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Town of Cumberland, RI
Police Retirement Plan

Experience Study
July 1, 2009 - July 1, 2014

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I. Objectives and Process

The primary objectives of this study are to measure the recent experience of the Town of Cumberland, RI Police Retirement Plan, recommend a new set of actuarial assumptions to be used starting with the 7/1/2015 valuation, and measure the impact on the plan's liabilities of changing to this new set of assumptions.

We gathered data from valuations spanning 7/1/2009 through 7/1/2014. After gathering the six necessary census files, we measured the experience for each of the five years individually. For instance, we determined the withdrawal rates during the period 7/1/2009 – 7/1/2010 by checking to see which members on the 7/1/2009 active file did not appear on the 7/1/2010 active file.

Each of the assumptions analyzed could potentially vary by age or service. We initially looked to see if the structure of the tables in effect during the 7/1/2009 through 7/1/2014 period made sense. Did termination rates really differ by age? Did pay increases follow a more predictable pattern when broken down by age or by service?

In addition, as of July 1, 2013, a number of changes were made to the plan provisions and assumptions of the Town of Cumberland, RI Police Retirement Plan. As we have not yet had the opportunity to analyze experience relating to this new set of assumptions, and given that our experience from 7/1/2009 through 7/1/2014 has been under a different set of assumptions, we are recommending few changes for the upcoming valuation.

We charted both the current assumption where applicable, the assumption in effect during the 7/1/2009 through 7/1/2014 period, and the recent actual experience. Based on this analysis, we are recommending a change to the annual pay increase assumption.

The other change we recommend relates to the mortality table used for the valuation. In 2014, the Society of Actuaries (SOA) released a more up-to-date mortality table which took into account more recent experience than the mortality table and projection scale used in the most recent valuation. Given the mortality improvement shown in the study

I. Objectives and Process - *Continued*

by the SOA, we would recommend updating the mortality tables to those based on this new table, RP-2014 with blue collar adjustments and Social Security improvements from 2006.

There are a few key points to note:

- **Past experience doesn't necessarily predict future outcomes.** This is most often seen or heard in the investment arena. Just because employees behave a certain way over the past, doesn't mean their behavior will continue unchanged. Outside factors often have a significant impact on behavior.

- **Only a small number of exposures were present in this study.** To obtain credible and valid conclusions from a study such as this, large amounts of exposures or lives are required. The Town of Cumberland does not contain enough exposures for the results of this study to be highly credible. Thus, these results should be viewed with a lens that still focuses very much on the expectation of the Town and not just solely on the results of this study.

- **Plan provisions remained unchanged.** None of the results of this study have any impact on the actual benefits that will be paid out to participants. This study only deals with the underlying actuarial assumptions and thus only affects the timing of the contributions to the plan.

The actual assumptions that were reviewed are in the following list:

- **Economic**
  - Investment return
  - Investment expenses
  - Annual pay increases
  - Annual rate of inflation
  - Annual cost of living adjustments (COLA)

II. Objectives and Process – *Continued*

- **Demographic**
  - Rates of retirement
  - Rates of withdrawal
  - Rates of disability
  - Rates of mortality
  - Percentage of participants married

Please note, that not every assumption in this list was examined historically. There are a variety of reasons for not doing so, including materiality in the valuation, lack of historical data, and/or lack of exposures for analysis.

II. Certification

This report is prepared for the primary purposes of measuring the recent experience of The Town of Cumberland, RI Police Retirement Plan and recommending reasonable actuarial assumptions used in determining the annual funding requirements.

The information presented in this report is based on the information furnished to us by the Plan Administrator. In our opinion, the assumptions recommended are reasonable and represent a reasonable expectation of future experience under the plan. All calculations have been made in accordance with generally accepted actuarial principles and practice.

To our knowledge there have been no significant events prior to the current year's measurement date or as of the date of this report which could materially affect the results contained herein.

Neither Nyhart nor any of its employees have any relationship with the plan or its sponsor which could impair or appear to impair the objectivity of this report.

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March 31, 2015
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III. Economic Assumptions

A. Investment Return

The assumption that has the largest impact on the measurement of pension liabilities is the interest rate used to discount benefit liabilities. The interest rate should be set at the expected long-term rate of return of the pension assets. Historical asset returns for the pension trust are only available to us from the time period 7/1/2001 through 6/20/2014 at the time of this analysis. Those results are summarized on the next page. You will note that this information was only available over the past 13 years, and therefore we would not recommend using the table below as the standard for setting a long-term return assumption.

In addition, we communicated with the trustee, Washington Trust Investors, regarding the long-term expected rate of return based on the most recent plan allocation. As of 6/30/2014, the long-term expected rate of return for the Town of Cumberland, RI Police Retirement Plan trust is 7.43%. The long-term expected rate of return is based on the neutral target asset allocation and long-term return assumptions for each asset class. The table below indicates the targets and assumptions provided by Washington Trust Investors.

	Target Allocation	Expected Return
Fixed Income	40.00%	4.25%
Domestic Equity	54.00%	9.50%
International Equity	6.00%	10.00%
Cash	0.00%	2.25%

The current interest rate assumption is 7.50%. This assumption was just lowered as of 7/1/2013, and we are not aware of any changes that would require it to be lowered again as of 7/1/2015. Based on the asset allocation and long-term expected rate of return for the Town of Cumberland, RI Police Retirement Plan trust and future expectations of market returns, we are recommending that the interest rate assumption be unchanged at 7.50%.

III. Economic Assumptions - *Continued*

Plan Year Beginning	Market Value Return	Actuarial Value Return
2013	12.5%	10.3%
2012	10.9%	5.4%
2011	3.0%	2.6%
2010	19.2%	2.8%
2009	9.0%	4.0%
2008	-10.5%	-4.3%
2007	-3.6%	1.8%
2006	10.7%	2.5%
2005	4.0%	0.6%
2004	-10.7%	-0.5%
2003	5.6%	3.0%
2002	0.6%	3.5%
2001	-4.9%	N/A
Total	3.1%	2.6%

B. Investment Expenses

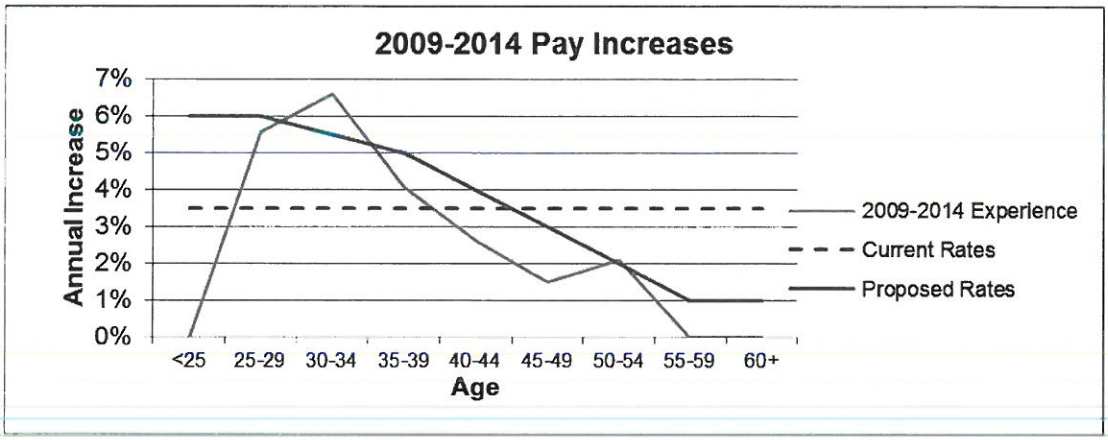
The current assumptions use a discount rate that is net of all expenses, both administrative and investment expenses. As such, there is no assumption for investment expenses. Based on this current policy, there is no need for a historical analysis of the investment expenses. The plan will continue to operate using a net of expenses investment return assumption.

C. Annual Pay Increases

To examine the historical experience of pay increases, data from 2009 to 2014 was studied. The data was charted separately for age and service. The current pay increase assumption is 3.5%, regardless of age or service. Based on the experience studied and future expectations, we are recommending that the pay increase assumption be updated to a graded scale based on age. The following two pages show the results of the pay increase analysis charted by age and service separately. Please see the Appendix for a detailed description of the data.

III. Economic Assumptions - *Continued*

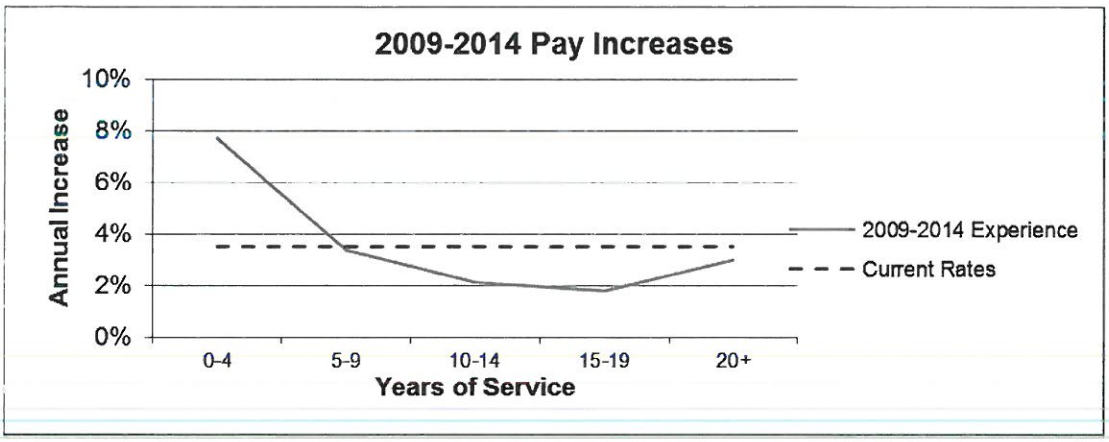
Pay Increases by Age



Age	2009-2014 Experience	Current Rates	Proposed Rates
<25	0.00%	3.50%	6.00%
25-29	5.55%	3.50%	6.00%
30-34	6.61%	3.50%	5.50%
35-39	4.05%	3.50%	5.00%
40-44	2.62%	3.50%	4.00%
45-49	1.51%	3.50%	3.00%
50-54	2.10%	3.50%	2.00%
55-59	0.00%	3.50%	1.00%
60+	0.00%	3.50%	1.00%
Total	3.67%	N/A	N/A

III. Economic Assumptions - *Continued*

Pay Increases by Service



Service	2009-2014 Experience	Current Rates
0-4	7.70%	3.50%
5-9	3.37%	3.50%
10-14	2.14%	3.50%
15-19	1.82%	3.50%
20+	2.97%	3.50%
Total	3.67%	N/A

D. Annual Rate of Inflation

The annual rate of inflation assumption is not used directly in any of the actuarial valuation procedures. There is, however, an implied rate of inflation that is found in the assumed wage growth, expected return on assets, and the annual cost of living adjustment. As these rates are all remaining unchanged, the implied assumption for inflation will remain unchanged also. It is important to ensure that these assumptions all fit together and achieve the same implied inflation rate. At the proposed levels of these assumptions, the implied inflation rate is consistent.

III. Economic Assumptions - *Continued*

E. Annual Cost of Living Adjustments (COLA)

The COLA currently applies as follows:

- 3% non-compounded from age 57 for retirement on or after July 1, 1992.
- No COLA for retirement before July 1, 1992

Since the standard COLA does not vary from year to year, the assumption should match the actual COLA that will be received. As such, we are recommending that the 3% COLA assumption remain unchanged from the July 1, 2014 valuation.

IV. Demographic Assumptions

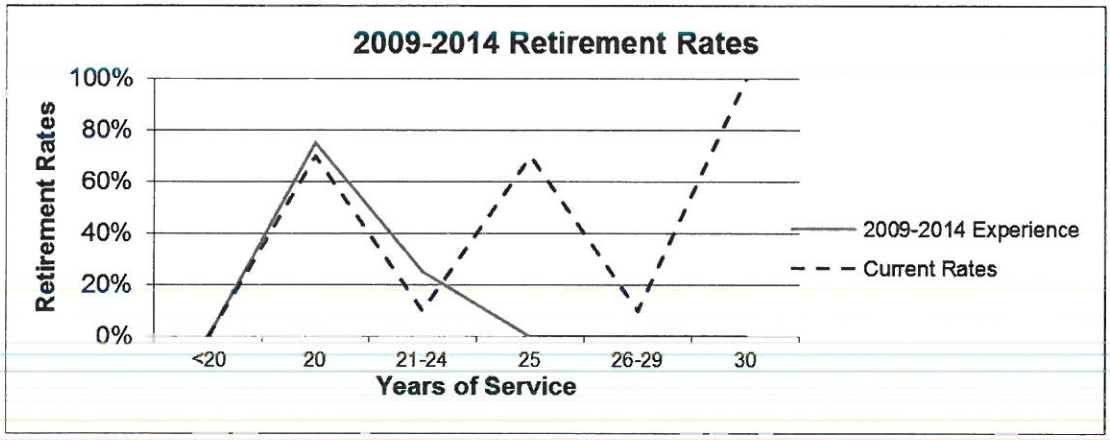
A. Rates of Retirement

Retirements over the period 2009-2014 were examined based on service. After evaluating the data, there was not enough data to credibly determine retirement rates based on age or service. In addition, retirement eligibility was changed for new hires as of the July 1, 2013 valuation to be 100% at age 55 with 25 years of service. As we have not had the opportunity to compare experience to the new assumptions, we would not recommend making any changes to the current retirement rates based on this analysis.

Due to the small number of exposures in the data and in light of the changes implemented at the July 1, 2013 valuation, we do not recommend making any changes to the current retirement rates based on this analysis.

IV. Demographic Assumptions - *Continued*

Retirement - by Service



Service	2009-2014 Experience	Current Rates*
<20	0.00%	0.00%
20	75.00%	70.00%
21-24	25.00%	10.00%
25	0.00%	70.00%
26-29	0.00%	10.00%
30	0.00%	100.00%
Total	65.00%	N/A

**This analysis does not include any retirements for participants who were hired after 7/1/2013. Therefore, the new retirement assumption for officers hired after 7/1/2013 was not examined.*

IV. Demographic Assumptions - *Continued*

B. Rates of Withdrawal

Withdrawal or termination rates were also studied. This assumption is applicable to people that are not yet eligible to retire. The assumption forecasts the rates at which people will leave prior to becoming eligible for retirement. Again, data from 2009 to 2014 was studied.

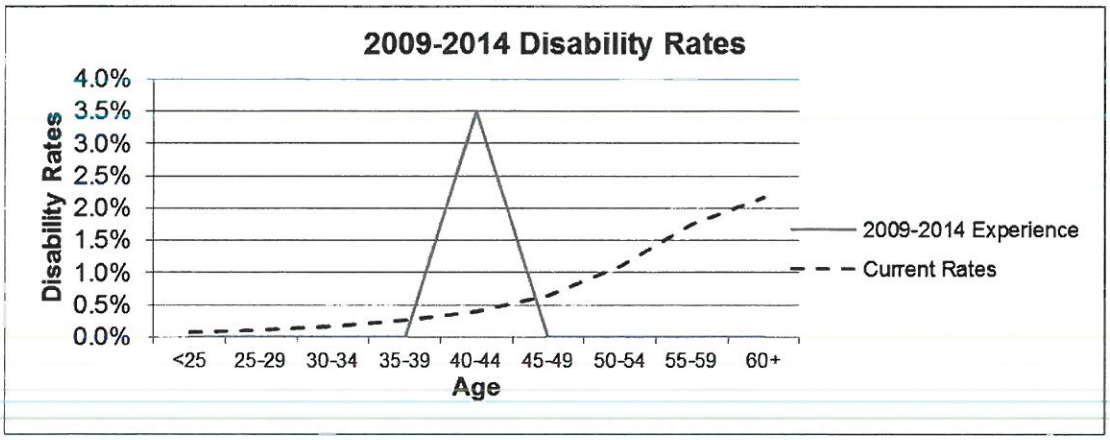
The current assumed termination rate is zero. The experience studied indicates that there were no terminations between 2009 and 2014. This is consistent with our experience working with other public safety pension plans. Due to the small number of exposures in the data, we recommend making no changes to the current termination rates.

C. Rates of Disability

The current disability rates come from the 1985 Pension Disability Table. All Disability is assumed to be Duty related. After evaluating the data, there was not enough data to credibly determine disability rates. Therefore, we recommend making no changes to the current rates of disability. The following page show the results of the disability analysis by age.

IV. Demographic Assumptions - *Continued*

Disability Rates - by Age



Age	2009-2014 Experience	Current Rates
<25	0.00%	0.07%
25-29	0.00%	0.12%
30-34	0.00%	0.18%
35-39	0.00%	0.26%
40-44	3.51%	0.40%
45-49	0.00%	0.64%
50-54	0.00%	1.10%
55-59	0.00%	1.74%
60+	0.00%	2.17%
Total	0.91%	N/A

IV. Demographic Assumptions - *Continued*

D. Rates of Mortality

Mortality is one of the most important assumptions made in an actuarial valuation. It has a very large impact on the overall plan liability and the annual contribution requirements. In order to perform an actual experience study on mortality, an extremely large number of exposures is required. Only a select few plans have enough participants to be able to do such a study. The Town of Cumberland plan is not one of those plans. In light of this fact, we did not complete an experience study on the plan regarding mortality. The current assumption is the RP-2000 table with generational improvements per scale AA.

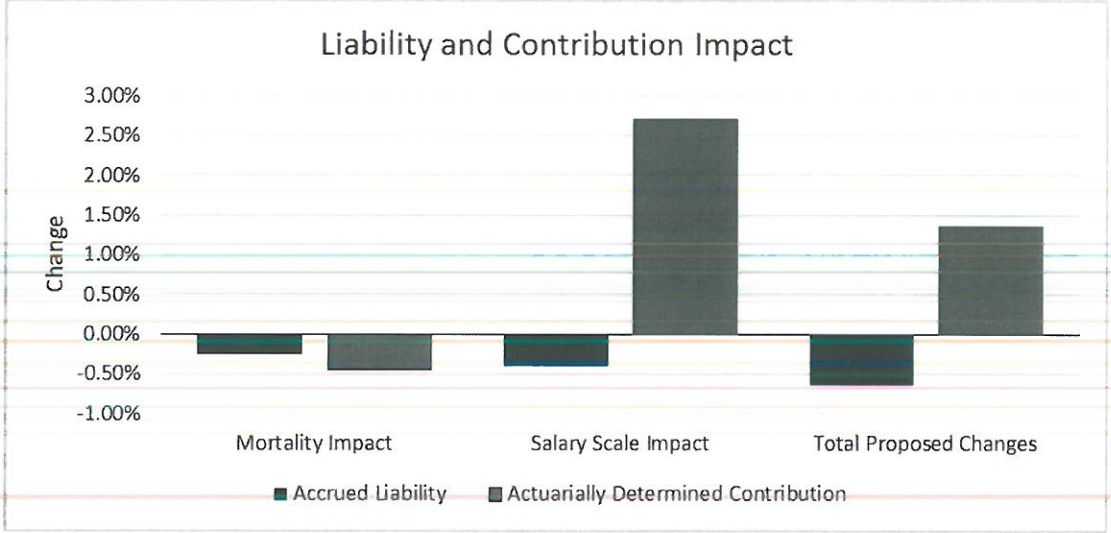
At the time of the previous experience study for this plan, these tables were the most up-to-date mortality tables available. However, recently the Society of Actuaries has released a new table entitled RP-2014 which studied mortality over a much more recent time period 2004-2008. As this table is more up-to-date, we analyzed the impact of switching from the tables mentioned above to RP-2014 table with blue collar adjustments and Social Security improvements from 2006.The results are shown in Section V "Liability Analysis".

E. Percentage of Participants Married

Typically, the percentage married assumption has little impact on the results of the valuation. When the normal form of benefit is determined as a life annuity, the liability is based on only the participant's lifetime. Currently, it is assumed that 100% of participants are married with female spouses four years younger than husbands. We recommend making no changes to this assumption.

V. Liability Analysis

The changes recommended earlier were examined to determine the impact on both the plan liability and contribution amount. These changes are all analyzed on the most recently completed valuation, the July 1, 2014 valuation. The results of the liability analysis are shown below.



	2014 Valuation	Mortality Impact	Salary Scale Impact	Total Proposed Changes *
Accrued Liability	$31,046,330	($79,798)	($120,916)	$30,846,660
% Change		-0.26%	-0.39%	-0.64%
Actuarially Determined Contribution	$1,997,828	($8,883)	$54,002	$2,025,014
% Change		-0.44%	2.70%	1.36%

Implementing these changes will result in a non-material impact to the plan's overall liability. However, there is a slight increase in the annual cost due to the role the salary scale assumption plays in determining the normal cost. These changes will need to be discussed with the pension board.

**Changes are not necessarily additive due to interaction between the assumptions*

VI. APPENDIX

Pay Increase Data

Age	2009-2010 Experience	2010-2011 Experience	2011-2012 Experience	2012-2013 Experience	2013-2014 Experience	2009-2014 Total Experience
<25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
25-29	-3.33%	-4.78%	12.82%	20.99%	6.30%	5.55%
30-34	6.19%	-1.00%	13.21%	6.20%	5.79%	6.61%
35-39	12.32%	-2.36%	6.02%	0.75%	4.04%	4.05%
40-44	7.30%	-3.28%	3.54%	1.53%	4.06%	2.62%
45-49	5.42%	-2.78%	2.19%	1.71%	2.85%	1.51%
50-54	-2.74%	0.00%	4.51%	1.25%	6.72%	2.10%
55-59	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
60+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	5.65%	-2.83%	6.45%	4.79%	4.73%	3.67%

Service	2009-2010 Experience	2010-2011 Experience	2011-2012 Experience	2012-2013 Experience	2013-2014 Experience	2009-2014 Total Experience
0-4	4.46%	-3.99%	17.23%	12.31%	6.38%	7.70%
5-9	9.63%	-2.96%	2.79%	4.04%	1.53%	3.37%
10-14	4.61%	-2.07%	4.10%	0.79%	3.84%	2.14%
15-19	3.76%	-2.57%	2.80%	0.86%	4.48%	1.82%
20+	11.37%	-3.41%	5.06%	0.00%	0.00%	2.97%
Total	5.65%	-2.83%	6.45%	4.79%	4.73%	3.67%

Retirement Data

Service	2009-2010 Experience	2010-2011 Experience	2011-2012 Experience	2012-2013 Experience	2013-2014 Experience	2009-2014 Total Experience
<20	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
20	50.00%	80.00%	0.00%	100.00%	100.00%	75.00%
21-24	50.00%	0.00%	0.00%	0.00%	0.00%	25.00%
25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
26-29	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
30	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	50.00%	57.14%	0.00%	100.00%	100.00%	65.00%

Withdrawal Data

Service	2009-2010 Experience	2010-2011 Experience	2011-2012 Experience	2012-2013 Experience	2013-2014 Experience	2009-2014 Total Experience
<20	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
20	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
21-24	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
26-29	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
30	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Disability Data

Age	2009-2010 Experience	2010-2011 Experience	2011-2012 Experience	2012-2013 Experience	2013-2014 Experience	2009-2014 Total Experience
<25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
25-29	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
30-34	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
35-39	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
40-44	11.11%	0.00%	0.00%	0.00%	0.00%	3.51%
45-49	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
50-54	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
55-59	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
60+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	4.35%	0.00%	0.00%	0.00%	0.00%	0.91%