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March 29, 2012

PERSONAL & CONFIDENTIAL

Mr. Walter Edge
Finance Director
Town of North Providence
2000 Smith Street
North Providence, RI 02911

Re: Town of North Providence, Rhode Island Police Pension Plan
Updated July 1, 2010 Actuarial Valuation Results

Dear Walter:

The attached is an exhibit summarizing the impact on the July 1, 2010 actuarial valuation results of the proposed assumption changes per our Experience Study report dated March 29, 2012.

The exhibit is reproduced from page 7 of our Experience Study report and shows the impact of the proposed assumption changes on the plan's Unfunded Actuarial Liability and Funded Ratio as of July 1, 2010, and Annual Required Contribution for 2011-2012. Based on guidance issued by the Pension Study Commission on March 2, 2012, it is our understanding that this letter (including the attached exhibits) satisfies the "initial actuarial valuation" requirement of General Law Chapter 45-65, in lieu of a completely revised actuarial valuation report.

In preparing this analysis, we relied without audit on employee census data and financial information from July 1, 2006 through July 1, 2010, furnished by the Town of North Providence. This information includes, but is not limited to, plan provisions, employee data, and financial information. In our examination of these data, we have found them to be reasonably consistent and comparable with data used for other purposes. Since the valuation results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

The calculations reported herein have been made on a basis consistent with our understanding of the plan provisions for the Town of North Providence, Rhode Island Police Pension Plan. Furthermore, the calculations were determined in conformance with generally recognized and accepted actuarial principles and practices, which are consistent with the Actuarial Standards of Practice promulgated by the Actuarial Standards Board and the applicable Guides to Professional Conduct, amplifying Opinions, and supporting Recommendations of the American Academy of Actuaries.

Milliman's work is prepared solely for the internal business use of the Town of North Providence. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exception(s): (a) the Town may provide a copy of Milliman's work, in its entirety, to the Town's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit the Town; and (b) the Town may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law. No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs. If these results are distributed to other parties, we request that it be copied in its entirety and distributed along with a copy of the July 1, 2010 actuarial valuation report in its entirety as well, because this document provides background information that is important in understanding the basis for these results.

The calculations reported herein have been made on a basis consistent with our understanding of ERISA and the related sections of the tax code. Additional determinations may be needed for other purposes, such as judging benefit security at plan termination or meeting employer accounting requirements. On the basis of the foregoing, we hereby certify that, to the best of our knowledge, this report is complete and accurate and all costs and liabilities were determined in conformance with generally accepted actuarial principles and practices. We further certify that, in our opinion, each actuarial assumption, method and technique used is reasonable taking into account the experience of the Plan and reasonable expectations or would, in the aggregate, result in a total contribution equivalent to that which would be determined if each such assumption, method, or technique were reasonable. Differences between our projections and actual amounts depend on the extent to which future experience conforms to the assumptions made for this analysis. Actual experience will not conform exactly to the assumptions made for this analysis. Actual amounts will differ from projected amounts to the extent that actual experience deviates from expected experience.

I am a member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Please let me know if you have any questions.

Sincerely,

Becky

Rebecca A. Sielman, FSA
Consulting Actuary

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SECTION I
EXHIBIT B - ESTIMATED IMPACT OF PROPOSED ASSUMPTIONS
($ millions)

		Current Assumptions	After Proposed Assumption Changes
		July 1, 2010 Valuation	July 1, 2010 Valuation
Funded Ratio*			
1.	Actuarial Value of Assets at July 1, 2010	$13.748	$13.748
2.	Actuarial Liability as of July 1, 2010	30.323	34.372
3.	Unfunded Accrued Liability (UAL) as of July 1, 2010	16.575	20.624
4.	Funded Ratio at July 1, 2010: (1) / (2)	45.3%	40.0%
Annual Town Cost for 2011-2012*			
1.	Net Normal Cost	$0.541	$0.623
2.	Past Service Cost (22 year amortization of UAL)	1.021	1.273
3.	Interest on (1) + (2) to the end of the fiscal year	0.113	0.128
4.	Total Town Cost for 2011-2012: (1) + (2) + (3)	1.675	2.024
5.	Total Town Cost for 2011-2012 as a Percentage of Payroll	46.7%	56.5%
Annual Required Contribution for 2011-2012		1.675	2.024

* Note: The estimated impact on the July 1, 2010 funded ratio and Annual Required Contribution for 2011-2012 is for illustrative purposes only. We understand that any adopted changes in the actuarial assumptions would first be required to be included in the July 1, 2012 actuarial valuation (which develops the Annual Required Contribution for 2013-2014).

Milliman

TOWN OF NORTH PROVIDENCE, RHODE ISLAND
POLICE PENSION PLAN

EXPERIENCE STUDY

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March 29, 2012

PERSONAL & CONFIDENTIAL

Mr. Walter Edge
Finance Director
Town of North Providence
2000 Smith Street
North Providence, RI 02911

Re: Experience Study – Town of North Providence, Rhode Island Police Pension Plan

Dear Walter:

We are pleased to present the results of the Experience Study for the Town of North Providence, Rhode Island Police Pension Plan.

The enclosed study reviews experience through July 1, 2010 and summarizes the results of the following economic and demographic experience: Consumer Price Inflation, Salary Scale, Payroll Growth Rate, Investment Return, Turnover, Retirement, Healthy Mortality, Disabled Mortality, Disability, and Percent Married. The following actuarial methods are also reviewed: Asset Valuation Method (Actuarial Value), and the Actuarial Cost Method. Section II contains a discussion of the economic assumptions used in the actuarial valuation. Details regarding demographic assumptions are found in Section III. Section IV reviews the actuarial methods.

We have included proposals for new assumptions, as well as the estimated impact of the proposed assumptions on the funded ratio and the Annual Required Contribution.

In preparing this study, we relied without audit on employee census data and financial information for the period July 1, 2006 through July 1, 2010, furnished by the Town of North Providence. This information includes, but is not limited to, plan provisions, employee data, and financial information. In our examination of these data, we have found them to be reasonably consistent and comparable with data used for other purposes. Since the valuation results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

The calculations reported herein have been made on a basis consistent with our understanding of the plan provisions for the Town of North Providence, Rhode Island Police Pension Plan. Furthermore, the calculations were determined in conformance with generally recognized and accepted actuarial principles and practices, which are consistent with the Actuarial Standards of Practice promulgated by the Actuarial Standards Board and the applicable Guides to Professional Conduct, amplifying Opinions, and supporting Recommendations of the American Academy of Actuaries.

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The calculations reported herein have been made on a basis consistent with our understanding of ERISA and the related sections of the tax code. Additional determinations may be needed for other purposes, such as judging benefit security at plan termination or meeting employer accounting requirements. On the basis of the foregoing, we hereby certify that, to the best of our knowledge, this report is complete and accurate and all costs and liabilities were determined in conformance with generally accepted actuarial principles and practices. We further certify that, in our opinion, each actuarial assumption, method and technique used is reasonable taking into account the experience of the Plan and reasonable expectations or would, in the aggregate, result in a total contribution equivalent to that which would be determined if each such assumption, method, or technique were reasonable. Differences between our projections and actual amounts depend on the extent to which future experience conforms to the assumptions made for this analysis. Actual experience will not conform exactly to the assumptions made for this analysis. Actual amounts will differ from projected amounts to the extent that actual experience deviates from expected experience.

I am a member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

I look forward to discussing this report with you. In the meantime, please call if I can be of assistance.

Respectfully submitted,

Rebecca A. Sielman, FSA
Consulting Actuary

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TOWN OF NORTH PROVIDENCE, RHODE ISLAND
POLICE PENSION PLAN
EXPERIENCE STUDY

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SECTION I
EXECUTIVE SUMMARY

The following is a discussion of the key findings of the Experience Study for the Town of North Providence, Rhode Island Police Pension Plan.

Consumer Price Inflation

Current Basis	3.00% per year.
Recommendation	Based on the history over the last 75 years and future expectations, we recommend that the long-term assumed price inflation rate be lowered from 3.00% to 2.75%. This rate will be used to build the net investment return and salary scale assumptions.

Salary Scale

Current Basis	4.00% per year.
Comment	Experience shows that average salary increases per year from 2006 to 2010 were higher than the current basis earlier in an employee's career (on average, at younger ages), and lower than the current basis later in an employee's career (on average, at older ages).
Recommendation	Move from a flat salary scale assumption to a graded salary scale assumption. Rates at younger ages are assumed to be greater than the current basis, while rates at older ages are assumed to be lower than the current basis.

Payroll Growth Rate

Current Basis	4.00% per year.
Recommendation	In conjunction with a change in the salary scale assumption, change the payroll growth rate assumption to 3.50% per year. The proposed assumption is consistent with the "ultimate" proposed rate of salary increase.

SECTION I
EXECUTIVE SUMMARY

Investment Return

Current Basis	7.25% per year, net of investment expenses.
Comment	Based on updated capital market assumptions (Milliman, December 2011) and your current asset mix, we propose that the investment return assumption be reduced.
Recommendation	6.75% per year, net of investment expenses.

Turnover

Current Basis	25% of the Sarason T-1 Table.
Comment	Experience indicates that turnover has been generally heavier than the current basis.

Recommendation

Age	Rate
20	2.9%
25	2.9
30	2.9
35	1.9
40	1.7
45+	0

Retirement

Current Basis	25% of active members are assumed to retire on completion of 20 years of service; 5% retire at each age thereafter; 100% are assumed to have retired by age 55.
Comment	Experience indicates that members are retiring generally earlier than assumed under the current basis.

Recommendation

Service	Rate
20	40%
21	30
22	30
23	40
24	40
25	40
26	5
27	5
28	100

SECTION I
EXECUTIVE SUMMARY

Healthy Mortality

Current Basis	RP-2000 Combined Healthy Mortality Table with separate tables for males and females.
Comment	Experience indicates that mortality has been generally consistent with the current assumption.
Recommendation	The mortality table should provide a margin for future mortality improvement. We recommend that the mortality assumption continue to be the RP-2000 Combined Healthy Mortality Table, but with generational projection per Scale AA. The RP-2000 mortality table is the table recommended by the Society of Actuaries Retirement Plan Experience Committee (RPEC), and generational projection is consistent with the RPEC's recommendation that "pension valuations should take trends in long-term mortality improvement into account."

Disabled Mortality

Current Basis	RP-2000 Disabled Mortality Table with separate tables for males and females.
Recommendation	No change.

Disability

Current Basis	The United Auto Workers Table. 50% of disabilities are assumed to be ordinary and 50% of disabilities are assumed to be accidental work related.
Recommendation	We recommend moving to 50% of the 1985 Pension Disability Table (DP-85 Table) Class 4, which is a more recent standard published table.

SECTION I
EXECUTIVE SUMMARY

Percent Married

Current Basis	90% of men and 75% of women are assumed to be married, with wives four years younger than husbands.
Comment	Experience indicates that a lower percentage of retirees are married than under the current basis.
Recommendation	70% of active members are assumed to be married at retirement, with wives one year younger than husbands.

Asset Valuation Method (Actuarial Value)

Current Basis	You are using a smoothing method which phases in recognition of the difference between the actual return on market value and the expected return on market value over a five-year period at 20% per year.
Recommendation	We recommend the continued use of this asset valuation method.

Actuarial Cost Method

Current Basis	The current method is the Entry Age Normal Cost Method. It is used in determining the contributions required for funding future benefits by determining two pieces: the Normal Cost of each individual's benefit accrued during the year and any prior service costs amortized as a level percent of payroll amount over a 25 year period (starting July 1, 2007).
Recommendation	We recommend the continued use of this funding method.

SECTION I

EXHIBIT A - CURRENT AND PROPOSED ACTUARIAL ASSUMPTIONS

The current actuarial assumptions used in the 2010 Town of North Providence, Rhode Island Police Pension Plan valuation plus the proposed changes in actuarial assumptions are compared as follows:

	Current Assumption	Proposed Assumption
Consumer Price Inflation	3.00% per year.	2.75% per year.
Salary Scale	4.00% per year.*	Age / Rate* 25 / 4.50% 30 / 4.00 35 / 3.75 40 / 3.50 45 / 3.50 50 / 3.50
	*Includes 3.00% for inflation	*Includes 2.75% for inflation
Payroll Growth Rate	4.00% per year.	3.50% per year.
Investment Return	7.25% per year, net of investment expenses.	6.75% per year, net of investment expenses.
Turnover	25% of the Sarason T-1 Table.	Age / Rate 20 / 2.9% 25 / 2.9 30 / 2.9 35 / 1.9 40 / 1.7 45 / 0.0
Retirement	25% of active members are assumed to retire on completion of 20 years of service; 5% retire at each age thereafter; 100% are assumed to have retired by age 55.	Service / Rate 20 / 40% 21 / 30 22 / 30 23 / 40 24 / 40 25 / 40 26 / 5 27 / 5 28 / 100
Healthy Mortality	RP-2000 Combined Healthy Mortality Table, with separate male and female tables.	RP-2000 Combined Healthy Mortality Table with generational projection per Scale AA, with separate male and female tables.
Disabled Mortality	RP-2000 Disabled Table, with separate male and female tables.	No change.
Disability	The United Auto Workers Table. 50% of disabilities are assumed to be duty related.	50% of the 1985 Pension Disability Table (DP-85 Table) Class 4. 50% of disabilities are assumed to be duty related.

SECTION I

EXHIBIT A - CURRENT AND PROPOSED ACTUARIAL ASSUMPTIONS

	Current Assumption	Proposed Assumption
Percent Married	90% of men and 75% of women are assumed to be married, with wives four years younger than husbands.	70% of active members are assumed to be married, with wives one year younger than husbands.
Asset Valuation Method (Actuarial Value)	The total value of the plan assets is adjusted by phasing in recognition of the difference between the expected return on market value and the actual return on market value over a five-year period at 20% per year.	No change.
Actuarial Cost Method	Entry Age Normal actuarial cost method. The Unfunded Accrued Liability is amortized as a level percent of payroll amount over a decreasing number of years, starting with 25 years on July 1, 2007.	No change.

SECTION I
EXHIBIT B - ESTIMATED IMPACT OF PROPOSED ASSUMPTIONS
($ millions)

	Current Assumptions	After Proposed Assumption Changes
	July 1, 2010 Valuation	July 1, 2010 Valuation
Funded Ratio*		
1. Actuarial Value of Assets at July 1, 2010	$13.748	$13.748
2. Actuarial Liability as of July 1, 2010	30.323	34.372
3. Unfunded Accrued Liability (UAL) as of July 1, 2010	16.575	20.624
4. Funded Ratio at July 1, 2010: (1) / (2)	45.3%	40.0%
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1. Net Normal Cost	$0.541	$0.623
2. Past Service Cost (22 year amortization of UAL)	1.021	1.273
3. Interest on (1) + (2) to the end of the fiscal year	0.113	0.128
4. Total Town Cost for 2011-2012: (1) + (2) + (3)	1.675	2.024
5. Total Town Cost for 2011-2012 as a Percentage of Payroll	46.7%	56.5%
Annual Required Contribution for 2011-2012	1.675	2.024

* Note: The estimated impact on the July 1, 2010 funded ratio and Annual Required Contribution for 2011-2012 is for illustrative purposes only. We understand that any adopted changes in the actuarial assumptions would first be required to be included in the July 1, 2012 actuarial valuation (which develops the Annual Required Contribution for 2013-2014).

SECTION II
ECONOMIC ASSUMPTIONS

A. OVERVIEW OF ECONOMIC ASSUMPTIONS

Actuarial Standard of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*, provides guidance to actuaries on selecting economic assumptions for measuring obligations under defined benefit plans. Because no one knows what the future holds, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes. These estimates are based on a mixture of past experience, future expectations, and professional judgment. The actuary should consider a number of factors, including the purpose and nature of the measurement, and appropriate recent and long-term historical economic data. However, the Standard explicitly advises the actuary not to give undue weight to recent experience.

Recognizing that there is not one "right answer", the Standard calls for the actuary to develop a best estimate range for each economic assumption, and then recommend a specific point within that range. Each economic assumption should individually satisfy the Standard. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period.

In our opinion, the economic assumptions set forth in this report have been developed in accordance with ASOP No. 27.

The remainder of this section contains the study results for the following economic assumptions:

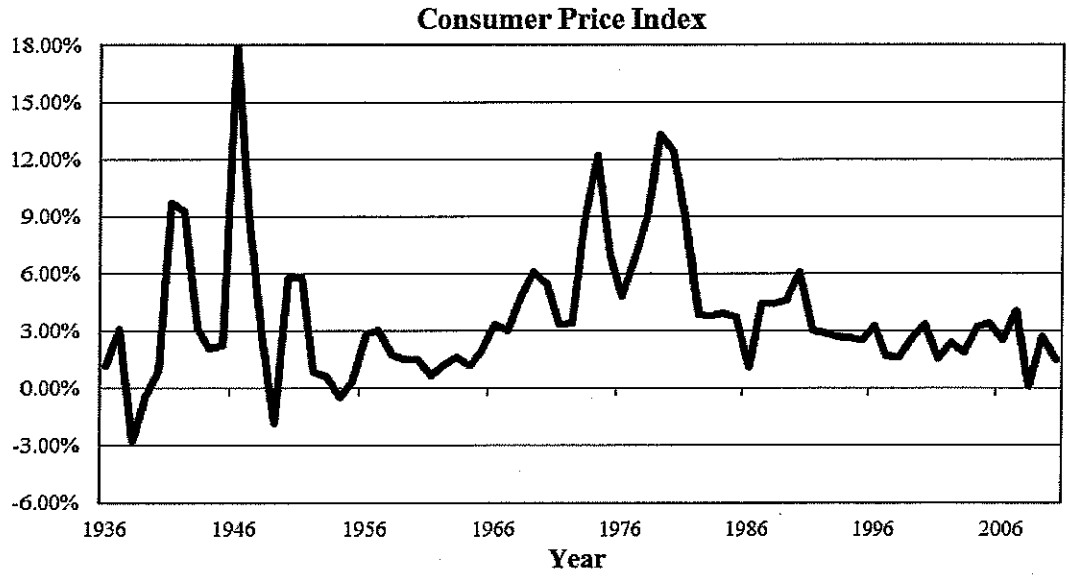
- Consumer Price Inflation (CPI)
- Salary Scale and Payroll Growth Rate
- Investment Return

SECTION II
ECONOMIC ASSUMPTIONS

B. CONSUMER PRICE INFLATION (CPI)

Use in the Valuation: Future price inflation has an indirect impact on the results of the actuarial valuation through the development of the assumptions for investment return, and salary scale.

The current assumption for price inflation is 3.00% per year.



Historical Perspective: We have used certain published economic statistics that have been accumulated on a monthly basis over the last 75 years. The data for price inflation is based on the Consumer Price Index, US City Average, All Urban Consumers (CPI). The data for periods ending in December of each year is shown graphically below.

There are numerous ways to review this data. The table below shows the compounded annual price inflation rate for various 10 year periods and for longer periods ended in December 2011. Standard Deviation is a measure of the extent to which inflation varied from the Mean, or average, for the period.

SECTION II
ECONOMIC ASSUMPTIONS

B. CONSUMER PRICE INFLATION (CPI)

Period	Mean	Standard Deviation
2001-2011	2.48%	1.07%
1991-2001	2.51%	0.64%
1981-1991	3.91%	1.20%
1971-1981	8.62%	3.11%
1961-1971	3.19%	1.68%
2001-2011	2.48%	1.07%
1991-2011	2.49%	0.88%
1981-2011	2.96%	1.20%
1971-2011	4.35%	3.10%
1961-2011	4.12%	2.91%
75 years	3.78%	3.50%
25 years	2.90%	1.21%

Many economists forecast that future price inflation will be lower than the current assumption of 3.00%, but they may be looking at shorter periods than are appropriate for a pension valuation. To find an economic forecast with a long enough time frame to suit our purpose, we looked at the expected increase in the CPI by the Office of the Chief Actuary for the Social Security Administration. In the 2011 Trustees Report, the projected average annual increase in the CPI over the next 30 years under the intermediate cost assumptions was 2.8%. The reasonable range was stated as 1.8% to 3.8%.

Reasonable Range and Recommendation: Based on the history over the last 75 years, and future expectations, we recommend that the long-term assumed price inflation rate be lowered from 3.00% to 2.75%. This rate will be used to build the net investment return and salary scale assumptions.

Consumer Price Inflation	
Current Assumption	3.00%
Reasonable Range	1.8% - 3.8%
Recommended Assumption	2.75%

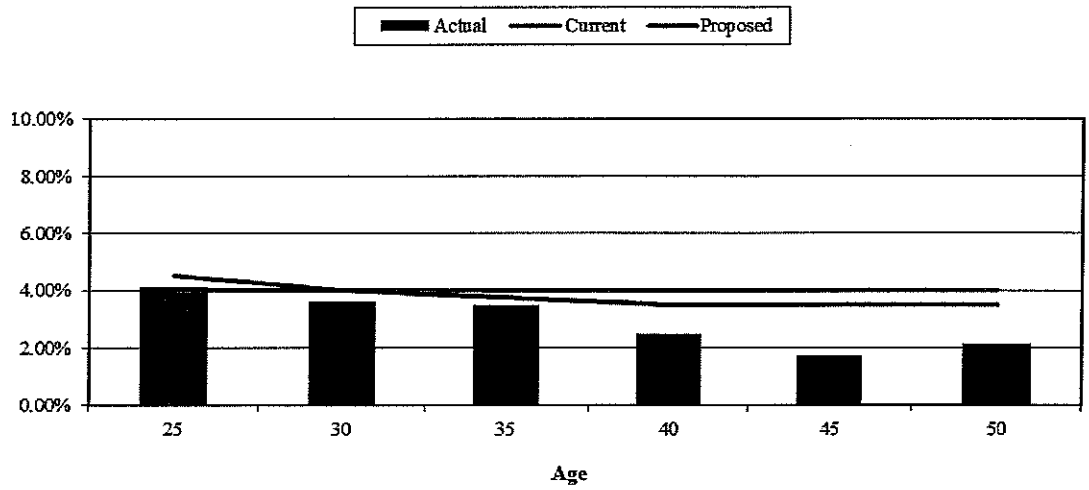
SECTION II
ECONOMIC ASSUMPTIONS

C. SALARY SCALE AND PAYROLL GROWTH RATE

Current Assumption: The current salary scale assumption is 4.00% per year.
The current payroll growth rate assumption is 4.00% per year.

Study Design: We looked at the impact of age on annual salary increases for each individual in our study. We segregated the experience into 5-year age groups (i.e. ages 23-27, 28-32, etc.) and then smoothed the raw experience data to develop the proposed salary scale assumption.

Results: The graphs below correspond to different 5-year age groups. Actual experience is shown in blue; the results predicted by the current assumption are shown in green, and the proposed assumptions are shown in red.



Salary Scale Recommendation: Move from a flat salary scale assumption to a graded salary scale assumption. Rates at younger ages are assumed to be greater than the current basis, while rates at older ages are assumed to be lower than the current basis. The recommended assumption is shown in the table below:

SECTION II
ECONOMIC ASSUMPTIONS

Age	Rate
25	4.50%
30	4.00
35	3.75
40	3.50
45	3.50
50	3.50

Payroll Growth Rate Recommendation: Change the payroll growth rate assumption to 3.50% per year. The proposed assumption is consistent with the "ultimate" proposed rate of salary increase, shown above.

SECTION II
ECONOMIC ASSUMPTIONS

D. INVESTMENT RETURN

Current Assumption: 7.25% (net of investment-related administrative expenses).

Recommendation: Lower the assumption to 6.75% (net of investment-related administrative expenses).

Basis for Recommendation

Based on the following analysis, we have developed the best estimate range for the assumption regarding the long-term annualized rate of return on Plan assets, net of investment-related fees.

Investment Return	
Current Assumption	7.25%
Best-Estimate Range	5.21% to 8.10%
Best-Estimate	6.67%
Recommended Assumption	6.75%

The investment return assumption is one of the primary determinants in the allocation of the expected cost of the Fund's benefits, providing a discount of the estimated future benefit payments to reflect the time value of money. The valuation investment return assumption should represent the expected long-term rate of return on the actuarial value of assets, considering the Fund's asset allocation policy, expected long-term real rates of return on specific asset classes, the underlying inflation rate and investment-related expenses.

ASOP No. 27 provides guidance to actuaries on selecting assumptions for measuring obligations under defined benefit pension plans. Because the future cannot be accurately predicted, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes. These estimates are based on a combination of past experience, future expectations, and professional judgment. The actuary should consider a number of factors including the purpose and nature of the measurement and appropriate recent and long-term historical economic data. However, ASOP No. 27 explicitly advises the actuary not to give undue weight to recent experience.
Recognizing that there is not one "right answer", ASOP No. 27 calls for the actuary to develop a best estimate range for each economic assumption and then recommend a

specific point within that range. Each economic assumption should individually satisfy this standard. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period.

The Fund's Investment Policy

The Fund's long-term rate of return on its investments will be mostly determined by its allocation to various asset classes. According to the Fund's Investment Policy Statement, the target asset allocation is composed of 23.1% domestic large cap equity, 5.0% domestic mid cap equity, 6.0% domestic small cap equity, 15.0% international equity, 6.0% emerging markets equity, 5.0% real estate securities (REITS), 33.9% intermediate-term fixed income, 3.0% high yield fixed income and 3.0% cash.

Domestic Large Cap Equity

We use the Dividend Discount Model to forecast the long-term return on large cap equity. According to this model, the expected annualized return on the equity market is the sum of long-term inflation, the current dividend yield (based on next year's expected dividend), and the expected long-term real growth rate in dividends.

Our long-term assumption for the annualized rate of inflation is 2.75%. This is based on the difference between current yields on long maturity treasury bonds and inflation-indexed treasury bonds at the end of December 2011.

The trailing dividend yield on the S&P 500 Index was 2.19% at the end of December 2011. We expect the real growth rate in dividends to match the real growth in corporate earnings which, in turn, should closely track, but not exceed, the real growth rate in GDP. The December 2011 issue of Blue Chip Financial Forecasts reports a consensus forecast for average U.S. real GDP growth of about 2.70% over the next 10 years. We use 2.40% as our forecast for the growth in real earnings and dividends. Therefore, the current dividend yield based on next year's expected dividend is 2.24% (2.19% x 1.024 = 2.24%). Adding the dividend growth rate to the yield gives us an expected real return of 4.64% (2.24% + 2.40% = 4.64%). Finally, we add (using geometric addition) expected inflation of 2.75% per year to adjust the real return to a nominal return. This leads to the expected annualized return for large cap equity of 7.52%.

$$(1 + 4.64\%) \times (1 + 2.75\%) - 1 = 7.52\%$$

We round this result to 7.50%.

SECTION II
ECONOMIC ASSUMPTIONS

Core Fixed Income

We assume that the yield to maturity of the Barclays Capital Aggregate Bond Index will move over the next five years from its current level to an expected level. The expected level is equal to the forecasted yield of long Treasury bonds in five years based on consensus forecasts (5.60%) plus the Aggregate's average historical yield spread to long Treasury bonds. Expected 30-year returns reflect the impact of this yield movement. The yield to maturity of the Barclays Capital Aggregate Bond Index was 2.24% at the end of December 2011. Its yield spread over long Treasury bonds has averaged -0.08% since 1990. Applying this process leads to an expected annualized yield of 5.52% in 5 years and an annualized return of 4.65% over the 30-year period.

Other Asset Classes

We use capital asset pricing theory to develop expected returns for other asset classes. The theory holds that the expected return for an asset class is based on its contribution to the risk of the total market portfolio containing all assets. Assets that bring high risk to the market portfolio have higher expected returns than assets that bring low risk. Risk is measured by covariance. The level of expected return associated with the amount of risk is calibrated by the expected returns developed above for large cap equity and core fixed income.

The expected returns for the portfolio's asset classes are shown in the tables below for the current policy asset mix. We show both the expected annualized rate of return and the expected arithmetic average return for each asset class and the total portfolio. The expected arithmetic average return for each asset class is a necessary input to determine the expected annualized return on the total portfolio. The expected arithmetic average return is the best estimate of the return in any single year, and is always higher than the expected annualized return. The annualized return over a multiple-year period is less than the arithmetic average return due to volatility and the process of compounding. The expected annualized rate of return is based on a 30-year horizon. We also show the expected standard deviation of annual returns for each asset class. The standard deviations and the correlations between each pair of assets (not shown) are estimated based on actual returns over the last 42 years (or longest time period available).

Asset Class	Policy Target Weight	Expected 30-Year Annualized Return	Expected Arithmetic Average Annual	Expected Annual Standard Deviation

SECTION II
ECONOMIC ASSUMPTIONS

			Return	
Domestic Large Cap Equity	23.1%	7.50%	8.90%	17.92%
Domestic Mid Cap Equity	5.0	7.50	9.59	22.05
Domestic Small Cap Equity	6.0	7.50	10.45	26.49
International Equity	15.0	7.50	9.34	20.65
Emerging Markets Equity	6.0	7.50	11.70	32.09
Real Estate (REITS)	5.0	7.00	8.65	19.45
Intermediate-Term Fixed Income	33.9	4.10	4.23	5.21
High Yield Fixed Income	3.0	6.75	7.31	11.15
Cash	3.0	3.15	3.16	1.58
Total Portfolio	100.0%	6.82%*	7.44%*	11.85%*

* The derivation of the portfolio's annualized rate of return and standard deviation are complicated and cannot be calculated by what is provided in the above table.

Our best estimate assumption for the long-term annualized rate of return on the Fund's policy portfolio is 6.82% before investment management fees. Our best estimate for the long-term **arithmetic** average return is 7.44% before investment management fees. We understand that a formal asset allocation study was prepared by Wells Fargo in February 2012. The results of that study showed an annual expected return of 7.8% over a 10 year time horizon. The allocation study report does not provide details about how the expected return of 7.8% was calculated. However, we believe that it was likely calculated based on a long-term **arithmetic** average return. Since the Fund's assets accumulate at the long-term **annualized** rate of return, this is the expected rate of return that should be used as the basis for selecting the investment return assumption, rather than the arithmetic average return.

Investment Management Fees

SECTION II
ECONOMIC ASSUMPTIONS

Most funds pay considerable fees to active investment managers. If active management fails to outperform an index fund by at least the amount of the difference between active management fees and index fund fees, the Fund always has the option to use index funds. So, over the long run, we would expect the Fund's long-term rate of return, net of fees, to be the same or higher than that which could be earned using index funds. For a Fund this size, index fees are estimated to be about 15 basis points, or 0.15%.

Our best estimate assumption for the long-term annualized rate of return on the Fund's policy portfolio is 6.67% after reflecting investment management fees. Our best estimate assumption for the long-term arithmetic average return on the Fund's policy portfolio is 7.29% after reflecting investment management fees.

Reasonable Range and Recommendation: Based on the ASOP No. 27 guidelines, we conclude that the reasonable range should be based on the expected nominal rates of return between the 25th and the 75th percentile projected out 75 years, less investment-related administrative expenses.

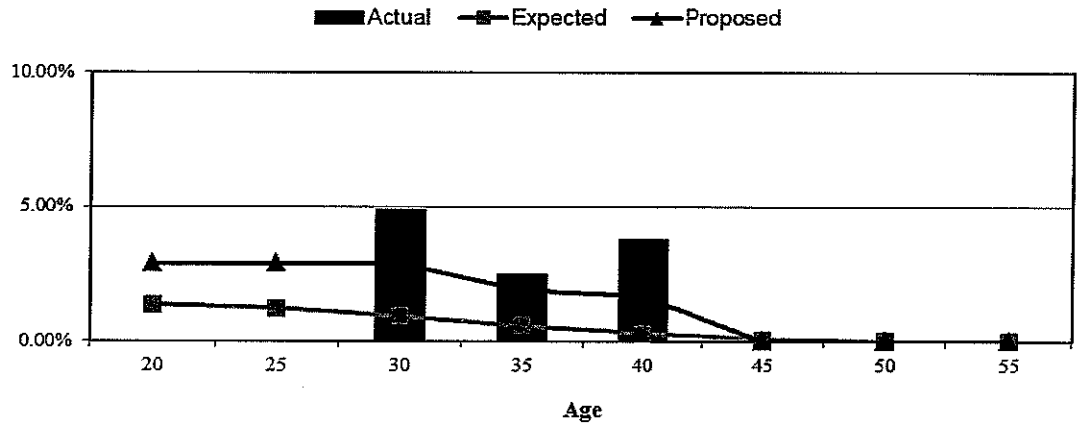
Investment Return	
Current Assumption	7.25%
Reasonable Range	5.21% - 8.10%
Recommended Assumption	6.75%

SECTION III
DEMOGRAPHIC ASSUMPTIONS

A. TURNOVER

Current Assumption: 25% of the Sarason T-1 Table

Results: We analyzed the data for 2006 through 2010 by age for each individual in our study. We combined the experience into 5-year age groups (i.e. ages 23-27, 28-32, etc.) and then smoothed the raw experience data to develop the proposed turnover assumption. Any turnover experience occurring at central ages of 55 and above was considered to be an "outlier" and was not used for purposes of developing the proposed turnover assumption. The graph below shows the results by age group. Actual experience is shown in blue. The results predicted by the current assumptions are shown in green, and the results predicted by the proposed assumptions are shown in red.



Recommended Assumption: We recommend modifying the turnover rates to better reflect plan experience as follows:

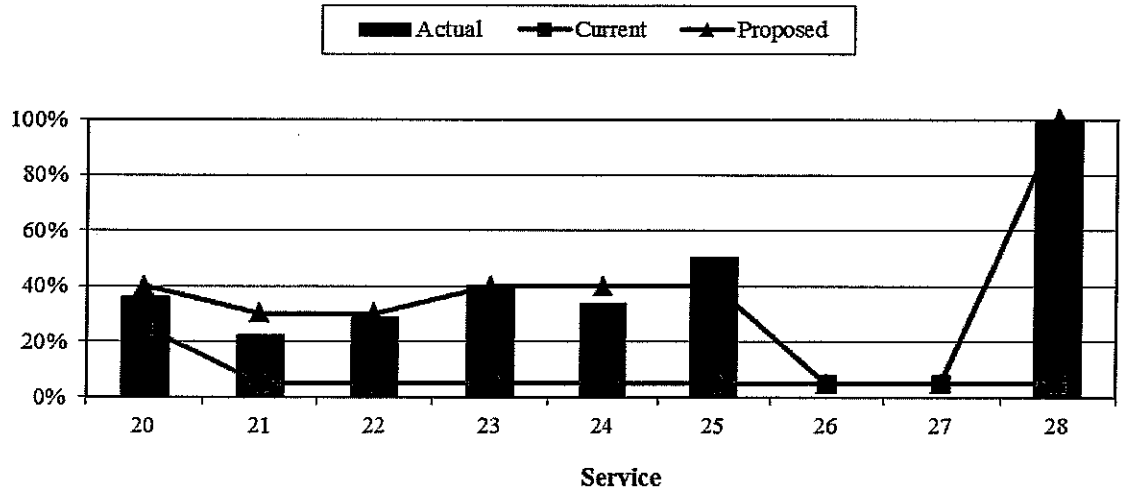
Age	Rate
20	2.9%
25	2.9
30	2.9
35	1.9
40	1.7
45+	0

SECTION III
DEMOGRAPHIC ASSUMPTIONS

B. RETIREMENT

Current Assumption: 25% of active members are assumed to retire on completion of 20 years of service; 5% retire at each age thereafter; 100% are assumed to have retired by age 55.

Study Design: We analyzed the data for 2006 through 2010 by age for each individual in our study. We smoothed the raw experience data to develop the proposed retirement assumption. The graph below shows the results by age group. Actual experience is shown in blue. The results predicted by the current assumptions are shown in green, and the results predicted by the proposed assumptions are shown in red.



SECTION III
DEMOGRAPHIC ASSUMPTIONS

Results and Recommended Assumption:

We recommend modifying the current assumptions to better reflect actual experience. The recommended rates are shown below:

Service	Rate
20	40%
21	30
22	30
23	40
24	40
25	40
26	5
27	5
28	100

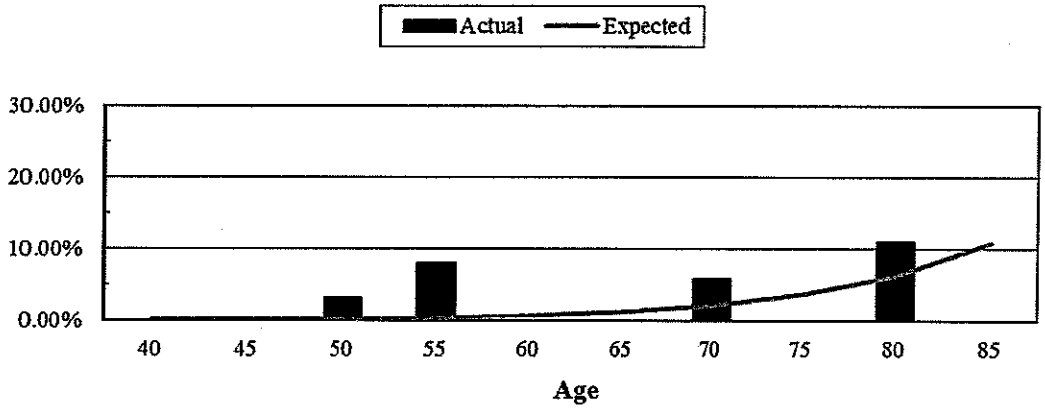
SECTION III
DEMOGRAPHIC ASSUMPTIONS

C. HEALTHY MORTALITY

Current Assumption: RP-2000 Combined Healthy Mortality Table, with separate male and female tables.

Study Design: We looked at the rates of mortality among retirees and beneficiaries.

Results: The graph below shows the actual rate of deaths during the study period along with the rate of deaths predicted by the current mortality table. Please note that the graph shows the rates of actual and expected deaths, not the number of deaths. Actual experience is shown in blue; the results predicted by the current assumptions are shown in green. The current assumptions are generally reasonable.



Recommended Assumption: The mortality table should provide a margin for future mortality improvement. The plan's population is not large enough to generate full credible mortality experience. Therefore, the mortality table should reflect a standard published table. We recommend that the mortality assumption continue to be the RP-2000 Combined Healthy Mortality Table, but with generational projection per Scale AA. The RP-2000 mortality table is the table recommended by the Society of Actuaries Retirement Plan Experience Committee (RPEC), and generational projection is consistent with the RPEC's recommendation that "pension valuations should take trends in long-term mortality improvement into account." We recommend continuing to use separate male and female tables.

SECTION III
DEMOGRAPHIC ASSUMPTIONS

D. DISABLED MORTALITY

Current Assumption: RP-2000 Disabled Mortality Table.

Study Design: We looked at the rates of mortality among disabled participants, for which there were none during the period.

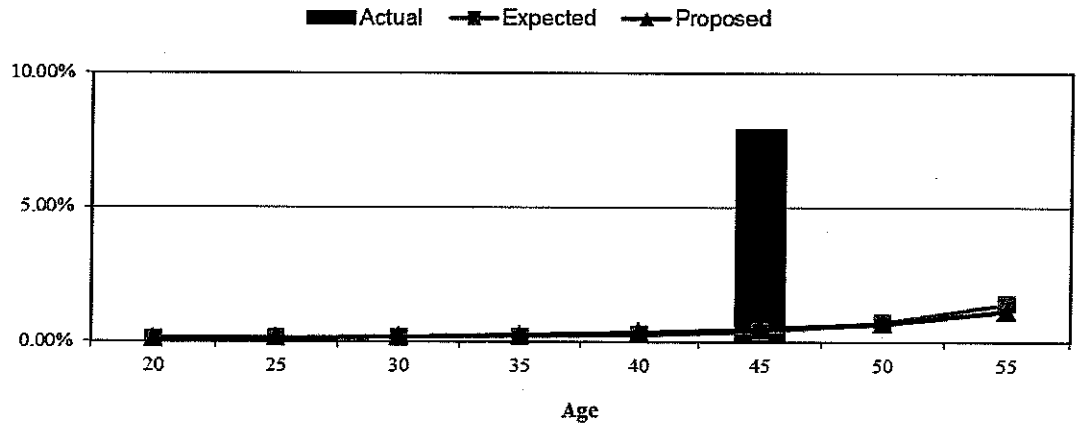
Results: We recommend continuation of the current assumption as credible experience does not exist that would suggest a change in this assumption.

SECTION III
DEMOGRAPHIC ASSUMPTIONS

E. DISABILITY

Current Assumption: The United Auto Workers Table. 50% of disabilities are assumed to be duty related.

Recommendation: We recommend moving to a more recent table as the plan's population is not large enough to generate fully credible disability experience. Therefore, the disability assumption should reflect a standard published table. We recommend that the disability assumption be updated to 50% of the 1985 Pension Disability Table (DP-85 Table) Class 4 rates, with 50% of disabilities assumed to be duty related.



SECTION III
DEMOGRAPHIC ASSUMPTIONS

F. PERCENT MARRIED

Current Assumption: 90% of men and 75% of women are assumed to be married, with wives four years younger than husbands.

Recommendation: Experience indicates that a lower percentage of retirees are married than under the current basis. We recommend changing this assumption to 70% of active members assumed to be married, with wives assumed to be one year younger than husbands.

SECTION IV
ACTUARIAL METHODS

A. ASSET VALUATION METHOD (ACTUARIAL VALUE)

Current Method: You are using a smoothing method which phases in recognition of the difference between the actual return on market value and the expected return on market value over a five-year period at 20% per year.

Recommendation: We recommend the continued use of this asset valuation method. It is a widely-used method for public sector pension plans and provides an excellent degree of smoothing of investment gains and losses.

SECTION IV
ACTUARIAL METHODS

B. ACTUARIAL COST METHOD

Current Method: The current method is the Entry Age Normal Cost Method. It is used in determining the contributions required for funding future benefits by determining two pieces: the Normal Cost of each individual's benefit accrued during the year and any prior service costs amortized over a 25 year period (starting July 1, 2007).

Recommendation: We recommend the continued use of this actuarial cost method. It is commonly used for public sector pension plans and is one of the acceptable methods under GASB 25/27.

APPENDIX

SELECTED ECONOMIC ASSUMPTIONS FROM THE 2011 OASDI TRUST FUNDS ANNUAL REPORT

112th Congress, 1st Session ---------- House Document 112-23

THE 2011 ANNUAL REPORT OF THE BOARD OF TRUSTEES OF THE FEDERAL OLD-AGE AND SURVIVORS INSURANCE AND FEDERAL DISABILITY INSURANCE TRUST FUNDS

COMMUNICATION

FROM

THE BOARD OF TRUSTEES, FEDERAL OLD-AGE AND SURVIVORS INSURANCE AND FEDERAL DISABILITY INSURANCE TRUST FUNDS

TRANSMITTING

THE 2011 ANNUAL REPORT OF THE BOARD OF TRUSTEES OF THE FEDERAL OLD-AGE AND SURVIVORS INSURANCE AND FEDERAL DISABILITY INSURANCE TRUST FUNDS

May 13, 2011.—Referred to the Committee on Ways and Means and ordered to be printed

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66-327 WASHINGTON: 2011

1.1 percentage points for 2020 and to average 1.2 percentage points for 2021 through 2085. For the low-cost assumptions, the real-wage differential is projected to average 3.3 percentage points for 2011 through 2013, 2.2 percentage points for 2014 through 2020, and 1.8 percentage points for 2021 through 2085. For the high-cost assumptions, the real-wage differential is projected to average 2.3 percentage points for 2011 through 2013, and then mostly decline to 0.6 percentage point by 2020, and to average 0.6 percentage point for 2021 through 2085.

Table V.B1.—Principal Economic Assumptions

	Annual percentage change[a] in—						
Calendar year	Productivity (Total U.S. economy)	Earnings as a percent of compensation	Average hours worked	GDP price index	Average annual wage in covered employment	Consumer Price Index	Real-wage differential[b]
Historical data:							
1960 to 1965....	3.2	-0.2	0.2	1.4	3.2	1.2	2.0
1965 to 1970....	2.0	-.4	-.7	4.1	5.8	4.2	1.6
1970 to 1975....	2.1	-.7	-.9	6.7	6.6	6.8	-.2
1975 to 1980....	.9	-.6	-.2	7.3	8.9	8.9	-.1
1980 to 1985....	1.7	-.3	.0	5.2	6.5	5.2	1.3
1985 to 1990....	1.3	.1	-.1	3.2	4.7	3.8	.9
1990 to 1995....	1.2	-.2	.4	2.5	3.6	3.0	.6
1995 to 2000....	2.3	.5	.1	1.7	5.3	2.4	2.9
2000 to 2005....	2.5	-.5	-.8	2.4	2.7	2.5	.2
2005 to 2010....	1.8	-.2	-.4	2.1	2.5	2.3	.2
2000	2.7	.1	-1.1	2.2	6.1	3.5	2.6
2001	2.4	-.5	-1.3	2.3	2.0	2.7	-.7
2002	3.2	-1.1	-1.0	1.6	.7	1.4	-.7
2003	3.0	-1.3	-1.5	2.2	2.6	2.2	.3
2004	2.4	.7	.0	2.8	4.7	2.6	2.1
2005	1.5	-.4	-.2	3.3	3.7	3.5	.2
2006	.8	.5	.0	3.3	4.6	3.2	1.4
2007	1.2	.4	-.4	2.9	4.7	2.9	1.8
2008	1.1	-.4	-.7	2.2	2.3	4.1	-1.8
2009	2.9	-1.2	-1.8	.9	-1.8	-.7	-1.2
2010[c]	2.7	-.1	.7	1.0	2.9	2.1	.8
Intermediate:							
2011	1.7	.2	.2	1.2	4.1	1.2	2.9
2012	2.0	.2	.0	1.3	4.5	1.7	2.9
2013	2.0	.0	.0	1.5	4.6	1.9	2.7
2014	1.9	-.3	.0	1.6	4.2	2.0	2.2
2015	1.7	-.3	.0	1.6	3.9	2.0	1.9
2016	1.5	.0	.0	1.6	4.0	2.0	2.0
2017	1.5	.0	.0	1.8	4.0	2.2	1.8
2018	1.6	.2	.0	2.2	4.4	2.6	1.8
2019	1.6	.0	.0	2.4	4.2	2.8	1.4
2020	1.6	-.1	.0	2.4	3.9	2.8	1.1
2020 to 2025....	1.7	-.1	.0	2.4	3.9	2.8	1.1
2025 to 2085....	1.7	-.1	.0	2.4	4.0	2.8	1.2

Table V.B1.—Principal Economic Assumptions (Cont.)

Calendar year	Annual percentage change[a] in— Productivity (Total U.S. economy)	Earnings as a percent of compensation	Average hours worked	GDP price index	Average annual wage in covered employment	Consumer Price Index	Real-wage differential[b]
Low-cost:							
2011	1.8	0.2	0.3	1.2	4.4	1.1	3.2
2012	2.2	.2	.1	.9	4.5	1.1	3.4
2013	2.2	.0	.1	1.0	4.5	1.3	3.3
2014	1.8	-.2	.1	1.1	3.9	1.4	2.5
2015	1.6	-.3	.1	1.2	3.6	1.5	2.2
2016	1.6	.0	.1	1.3	3.8	1.6	2.2
2017	1.8	.1	.1	1.4	3.9	1.7	2.2
2018	1.9	.2	.1	1.5	4.0	1.8	2.3
2019	1.9	.0	.1	1.5	3.8	1.8	2.0
2020	1.9	.0	.1	1.5	3.5	1.8	1.7
2020 to 2025	2.0	.0	.1	1.5	3.5	1.8	1.7
2025 to 2085	2.0	.0	.1	1.5	3.6	1.8	1.8
High-cost:							
2011	1.3	.2	.1	1.5	3.8	1.6	2.2
2012	1.9	.2	-.1	1.9	4.8	2.4	2.5
2013	1.9	.0	-.1	2.3	5.1	2.8	2.3
2014	1.7	-.3	-.1	2.5	4.8	3.0	1.8
2015	1.7	-.4	-.1	2.7	4.9	3.2	1.7
2016	1.6	-.1	-.1	2.7	5.1	3.2	1.9
2017	1.4	-.1	-.1	2.9	4.9	3.4	1.5
2018	1.3	.1	-.1	3.1	4.8	3.6	1.2
2019	1.3	-.1	-.1	3.3	4.7	3.8	.9
2020	1.4	-.2	-.1	3.3	4.4	3.8	.6
2020 to 2025	1.4	-.2	-.1	3.3	4.3	3.8	.5
2025 to 2085	1.4	-.2	-.1	3.3	4.4	3.8	.6

[a] For rows with a single year listed, the value is the annual percentage change from the prior year. For rows with a range of years listed, the value is the compound average annual percentage change.

[b] For rows with a single year listed, the value is the annual percentage change in the average annual wage in covered employment less the annual percentage change in the Consumer Price Index. For rows with a range of years listed, the value is the average of annual values of the differential. Values are rounded after all computations.

[c] Historical data are not available for the full year. Estimated values vary slightly by alternative and are shown for the intermediate assumptions.

5. Labor Force and Unemployment Projections

The civilian labor force is projected by age, sex, marital status, and presence of children. Projections of the labor force participation rates for each group take into account disability prevalence, educational attainment, the average level of Social Security retirement benefits, the state of the economy, and the change in life expectancy. The projections also include a "cohort effect" that applies differences in participation rates for a cohort at a specific age, relative to earlier cohorts at the same age, to participation rates for that cohort at older ages.

The annual rate of growth in the labor force decreased from an average of about 2.1 percent during the 1970s and 1980s to about 1.1 percent from 1990