatives.

VSERS Group F - Pension

| Feature | Plan Scenario | | | | | | | | | | | |
|---|---------------|---|---|---|---|---|---|---|---|----|----|------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12** |
| Formula change: Increase cap to 60% | X | | | | | | | | | | | X |
| Add Early Retirement Reduction Factor (ERF) * | X | X | X | X | X | X | X | X | X | X | | X |
| Change Normal Retirement Date (NRD): Age 65 | | | X | | | | | | X | | | |
| Change Normal Retirement Date (NRD): 85 points or 65 | X | X | | X | X | | | X | | | | |
| Change Normal Retirement Date (NRD): 90 points or 65 | | | | | | | | | | | | X |
| Change Normal Retirement Date (NRD): 62&20, or 65 | | | | | | X | X | | | X | | |
| Formula change: 2% Final Average Pay minus 1.5% of Social Security Benefit, 35 year maximum (Primary Insurance Amount - Level Post Retirement Salary) | | | | | | | X | | | | | |
| Formula change: 2% Final Average Pay minus 1.5% of Social Security Benefit, 35 year maximum (Primary Insurance Amount - Zero Post Retirement Salary) | | | | | | | | | | X | | |
| Formula change: 9% DC Plan (4% Employer, 5% Employee) | | | | | | | | | | | X | |

* Proposed early retirement factors

Years of Service Retirement

35+
30-35
25-30
20-25
less than 20

Monthly % Reduction from NRD

1/8 of 1%
1/4 of 1%
1/3 of 1%
5/12 of 1%
5/9 of 1%

** Recommended

VSERS Group F - Post Retirement Medical

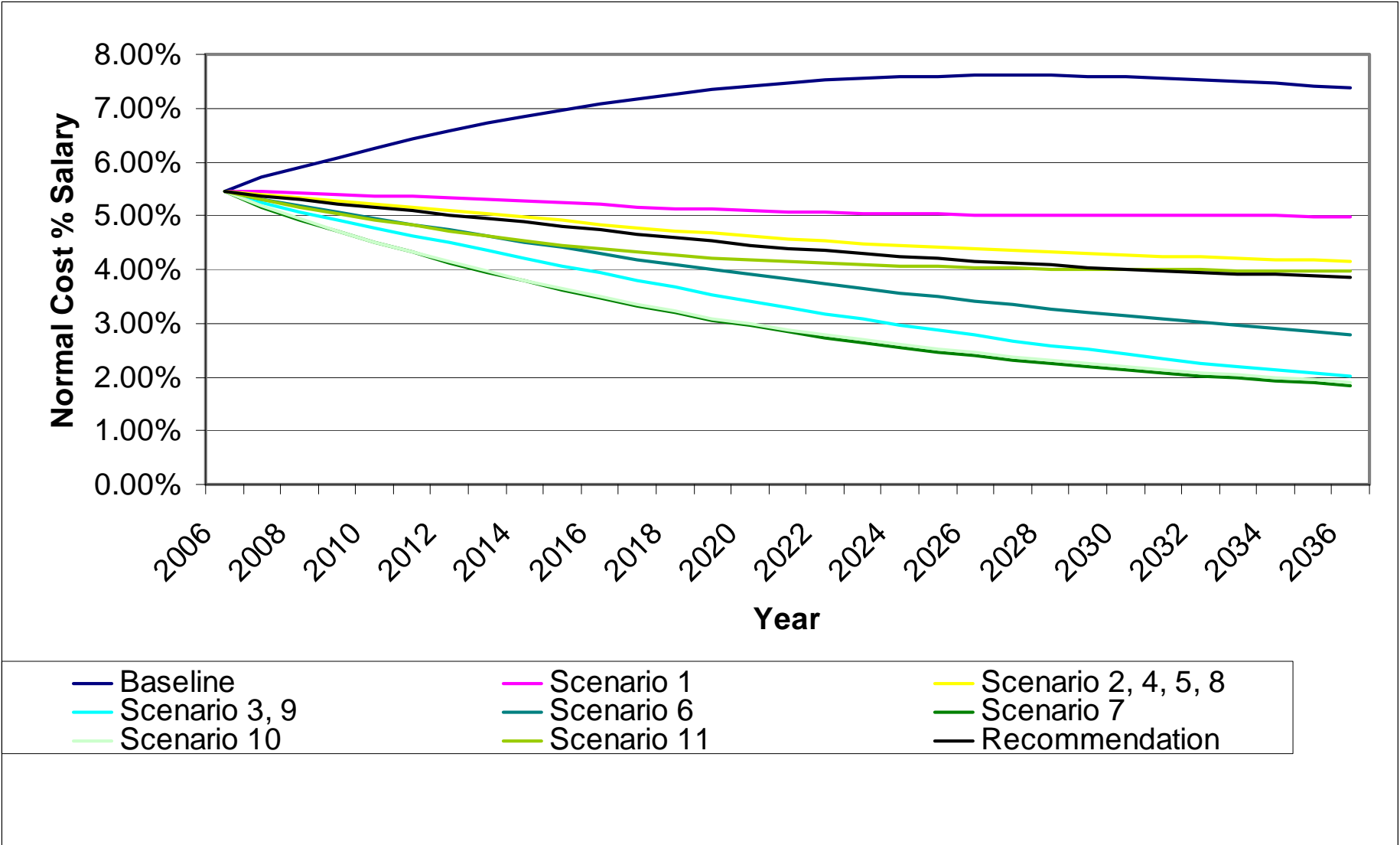
| Feature | Plan Scenario | | | | | | | | | | | |
|--|---------------|---|---|---|---|---|---|---|---|----|----|------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12** |
| Change Normal Retirement Date (NRD): Age 65 | | | X | | | | | | X | | | |
| Change Normal Retirement Date (NRD): 85 points or 65 | X | X | | X | X | | | X | | | X | |
| Change Normal Retirement Date (NRD): 90 points or 65 | | | | | | | | | | | | X |
| Change Normal Retirement Date (NRD): 62&20, or 65 | | | | | | X | X | | | X | | |
| Include Recapture at 20 years of Service | X | | X | X | X | X | X | X | X | X | X | X |
| Tier 1* | X | | | | | | | | | | | |
| Tier 2* | | | | X | | X | X | | | X | | |
| Tier 3* | | | | | X | | | | | | X | |
| Tier 4* | | | | | | | | X | X | | | |
| Tier 5* | | | | | | | | | | | | X |

* Proposed Employer Share %

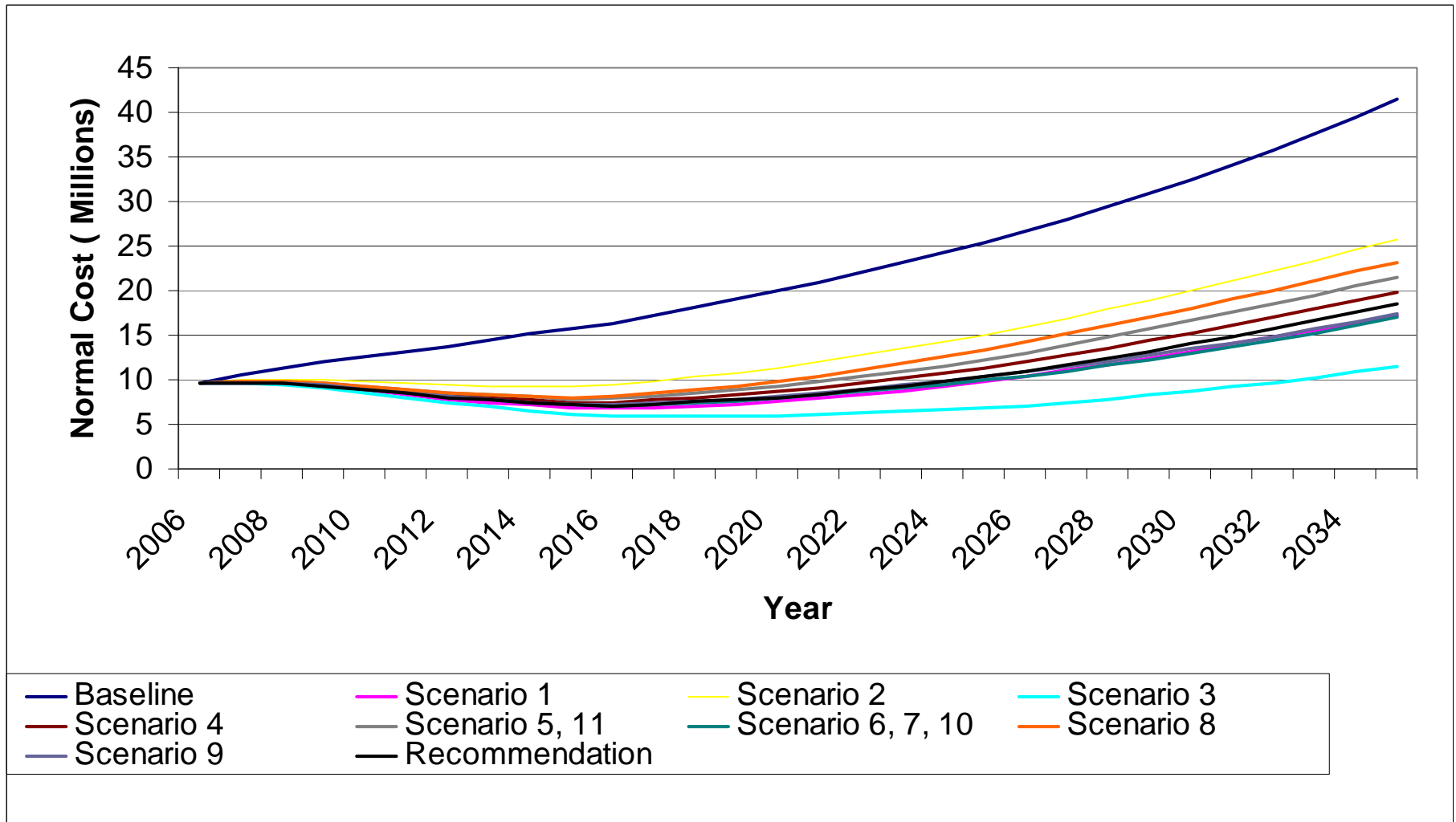
| Years of Service | Tier 1 | Tier 2 | Tier 3 | Tier 4 | Tier 5 |
|------------------|--------|--------|--------|--------|--------|
| 30+ | 80% | 80% | 80% | 80% | 80% |
| 25 - 29 | 60% | 70% | 80% | 80% | 80% |
| 20 - 24 | 40% | 45% | 50% | 80% | 50% |
| 15 - 19 | 20% | 35% | 40% | 50% | 40% |
| 10 - 14 | 20% | 35% | 40% | 30% | 30% |
| less than 10 | 0% | 20% | 30% | 0% | 0% |

** Recommended

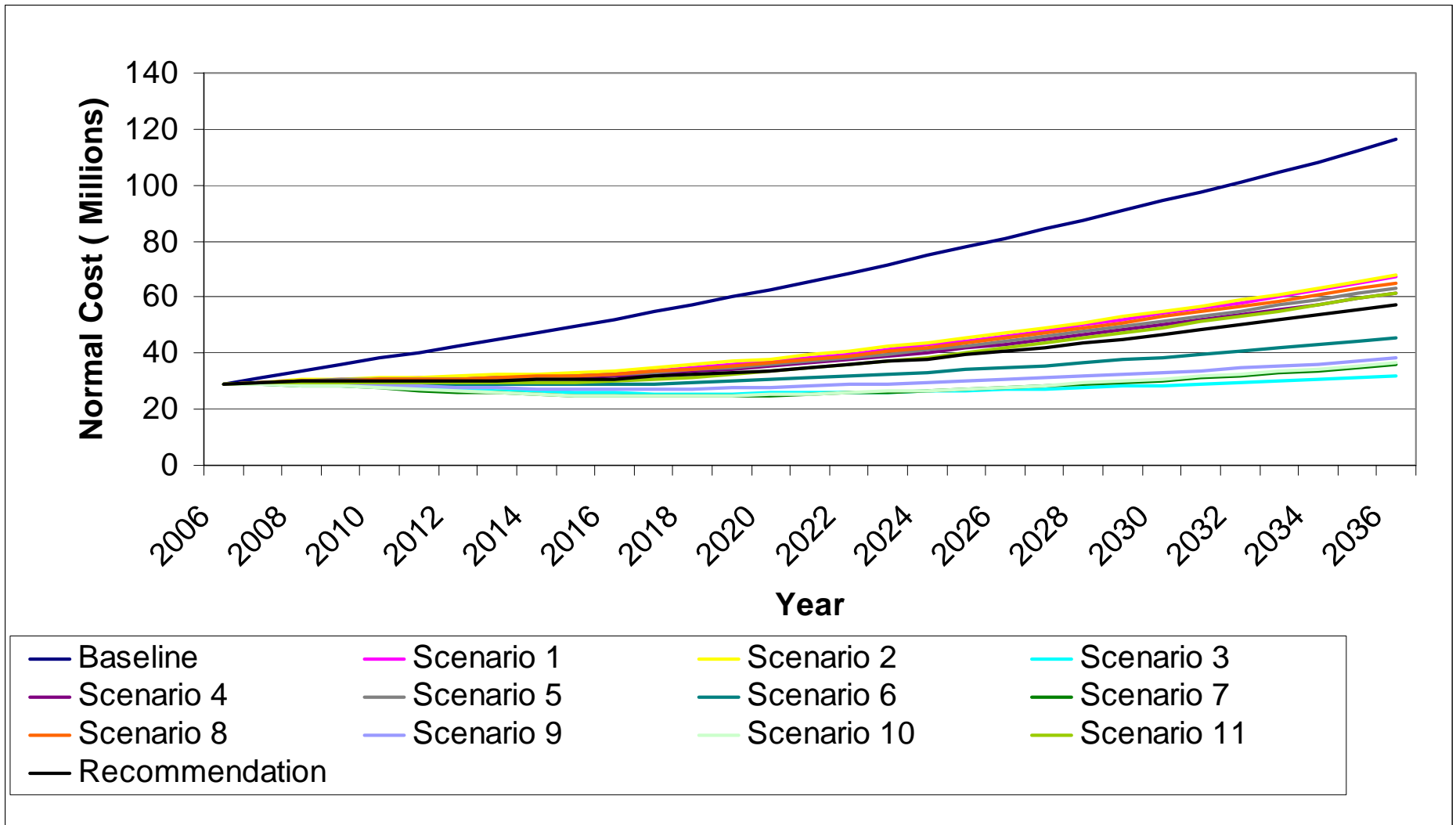
VSERS – Group F Pension



VSERS – Group F Post-retirement Medical



VSERS – Group F Pension plus Post-retirement Medical



VSERS – Group F Pension

| | | Baseline | | Scenario 1 | | | Scenario 2, 4, 5, 8 | | | Scenario 3, 9 | | |
|------|-------------|----------------------|-------------|-------------------------|-------------|--------------|----------------------|-------------|--------------|----------------------|-------------|--------------|
| | | | | 60 %Cap, ERF, NRD 85/65 | | | ERF, NRD 85/65 | | | ERF, NRD 65 | | |
| Year | Payroll | Employer Normal Cost | % of Salary | Employer Normal Cost | % of Salary | Change | Employer Normal Cost | % of Salary | Change | Employer Normal Cost | % of Salary | Change |
| 2007 | 367,582,515 | 20,987,200 | 5.71% | 20,014,010 | 5.44% | (973,190) | 19,814,424 | 5.39% | (1,172,776) | 19,298,362 | 5.25% | (1,688,838) |
| 2009 | 396,072,150 | 24,115,772 | 6.09% | 21,393,855 | 5.40% | (2,721,917) | 20,862,665 | 5.27% | (3,253,107) | 19,494,271 | 4.92% | (4,621,501) |
| 2011 | 425,230,840 | 27,285,863 | 6.42% | 22,760,310 | 5.35% | (4,525,553) | 21,900,322 | 5.15% | (5,385,541) | 19,689,632 | 4.63% | (7,596,231) |
| 2013 | 455,845,178 | 30,599,319 | 6.71% | 24,155,541 | 5.30% | (6,443,778) | 22,942,297 | 5.03% | (7,657,022) | 19,829,744 | 4.35% | (10,769,575) |
| 2015 | 489,094,943 | 34,087,579 | 6.97% | 25,609,496 | 5.24% | (8,478,083) | 24,002,113 | 4.91% | (10,085,466) | 19,894,760 | 4.07% | (14,192,819) |
| 2017 | 522,330,913 | 37,462,553 | 7.17% | 26,996,212 | 5.17% | (10,466,341) | 24,967,318 | 4.78% | (12,495,235) | 19,817,085 | 3.79% | (17,645,468) |
| 2019 | 560,360,426 | 41,142,081 | 7.34% | 28,665,138 | 5.12% | (12,476,943) | 26,150,472 | 4.67% | (14,991,609) | 19,812,213 | 3.54% | (21,329,868) |
| 2021 | 599,686,290 | 44,747,392 | 7.46% | 30,421,131 | 5.07% | (14,326,261) | 27,383,418 | 4.57% | (17,363,974) | 19,772,002 | 3.30% | (24,975,390) |
| 2023 | 643,454,020 | 48,568,083 | 7.55% | 32,457,882 | 5.04% | (16,110,201) | 28,834,105 | 4.48% | (19,733,978) | 19,785,826 | 3.07% | (28,782,257) |
| 2025 | 691,293,864 | 52,534,467 | 7.60% | 34,755,951 | 5.03% | (17,778,516) | 30,490,005 | 4.41% | (22,044,462) | 19,846,558 | 2.87% | (32,687,909) |
| 2027 | 738,685,396 | 56,214,421 | 7.61% | 37,047,251 | 5.02% | (19,167,170) | 32,118,669 | 4.35% | (24,095,752) | 19,803,286 | 2.68% | (36,411,135) |
| 2029 | 791,680,624 | 60,146,046 | 7.60% | 39,661,340 | 5.01% | (20,484,706) | 34,012,372 | 4.30% | (26,133,674) | 19,842,274 | 2.51% | (40,303,772) |
| 2031 | 841,837,588 | 63,557,293 | 7.55% | 42,106,719 | 5.00% | (21,450,574) | 35,748,809 | 4.25% | (27,808,484) | 19,715,146 | 2.34% | (43,842,147) |
| 2033 | 895,874,281 | 67,085,948 | 7.49% | 44,757,753 | 5.00% | (22,328,195) | 37,660,893 | 4.20% | (29,425,055) | 19,651,103 | 2.19% | (47,434,845) |
| 2035 | 953,904,921 | 70,782,661 | 7.42% | 47,607,172 | 4.99% | (23,175,489) | 39,753,052 | 4.17% | (31,029,609) | 19,692,761 | 2.06% | (51,089,900) |

VSERS – Group F Pension

| | | Baseline | | Scenario 6 | | | Scenario 7 | | | Scenario 10 | | |
|------|-------------|-------------------------|----------------|-------------------------|----------------|--------------|---------------------------|----------------|--------------|--------------------------|----------------|--------------|
| | | | | ERF, NRD 62/20 | | | ERF, NRD 62/20, PIA Level | | | ERF, NRD 62/20, PIA Zero | | |
| Year | Payroll | Employer Normal Cost | % of Salary | Employer Normal Cost | % of Salary | Change | Employer Normal Cost | % of Salary | Change | Employer Normal Cost | % of Salary | Change |
| 2007 | 367,582,515 | 20,987,200 | 5.71% | 19,496,272 | 5.30% | (1,490,928) | 19,002,170 | 5.17% | (1,985,030) | 19,006,199 | 5.17% | (1,981,001) |
| 2009 | 396,072,150 | 24,115,772 | 6.09% | 20,029,663 | 5.06% | (4,086,109) | 18,677,832 | 4.72% | (5,437,940) | 18,690,466 | 4.72% | (5,425,306) |
| 2011 | 425,230,840 | 27,285,863 | 6.42% | 20,565,387 | 4.84% | (6,720,476) | 18,359,340 | 4.32% | (8,926,523) | 18,383,984 | 4.32% | (8,901,879) |
| 2013 | 455,845,178 | 30,599,319 | 6.71% | 21,073,835 | 4.62% | (9,525,484) | 18,025,750 | 3.95% | (12,573,569) | 18,069,689 | 3.96% | (12,529,630) |
| 2015 | 489,094,943 | 34,087,579 | 6.97% | 21,547,333 | 4.41% | (12,540,246) | 17,721,001 | 3.62% | (16,366,578) | 17,795,509 | 3.64% | (16,292,070) |
| 2017 | 522,330,913 | 37,462,553 | 7.17% | 21,896,101 | 4.19% | (15,566,452) | 17,384,830 | 3.33% | (20,077,723) | 17,498,864 | 3.35% | (19,963,689) |
| 2019 | 560,360,426 | 41,142,081 | 7.34% | 22,372,378 | 3.99% | (18,769,703) | 17,178,013 | 3.07% | (23,964,068) | 17,340,395 | 3.09% | (23,801,686) |
| 2021 | 599,686,290 | 44,747,392 | 7.46% | 22,845,530 | 3.81% | (21,901,862) | 17,034,921 | 2.84% | (27,712,471) | 17,249,631 | 2.88% | (27,497,761) |
| 2023 | 643,454,020 | 48,568,083 | 7.55% | 23,430,354 | 3.64% | (25,137,729) | 17,007,589 | 2.64% | (31,560,494) | 17,277,025 | 2.69% | (31,291,058) |
| 2025 | 691,293,864 | 52,534,467 | 7.60% | 24,109,072 | 3.49% | (28,425,395) | 17,093,718 | 2.47% | (35,440,749) | 17,417,588 | 2.52% | (35,116,879) |
| 2027 | 738,685,396 | 56,214,421 | 7.61% | 24,688,249 | 3.34% | (31,526,172) | 17,176,529 | 2.33% | (39,037,892) | 17,551,213 | 2.38% | (38,663,208) |
| 2029 | 791,680,624 | 60,146,046 | 7.60% | 25,384,048 | 3.21% | (34,761,998) | 17,370,869 | 2.19% | (42,775,177) | 17,796,908 | 2.25% | (42,349,138) |
| 2031 | 841,837,588 | 63,557,293 | 7.55% | 25,876,393 | 3.07% | (37,680,900) | 17,496,942 | 2.08% | (46,060,351) | 17,971,145 | 2.13% | (45,586,148) |
| 2033 | 895,874,281 | 67,085,948 | 7.49% | 26,435,721 | 2.95% | (40,650,227) | 17,695,713 | 1.98% | (49,390,235) | 18,218,419 | 2.03% | (48,867,529) |
| 2035 | 953,904,921 | 70,782,661 | 7.42% | 27,099,710 | 2.84% | (43,682,951) | 17,988,130 | 1.89% | (52,794,531) | 18,559,306 | 1.95% | (52,223,355) |

VSERS – Group F Pension

| | | Baseline | | Scenario 11 | | | Recommendation | | |
|------|-------------|-------------------------|----------------|-------------------------|----------------|--------------|-------------------------|----------------|--------------|
| | | | | DC Plan, NRD 85/65 | | | 60 %Cap, ERF, NRD 90/65 | | |
| Year | Payroll | Employer Normal Cost | % of Salary | Employer Normal Cost | % of Salary | Change | Employer Normal Cost | % of Salary | Change |
| 2007 | 367,582,515 | 20,987,200 | 5.71% | 19,494,195 | 5.30% | (1,493,005) | 19,755,025 | 5.37% | (1,232,175) |
| 2009 | 396,072,150 | 24,115,772 | 6.09% | 19,986,234 | 5.05% | (4,129,538) | 20,700,091 | 5.23% | (3,415,681) |
| 2011 | 425,230,840 | 27,285,863 | 6.42% | 20,495,947 | 4.82% | (6,789,916) | 21,632,767 | 5.09% | (5,653,096) |
| 2013 | 455,845,178 | 30,599,319 | 6.71% | 21,058,755 | 4.62% | (9,540,564) | 22,560,898 | 4.95% | (8,038,421) |
| 2015 | 489,094,943 | 34,087,579 | 6.97% | 21,787,085 | 4.45% | (12,300,494) | 23,492,897 | 4.80% | (10,594,682) |
| 2017 | 522,330,913 | 37,462,553 | 7.17% | 22,573,255 | 4.32% | (14,889,298) | 24,318,698 | 4.66% | (13,143,855) |
| 2019 | 560,360,426 | 41,142,081 | 7.34% | 23,641,060 | 4.22% | (17,501,021) | 25,336,482 | 4.52% | (15,805,599) |
| 2021 | 599,686,290 | 44,747,392 | 7.46% | 24,843,919 | 4.14% | (19,903,473) | 26,382,310 | 4.40% | (18,365,082) |
| 2023 | 643,454,020 | 48,568,083 | 7.55% | 26,290,993 | 4.09% | (22,277,090) | 27,613,987 | 4.29% | (20,954,096) |
| 2025 | 691,293,864 | 52,534,467 | 7.60% | 27,970,268 | 4.05% | (24,564,199) | 29,021,633 | 4.20% | (23,512,834) |
| 2027 | 738,685,396 | 56,214,421 | 7.61% | 29,686,724 | 4.02% | (26,527,697) | 30,387,271 | 4.11% | (25,827,150) |
| 2029 | 791,680,624 | 60,146,046 | 7.60% | 31,667,449 | 4.00% | (28,478,597) | 32,000,859 | 4.04% | (28,145,187) |
| 2031 | 841,837,588 | 63,557,293 | 7.55% | 33,581,801 | 3.99% | (29,975,492) | 33,471,614 | 3.98% | (30,085,679) |
| 2033 | 895,874,281 | 67,085,948 | 7.49% | 35,682,565 | 3.98% | (31,403,383) | 35,131,850 | 3.92% | (31,954,098) |
| 2035 | 953,904,921 | 70,782,661 | 7.42% | 37,973,035 | 3.98% | (32,809,626) | 36,996,846 | 3.88% | (33,785,815) |

VSERS – Group F Post-retirement Medical

| Baseline | | Scenario 1 | | Scenario 2 | | Scenario 3 | | Scenario 4 | |
|----------|----------------------|--------------------------|--------------|----------------------|--------------|----------------------|--------------|--------------------------|--------------|
| | | NRD 85/65, Tier 1, Recap | | NRD 85/65 | | NRD 65, Recap | | NRD 85/65, Tier 2, Recap | |
| Year | Employer Normal Cost | Employer Normal Cost | Change | Employer Normal Cost | Change | Employer Normal Cost | Change | Employer Normal Cost | Change |
| 2007 | 10,534,613 | 9,689,239 | (845,374) | 9,953,872 | (580,741) | 9,631,470 | (903,143) | 9,758,897 | (775,716) |
| 2009 | 11,956,847 | 9,268,493 | (2,688,354) | 10,025,422 | (1,931,425) | 9,085,129 | (2,871,718) | 9,468,929 | (2,487,918) |
| 2011 | 13,077,409 | 8,298,550 | (4,778,859) | 9,583,120 | (3,494,289) | 7,956,225 | (5,121,184) | 8,640,486 | (4,436,923) |
| 2013 | 14,409,399 | 7,499,795 | (6,909,604) | 9,340,511 | (5,068,888) | 6,959,593 | (7,449,806) | 7,992,602 | (6,416,797) |
| 2015 | 15,740,099 | 6,854,800 | (8,885,299) | 9,246,770 | (6,493,329) | 6,073,292 | (9,666,807) | 7,499,975 | (8,240,124) |
| 2017 | 17,233,964 | 6,936,458 | (10,297,506) | 9,888,460 | (7,345,504) | 5,861,693 | (11,372,271) | 7,739,496 | (9,494,468) |
| 2019 | 18,982,191 | 7,297,172 | (11,685,019) | 10,815,596 | (8,166,595) | 5,869,337 | (13,112,854) | 8,263,418 | (10,718,773) |
| 2021 | 20,954,330 | 7,928,314 | (13,026,016) | 12,017,206 | (8,937,124) | 6,072,213 | (14,882,117) | 9,063,317 | (11,891,013) |
| 2023 | 23,104,404 | 8,786,285 | (14,318,119) | 13,447,797 | (9,656,607) | 6,416,750 | (16,687,654) | 10,098,196 | (13,006,208) |
| 2025 | 25,384,030 | 9,789,822 | (15,594,208) | 15,042,403 | (10,341,627) | 6,804,801 | (18,579,229) | 11,294,752 | (14,089,278) |
| 2027 | 27,976,256 | 11,039,272 | (16,936,984) | 16,889,664 | (11,086,592) | 7,408,521 | (20,567,735) | 12,749,360 | (15,226,896) |
| 2029 | 30,893,197 | 12,485,836 | (18,407,361) | 18,937,597 | (11,955,600) | 8,241,691 | (22,651,506) | 14,404,587 | (16,488,610) |
| 2031 | 34,069,149 | 13,991,147 | (20,078,002) | 21,084,688 | (12,984,461) | 9,176,305 | (24,892,844) | 16,120,852 | (17,948,297) |
| 2033 | 37,569,311 | 15,579,088 | (21,990,223) | 23,383,454 | (14,185,857) | 10,258,963 | (27,310,348) | 17,928,027 | (19,641,284) |
| 2035 | 41,399,979 | 17,173,952 | (24,226,027) | 25,782,501 | (15,617,478) | 11,471,330 | (29,928,649) | 19,763,229 | (21,636,750) |

VSERS – Group F Post-retirement Medical

| Baseline | | Scenario 5, 11 | | Scenario 6, 7, 10 | | Scenario 8 | | Scenario 9 | |
|----------|----------------------|--------------------------|--------------|--------------------------|--------------|--------------------------|--------------|-----------------------|--------------|
| | | NRD 85/65, Tier 3, Recap | | NRD 62/20, Tier 2, Recap | | NRD 85/65, Tier 4, Recap | | NRD 65, Tier 4, Recap | |
| Year | Employer Normal Cost | Employer Normal Cost | Change | Employer Normal Cost | Change | Employer Normal Cost | Change | Employer Normal Cost | Change |
| 2007 | 10,534,613 | 9,795,676 | (738,937) | 9,734,914 | (799,699) | 9,775,412 | (759,201) | 9,716,420 | (818,193) |
| 2009 | 11,956,847 | 9,575,291 | (2,381,556) | 9,391,911 | (2,564,936) | 9,543,685 | (2,413,162) | 9,357,035 | (2,599,812) |
| 2011 | 13,077,409 | 8,822,881 | (4,254,528) | 8,495,408 | (4,582,001) | 8,809,978 | (4,267,431) | 8,461,223 | (4,616,186) |
| 2013 | 14,409,399 | 8,257,887 | (6,151,512) | 7,761,778 | (6,647,621) | 8,301,037 | (6,108,362) | 7,751,117 | (6,658,282) |
| 2015 | 15,740,099 | 7,853,274 | (7,886,825) | 7,165,608 | (8,574,491) | 7,996,653 | (7,743,446) | 7,201,568 | (8,538,531) |
| 2017 | 17,233,964 | 8,189,646 | (9,044,318) | 7,277,327 | (9,956,637) | 8,469,673 | (8,764,291) | 7,377,606 | (9,856,358) |
| 2019 | 18,982,191 | 8,820,650 | (10,161,541) | 7,646,778 | (11,335,413) | 9,269,961 | (9,712,230) | 7,822,093 | (11,160,098) |
| 2021 | 20,954,330 | 9,739,424 | (11,214,906) | 8,261,116 | (12,693,214) | 10,383,341 | (10,570,989) | 8,503,968 | (12,450,362) |
| 2023 | 23,104,404 | 10,906,386 | (12,198,018) | 9,069,743 | (14,034,661) | 11,760,174 | (11,344,230) | 9,365,030 | (13,739,374) |
| 2025 | 25,384,030 | 12,250,984 | (13,133,046) | 9,967,441 | (15,416,589) | 13,318,969 | (12,065,061) | 10,303,975 | (15,080,055) |
| 2027 | 27,976,256 | 13,861,384 | (14,114,872) | 11,017,749 | (16,958,507) | 15,102,344 | (12,873,912) | 11,434,953 | (16,541,303) |
| 2029 | 30,893,197 | 15,669,371 | (15,223,826) | 12,299,151 | (18,594,046) | 17,037,582 | (13,855,615) | 12,752,723 | (18,140,474) |
| 2031 | 34,069,149 | 17,532,197 | (16,536,952) | 13,686,777 | (20,382,372) | 19,020,450 | (15,048,699) | 14,157,488 | (19,911,661) |
| 2033 | 37,569,311 | 19,484,218 | (18,085,093) | 15,256,254 | (22,313,057) | 21,102,983 | (16,466,328) | 15,717,355 | (21,851,956) |
| 2035 | 41,399,979 | 21,474,805 | (19,925,174) | 16,975,039 | (24,424,940) | 23,239,797 | (18,160,182) | 17,434,574 | (23,965,405) |

VSERS – Group F Post-retirement Medical

| Baseline | | Recommendation | |
|----------|----------------------|---------------------------------|--------------|
| | | NRD 90/65, Tier 5, Recap | |
| Year | Employer Normal Cost | Employer Normal Cost | Change |
| 2007 | 10,534,613 | 9,713,203 | (821,410) |
| 2009 | 11,956,847 | 9,343,530 | (2,613,317) |
| 2011 | 13,077,409 | 8,435,787 | (4,641,622) |
| 2013 | 14,409,399 | 7,711,821 | (6,697,578) |
| 2015 | 15,740,099 | 7,147,333 | (8,592,766) |
| 2017 | 17,233,964 | 7,307,593 | (9,926,371) |
| 2019 | 18,982,191 | 7,739,840 | (11,242,351) |
| 2021 | 20,954,330 | 8,425,653 | (12,528,677) |
| 2023 | 23,104,404 | 9,315,543 | (13,788,861) |
| 2025 | 25,384,030 | 10,330,791 | (15,053,239) |
| 2027 | 27,976,256 | 11,615,704 | (16,360,552) |
| 2029 | 30,893,197 | 13,175,358 | (17,717,839) |
| 2031 | 34,069,149 | 14,858,431 | (19,210,718) |
| 2033 | 37,569,311 | 16,673,260 | (20,896,051) |
| 2035 | 41,399,979 | 18,584,504 | (22,815,475) |

VSERS – Group F Pension plus Post-retirement Medical

| | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5 | Scenario 6 | Scenario 7 | Scenario 8 | Scenario 9 |
|------|-------------|---|-------------------|------------------------------|--|--|--|--|--|---|
| | | 60% Cap, ERF, NRD 85/65, Tier 1, Recap | ERF, NRD 85/65 | ERF, NRD 65, Recapture | ERF, NRD 85/65, Recapture, Tier 2 | ERF, NRD 85/65, Recapture, Tier 3 | ERF, NRD 62/20, Recapture, Tier 2 | ERF, NRD 62/20, Pia Level, Recapture, Tier 2 | ERF, NRD 85/65, Recapture, Tier 4 | ERF, NRD 65, Recapture, Tier 4 |
| 2007 | 31,521,813 | 29,703,249 | 29,768,296 | 28,929,832 | 29,573,321 | 29,610,100 | 29,231,186 | 28,737,084 | 29,589,836 | 29,014,782 |
| 2009 | 36,072,619 | 30,662,348 | 30,888,087 | 28,579,400 | 30,331,594 | 30,437,956 | 29,421,574 | 28,069,743 | 30,406,350 | 28,851,306 |
| 2011 | 40,363,272 | 31,058,860 | 31,483,442 | 27,645,857 | 30,540,808 | 30,723,203 | 29,060,795 | 26,854,748 | 30,710,300 | 28,150,855 |
| 2013 | 45,008,718 | 31,655,336 | 32,282,808 | 26,789,337 | 30,934,899 | 31,200,184 | 28,835,613 | 25,787,528 | 31,243,334 | 27,580,861 |
| 2015 | 49,827,678 | 32,464,296 | 33,248,883 | 25,968,052 | 31,502,088 | 31,855,387 | 28,712,941 | 24,886,609 | 31,998,766 | 27,096,328 |
| 2017 | 54,696,517 | 33,932,670 | 34,855,778 | 25,678,778 | 32,706,814 | 33,156,964 | 29,173,428 | 24,662,157 | 33,436,991 | 27,194,691 |
| 2019 | 60,124,272 | 35,962,310 | 36,966,068 | 25,681,550 | 34,413,890 | 34,971,122 | 30,019,156 | 24,824,791 | 35,420,433 | 27,634,306 |
| 2021 | 65,701,722 | 38,349,445 | 39,400,624 | 25,844,215 | 36,446,735 | 37,122,842 | 31,106,646 | 25,296,037 | 37,766,759 | 28,275,970 |
| 2023 | 71,672,487 | 41,244,167 | 42,281,902 | 26,202,576 | 38,932,301 | 39,740,491 | 32,500,097 | 26,077,332 | 40,594,279 | 29,150,856 |
| 2025 | 77,918,497 | 44,545,773 | 45,532,408 | 26,651,359 | 41,784,757 | 42,740,989 | 34,076,513 | 27,061,159 | 43,808,974 | 30,150,533 |
| 2027 | 84,190,677 | 48,086,523 | 49,008,333 | 27,211,807 | 44,868,029 | 45,980,053 | 35,705,998 | 28,194,278 | 47,221,013 | 31,238,239 |
| 2029 | 91,039,243 | 52,147,176 | 52,949,969 | 28,083,965 | 48,416,959 | 49,681,743 | 37,683,199 | 29,670,020 | 51,049,954 | 32,594,997 |
| 2031 | 97,626,442 | 56,097,866 | 56,833,497 | 28,891,451 | 51,869,661 | 53,281,006 | 39,563,170 | 31,183,719 | 54,769,259 | 33,872,634 |
| 2033 | 104,655,259 | 60,336,841 | 61,044,347 | 29,910,066 | 55,588,920 | 57,145,111 | 41,691,975 | 32,951,967 | 58,763,876 | 35,368,458 |
| 2035 | 112,182,640 | 64,781,124 | 65,535,553 | 31,164,091 | 59,516,281 | 61,227,857 | 44,074,749 | 34,963,169 | 62,992,849 | 37,127,335 |

VSERS – Group F Pension plus Post-retirement Medical

| | Baseline | Scenario 10 | Scenario 11 | Recommendation |
|------|-------------|---|--|--|
| | | ERF, NRD 62/20, Pia Zero, Recapture, Tier 2 | DC Plan, NRD 85/65, Recapture, Tier 3 | 60% Cap, ERF, NRD 90/65, Tier 5, Recap |
| 2007 | 31,521,813 | 28,741,113 | 29,289,871 | 29,468,228 |
| 2009 | 36,072,619 | 28,082,377 | 29,561,525 | 30,043,621 |
| 2011 | 40,363,272 | 26,879,392 | 29,318,828 | 30,068,554 |
| 2013 | 45,008,718 | 25,831,467 | 29,316,642 | 30,272,719 |
| 2015 | 49,827,678 | 24,961,117 | 29,640,359 | 30,640,230 |
| 2017 | 54,696,517 | 24,776,191 | 30,762,901 | 31,626,291 |
| 2019 | 60,124,272 | 24,987,173 | 32,461,710 | 33,076,322 |
| 2021 | 65,701,722 | 25,510,747 | 34,583,343 | 34,807,963 |
| 2023 | 71,672,487 | 26,346,768 | 37,197,379 | 36,929,530 |
| 2025 | 77,918,497 | 27,385,029 | 40,221,252 | 39,352,424 |
| 2027 | 84,190,677 | 28,568,962 | 43,548,108 | 42,002,975 |
| 2029 | 91,039,243 | 30,096,059 | 47,336,820 | 45,176,217 |
| 2031 | 97,626,442 | 31,657,922 | 51,113,998 | 48,330,045 |
| 2033 | 104,655,259 | 33,474,673 | 55,166,783 | 51,805,110 |
| 2035 | 112,182,640 | 35,534,345 | 59,447,840 | 55,581,350 |

VSERS – Group F Relative Cost of Features

Pension

| From | To | Relative Cost % of Payroll |
|----------------------|---|-------------------------------|
| 50% Cap | 60% Cap | 0.84% |
| NRD 85 Points or 65 | NRD 65 | -2.14% |
| NRD 85 Points or 65 | NRD 62 & 20, or 65 | -1.36% |
| NRD 62 & 20, or 65 | NRD 65 | -0.78% |
| Current Plan Formula | SS Offset formula with level post retirement salary | -0.95% |
| Current Plan Formula | SS Offset formula with zero post retirement salary | -0.89% |
| Current Plan Formula | 4% Employer Cost DC Plan | -3.40% |

Post Retirement Medical

| From | To | Relative Cost % of Payroll |
|--------------|---|-------------------------------|
| No Recapture | Recapture at 20 years (Based on Tier 3) | 0.13% |
| Tier 1 | Tier 2 | 0.28% |
| Tier 1 | Tier 3 | 0.46% |
| Tier 1 | Tier 4 | 0.65% |
| Tier 2 | Tier 3 | 0.18% |
| Tier 2 | Tier 4 | 0.37% |
| Tier 3 | Tier 4 | 0.19% |

VSERS – Group F Payroll Forecast & DC Cost

| Year | Payroll Current Employees | Payroll New Employees | Payroll Total | 1 % of Payroll New Employees | 4% of Payroll New Employees | 5% of Payroll New Employees |
|------|------------------------------|--------------------------|------------------|---------------------------------|--------------------------------|--------------------------------|
| 2007 | 340,794,377 | 26,788,138 | 367,582,515 | 267,881 | 1,071,526 | 1,339,407 |
| 2009 | 323,609,454 | 72,462,695 | 396,072,149 | 724,627 | 2,898,508 | 3,623,135 |
| 2011 | 306,794,799 | 118,436,041 | 425,230,840 | 1,184,360 | 4,737,442 | 5,921,802 |
| 2013 | 288,692,791 | 167,152,387 | 455,845,178 | 1,671,524 | 6,686,095 | 8,357,619 |
| 2015 | 270,160,260 | 218,934,683 | 489,094,943 | 2,189,347 | 8,757,387 | 10,946,734 |
| 2017 | 250,835,107 | 271,495,806 | 522,330,913 | 2,714,958 | 10,859,832 | 13,574,790 |
| 2019 | 231,062,423 | 329,298,003 | 560,360,426 | 3,292,980 | 13,171,920 | 16,464,900 |
| 2021 | 211,066,915 | 388,619,376 | 599,686,291 | 3,886,194 | 15,544,775 | 19,430,969 |
| 2023 | 190,473,267 | 452,980,753 | 643,454,020 | 4,529,808 | 18,119,230 | 22,649,038 |
| 2025 | 169,687,344 | 521,606,520 | 691,293,864 | 5,216,065 | 20,864,261 | 26,080,326 |
| 2027 | 148,530,387 | 590,155,009 | 738,685,396 | 5,901,550 | 23,606,200 | 29,507,750 |
| 2029 | 127,584,082 | 664,096,543 | 791,680,625 | 6,640,965 | 26,563,862 | 33,204,827 |
| 2031 | 106,960,108 | 734,877,479 | 841,837,587 | 7,348,775 | 29,395,099 | 36,743,874 |
| 2033 | 87,107,639 | 808,766,641 | 895,874,280 | 8,087,666 | 32,350,666 | 40,438,332 |
| 2035 | 68,699,551 | 885,205,370 | 953,904,921 | 8,852,054 | 35,408,215 | 44,260,269 |

Appendix B

VSEERS C

In the pages that follow, we show the program scenarios examined and the financial forecasts. We believe the state should also consider these alternatives.

VSERS Group C - Pension

| Feature | Plan Scenario | | | | | | | | |
|--|---------------|---|---|---|---|---|---|---|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9** |
| Formula change: Increase cap to 65% | X | | | X | | | | | X |
| Add Early Retirement Reduction Factor (ERF) * | X | X | | | X | X | X | X | X |
| Formula change: Average annual compensation based on 3 year average | X | X | X | X | X | X | X | X | X |
| Change Normal Retirement Date (NRD): Age 65 | | | X | X | | | | | |
| Change Normal Retirement Date (NRD): Age 60 | X | X | | | X | X | X | X | |
| Normal Retirement Date (NRD): Age 55, early retirement reduction from 55-50 | | | | | | | | | X |
| Eliminate the subsidy for the 70% Joint and Survivor Option | X | X | X | X | | X | X | X | X |
| Formula change: Add accrual of 1% of final average salary for years of service in excess of 20 | X | | | X | | | | | X |

* Proposed early retirement factors

Years of Service Retirement

35+

30-35

25-30

20-25

less than 20

Monthly % Reduction from NRD

1/8 of 1%

1/4 of 1%

1/3 of 1%

5/12 of 1%

5/9 of 1%

** Recommendation

VSERS Group C - Post Retirement Medical

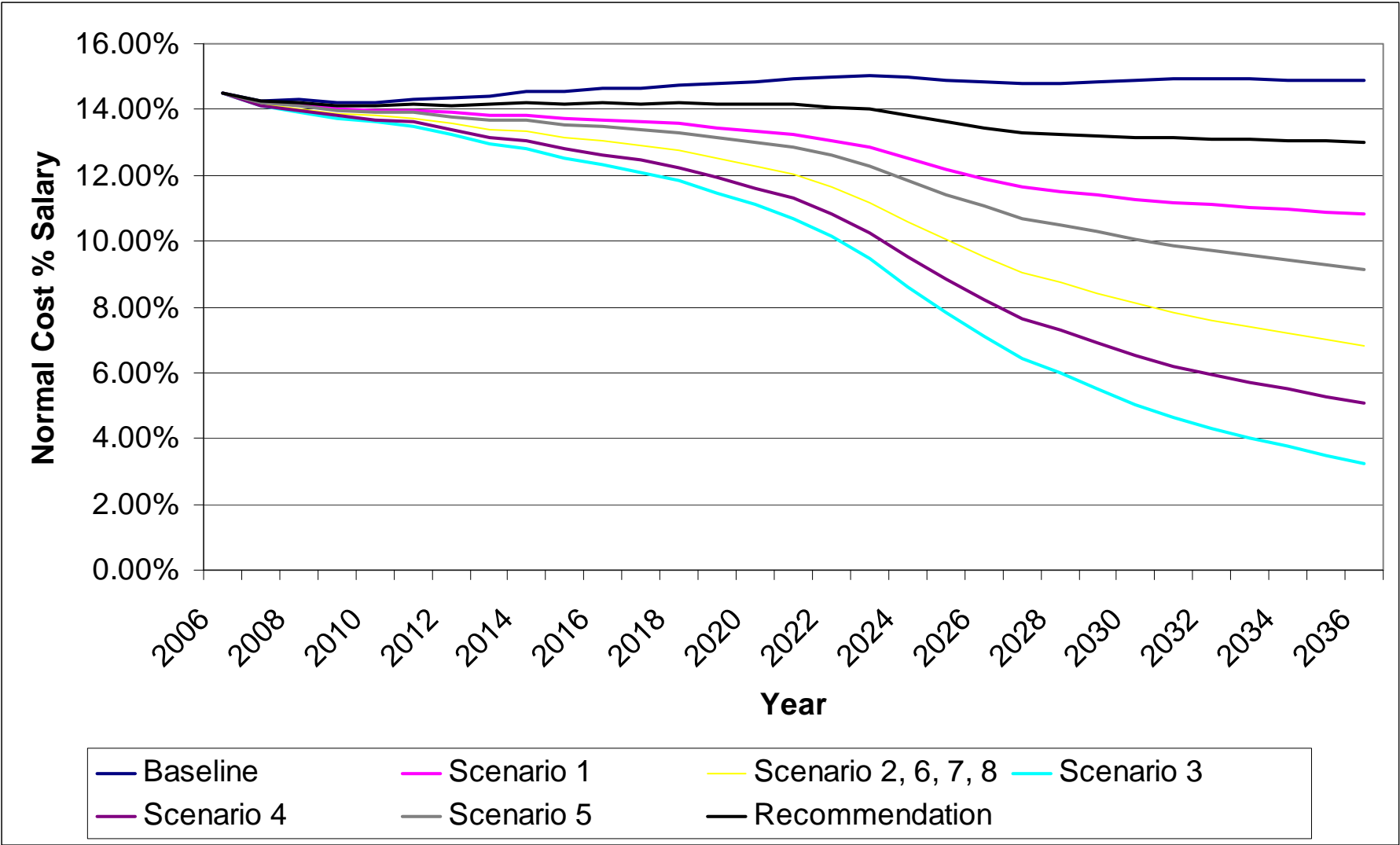
| Feature | Plan Scenario | | | | | | | | |
|---|---------------|---|---|---|---|---|---|---|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9** |
| Change Normal Retirement Date (NRD): Age 65 | | | X | X | | | | | |
| Change Normal Retirement Date (NRD): Age 60 | X | X | | | X | X | X | X | |
| Normal Retirement Date (NRD): Age 55 | | | | | | | | | X |
| Include Recapture at 20 years of Service | X | | X | X | X | X | X | X | X |
| Tier 1* | X | | X | X | | | | | |
| Tier 2* | | | | | X | | X | | |
| Tier 3* | | | | | | X | | | |
| Tier 4* | | | | | | | | X | |
| Tier 5* | | | | | | | | | X |

* Proposed Employer Share %

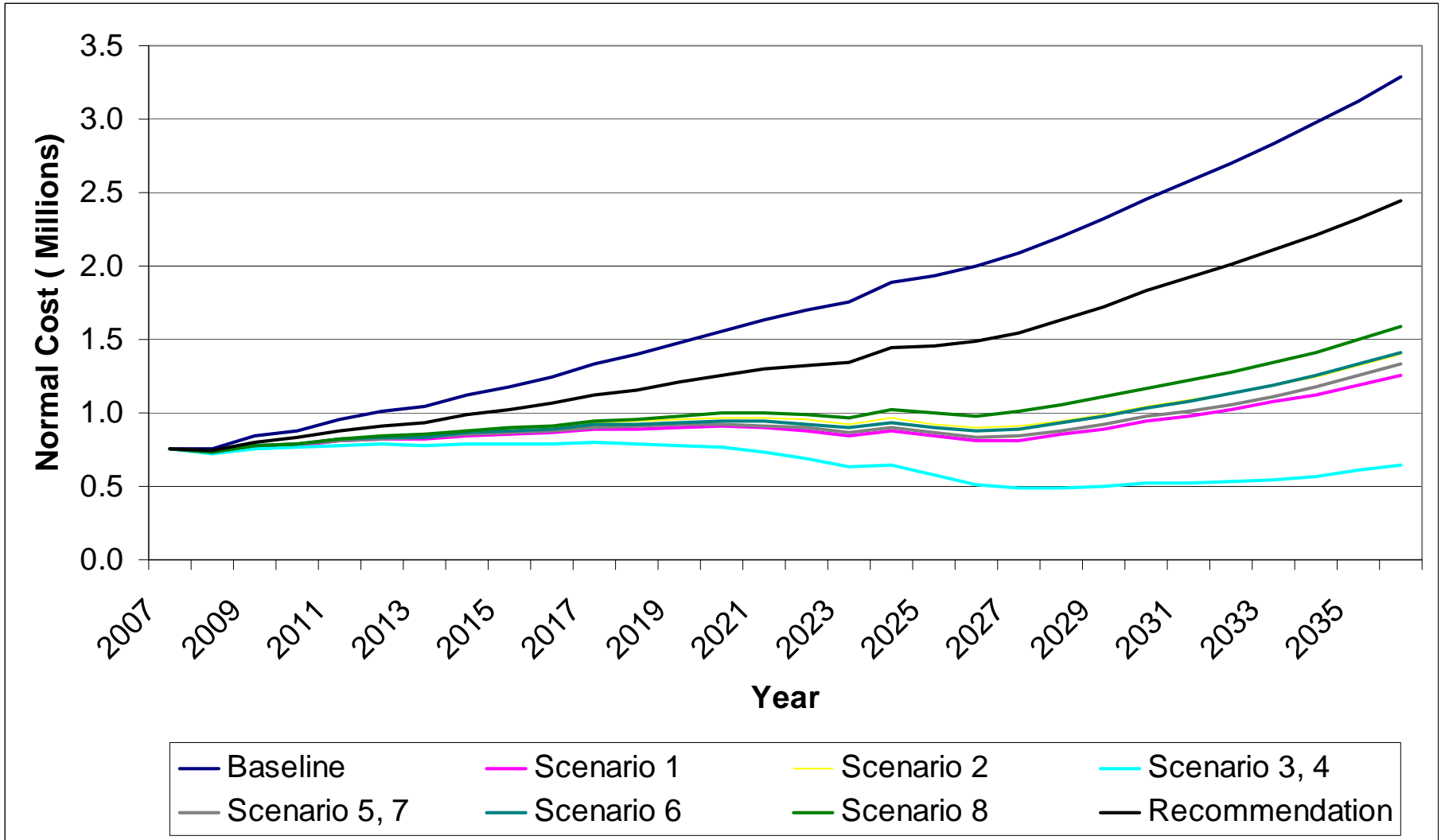
| Years of Service | Tier 1 | Tier 2 | Tier 3 | Tier 4 | Tier 5 |
|------------------|--------|--------|--------|--------|--------|
| 30+ | 80% | 80% | 80% | 80% | 80% |
| 25 - 29 | 60% | 70% | 80% | 80% | 80% |
| 20 - 24 | 40% | 45% | 50% | 80% | 50% |
| 15 - 19 | 20% | 35% | 40% | 50% | 40% |
| 10 - 14 | 20% | 35% | 40% | 30% | 30% |
| less than 10 | 0% | 20% | 30% | 0% | 0% |

** Recommendation

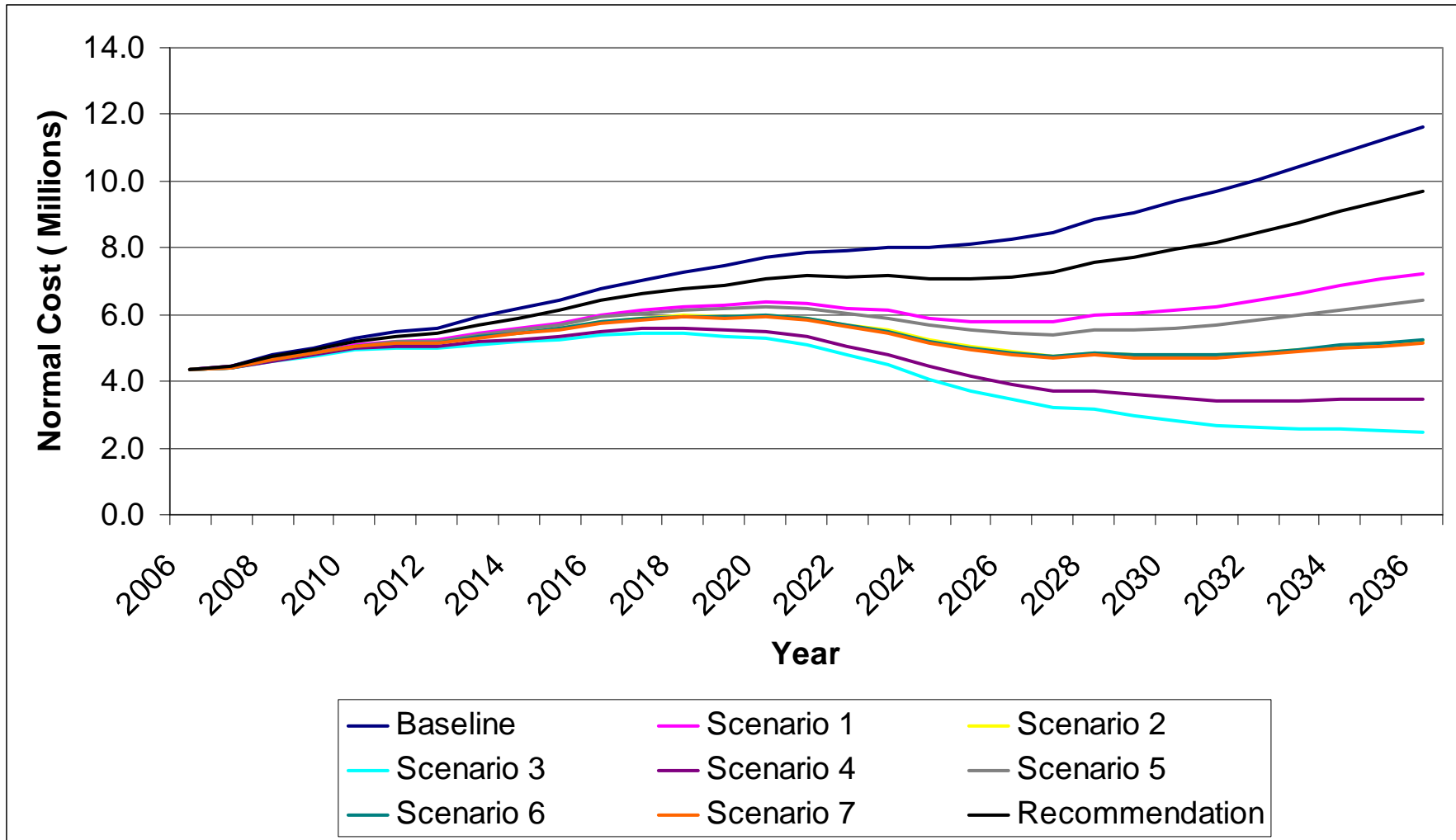
VSERS – Group C Pension



VSERS – Group C Postretirement Medical



VSERS – Group C Pension plus Postretirement Medical



VSERS – Group C Pension

| | | Baseline | | Scenario 1 | | | Scenario 2, 6, 7, 8 | | | Scenario 3 | | |
|------|------------|----------------------|-------------|--|-------------|-------------|---|-------------|-------------|--------------------------------------|-------------|-------------|
| | | | | 65% Cap, ERF, 3 Yr Avg, NRD 60, Remove J&S Subsidy, Add 1% accrual over 20 | | | ERF, 3 Yr Avg, NRD 60, Remove J&S Subsidy | | | 3 Yr Avg, NRD 65, Remove J&S Subsidy | | |
| Year | Payroll | Employer Normal Cost | % of Salary | Employer Normal Cost | % of Salary | Change | Employer Normal Cost | % of Salary | Change | Employer Normal Cost | % of Salary | Change |
| 2007 | 26,021,596 | 3,715,048 | 14.28% | 3,698,935 | 14.21% | (16,113) | 3,684,224 | 14.16% | (30,824) | 3,670,743 | 14.11% | (44,305) |
| 2009 | 29,108,081 | 4,135,594 | 14.21% | 4,081,630 | 14.02% | (53,964) | 4,039,998 | 13.88% | (95,596) | 3,997,854 | 13.73% | (137,740) |
| 2011 | 31,282,275 | 4,471,247 | 14.29% | 4,372,883 | 13.98% | (98,364) | 4,301,081 | 13.75% | (170,166) | 4,225,848 | 13.51% | (245,399) |
| 2013 | 33,286,015 | 4,800,500 | 14.42% | 4,604,628 | 13.83% | (195,872) | 4,463,160 | 13.41% | (337,340) | 4,313,245 | 12.96% | (487,255) |
| 2015 | 35,628,280 | 5,188,974 | 14.56% | 4,893,581 | 13.74% | (295,393) | 4,685,482 | 13.15% | (503,492) | 4,460,833 | 12.52% | (728,141) |
| 2017 | 38,426,175 | 5,634,390 | 14.66% | 5,233,343 | 13.62% | (401,047) | 4,952,470 | 12.89% | (681,920) | 4,646,048 | 12.09% | (988,342) |
| 2019 | 39,830,412 | 5,890,194 | 14.79% | 5,358,025 | 13.45% | (532,169) | 4,981,080 | 12.51% | (909,114) | 4,571,373 | 11.48% | (1,318,821) |
| 2021 | 41,280,165 | 6,163,619 | 14.93% | 5,466,635 | 13.24% | (696,984) | 4,960,140 | 12.02% | (1,203,479) | 4,415,578 | 10.70% | (1,748,041) |
| 2023 | 40,774,779 | 6,128,800 | 15.03% | 5,236,159 | 12.84% | (892,641) | 4,562,409 | 11.19% | (1,566,391) | 3,853,535 | 9.45% | (2,275,265) |
| 2025 | 41,100,830 | 6,128,638 | 14.91% | 5,003,117 | 12.17% | (1,125,521) | 4,123,520 | 10.03% | (2,005,118) | 3,216,524 | 7.83% | (2,912,114) |
| 2027 | 42,251,287 | 6,258,910 | 14.81% | 4,915,388 | 11.63% | (1,343,522) | 3,814,637 | 9.03% | (2,444,273) | 2,710,255 | 6.41% | (3,548,655) |
| 2029 | 44,470,835 | 6,609,226 | 14.86% | 5,066,631 | 11.39% | (1,542,595) | 3,742,354 | 8.42% | (2,866,872) | 2,447,315 | 5.50% | (4,161,911) |
| 2031 | 46,787,608 | 6,981,537 | 14.92% | 5,222,299 | 11.16% | (1,759,238) | 3,660,816 | 7.82% | (3,320,721) | 2,165,993 | 4.63% | (4,815,544) |
| 2033 | 50,011,461 | 7,470,378 | 14.94% | 5,522,575 | 11.04% | (1,947,803) | 3,702,353 | 7.40% | (3,768,025) | 2,015,543 | 4.03% | (5,454,835) |
| 2035 | 53,251,312 | 7,928,415 | 14.89% | 5,803,472 | 10.90% | (2,124,943) | 3,727,593 | 7.00% | (4,200,822) | 1,862,276 | 3.50% | (6,066,139) |

VSERS – Group C Pension

| | | Baseline | | Scenario 4 | | | Scenario 5 | | | Recommendation | | |
|------|------------|----------------------------|----------------|---|----------------|-------------|----------------------------|----------------|-------------|--|----------------|-----------|
| | | | | 65% Cap, 3 Yr Avg, NRD 65, Remove J&S Subsidy, Add 1% accrual over 20 | | | ERF, 3 Yr Avg, NRD 60 | | | 65% Cap, ERF, 3 Yr Avg, NRD 55, Remove J&S Subsidy, Add 1% accrual over 20 | | |
| Year | Payroll | Employer Normal Cost | % of Salary | Employer Normal Cost | % of Salary | Change | Employer Normal Cost | % of Salary | Change | Employer Normal Cost | % of Salary | Change |
| 2007 | 26,021,596 | 3,715,048 | 14.28% | 3,677,195 | 14.13% | (37,853) | 3,692,759 | 14.19% | (22,289) | 3,707,376 | 14.25% | (7,672) |
| 2009 | 29,108,081 | 4,135,594 | 14.21% | 4,017,332 | 13.80% | (118,262) | 4,066,537 | 13.97% | (69,057) | 4,110,420 | 14.12% | (25,174) |
| 2011 | 31,282,275 | 4,471,247 | 14.29% | 4,260,211 | 13.62% | (211,036) | 4,348,382 | 13.90% | (122,865) | 4,425,663 | 14.15% | (45,584) |
| 2013 | 33,286,015 | 4,800,500 | 14.42% | 4,381,481 | 13.16% | (419,019) | 4,557,320 | 13.69% | (243,180) | 4,709,663 | 14.15% | (90,837) |
| 2015 | 35,628,280 | 5,188,974 | 14.56% | 4,562,452 | 12.81% | (626,522) | 4,826,461 | 13.55% | (362,513) | 5,052,275 | 14.18% | (136,699) |
| 2017 | 38,426,175 | 5,634,390 | 14.66% | 4,784,232 | 12.45% | (850,158) | 5,144,565 | 13.39% | (489,825) | 5,448,541 | 14.18% | (185,849) |
| 2019 | 39,830,412 | 5,890,194 | 14.79% | 4,756,486 | 11.94% | (1,133,708) | 5,238,194 | 13.15% | (652,000) | 5,642,436 | 14.17% | (247,758) |
| 2021 | 41,280,165 | 6,163,619 | 14.93% | 4,662,695 | 11.30% | (1,500,924) | 5,302,116 | 12.84% | (861,503) | 5,837,137 | 14.14% | (326,482) |
| 2023 | 40,774,779 | 6,128,800 | 15.03% | 4,178,164 | 10.25% | (1,950,636) | 5,008,730 | 12.28% | (1,120,070) | 5,707,612 | 14.00% | (421,188) |
| 2025 | 41,100,830 | 6,128,638 | 14.91% | 3,636,094 | 8.85% | (2,492,544) | 4,696,842 | 11.43% | (1,431,796) | 5,594,643 | 13.61% | (533,995) |
| 2027 | 42,251,287 | 6,258,910 | 14.81% | 3,228,710 | 7.64% | (3,030,200) | 4,516,351 | 10.69% | (1,742,559) | 5,618,255 | 13.30% | (640,655) |
| 2029 | 44,470,835 | 6,609,226 | 14.86% | 3,065,878 | 6.89% | (3,543,348) | 4,570,085 | 10.28% | (2,039,141) | 5,873,822 | 13.21% | (735,404) |
| 2031 | 46,787,608 | 6,981,537 | 14.92% | 2,893,903 | 6.19% | (4,087,634) | 4,622,382 | 9.88% | (2,359,155) | 6,147,843 | 13.14% | (833,694) |
| 2033 | 50,011,461 | 7,470,378 | 14.94% | 2,856,123 | 5.71% | (4,614,255) | 4,795,251 | 9.59% | (2,675,127) | 6,552,689 | 13.10% | (917,689) |
| 2035 | 53,251,312 | 7,928,415 | 14.89% | 2,815,040 | 5.29% | (5,113,375) | 4,946,171 | 9.29% | (2,982,244) | 6,939,255 | 13.03% | (989,160) |

VSERS – Group C Postretirement Medical

| Baseline | | Scenario 1 | | Scenario 2 | | Scenario 3, 4 | | Scenario 5, 7 | |
|----------|----------------------|-----------------------|-------------|----------------------|-------------|-----------------------|-------------|-----------------------|-------------|
| | | NRD 60, Recap, Tier 1 | | NRD 60 | | NRD 65, Recap, Tier 1 | | NRD 60, Recap, Tier 2 | |
| Year | Employer Normal Cost | Employer Normal Cost | Change | Employer Normal Cost | Change | Employer Normal Cost | Change | Employer Normal Cost | Change |
| 2007 | 760,006 | 728,770 | (31,236) | 732,351 | (27,655) | 722,907 | (37,099) | 729,439 | (30,567) |
| 2009 | 882,481 | 781,516 | (100,965) | 790,698 | (91,783) | 762,089 | (120,392) | 783,817 | (98,664) |
| 2011 | 1,008,225 | 823,337 | (184,888) | 839,636 | (168,589) | 787,666 | (220,559) | 827,599 | (180,626) |
| 2013 | 1,119,061 | 847,117 | (271,944) | 872,357 | (246,704) | 791,901 | (327,160) | 853,736 | (265,325) |
| 2015 | 1,247,688 | 863,903 | (383,785) | 900,696 | (346,992) | 783,717 | (463,971) | 873,520 | (374,168) |
| 2017 | 1,398,050 | 894,304 | (503,746) | 942,437 | (455,613) | 784,986 | (613,064) | 906,799 | (491,251) |
| 2019 | 1,559,390 | 907,855 | (651,535) | 968,002 | (591,388) | 762,079 | (797,311) | 923,390 | (636,000) |
| 2021 | 1,695,037 | 878,887 | (816,150) | 950,301 | (744,736) | 690,332 | (1,004,705) | 897,071 | (797,966) |
| 2023 | 1,884,801 | 878,520 | (1,006,281) | 962,098 | (922,703) | 639,955 | (1,244,846) | 901,679 | (983,122) |
| 2025 | 1,998,311 | 808,477 | (1,189,834) | 899,995 | (1,098,316) | 513,870 | (1,484,441) | 834,398 | (1,163,913) |
| 2027 | 2,202,359 | 850,667 | (1,351,692) | 949,778 | (1,252,581) | 492,658 | (1,709,701) | 879,269 | (1,323,090) |
| 2029 | 2,460,347 | 945,607 | (1,514,740) | 1,046,483 | (1,413,864) | 522,128 | (1,938,219) | 975,642 | (1,484,705) |
| 2031 | 2,702,679 | 1,025,138 | (1,677,541) | 1,129,290 | (1,573,389) | 529,040 | (2,173,639) | 1,057,282 | (1,645,397) |
| 2033 | 2,975,951 | 1,126,208 | (1,849,743) | 1,249,220 | (1,726,731) | 570,443 | (2,405,508) | 1,176,043 | (1,799,908) |
| 2035 | 3,286,318 | 1,254,128 | (2,032,190) | 1,403,790 | (1,882,528) | 649,589 | (2,636,729) | 1,328,782 | (1,957,536) |

VSERS – Group C Postretirement Medical

| Baseline | | Scenario 6 | | Scenario 8 | | Recommendation | |
|----------|----------------------|-----------------------|-------------|-----------------------|-------------|-----------------------|-----------|
| | | NRD 60, Recap, Tier 3 | | NRD 60, Recap, Tier 4 | | NRD 55, Recap, Tier 5 | |
| Year | Employer Normal Cost | Employer Normal Cost | Change | Employer Normal Cost | Change | Employer Normal Cost | Change |
| 2007 | 760,006 | 730,354 | (29,652) | 732,246 | (27,760) | 743,146 | (16,860) |
| 2009 | 882,481 | 786,893 | (95,588) | 793,217 | (89,264) | 829,326 | (53,155) |
| 2011 | 1,008,225 | 833,257 | (174,968) | 844,893 | (163,332) | 911,192 | (97,033) |
| 2013 | 1,119,061 | 862,504 | (256,557) | 880,530 | (238,531) | 983,531 | (135,530) |
| 2015 | 1,247,688 | 886,252 | (361,436) | 912,394 | (335,294) | 1,061,127 | (186,561) |
| 2017 | 1,398,050 | 924,051 | (473,999) | 960,257 | (437,793) | 1,159,274 | (238,776) |
| 2019 | 1,559,390 | 946,161 | (613,229) | 995,557 | (563,833) | 1,258,292 | (301,098) |
| 2021 | 1,695,037 | 926,165 | (768,872) | 990,803 | (704,234) | 1,326,590 | (368,447) |
| 2023 | 1,884,801 | 938,257 | (946,544) | 1,021,018 | (863,783) | 1,440,948 | (443,853) |
| 2025 | 1,998,311 | 879,150 | (1,119,161) | 981,983 | (1,016,328) | 1,486,139 | (512,172) |
| 2027 | 2,202,359 | 932,855 | (1,269,504) | 1,053,551 | (1,148,808) | 1,630,606 | (571,753) |
| 2029 | 2,460,347 | 1,037,637 | (1,422,710) | 1,170,438 | (1,289,909) | 1,832,135 | (628,212) |
| 2031 | 2,702,679 | 1,127,819 | (1,574,860) | 1,272,317 | (1,430,362) | 2,015,973 | (686,706) |
| 2033 | 2,975,951 | 1,253,965 | (1,721,986) | 1,411,667 | (1,564,284) | 2,215,007 | (760,944) |
| 2035 | 3,286,318 | 1,413,079 | (1,873,239) | 1,583,800 | (1,702,518) | 2,445,607 | (840,711) |

VSERS – Group C Pension plus Postretirement Medical

| | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5 | Scenario 6 | Scenario 7 | Scenario 8 |
|------|------------|--|--|--|---|---|---|---|---|
| | | 65% Cap, ERF, 3 Yr Avg, NRD 60, Remove J&S Subsidy, Add 1% accrual over 20, Recap, Tier 1 | ERF, 3 Yr Avg, NRD 60, Remove J&S Subsidy | 3 Yr Avg, NRD 65, Remove J&S Subsidy, Recap, Tier 1 | 65% Cap, 3 Yr Avg, NRD 65, Remove J&S Subsidy, Add 1% accrual over 20, Recap, Tier 1 | ERF, 3 Yr Avg, NRD 60, Recap, Tier 2 | ERF, 3 Yr Avg, NRD 60, Remove J&S Subsidy, Recap, Tier 3 | ERF, 3 Yr Avg, NRD 60, Remove J&S Subsidy, Recap, Tier 2 | ERF, 3 Yr Avg, NRD 60, Remove J&S Subsidy, Recap, Tier 4 |
| 2007 | 4,475,054 | 4,427,705 | 4,416,575 | 4,393,650 | 4,400,102 | 4,422,198 | 4,414,578 | 4,413,663 | 4,416,470 |
| 2009 | 5,018,075 | 4,863,146 | 4,830,696 | 4,759,943 | 4,779,421 | 4,850,354 | 4,826,891 | 4,823,815 | 4,833,215 |
| 2011 | 5,479,472 | 5,196,220 | 5,140,717 | 5,013,514 | 5,047,877 | 5,175,981 | 5,134,338 | 5,128,680 | 5,145,974 |
| 2013 | 5,919,561 | 5,451,745 | 5,335,517 | 5,105,146 | 5,173,382 | 5,411,056 | 5,325,664 | 5,316,896 | 5,343,690 |
| 2015 | 6,436,662 | 5,757,484 | 5,586,178 | 5,244,550 | 5,346,169 | 5,699,981 | 5,571,734 | 5,559,002 | 5,597,876 |
| 2017 | 7,032,440 | 6,127,647 | 5,894,907 | 5,431,034 | 5,569,218 | 6,051,364 | 5,876,521 | 5,859,269 | 5,912,727 |
| 2019 | 7,449,584 | 6,265,880 | 5,949,082 | 5,333,452 | 5,518,565 | 6,161,584 | 5,927,241 | 5,904,470 | 5,976,637 |
| 2021 | 7,858,656 | 6,345,522 | 5,910,441 | 5,105,910 | 5,353,027 | 6,199,187 | 5,886,305 | 5,857,211 | 5,950,943 |
| 2023 | 8,013,601 | 6,114,679 | 5,524,507 | 4,493,490 | 4,818,119 | 5,910,409 | 5,500,666 | 5,464,088 | 5,583,427 |
| 2025 | 8,126,949 | 5,811,594 | 5,023,515 | 3,730,394 | 4,149,964 | 5,531,240 | 5,002,670 | 4,957,918 | 5,105,503 |
| 2027 | 8,461,269 | 5,766,055 | 4,764,415 | 3,202,913 | 3,721,368 | 5,395,620 | 4,747,492 | 4,693,906 | 4,868,188 |
| 2029 | 9,069,573 | 6,012,238 | 4,788,837 | 2,969,443 | 3,588,006 | 5,545,727 | 4,779,991 | 4,717,996 | 4,912,792 |
| 2031 | 9,684,216 | 6,247,437 | 4,790,106 | 2,695,033 | 3,422,943 | 5,679,664 | 4,788,635 | 4,718,098 | 4,933,133 |
| 2033 | 10,446,329 | 6,648,783 | 4,951,573 | 2,585,986 | 3,426,566 | 5,971,294 | 4,956,318 | 4,878,396 | 5,114,020 |
| 2035 | 11,214,733 | 7,057,600 | 5,131,383 | 2,511,865 | 3,464,629 | 6,274,953 | 5,140,672 | 5,056,375 | 5,311,393 |

VSERS – Group C Pension plus Postretirement Medical

| | Baseline | Recommendation |
|------|------------|---|
| | | 65% Cap, ERF, 3 Yr Avg, NRD 55, Remove J&S Subsidy, Add 1% accrual over 20, Recap, Tier 5 |
| 2007 | 4,475,054 | 4,450,522 |
| 2009 | 5,018,075 | 4,939,746 |
| 2011 | 5,479,472 | 5,336,855 |
| 2013 | 5,919,561 | 5,693,194 |
| 2015 | 6,436,662 | 6,113,402 |
| 2017 | 7,032,440 | 6,607,815 |
| 2019 | 7,449,584 | 6,900,728 |
| 2021 | 7,858,656 | 7,163,727 |
| 2023 | 8,013,601 | 7,148,560 |
| 2025 | 8,126,949 | 7,080,782 |
| 2027 | 8,461,269 | 7,248,861 |
| 2029 | 9,069,573 | 7,705,957 |
| 2031 | 9,684,216 | 8,163,816 |
| 2033 | 10,446,329 | 8,767,696 |
| 2035 | 11,214,733 | 9,384,862 |

VSERS – Group C Relative Cost of Features

Pension

| From | To | Relative Cost % of Payroll |
|--------------------|-------------------------------|-------------------------------|
| Subsidized 70& J&S | Eliminate Subsidy for 70% J&S | -2.34% |

Post Retirement Medical

| From | To | Relative Cost % of Payroll |
|--------------|---|-------------------------------|
| No Recapture | Recapture at 20 years (Based on Tier 3) | 0.38% |
| Tier 1 | Tier 2 | 0.18% |
| Tier 1 | Tier 3 | 0.34% |
| Tier 1 | Tier 4 | 0.66% |
| Tier 2 | Tier 3 | 0.16% |
| Tier 2 | Tier 4 | 0.48% |
| Tier 3 | Tier 4 | 0.32% |

Appendix C

VSTRS

In the pages that follow, we show the program scenarios examined and the financial forecasts. We believe the state should also consider these alternatives.

VSTRS Group C - Pension

| Feature | Plan Scenario | | | | | | | | | |
|---|---------------|---|---|---|---|---|---|---|---|------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10** |
| Formula change: Increase cap to 60% | X | | | | | | | | | X |
| Add Early Retirement Reduction Factor (ERF) * | X | X | X | X | X | X | X | X | | X |
| Change Normal Retirement Date (NRD): Age 65 | | | X | X | | | | X | | |
| Change Normal Retirement Date (NRD): 85 points or 65 | X | X | | | | X | X | | | |
| Change Normal Retirement Date (NRD): 90 points or 65 | | | | | | | | | | X |
| Change Normal Retirement Date (NRD): 62&20, or 65 | | | | | X | | | | | |
| Formula change: 2% Final Average Pay minus 1.5% of Social Security Benefit, 35 year maximum (Primary Insurance Amount - Level Post Retirement Salary) | | | | X | | | | | | |
| Formula change: 2% Final Average Pay minus 1.5% of Social Security Benefit, 35 year maximum (Primary Insurance Amount - Zero Post Retirement Salary) | | | | | | | | X | | |
| Formula change: 9% DC Plan (4% Employer, 5% Employee) | | | | | X | | | | X | |

* Proposed early retirement factors

Years of Service Retirement

35+

30-35

25-30

20-25

less than 20

Monthly % Reduction from NRD

1/8 of 1%

1/4 of 1%

1/3 of 1%

5/12 of 1%

5/9 of 1%

**Recommendation

VSTRS Group C - Post Retirement Medical

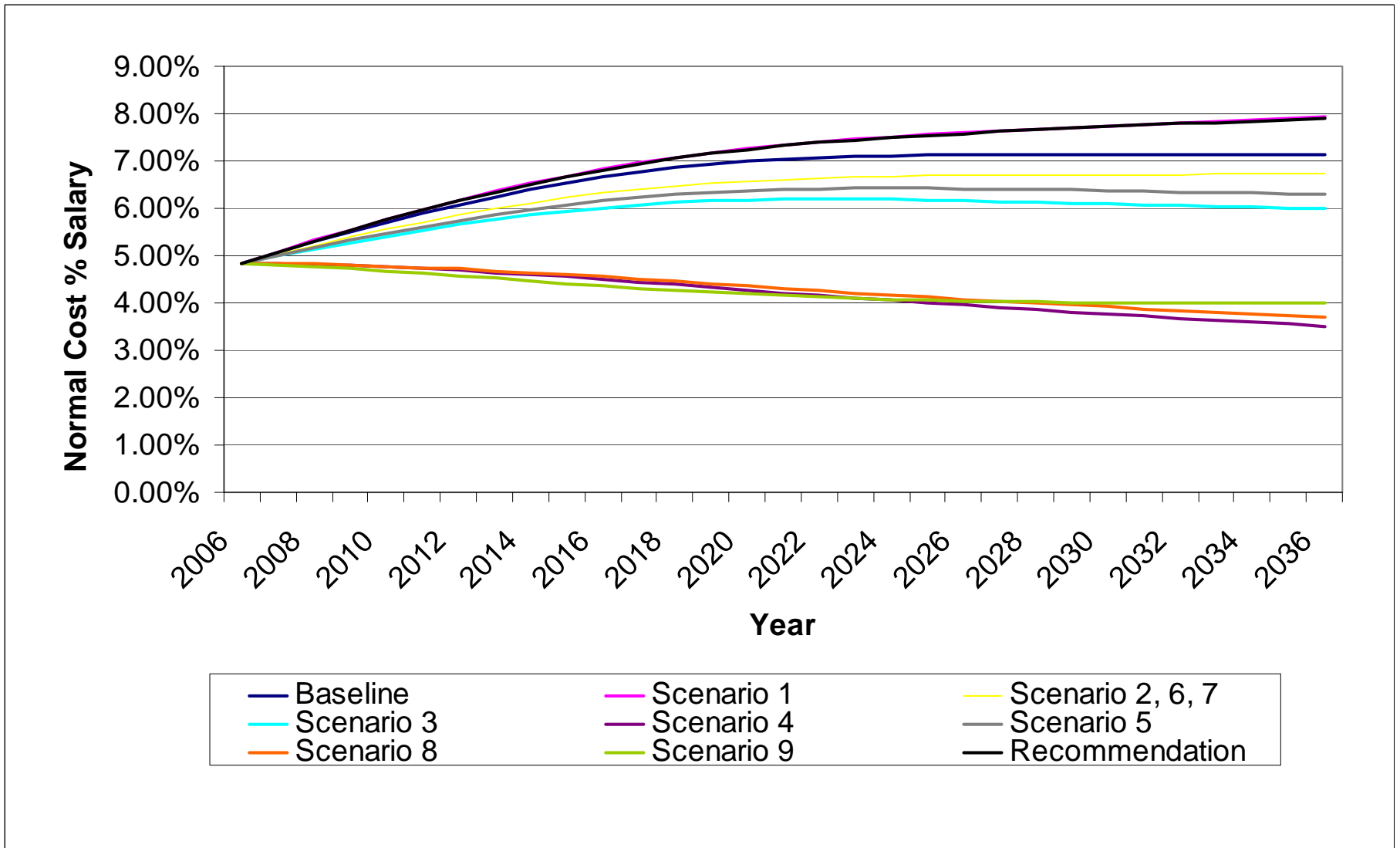
| Feature | Plan Scenario | | | | | | | | | |
|--|---------------|---|---|---|---|---|---|---|---|------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10** |
| Change Normal Retirement Date (NRD): Age 65 | | | X | X | | | | X | | |
| Change Normal Retirement Date (NRD): 85 points or 65 | X | X | | | | X | X | | X | |
| Change Normal Retirement Date (NRD): 90 points or 65 | | | | | | | | | | X |
| Change Normal Retirement Date (NRD): 62&20, or 65 | | | | | X | | | | | |
| Include Recapture at 20 years of Service | X | X | | | | | | | | X |
| Tier 1* | X | X | X | X | X | | | X | | |
| Tier 2* | | | | | | X | | | | |
| Tier 3* | | | | | | | X | | X | |
| Tier 4* | | | | | | | | | | X |

* Proposed Employer Share %

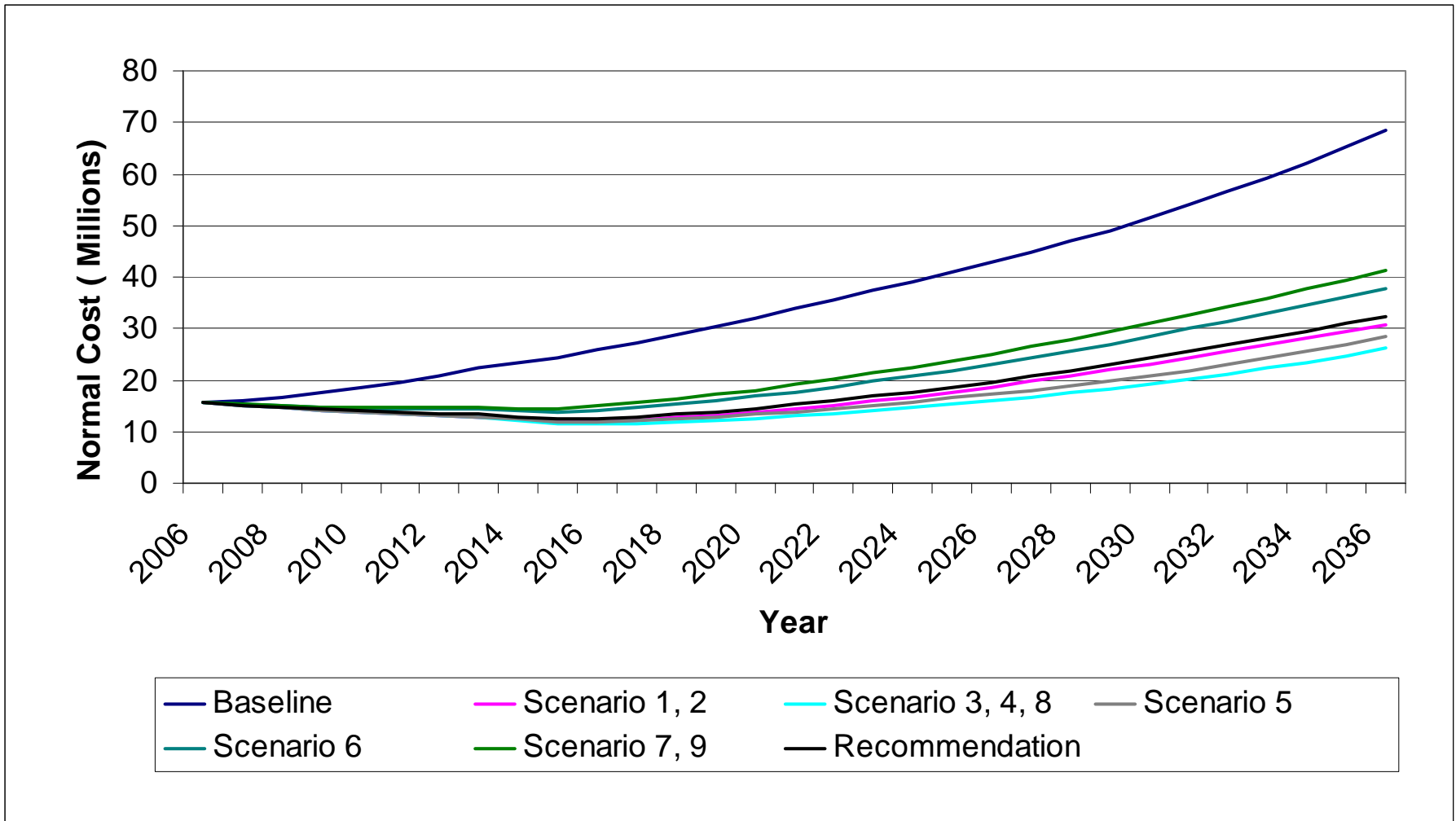
| Years of Service | Tier 1 | Tier 2 | Tier 3 | Tier 4 |
|------------------|--------|--------|--------|--------|
| 30+ | 80% | 80% | 80% | 80% |
| 25 - 29 | 60% | 70% | 80% | 80% |
| 20 - 24 | 40% | 45% | 50% | 50% |
| 15 - 19 | 20% | 35% | 40% | 40% |
| 10 - 14 | 20% | 35% | 40% | 30% |
| less than 10 | 0% | 20% | 30% | 0% |

** Recommendation

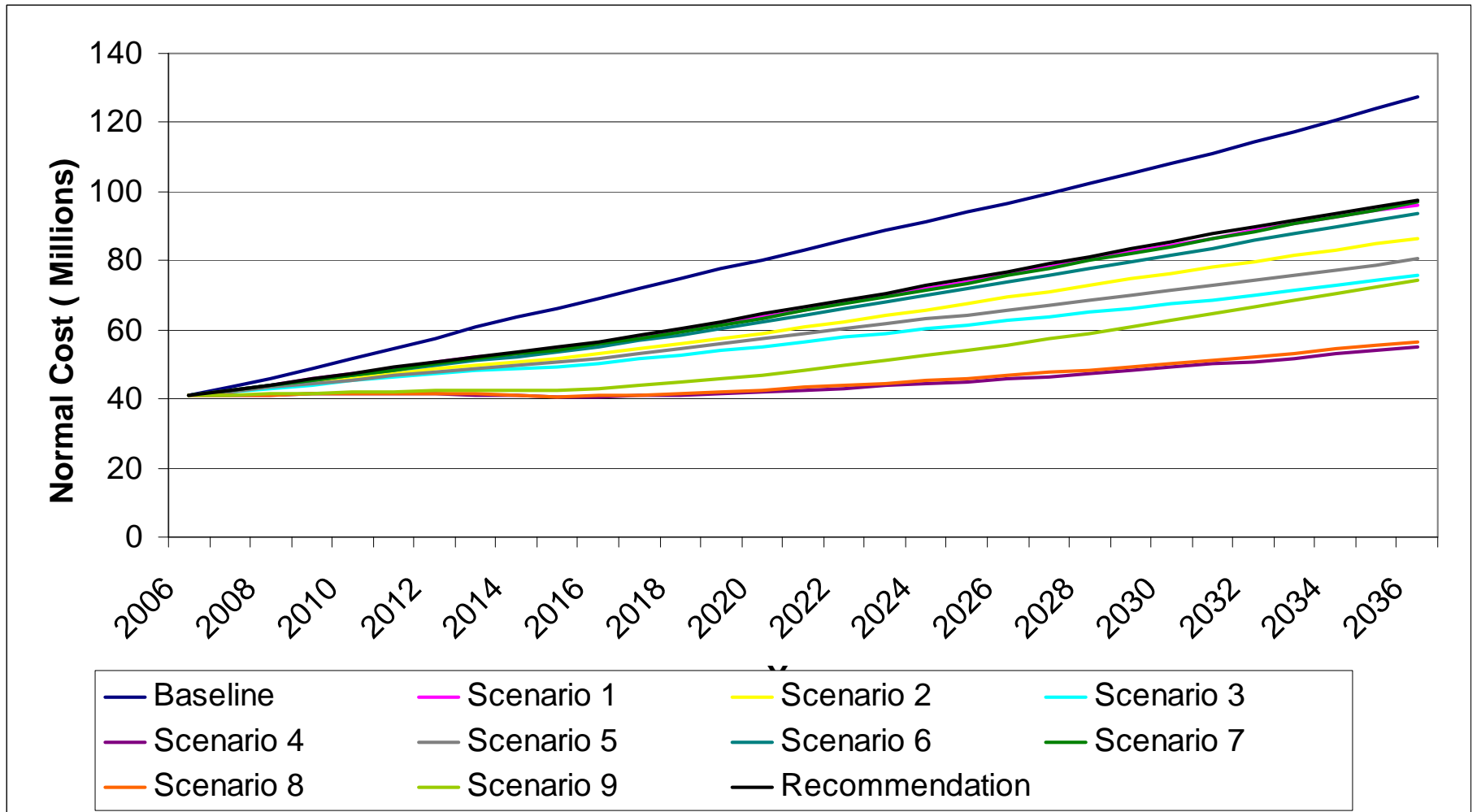
VSTRS – Group C Pension



VSTRS – Group C Post-retirement Medical



VSTRS – Group C Pension plus Post-retirement Medical



VSTRS – Group C Pension

| | | Baseline | | Scenario 1 60% Cap, ERF, NRD 85/65 | | | Scenario 2, 6 & 7 ERF, NRD 85/65 | | | Scenario 3 ERF, NRD 65 | | |
|------|-------------|-----------------------------|----------------|---------------------------------------|----------------|-----------|-------------------------------------|----------------|-------------|-----------------------------|----------------|-------------|
| Year | Payroll | Net Employer Normal Cost | % of Salary | Net Employer Normal Cost | % of Salary | Change | Net Employer Normal Cost | % of Salary | Change | Net Employer Normal Cost | % of Salary | Change |
| 2007 | 537,956,292 | 27,281,612 | 5.07% | 27,338,774 | 5.08% | 57,162 | 27,058,891 | 5.03% | (222,721) | 26,859,728 | 4.99% | (421,884) |
| 2009 | 567,025,256 | 31,226,955 | 5.51% | 31,424,809 | 5.54% | 197,854 | 30,549,182 | 5.39% | (677,773) | 29,949,493 | 5.28% | (1,277,462) |
| 2011 | 592,579,604 | 34,943,885 | 5.90% | 35,332,027 | 5.96% | 388,142 | 33,815,819 | 5.71% | (1,128,066) | 32,807,136 | 5.54% | (2,136,749) |
| 2013 | 615,382,236 | 38,443,055 | 6.25% | 39,079,931 | 6.35% | 636,876 | 36,889,603 | 5.99% | (1,553,452) | 35,482,806 | 5.77% | (2,960,249) |
| 2015 | 637,091,940 | 41,634,329 | 6.54% | 42,551,933 | 6.68% | 917,604 | 39,664,175 | 6.23% | (1,970,154) | 37,873,109 | 5.94% | (3,761,220) |
| 2017 | 657,851,122 | 44,476,629 | 6.76% | 45,726,227 | 6.95% | 1,249,598 | 42,124,172 | 6.40% | (2,352,457) | 39,952,235 | 6.07% | (4,524,394) |
| 2019 | 679,135,600 | 47,046,311 | 6.93% | 48,696,282 | 7.17% | 1,649,971 | 44,370,488 | 6.53% | (2,675,823) | 41,813,333 | 6.16% | (5,232,978) |
| 2021 | 701,154,223 | 49,326,659 | 7.04% | 51,440,940 | 7.34% | 2,114,281 | 46,389,571 | 6.62% | (2,937,088) | 43,438,626 | 6.20% | (5,888,033) |
| 2023 | 723,775,021 | 51,364,395 | 7.10% | 54,002,530 | 7.46% | 2,638,135 | 48,227,578 | 6.66% | (3,136,817) | 44,870,195 | 6.20% | (6,494,200) |
| 2025 | 745,939,673 | 53,164,234 | 7.13% | 56,379,633 | 7.56% | 3,215,399 | 49,887,243 | 6.69% | (3,276,991) | 46,108,208 | 6.18% | (7,056,026) |
| 2027 | 766,829,901 | 54,724,587 | 7.14% | 58,554,272 | 7.64% | 3,829,685 | 51,360,082 | 6.70% | (3,364,505) | 47,144,191 | 6.15% | (7,580,396) |
| 2029 | 785,854,772 | 56,081,132 | 7.14% | 60,545,260 | 7.70% | 4,464,128 | 52,673,571 | 6.70% | (3,407,561) | 48,009,107 | 6.11% | (8,072,025) |
| 2031 | 800,753,065 | 57,168,148 | 7.14% | 62,256,781 | 7.77% | 5,088,633 | 53,743,018 | 6.71% | (3,425,130) | 48,631,635 | 6.07% | (8,536,513) |
| 2033 | 813,375,996 | 58,069,050 | 7.14% | 63,759,071 | 7.84% | 5,690,021 | 54,657,869 | 6.72% | (3,411,181) | 49,096,348 | 6.04% | (8,972,702) |
| 2035 | 822,788,361 | 58,779,266 | 7.14% | 65,036,386 | 7.90% | 6,257,120 | 55,415,951 | 6.74% | (3,363,315) | 49,394,545 | 6.00% | (9,384,721) |

VSTRS – Group C Pension

| | | Baseline | | Scenario 4 ERF, NRD 65, PIA Level | | | Scenario 5 ERF, NRD 62/20 | | | Scenario 8 ERF, NRD 65, PIA Zero | | |
|------|-------------|-----------------------------|----------------|--------------------------------------|----------------|--------------|------------------------------|----------------|-------------|-------------------------------------|----------------|--------------|
| Year | Payroll | Net Employer Normal Cost | % of Salary | Net Employer Normal Cost | % of Salary | Change | Net Employer Normal Cost | % of Salary | Change | Net Employer Normal Cost | % of Salary | Change |
| 2007 | 537,956,292 | 27,281,612 | 5.07% | 25,968,693 | 4.83% | (1,312,919) | 26,934,571 | 5.01% | (347,041) | 25,988,958 | 4.83% | (1,292,654) |
| 2009 | 567,025,256 | 31,226,955 | 5.51% | 27,163,145 | 4.79% | (4,063,810) | 30,184,851 | 5.32% | (1,042,104) | 27,233,603 | 4.80% | (3,993,352) |
| 2011 | 592,579,604 | 34,943,885 | 5.90% | 28,002,577 | 4.73% | (6,941,308) | 33,216,217 | 5.61% | (1,727,668) | 28,137,310 | 4.75% | (6,806,575) |
| 2013 | 615,382,236 | 38,443,055 | 6.25% | 28,600,505 | 4.65% | (9,842,550) | 36,077,026 | 5.86% | (2,366,029) | 28,814,534 | 4.68% | (9,628,521) |
| 2015 | 637,091,940 | 41,634,329 | 6.54% | 28,990,701 | 4.55% | (12,643,628) | 38,660,570 | 6.07% | (2,973,759) | 29,299,958 | 4.60% | (12,334,371) |
| 2017 | 657,851,122 | 44,476,629 | 6.76% | 29,205,268 | 4.44% | (15,271,361) | 40,938,163 | 6.22% | (3,538,466) | 29,622,634 | 4.50% | (14,853,995) |
| 2019 | 679,135,600 | 47,046,311 | 6.93% | 29,383,401 | 4.33% | (17,662,910) | 43,000,369 | 6.33% | (4,045,942) | 29,917,578 | 4.41% | (17,128,733) |
| 2021 | 701,154,223 | 49,326,659 | 7.04% | 29,537,011 | 4.21% | (19,789,648) | 44,827,456 | 6.39% | (4,499,203) | 30,192,096 | 4.31% | (19,134,563) |
| 2023 | 723,775,021 | 51,364,395 | 7.10% | 29,701,523 | 4.10% | (21,662,872) | 46,461,085 | 6.42% | (4,903,310) | 30,477,458 | 4.21% | (20,886,937) |
| 2025 | 745,939,673 | 53,164,234 | 7.13% | 29,847,531 | 4.00% | (23,316,703) | 47,900,352 | 6.42% | (5,263,882) | 30,742,631 | 4.12% | (22,421,603) |
| 2027 | 766,829,901 | 54,724,587 | 7.14% | 29,941,721 | 3.90% | (24,782,866) | 49,134,583 | 6.41% | (5,590,004) | 30,952,914 | 4.04% | (23,771,673) |
| 2029 | 785,854,772 | 56,081,132 | 7.14% | 29,974,546 | 3.81% | (26,106,586) | 50,168,526 | 6.38% | (5,912,606) | 31,100,127 | 3.96% | (24,981,005) |
| 2031 | 800,753,065 | 57,168,148 | 7.14% | 29,832,455 | 3.73% | (27,335,693) | 50,928,302 | 6.36% | (6,239,846) | 31,071,325 | 3.88% | (26,096,823) |
| 2033 | 813,375,996 | 58,069,050 | 7.14% | 29,604,234 | 3.64% | (28,464,816) | 51,498,786 | 6.33% | (6,570,264) | 30,953,902 | 3.81% | (27,115,148) |
| 2035 | 822,788,361 | 58,779,266 | 7.14% | 29,265,476 | 3.56% | (29,513,790) | 51,874,246 | 6.30% | (6,905,020) | 30,721,838 | 3.73% | (28,057,428) |

VSTRS – Group C Pension

| | | Baseline | | Scenario 9 9% DC Plan | | | Recommendation 60% Cap, ERF, NRD 90/65 | | |
|------|-------------|-----------------------------|----------------|-----------------------------|----------------|--------------|---|----------------|-----------|
| Year | Payroll | Net Employer Normal Cost | % of Salary | Net Employer Normal Cost | % of Salary | Change | Net Employer Normal Cost | % of Salary | Change |
| 2007 | 537,956,292 | 27,281,612 | 5.07% | 25,828,479 | 4.80% | (1,453,133) | 27,333,429 | 5.08% | 51,817 |
| 2009 | 567,025,256 | 31,226,955 | 5.51% | 26,760,856 | 4.72% | (4,466,099) | 31,407,967 | 5.54% | 181,012 |
| 2011 | 592,579,604 | 34,943,885 | 5.90% | 27,373,166 | 4.62% | (7,570,719) | 35,302,653 | 5.96% | 358,768 |
| 2013 | 615,382,236 | 38,443,055 | 6.25% | 27,794,947 | 4.52% | (10,648,108) | 39,037,228 | 6.34% | 594,173 |
| 2015 | 637,091,940 | 41,634,329 | 6.54% | 28,114,094 | 4.41% | (13,520,235) | 42,495,336 | 6.67% | 861,007 |
| 2017 | 657,851,122 | 44,476,629 | 6.76% | 28,370,276 | 4.31% | (16,106,353) | 45,655,299 | 6.94% | 1,178,670 |
| 2019 | 679,135,600 | 47,046,311 | 6.93% | 28,702,073 | 4.23% | (18,344,238) | 48,610,681 | 7.16% | 1,564,370 |
| 2021 | 701,154,223 | 49,326,659 | 7.04% | 29,118,980 | 4.15% | (20,207,679) | 51,340,390 | 7.32% | 2,013,731 |
| 2023 | 723,775,021 | 51,364,395 | 7.10% | 29,649,299 | 4.10% | (21,715,096) | 53,886,731 | 7.45% | 2,522,336 |
| 2025 | 745,939,673 | 53,164,234 | 7.13% | 30,253,615 | 4.06% | (22,910,619) | 56,248,260 | 7.54% | 3,084,026 |
| 2027 | 766,829,901 | 54,724,587 | 7.14% | 30,887,090 | 4.03% | (23,837,497) | 58,407,060 | 7.62% | 3,682,473 |
| 2029 | 785,854,772 | 56,081,132 | 7.14% | 31,527,982 | 4.01% | (24,553,150) | 60,382,028 | 7.68% | 4,300,896 |
| 2031 | 800,753,065 | 57,168,148 | 7.14% | 32,051,656 | 4.00% | (25,116,492) | 62,077,484 | 7.75% | 4,909,336 |
| 2033 | 813,375,996 | 58,069,050 | 7.14% | 32,533,423 | 4.00% | (25,535,627) | 63,564,038 | 7.81% | 5,494,988 |
| 2035 | 822,788,361 | 58,779,266 | 7.14% | 32,932,841 | 4.00% | (25,846,425) | 64,825,853 | 7.88% | 6,046,587 |

VSTRS – Group C Post-retirement Medical

| Baseline | | Scenario 1, 2 NRD 85/65, Tier 1, Recap | | Scenario 3, 4, 8 NRD 65, Tier 1 | | Scenario 5 NRD 62/20, Tier 1 | | Scenario 6 NRD 85/65, Tier 2 | |
|----------|-------------------------|---|--------------|------------------------------------|--------------|---------------------------------|--------------|---------------------------------|--------------|
| Year | Employer Normal Cost | Employer Normal Cost | Change | Employer Normal Cost | Change | Employer Normal Cost | Change | Employer Normal Cost | Change |
| 2007 | 16,117,853 | 15,120,829 | (997,024) | 15,093,611 | (1,024,242) | 15,116,631 | (1,001,222) | 15,257,753 | (860,100) |
| 2009 | 17,501,658 | 14,220,648 | (3,281,010) | 14,127,100 | (3,374,558) | 14,207,038 | (3,294,620) | 14,683,602 | (2,818,056) |
| 2011 | 19,537,972 | 13,507,041 | (6,030,931) | 13,329,527 | (6,208,445) | 13,481,447 | (6,056,525) | 14,369,203 | (5,168,769) |
| 2013 | 22,268,688 | 12,957,364 | (9,311,324) | 12,672,874 | (9,595,814) | 12,914,129 | (9,354,559) | 14,288,057 | (7,980,631) |
| 2015 | 24,474,207 | 11,903,794 | (12,570,413) | 11,475,122 | (12,999,085) | 11,828,901 | (12,645,306) | 13,756,976 | (10,717,231) |
| 2017 | 27,348,325 | 12,276,326 | (15,071,999) | 11,639,924 | (15,708,401) | 12,129,513 | (15,218,812) | 14,658,123 | (12,690,202) |
| 2019 | 30,535,924 | 13,158,113 | (17,377,811) | 12,232,507 | (18,303,417) | 12,879,464 | (17,656,460) | 16,040,617 | (14,495,307) |
| 2021 | 33,862,646 | 14,395,253 | (19,467,393) | 13,084,207 | (20,778,439) | 13,919,060 | (19,943,586) | 17,740,820 | (16,121,826) |
| 2023 | 37,317,660 | 15,928,046 | (21,389,614) | 14,123,564 | (23,194,096) | 15,182,284 | (22,135,376) | 19,703,971 | (17,613,689) |
| 2025 | 40,869,316 | 17,665,314 | (23,204,002) | 15,257,239 | (25,612,077) | 16,518,537 | (24,350,779) | 21,862,148 | (19,007,168) |
| 2027 | 44,772,093 | 19,694,414 | (25,077,679) | 16,642,386 | (28,129,707) | 18,047,121 | (26,724,972) | 24,325,128 | (20,446,965) |
| 2029 | 49,067,313 | 21,924,084 | (27,143,229) | 18,244,724 | (30,822,589) | 19,813,241 | (29,254,072) | 27,017,171 | (22,050,142) |
| 2031 | 53,944,486 | 24,372,048 | (29,572,438) | 20,138,495 | (33,805,991) | 21,884,252 | (32,060,234) | 29,973,375 | (23,971,111) |
| 2033 | 59,293,260 | 26,893,653 | (32,399,607) | 22,286,334 | (37,006,926) | 24,218,731 | (35,074,529) | 33,061,677 | (26,231,583) |
| 2035 | 65,186,481 | 29,392,628 | (35,793,853) | 24,745,724 | (40,440,757) | 26,901,486 | (38,284,995) | 36,215,852 | (28,970,629) |

VSTRS – Group C Post-retirement Medical

| Baseline | | Scenario 7, 9 NRD 85/65, Tier 3 | | Recommendation NRD 90/65, Tier 4, Recap | |
|----------|-------------------------|------------------------------------|--------------|--|--------------|
| Year | Employer Normal Cost | Employer Normal Cost | Change | Employer Normal Cost | Change |
| 2007 | 15,310,119 | 15,310,119 | (807,734) | 15,151,174 | (966,679) |
| 2009 | 14,859,267 | 14,859,267 | (2,642,391) | 14,325,757 | (3,175,901) |
| 2011 | 14,693,448 | 14,693,448 | (4,844,524) | 13,708,641 | (5,829,331) |
| 2013 | 14,783,753 | 14,783,753 | (7,484,935) | 13,280,227 | (8,988,461) |
| 2015 | 14,445,875 | 14,445,875 | (10,028,332) | 12,366,597 | (12,107,610) |
| 2017 | 15,556,422 | 15,556,422 | (11,791,903) | 12,872,639 | (14,475,686) |
| 2019 | 17,158,457 | 17,158,457 | (13,377,467) | 13,872,087 | (16,663,837) |
| 2021 | 19,086,975 | 19,086,975 | (14,775,671) | 15,209,662 | (18,652,984) |
| 2023 | 21,289,433 | 21,289,433 | (16,028,227) | 16,825,766 | (20,491,894) |
| 2025 | 23,701,824 | 23,701,824 | (17,167,492) | 18,633,196 | (22,236,120) |
| 2027 | 26,425,879 | 26,425,879 | (18,346,214) | 20,732,969 | (24,039,124) |
| 2029 | 29,380,290 | 29,380,290 | (19,687,023) | 23,043,613 | (26,023,700) |
| 2031 | 32,596,133 | 32,596,133 | (21,348,353) | 25,591,354 | (28,353,132) |
| 2033 | 35,947,172 | 35,947,172 | (23,346,088) | 28,234,941 | (31,058,319) |
| 2035 | 39,389,365 | 39,389,365 | (25,797,116) | 30,881,800 | (34,304,681) |

VSTRS – Group C Pension plus Post-retirement Medical

| | Baseline | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5 | Scenario 6 | Scenario 7 | Scenario 8 |
|------|-------------|--|-------------------------------|---------------------|--------------------------------|------------------------|------------------------|------------------------|-------------------------------|
| | | 60% Cap, ERF, NRD 85/65, Tier 1, Recap | ERF, NRD 85/65, Tier 1, Recap | ERF, NRD 65, Tier 1 | ERF, NRD 65, Pia Level, Tier 1 | ERF, NRD 62/20, Tier 1 | ERF, NRD 85/65, Tier 2 | ERF, NRD 85/65, Tier 3 | ERF, NRD 65, Pia Zero, Tier 1 |
| 2007 | 43,399,465 | 42,459,603 | 42,179,720 | 41,953,339 | 41,062,304 | 42,051,202 | 42,316,644 | 42,369,010 | 41,082,569 |
| 2009 | 48,728,613 | 45,645,457 | 44,769,830 | 44,076,593 | 41,290,245 | 44,391,889 | 45,232,784 | 45,408,449 | 41,360,703 |
| 2011 | 54,481,857 | 48,839,068 | 47,322,860 | 46,136,663 | 41,332,104 | 46,697,664 | 48,185,022 | 48,509,267 | 41,466,837 |
| 2013 | 60,711,743 | 52,037,295 | 49,846,967 | 48,155,680 | 41,273,379 | 48,991,155 | 51,177,660 | 51,673,356 | 41,487,408 |
| 2015 | 66,108,536 | 54,455,727 | 51,567,969 | 49,348,231 | 40,465,823 | 50,489,471 | 53,421,151 | 54,110,050 | 40,775,080 |
| 2017 | 71,824,954 | 58,002,553 | 54,400,498 | 51,592,159 | 40,845,192 | 53,067,676 | 56,782,295 | 57,680,594 | 41,262,558 |
| 2019 | 77,582,235 | 61,854,395 | 57,528,601 | 54,045,840 | 41,615,908 | 55,879,833 | 60,411,105 | 61,528,945 | 42,150,085 |
| 2021 | 83,189,305 | 65,836,193 | 60,784,824 | 56,522,833 | 42,621,218 | 58,746,516 | 64,130,391 | 65,476,546 | 43,276,303 |
| 2023 | 88,682,055 | 69,930,576 | 64,155,624 | 58,993,759 | 43,825,087 | 61,643,369 | 67,931,549 | 69,517,011 | 44,601,022 |
| 2025 | 94,033,550 | 74,044,947 | 67,552,557 | 61,365,447 | 45,104,770 | 64,418,889 | 71,749,391 | 73,589,067 | 45,999,870 |
| 2027 | 99,496,680 | 78,248,686 | 71,054,496 | 63,786,577 | 46,584,107 | 67,181,704 | 75,685,210 | 77,785,961 | 47,595,300 |
| 2029 | 105,148,445 | 82,469,344 | 74,597,655 | 66,253,831 | 48,219,270 | 69,981,767 | 79,690,742 | 82,053,861 | 49,344,851 |
| 2031 | 111,112,634 | 86,628,829 | 78,115,066 | 68,770,130 | 49,970,950 | 72,812,554 | 83,716,393 | 86,339,151 | 51,209,820 |
| 2033 | 117,362,310 | 90,652,724 | 81,551,522 | 71,382,682 | 51,890,568 | 75,717,517 | 87,719,546 | 90,605,041 | 53,240,236 |
| 2035 | 123,965,747 | 94,429,014 | 84,808,579 | 74,140,269 | 54,011,200 | 78,775,732 | 91,631,803 | 94,805,316 | 55,467,562 |

VSTRS – Group C Pension plus Post-retirement Medical

| | Baseline | Scenario 9 | Recommendation |
|------|-------------|-------------------------------|---|
| | | DC Plan, NRD 85/65, Tier 3 | 60% Cap, ERF, NRD 90/65, Tier 4, Recap |
| 2007 | 43,399,465 | 41,138,598 | 42,484,603 |
| 2009 | 48,728,613 | 41,620,123 | 45,733,724 |
| 2011 | 54,481,857 | 42,066,614 | 49,011,294 |
| 2013 | 60,711,743 | 42,578,700 | 52,317,455 |
| 2015 | 66,108,536 | 42,559,969 | 54,861,933 |
| 2017 | 71,824,954 | 43,926,698 | 58,527,938 |
| 2019 | 77,582,235 | 45,860,530 | 62,482,768 |
| 2021 | 83,189,305 | 48,205,955 | 66,550,052 |
| 2023 | 88,682,055 | 50,938,732 | 70,712,497 |
| 2025 | 94,033,550 | 53,955,439 | 74,881,456 |
| 2027 | 99,496,680 | 57,312,969 | 79,140,029 |
| 2029 | 105,148,445 | 60,908,272 | 83,425,641 |
| 2031 | 111,112,634 | 64,647,789 | 87,668,838 |
| 2033 | 117,362,310 | 68,480,595 | 91,798,979 |
| 2035 | 123,965,747 | 72,322,206 | 95,707,653 |

VSTRS – Group C Relative Cost of Features

Pension

| From | To | Relative Cost % of Payroll |
|----------------------|---|-------------------------------|
| 50 % Cap | 60 % Cap | 1.19% |
| NRD 85 Points or 65 | NRD 65 | -0.76% |
| NRD 85 Points or 65 | NRD 62 & 20, or 65 | -0.46% |
| NRD 62 & 20, or 65 | NRD 65 | -0.30% |
| Current Plan Formula | SS Offset formula with level post retirement salary | -2.47% |
| Current Plan Formula | SS Offset formula with zero post retirement salary | -2.29% |

Post Retirement Medical

| From | To | Relative Cost % of Payroll |
|-----------------------|-----------------------|-------------------------------|
| Recapture at 10 Years | Recapture at 20 Years | -0.35% |
| Tier 1 | Tier 2 | 0.68% |
| Tier 1 | Tier 3 | 1.08% |
| Tier 2 | Tier 3 | 0.40% |

VSTRS – Group C Payroll Forecast & DC Cost

| Year | Payroll Current Employees | Payroll New Employees | Payroll Total | 1 % of Payroll New Employees | 4% of Payroll New Employees | 5% of Payroll New Employees |
|------|------------------------------|--------------------------|------------------|---------------------------------|--------------------------------|--------------------------------|
| 2007 | 512,472,388 | 25,483,904 | 537,956,292 | 254,839 | 1,019,356 | 1,274,195 |
| 2009 | 487,777,288 | 79,247,968 | 567,025,256 | 792,480 | 3,169,919 | 3,962,398 |
| 2011 | 456,268,762 | 136,310,842 | 592,579,604 | 1,363,108 | 5,452,434 | 6,815,542 |
| 2013 | 420,167,669 | 195,214,567 | 615,382,236 | 1,952,146 | 7,808,583 | 9,760,728 |
| 2015 | 383,047,073 | 254,044,867 | 637,091,940 | 2,540,449 | 10,161,795 | 12,702,243 |
| 2017 | 345,929,964 | 311,921,158 | 657,851,122 | 3,119,212 | 12,476,846 | 15,596,058 |
| 2019 | 311,073,901 | 368,061,699 | 679,135,600 | 3,680,617 | 14,722,468 | 18,403,085 |
| 2021 | 279,274,746 | 421,879,477 | 701,154,223 | 4,218,795 | 16,875,179 | 21,093,974 |
| 2023 | 250,350,397 | 473,424,624 | 723,775,021 | 4,734,246 | 18,936,985 | 23,671,231 |
| 2025 | 222,963,797 | 522,975,876 | 745,939,673 | 5,229,759 | 20,919,035 | 26,148,794 |
| 2027 | 196,274,596 | 570,555,305 | 766,829,901 | 5,705,553 | 22,822,212 | 28,527,765 |
| 2029 | 169,537,206 | 616,317,566 | 785,854,772 | 6,163,176 | 24,652,703 | 30,815,878 |
| 2031 | 140,429,624 | 660,323,441 | 800,753,065 | 6,603,234 | 26,412,938 | 33,016,172 |
| 2033 | 111,731,698 | 701,644,298 | 813,375,996 | 7,016,443 | 28,065,772 | 35,082,215 |
| 2035 | 83,092,551 | 739,695,810 | 822,788,361 | 7,396,958 | 29,587,832 | 36,984,791 |