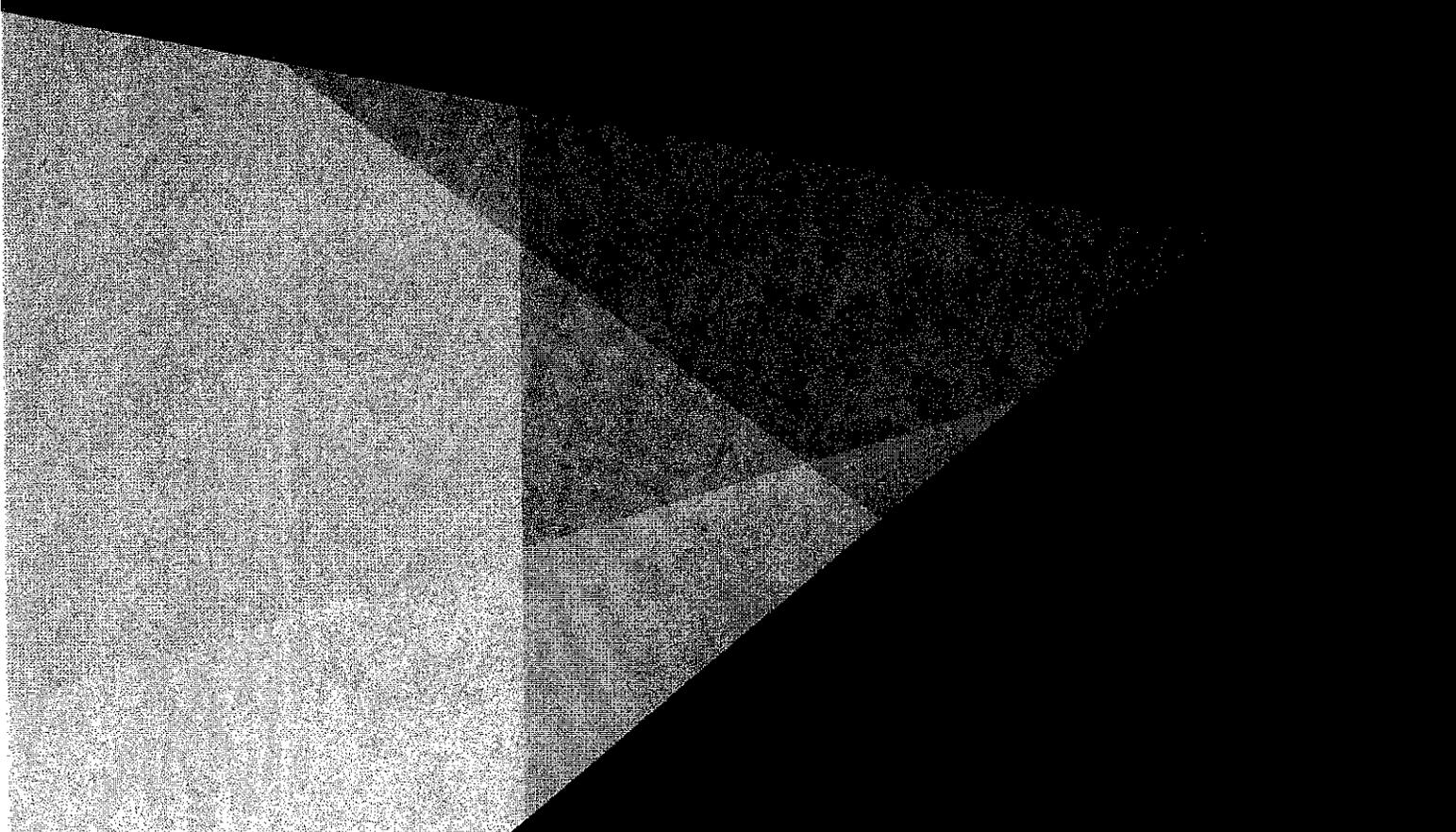




# Pension Plan of Town of West Warwick



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# Objectives and Process

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The primary objectives of this study are to measure the recent experience of the Pension Plan of Town of West Warwick, recommend, as appropriate, a new set of actuarial assumptions to be used starting with the 7/1/2018 valuation, and measure the impact on the plan's liabilities of changing to this new set of assumptions.

We analyzed data from valuations spanning 7/1/2010 through 7/1/2017. After utilizing our past valuation data as the 8 necessary census files, we measured the experience for each of the 7 years individually. For instance, we determined the withdrawal rates during the period 7/1/2016 – 7/1/2017 by checking to see which members on the 7/1/2016 active file did not appear on the 7/1/2017 active file.

Each of the demographic assumptions analyzed could potentially vary by age or service. We initially looked to see if the structure of the current tables 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? We ultimately concluded that the structures of the current tables were appropriate.

Once satisfied with the structure of the tables, we charted both the current assumption and the recent actual experience.

Finally, we measured the impact on the plan's liabilities of reflecting the recommended assumptions.

There are a few key points to note:

- **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 deals only with the underlying actuarial assumptions and thus only affects the levels and timing of the contributions to the plan.
- **Only a small number of exposures were present in this study.** Since the plan did not experience large amounts of exposures or lives for some of the assumptions (mortality, disability, e.g.), recommendations were developed based on the combination of observable results, past studies, and expectations of the Pension Fund, and not just solely on the results of this study.

# Objectives and Process

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

The actual assumptions that were reviewed are:

- **Economic**
  - Investment return
  - Investment & non-investment expenses
  - Annual rate of inflation
  - Annual pay increases
  - Annual cost of living adjustments (COLAs)
- **Demographic**
  - Rates of retirement
  - Rates of withdrawal
  - Rates of disability
  - Rates of mortality
  - Marital status
  - Age difference of spouses

# Certification

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This report is prepared for the primary purposes of measuring the recent experience of the Pension Plan of Town of West Warwick and recommending reasonable actuarial assumptions to be used in determining the annual funding requirements.

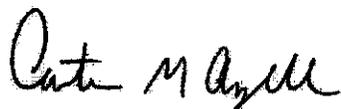
The information presented in this report is based on the information furnished to us by the prior actuary and the Plan Administrator and used in our annual valuations. In our opinion, the assumptions recommended are reasonable and represent a reasonable expectation of future experience under the Pension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

This report has been prepared in order to comply with Rhode Island legislation (specifically, 2011-H6319) that states in Section 45-65-6(1) that "actuarial experience studies must be submitted to the study commission no less frequently than once every three (3) years". The last experience study was issued March 31, 2015.

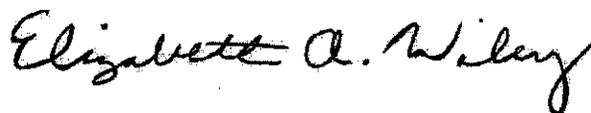
To our knowledge there have been no significant events prior to the current year's measurement date or as of the date of this report which could materially affect the results contained herein.

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.

## Nyhart



Carter M. Angell, FSA, EA, MAAA



Elizabeth A. Wiley, ASA, EA

**March 30, 2018**

Date

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# Cost Impact of Recommendations

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Actuarial assumptions are intended to be reasonable individually and in the aggregate in order to provide reasonable estimates of the future annual costs of the Pension Fund. Periodic experience studies and annual gain/loss analyses are necessary to ensure such reasonableness, and refinements are suggested when the experience of the plan diverges from those assumptions. Upon review of the experience for the Pension Plan for Town of West Warwick, we do not recommend any changes to the current assumptions. Plan experience has not diverged significantly from the assumptions and has limited reliability given the small number of exposures. Assumption changes are generally considered annually if there have been any significant changes in the plan provisions themselves or in the current and recent market environment.

# Economic Assumptions

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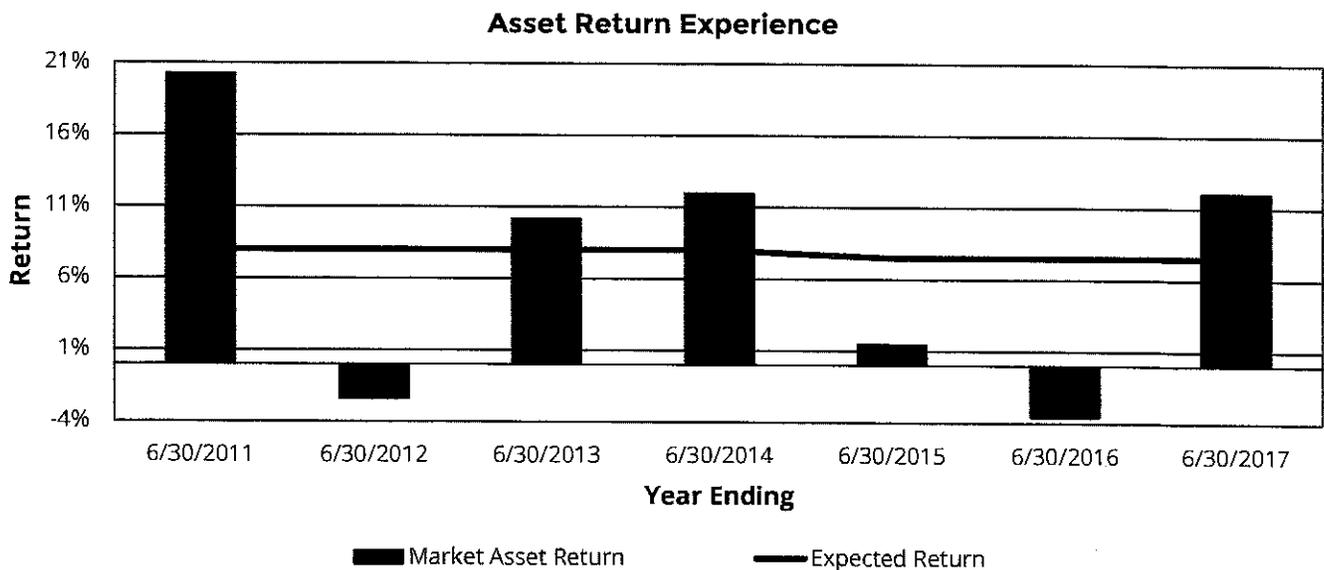
## A. Investment Return

The assumption that has the largest impact on pension liabilities is the interest rate used to discount benefit liabilities. The interest rate should be set at the expected long-term (20+ years) rate of return of the pension assets. Our review of this assumption consists of the following:

### Historical review

The graph and table below shows historical rates of return on the market value of assets since 2011. While historical performance doesn't guarantee future returns, it is useful for seeing overall trends. The 7-year average based on the market value rate of return for the period ending June 30, 2017 is 6.81%, which is below the expected return used for the valuation.

The market value rate of return is based on annual market values with adjustments for cash inflows and outflows. The expected return shows the investment return assumption used. Please note that the expected return assumption dropped by 50 basis points from 8.00% to 7.50% beginning with the plan year starting July 1, 2013. This decrease was recognized immediately for the investment return assumption, but was smoothed over five years for funding purposes.



# Economic Assumptions

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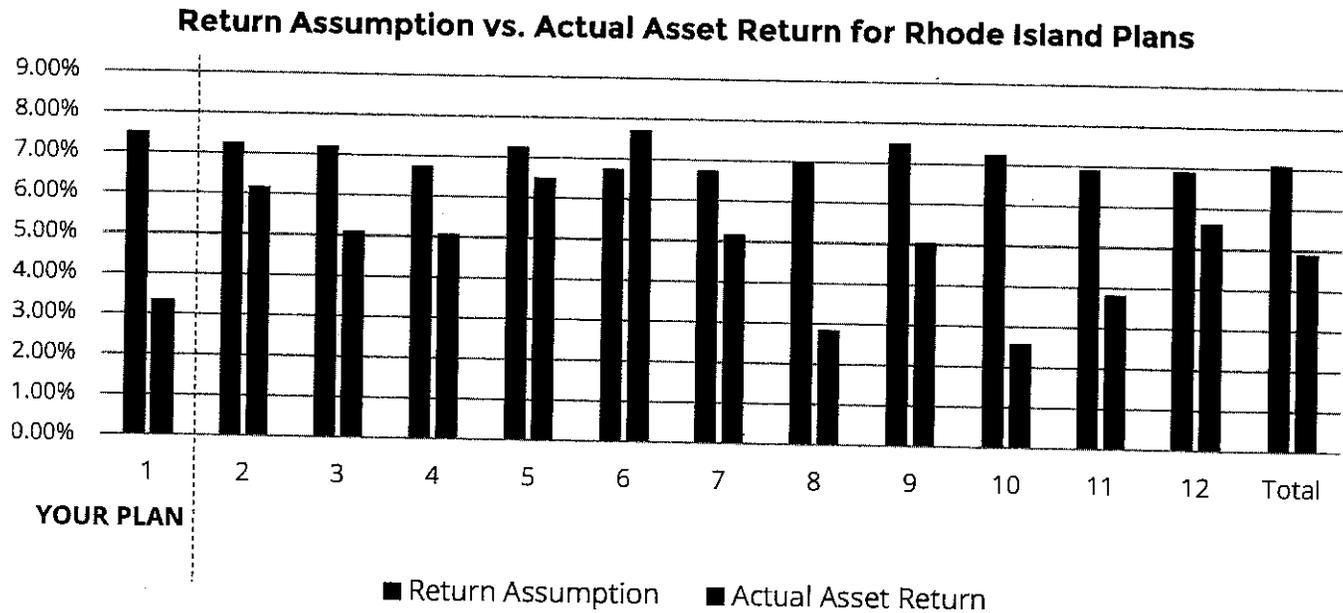
Fiscal Year Ending June 30	Market Value Basis
2012	-2.43%
2013	11.96%
2014	11.96%
2015	12.25%
2016	-3.60%
2017	12.25%
Averages	
7 Years	6.81%

## **Peer Comparison**

The National Association of State Retirement Administrators (NASRA) published its "Issue Brief: Public Pension Fund Plan Investment Return Assumptions" (February, 2018). Based on its survey of 129 State Pension Fund plans, the average return assumption as of December 31, 2017 was 7.36% with approximately 90% of survey respondents falling below 8.00%. Nearly three-fourths have reduced their return assumption since 2010.

# Economic Assumptions

We also recognize the following interest rate assumptions used by other relevant Rhode Island plans (red bar) as compared with their actual 5-year performance (blue bar). Please note that your plan's experience is the lighter-colored bars on the far left of the graph.



Note that the Actual Asset Return is the 5-Year average of returns for each plan ending 6/30/2016\*. Although neither the NASRA study nor the Actuarial Valuation Reports provide any indication of projected changes to investment returns, the results of both provide evidence that the current rate used for the Pension Fund is historically comparable to others of similar composition.

## Future expectations

Pension Fund plans are long-term obligations; as such, the investment horizon should be 20 to 50 years, a much longer time period than most people care to make predictions. Regardless, shorter-term predictions do provide guidance in terms of future expectations in comparison to past results.

\*Note that the graph above displays the most recent information available for plans with a fiscal year ending June 30<sup>th</sup>.

# Economic Assumptions

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The following asset allocation information from the 2017 Morgan Stanley Forecast shows the basis of the total expected return. Based on the Fund's targeted asset mix, the expected annual return after taking into account inflation is 4.83% over the next 7 years and 7.25% over the next 20 years.

## Plan Asset Allocation As of 6/30/2017

Investment	Allocation	Long-Term Return (20+ Yr)	Short-Term Return (< 7 Yr)	Long-Term Volatility	Portfolio Long-Term Return	Portfolio Short-Term Return
1 CASH (Ultrashort Fixed Income)	4.1%	3.4%	2.0%	0.9%	0.14%	0.08%
2 EQUITIES	14.0%	8.9%	5.7%	16.4%	1.25%	0.80%
3 US Large-Cap Growth	6.7%	8.9%	4.6%	17.0%	0.59%	0.31%
4 US Large-Cap Value	3.2%	8.9%	5.3%	14.5%	0.28%	0.17%
5 US Small-Cap Value	2.2%	10.0%	6.6%	17.4%	0.22%	0.14%
6 European Equities	17.2%	7.5%	6.4%	17.4%	1.29%	1.10%
7 Emerging & Frontier Mkt. Equities	11.4%	10.5%	7.5%	23.0%	1.19%	0.85%
8 Short-Term Fixed Income	6.7%	3.7%	1.9%	2.7%	0.25%	0.13%
9 US Fixed Income Taxable	15.9%	4.9%	3.0%	5.4%	0.78%	0.48%
10 ALTERNATIVES	18.7%	6.7%	4.1%	6.0%	1.25%	0.77%
<b>Total</b>					<b>7.25%</b>	<b>4.83%</b>

The probability of attaining at least the plan's expected return on assets of 7.50% is 39% over the short term (less than 7 years) and 49% over the long term (20+ years).

Underlying asset performance assumptions (return, risk, and correlations) are based on Morgan Stanley's inputs for GIC Asset Allocation for 2017.

### Recommendation

We do not recommend any changes to the expected long term rate of return on assets.

# Economic Assumptions

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## **B. Investment & Non-Investment Expenses**

The current assumptions use an expected rate of return that is net of all expenses. Consequently, there is no assumption for investment and non-investment expenses. Based on this current policy, there is no need for a historical analysis of the investment and non-investment expenses. The plan will continue to operate using a net of expenses investment return assumption.

# Economic Assumptions

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## **C. Annual Rate of Inflation (CPI)**

The annual rate of inflation assumption is not used directly in any of the actuarial valuation procedures. There is, however, an implicit rate of inflation in the assumed wage growth and expected return on assets. It is important to ensure that these assumptions all fit together and achieve the same implicit inflation rate. At the proposed levels of these assumptions, the implied inflation rate is consistent.

# Economic Assumptions

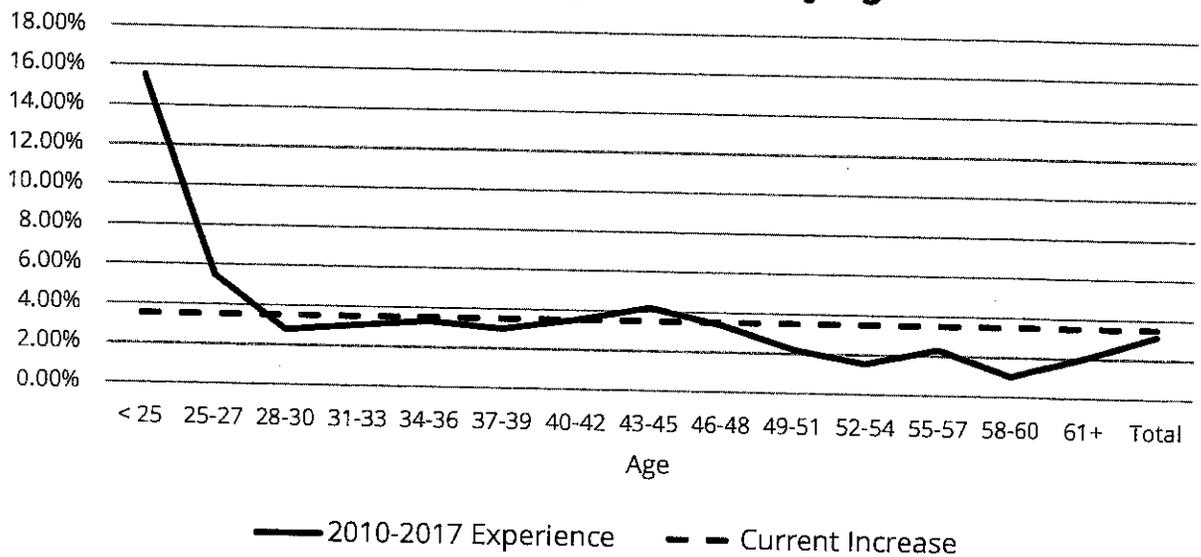
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## **D. Annual Pay Increases**

The data was charted separately for age and service. We found that the pattern remained consistent when charted by age. Similar to the prior experience study, the data indicated that younger employees receive higher annual pay increases than older employees. As of July 1, 2013, we changed the salary scale from a constant 3.50% compounded annually to a constant 2.00% compounded annually until July 1, 2018. Effective July 1, 2018, pay is assumed to grow at 3.50% compounded annually. This adjustment was confirmed with the findings for the plan's experience from 2010 to 2017, and is based upon pay increases as outlined in the most recent collective bargaining agreements for employees covered by the plan. 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.

# Economic Assumptions

## 2010 - 2017 Pay Increases by Age

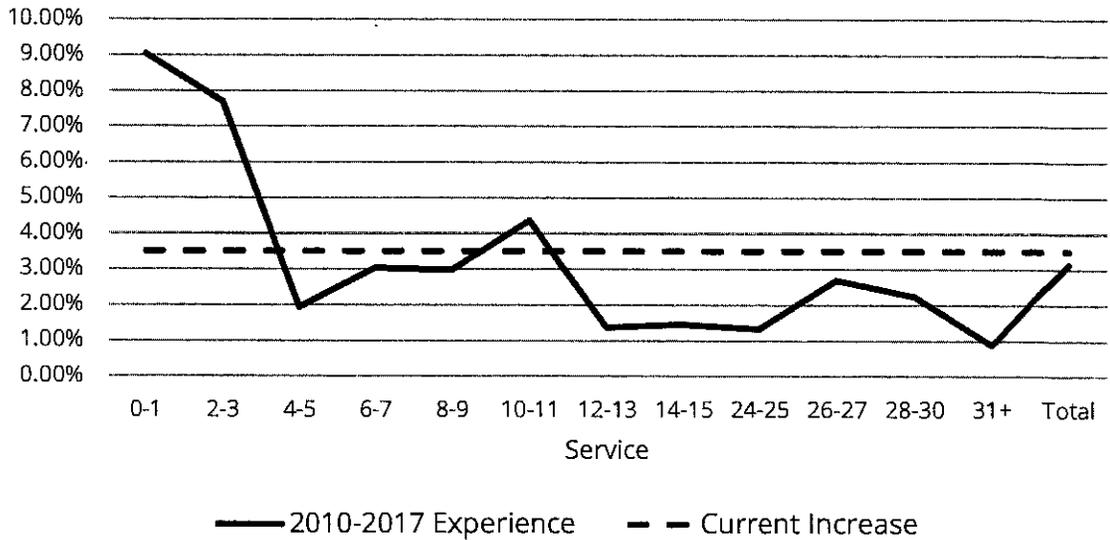


Age	2010-2017 Actual Experience	Current Assumption	Difference
< 25	15.5%	3.50%	11.0%
25-27	5.49%	3.50%	1.99%
28-30	2.77%	3.50%	-0.73%
31-33	3.05%	3.50%	-0.45%
34-36	3.31%	3.50%	-0.19%
37-39	2.98%	3.50%	-0.52%
40-42	3.51%	3.50%	0.01%
43-45	4.17%	3.50%	0.67%
46-48	3.36%	3.50%	-0.14%
49-51	2.20%	3.50%	-1.30%
52-54	1.55%	3.50%	-1.95%
55-57	2.32%	3.50%	-1.18%
58-60	1.02%	3.50%	-2.48%
61+	2.00%	3.50%	-1.50%
Total	3.13%	3.50%	-0.37%

\*Please note that pay increases have been frozen under the plan for the past 5 years, and the annual pay increase assumption was set at 2.00% during the 5-year period.

# Economic Assumptions

## 2007 - 2017 Pay Increases by Service



Service	2007-2017 Actual Experience	Current Assumption	
0-1	9.00%	3.50%	5.50%
2-3	7.69%	3.50%	4.19%
4-5	1.92%	3.50%	-1.58%
6-7	3.04%	3.50%	-0.46%
8-9	2.98%	3.50%	-0.52%
10-11	4.36%	3.50%	0.86%
12-13	1.37%	3.50%	-2.13%
14-15	1.45%	3.50%	-2.05%
16-17	3.37%	3.50%	-0.13%
18-19	3.85%	3.50%	0.35%
20-21	1.27%	3.50%	-2.23%
22-23	0.60%	3.50%	-2.90%
24-25	1.33%	3.50%	-2.17%
26-27	2.69%	3.50%	-0.81%
28-30	2.24%	3.50%	-1.26%
31+	0.87%	3.50%	-2.63%
Total	3.13%	3.50%	-0.37%

# Economic Assumptions

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## **E. Annual Cost of Living Adjustments (COLA)**

The COLA assumption is currently set to the applicable COLA by division outlined in the Collective Bargaining Agreement for members of the plan. As a general summary:

- Retirees as of 7/1/2014 have a COLA suspension until 6/30/2019, when their applicable COLA resumes
- Active police receive a 2.25% compounded COLA for 15 years, suspended until 7 years from retirement
- Active fire receive a 2.25% simple COLA for 15 years, suspended until 7 years from retirement or age 62, if earlier
- Library employees receive a 2.25% compounded COLA for 15 years
- Others receive a 2.00% compound COLA for 15 years, suspended until 5 years from retirement.

Further details can be found in the most recent actuarial valuation report as of 7/1/2017, dated 10/20/2017.

# Demographic Assumptions

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## **A. Rates of Retirement**

Retirements over the period 2010-2017 were examined based on both age and service. We looked at public safety employees and non-public safety employees separately. After evaluating the data, there was not enough data to credibly determine retirement rates based on age or service.

The current retirement rates vary by age and service of the participant. Because each department in the Town has different retirement eligibility definitions, the current retirement rates vary between departments. Due to the small number of exposures in the data, we do not recommend making any changes to the current retirement rates based on this analysis. The following four pages show the results of the retirement analysis for both public safety employees and non-public safety employees. Both groups are charted by age and service separately.

# Demographic Assumptions

**2010 - 2017 Retirement Rates by Age  
Public Safety**

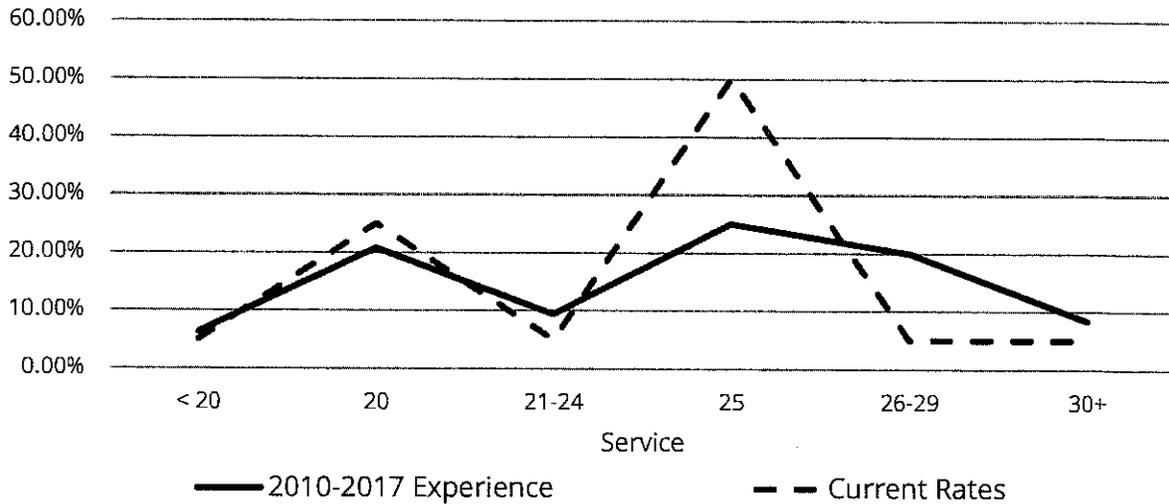


Age	2010 - 2017 Experience	Current Rates*
< 50	15.46%	N/A
50	7.69%	N/A
51	12.50%	N/A
52	15.38%	N/A
53	16.67%	N/A
54	14.29%	N/A
55	0.00%	N/A
56	0.00%	N/A
57	0.00%	N/A
58	0.00%	N/A
59	33.33%	N/A
60+	16.67%	N/A
Total	13.59%	N/A

\*Retirement rates are based upon service. All Public Safety employees are assumed to retire at age 62.

# Demographic Assumptions

**2010 - 2017 Retirement Rates by Service  
Public Safety**

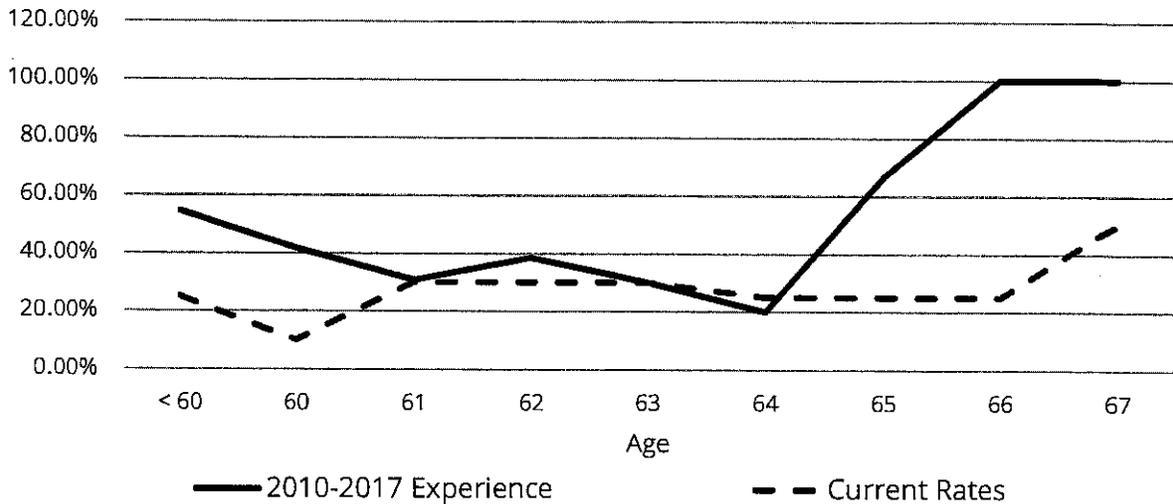


Service	2010 - 2017 Experience	Current Rates*
< 20	6.25%	5.00%
20	20.63%	25.00%
21-24	9.41%	5.00%
25	25.00%	50.00%
26-29	20.00%	5.00%
30+	8.33%	5.00%
Total	13.59%	N/A

\*All employees are assumed to retire at age 62. Current rates shown above are a basic summary. Additional detail can be found in the most recent actuarial valuation report as of 7/1/2017, dated 10/20/2017.

# Demographic Assumptions

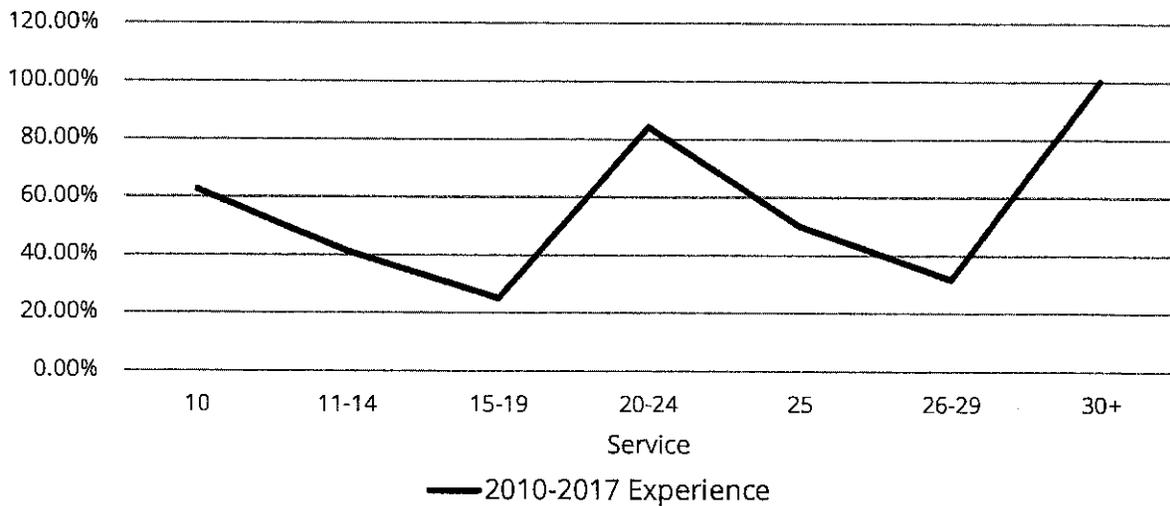
**2010 - 2017 Retirement Rates by Age  
Non-Public Safety**



Age	2010 - 2017 Experience	Current Rates
< 60	54.55%	2 - 4%
60	40.00%	5.00%
61	30.77%	10.00%
62	38.46%	10.00%
63	30.00%	30.00%
64	20.00%	25.00%
65	66.67%	25.00%
66	100.00%	25.00%
67	100.00%	50.00%
Total	45.76%	100% at age 70

# Demographic Assumptions

**2010 - 2017 Retirement Rates by Service  
Non-Public Safety**



Service	2010 - 2017 Experience	Current Rates*
10	62.50%	N/A
11-14	41.18%	N/A
15-19	25.00%	N/A
20-24	84.21%	N/A
25	50.00%	N/A
26-29	31.58%	N/A
30+	100.00%	N/A
Total	49.76%	N/A

\*Current rates are age-based.

# Demographic Assumptions

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## **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. Similar to the rates of retirement, we kept public safety employees and non-public safety employees separate. Again, data from 2010 to 2017 was studied. After evaluating the data for both employee groups, there were not enough exposures to credibly determine a pattern of termination rates based on either age or service.

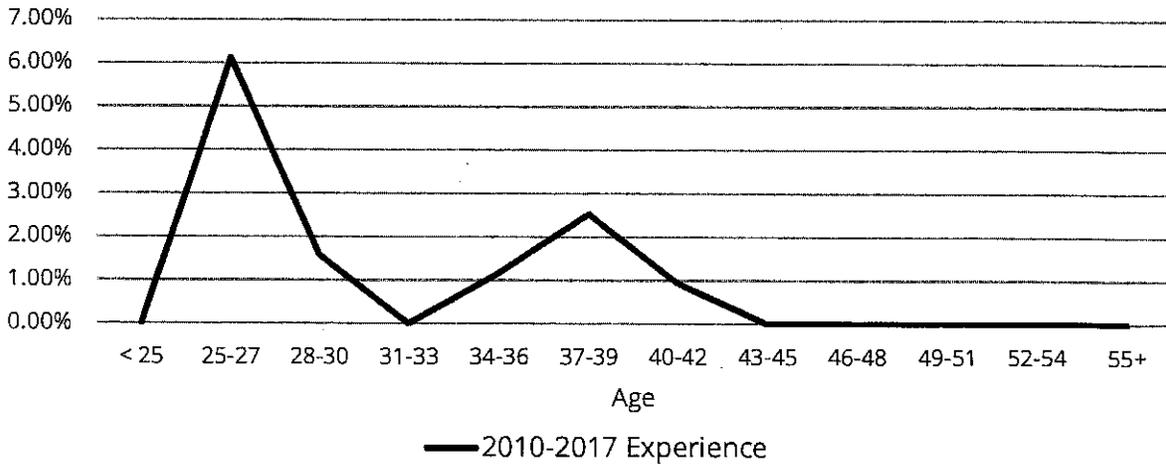
Due to the small number of exposures in the data, we do not recommend making any changes to the current termination rates for public safety nor non-public safety employees. The following four pages show the results of the withdrawal analysis for both public safety employees and non-public safety employees. Both groups are charted by age and service separately.

Note that the current rates shown in both age-based tables are at the mid-point of each age band studied. For example, the 5.14% rate shown for ages 25-27 on pg. 23 is the current termination rate assumed for a 26-year-old non-public safety participant.

The Appendix in the back of this report shows the plan's experience each year.

# Demographic Assumptions

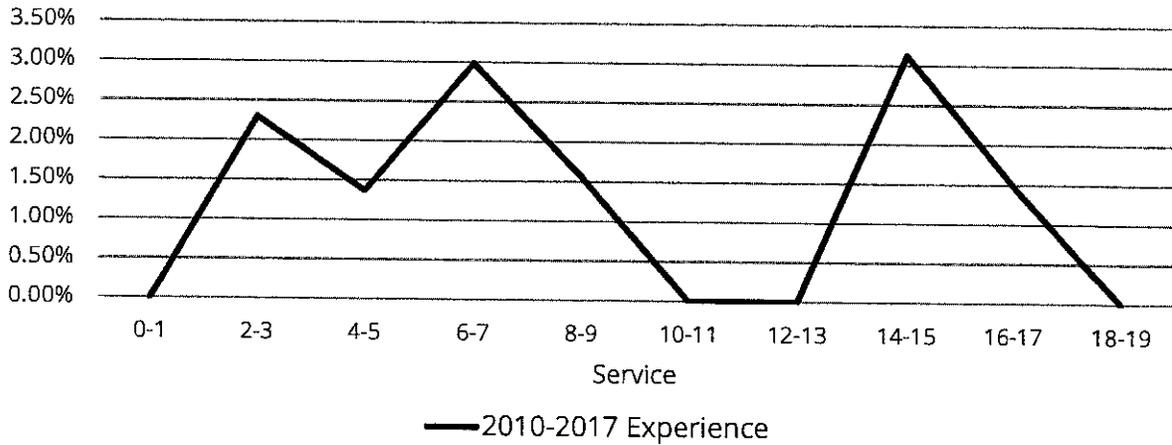
**2010 - 2017 Withdrawal Rates by Age  
Public Safety**



Age	2010 - 2017 Experience	Current Rates
< 25	0.00%	0.00%
25-27	6.00%	0.00%
28-30	1.59%	0.00%
31-33	0.00%	0.00%
34-36	1.16%	0.00%
37-39	2.52%	0.00%
40-42	0.93%	0.00%
43-45	0.00%	0.00%
46-48	0.00%	0.00%
49-51	0.00%	0.00%
52-54	0.00%	0.00%
55+	0.00%	0.00%
Total	1.38%	0.00%

# Demographic Assumptions

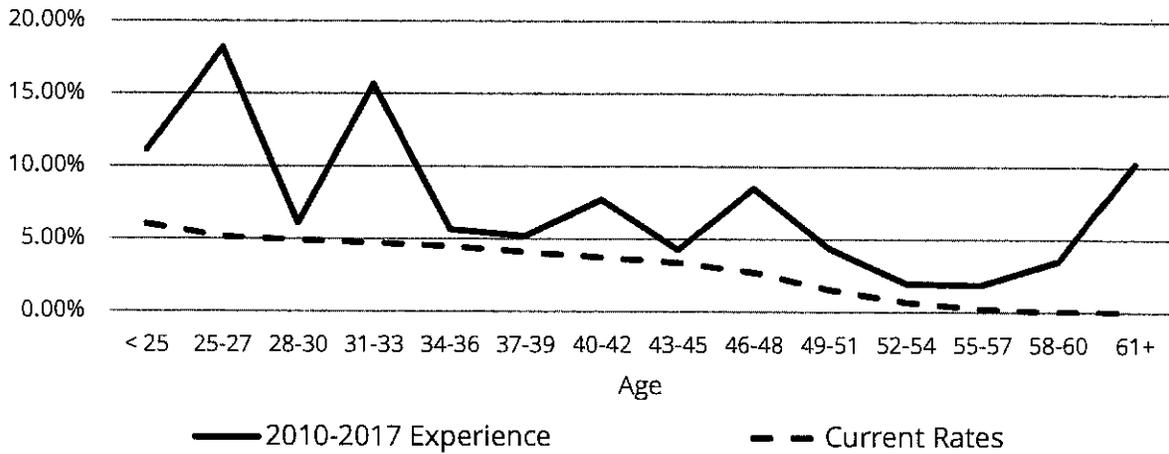
**2010 - 2017 Withdrawal Rates by Service  
Public Safety**



Service	2010 - 2017 Experience	Current Rates
0-1	0.00%	0.00%
2-3	2.25%	0.00%
4-5	1.37%	0.00%
6-7	2.93%	0.00%
8-9	1.56%	0.00%
10-11	0.00%	0.00%
12-13	0.00%	0.00%
14-15	2.93%	0.00%
16-17	1.49%	0.00%
18-19	0.00%	0.00%
Total	1.38%	0.00%

# Demographic Assumptions

**2010 - 2017 Withdrawal Rates by Age  
Non-Public Safety**

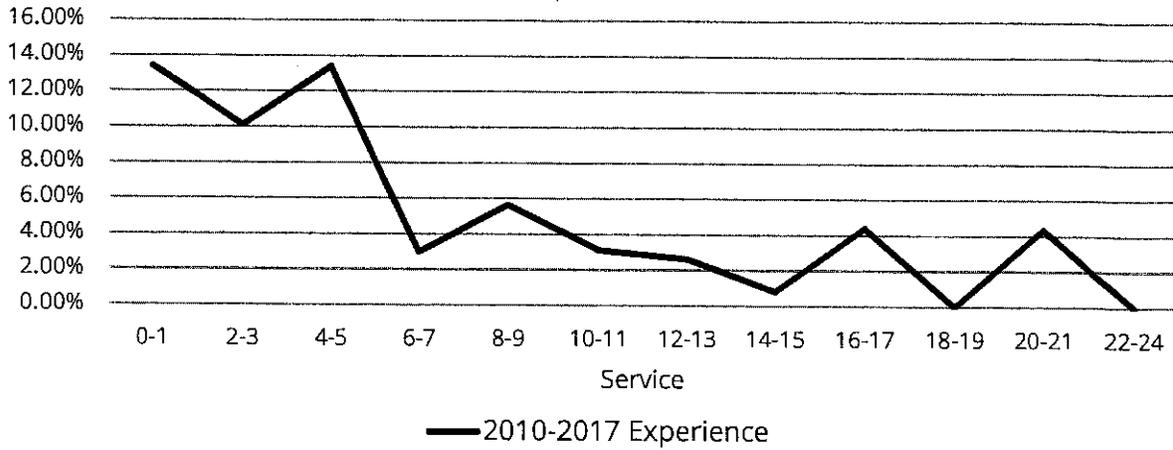


Age	2010 - 2017 Experience	Current Rates*
< 25	11.11%	>5.14%
25-27	18.70%	5.14%
28-30	6.06%	4.89%
31-33	15.68%	4.72%
34-36	5.66%	4.47%
37-39	5.19%	4.16%
40-42	7.69%	3.72%
43-45	4.26%	3.38%
46-48	8.51%	2.71%
49-51	4.35%	1.52%
52-54	1.99%	0.69%
55-57	1.88%	0.21%
58-60	3.49%	0.02%
61+	10.20%	0.00%
Total	5.46%	N/A

\*Rates are based on the Crocker-Sarason T-3 table.

# Demographic Assumptions

**2010 - 2017 Withdrawal Rates by Service  
Non-Public Safety**



Service	2010 - 2017 Experience	Current Rates
0-1	13.39%	N/A
2-3	10.09%	N/A
4-5	13.39%	N/A
6-7	2.99%	N/A
8-9	5.63%	N/A
10-11	3.13%	N/A
12-13	2.63%	N/A
14-15	0.82%	N/A
16-17	4.40%	N/A
18-19	0.00%	N/A
20-21	4.35%	N/A
22-24	0.00%	N/A
Total	5.46%	N/A

# Demographic Assumptions

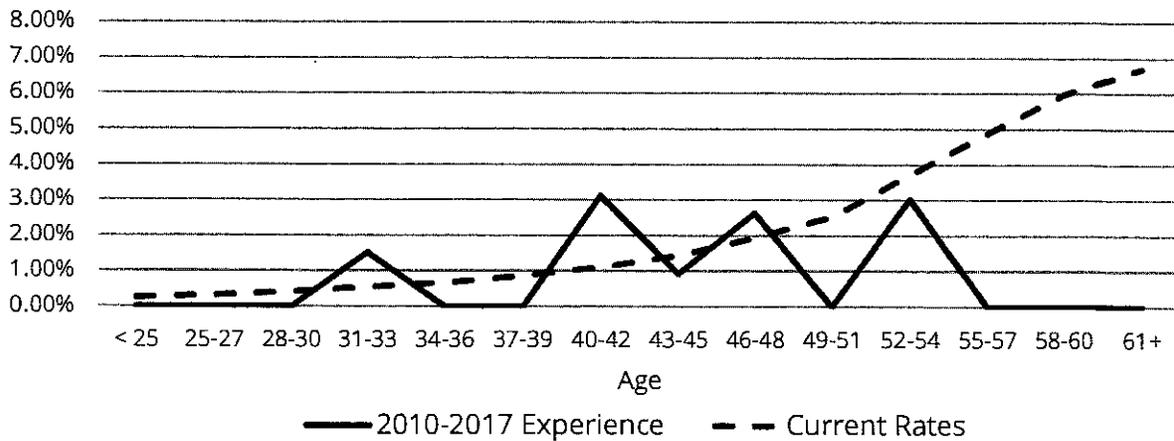
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## **C. Rates of Disability**

The current disability rates come from the 1985 Pension Disability Table for non-public safety employees through age 54. Beyond age 54, no disabilities are assumed to occur. The current disability rates for public safety employees are three times the rates found in the 1985 Pension Disability Table. Again, we looked at public safety employees and non-public safety employees separately. After evaluating the data, there was not enough data to credibly determine disability rates based on age or service. Therefore, we recommend making no changes to the current rates of disability. The following four pages show the results of the disability analysis for both public safety employees and non-public safety employees. Both groups are charted by age and service separately.

# Demographic Assumptions

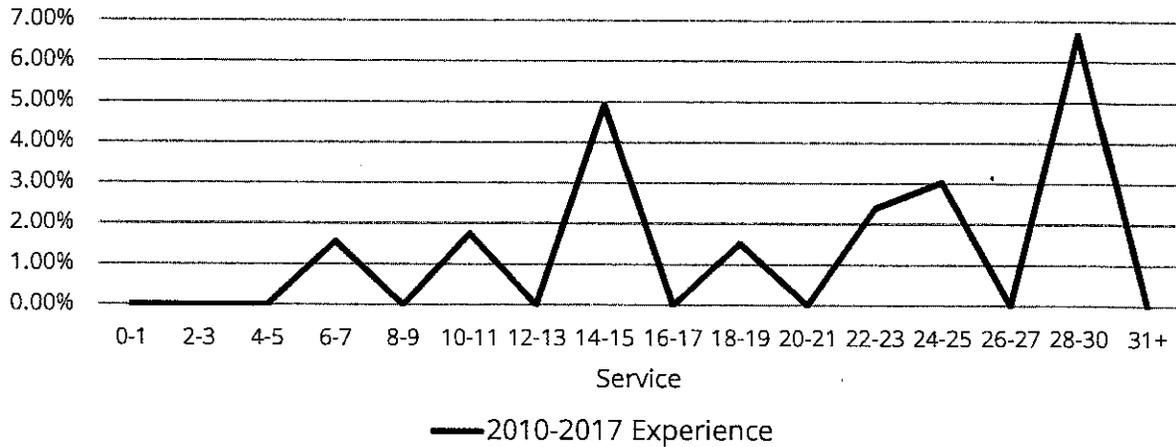
**2010 - 2017 Disability Rates by Age  
Public Safety**



Age	2010 - 2017 Experience	Current Rates
< 25	0.00%	<0.28%
25-27	0.00%	0.31%
28-30	0.00%	0.41%
31-33	1.52%	0.53%
34-36	0.00%	0.66%
37-39	0.00%	0.86%
40-42	3.13%	1.10%
43-45	0.92%	1.42%
46-48	2.63%	1.93%
49-51	0.00%	2.51%
52-54	3.03%	3.70%
55-57	0.00%	4.86%
58-60	0.00%	5.96%
61+	0.00%	6.69%
Total	1.08%	N/A

# Demographic Assumptions

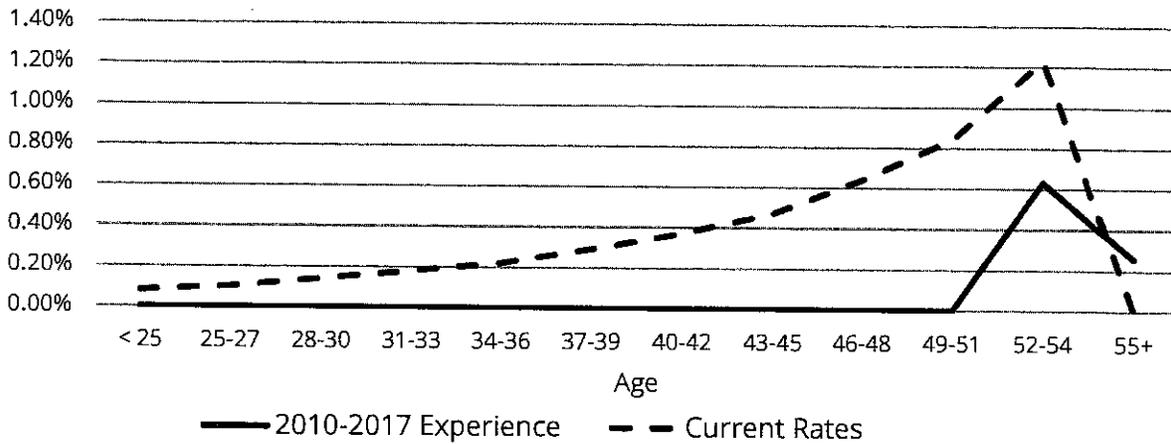
**2010 - 2017 Disability Rates by Service  
Public Safety**



Service	2010 - 2017 Experience	Current Rates
0-1	0.00%	N/A
2-3	0.00%	N/A
4-5	0.00%	N/A
6-7	1.56%	N/A
8-9	0.00%	N/A
10-11	1.75%	N/A
12-13	0.00%	N/A
14-15	4.92%	N/A
16-17	0.00%	N/A
18-19	1.52%	N/A
20-21	0.00%	N/A
22-23	2.38%	N/A
24-25	3.03%	N/A
26-27	0.00%	N/A
28-30	6.67%	N/A
31+	0.00%	N/A
Total	1.08%	N/A

# Demographic Assumptions

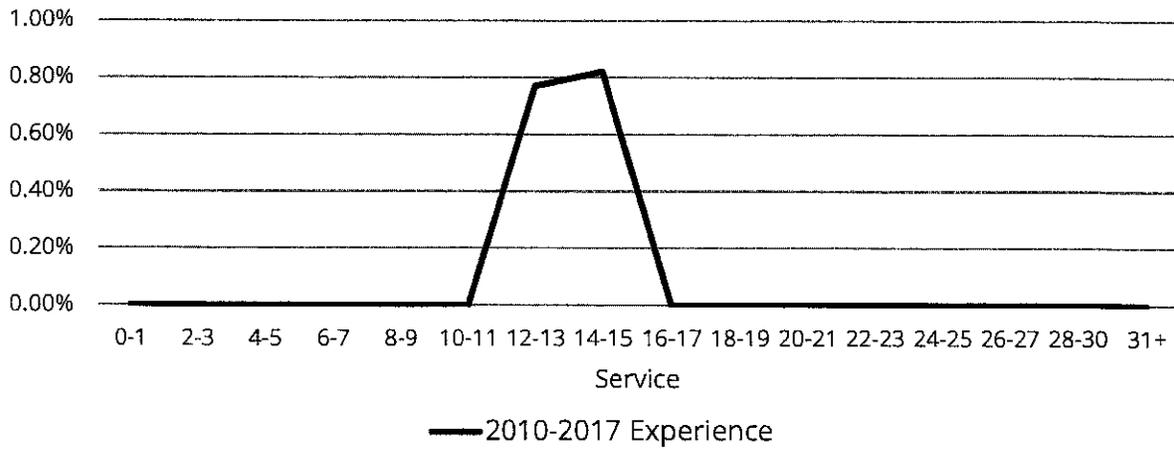
**2010 - 2017 Disability Rates by Age  
Non-Public Safety**



Age	2010 - 2017 Experience	Current Rates
< 25	0.00%	<0.09%
25-27	0.00%	0.10%
28-30	0.00%	0.14%
31-33	0.00%	0.18%
34-36	0.00%	0.22%
37-39	0.00%	0.29%
40-42	0.00%	0.37%
43-45	0.00%	0.47%
46-48	0.00%	0.64%
49-51	0.00%	0.84%
52-54	0.63%	1.23%
55+	0.26%	0.00%
Total	0.15%	N/A

# Demographic Assumptions

**2010 - 2017 Disability Rates by Service  
Non-Public Safety**



Service	2010 - 2017 Experience	Current Rates
0-1	0.00%	N/A
2-3	0.00%	N/A
4-5	0.00%	N/A
6-7	0.00%	N/A
8-9	0.00%	N/A
10-11	0.00%	N/A
12-13	0.77%	N/A
14-15	0.82%	N/A
16-17	0.00%	N/A
18-19	0.00%	N/A
20-21	0.00%	N/A
22-23	0.00%	N/A
24-25	0.00%	N/A
26-27	0.00%	N/A
28-30	0.00%	N/A
31+	0.00%	N/A
Total	0.15%	N/A

# Demographic Assumptions

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## 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 Pension Plan of Town of West Warwick is not one of those plans. In light of this fact, we did not complete an experience study on the plan regarding mortality.

In the 2015 experience study, we analyzed the impact of updating the mortality to the RP-2014 Table with blue collar adjustments and mortality improvements from 2006 for public safety members, the RP-2014 Total Table with mortality improvements from 2006 for non-public safety members, and the RP-2014 Disabled Table with mortality improvements from 2006 for disabled members. Mortality improvements are based on the most recently released Social Security Trustees Report and are updated annually. We do not recommend any changes to these assumptions.

Expected Total Lifetime Public Safety as of 7/1/2017		
Age	Actives	Inactives
<25	*	*
25 - 35	81.61	77.77
35 - 45	81.27	80.02
45 - 55	81.75	79.18
55 - 65	83.25	82.22
65 - 75	*	85.69
>75	*	91.56

Expected Total Lifetime Non-Public Safety as of 7/1/2017		
Age	Actives	Inactives
<25	*	*
25 - 35	85.64	86.17
35 - 45	85.47	86.30
45 - 55	85.92	84.99
55 - 65	86.83	85.56
65 - 75	87.76	87.43
>75	*	91.35

\*Indicates the plan doesn't have any participants that fall into this category.

# Demographic Assumptions

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## **E. Marital Status and Assumed Ages of Spouses**

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. However, in the case of the public safety employees for the Town of West Warwick, the normal form of payment is a 67.5% Joint and Survivor annuity. Thus, for married participants, the liability is based on both the participant and the spouse's lives. Currently, it is assumed that 80% of participants are married with female spouses 3 years younger than husbands. Given the insignificant effect of this assumption on the plan's liabilities and the lack of available data, we don't recommend a change in this assumption.

## APPENDIX

# Pay Increase Data

< 25	4.50%	-1.40%	4.50%	23.82%	7.95%	9.64%	4.09%	15.49%
28-30	0.41%	-2.64%	0.41%	5.26%	11.12%	-0.39%	2.41%	2.77%
34-36	2.89%	-5.29%	2.89%	2.95%	7.73%	3.39%	2.73%	3.31%
40-42	-1.73%	-3.95%	-1.73%	3.12%	6.29%	6.41%	1.19%	3.51%
46-48	0.72%	-2.00%	0.72%	8.51%	7.62%	7.34%	0.58%	3.36%
52-54	-2.07%	1.31%	-2.07%	3.98%	0.30%	6.35%	-0.06%	1.55%
58-60	3.67%	-8.57%	3.67%	1.25%	1.75%	5.62%	0.01%	1.02%
Total	7.32%	-2.94%	1.13%	3.37%	5.72%	6.15%	1.18%	3.13%

	2014-2015 Payroll	2015-2016 Payroll	2016-2017 Payroll	2017-2018 Payroll	2018-2019 Payroll	2019-2020 Payroll	2020-2021 Payroll	2021-2022 Payroll
0-1	-0.01%	0.00%	16.51%	23.75%	10.91%	9.51%	-1.11%	9.03%
4-5	-4.60%	-0.16%	-2.11%	0.21%	3.74%	8.53%	0.52%	1.92%
8-9	-0.02%	-5.53%	4.73%	2.95%	5.81%	1.90%	0.27%	2.98%
12-13	3.55%	-6.15%	2.41%	-1.94%	6.06%	4.89%	-0.60%	1.37%
16-17	-2.69%	-1.17%	0.57%	2.84%	4.03%	6.45%	4.06%	3.37%
20-21	5.52%	0.86%	-0.69%	5.97%	3.29%	4.90%	-0.88%	1.27%
24-25	-1.97%	-6.93%	0.13%	-0.52%	9.36%	1.50%	-0.47%	1.33%
28-30	0.00%	0.00%	8.98%	2.00%	0.50%	4.04%	0.64%	2.24%
Total	7.32%	-2.94%	1.13%	3.37%	5.72%	6.15%	1.18%	3.13%

# Retirement Data - Public Safety

Age	2010-2011 Expenses	2011-2012 Expenses	2012-2013 Expenses	2013-2014 Expenses	2014-2015 Expenses	2015-2016 Expenses	2016-2017 Expenses	2018-2019 Expenses
< 50	34.78%	5.88%	0.00%	7.14%	16.67%	9.09%	25.00%	15.46%
51	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%
53	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.67%
55	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
57	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
59	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.33%
Total	44.74%	4.35%	4.35%	3.85%	5.26%	3.70%	10.71%	13.59%

Age	2010-2011 Expenses	2011-2012 Expenses	2012-2013 Expenses	2013-2014 Expenses	2014-2015 Expenses	2015-2016 Expenses	2016-2017 Expenses	2018-2019 Expenses
< 20	14.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.25%
20	50.00%	25.00%	0.00%	0.00%	20.00%	0.00%	50.00%	21.00%
21-24	33.33%	0.00%	7.69%	0.00%	0.00%	9.09%	7.14%	9.41%
25-29	77.85%	0.00%	0.00%	16.67%	0.00%	0.00%	21.11%	21.43%
30 +	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.33%
Total	44.74%	4.35%	4.35%	3.85%	5.26%	3.70%	10.71%	13.59%

# Retirement Data - Non-public Safety

Age	2010-2011 Expenses	2011-2012 Expenses	2012-2013 Expenses	2013-2014 Expenses	2014-2015 Expenses	2015-2016 Expenses	2016-2017 Expenses	2011-2017 Total Expenses
< 60	100.00%	50.00%	66.67%	20.00%	50.00%	28.57%	28.57%	54.55%
60	50.00%	50.00%	25.00%	25.00%	50.00%	0.00%	0.00%	25.00%
61	50.00%	0.00%	0.00%	25.00%	0.00%	100.00%	50.00%	30.77%
62	50.00%	50.00%	25.00%	10.00%	0.00%	25.00%	0.00%	25.00%
63	100.00%	100.00%	0.00%	100.00%	0.00%	0.00%	0.00%	30.00%
64	50.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	10.00%
65	100.00%	0.00%	100.00%	100.00%	0.00%	100.00%	0.00%	66.67%
66	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
67	100.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%
Total	76.57%	53.85%	62.86%	52.38%	53.33%	29.41%	20.00%	45.76%

Service	2010-2011 Expenses	2011-2012 Expenses	2012-2013 Expenses	2013-2014 Expenses	2014-2015 Expenses	2015-2016 Expenses	2016-2017 Expenses	2011-2017 Total Expenses
10	0.00%	100.00%	50.00%	100.00%	0.00%	0.00%	0.00%	62.50%
11-14	100.00%	100.00%	25.00%	0.00%	0.00%	50.00%	0.00%	41.43%
15-19	50.00%	0.00%	28.57%	50.00%	0.00%	0.00%	0.00%	25.00%
20-24	92.31%	0.00%	100.00%	0.00%	0.00%	50.00%	100.00%	84.21%
25	0.00%	50.00%	100.00%	33.33%	66.67%	40.00%	50.00%	50.00%
26-29	50.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	21.43%
30+	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
Total	76.57%	53.85%	62.86%	56.94%	53.33%	29.41%	20.00%	45.76%

# Withdrawal Data - Public Safety

Age	2008-2011 Expenditure	2011-2012 Expenditure	2012-2013 Expenditure	2013-2014 Expenditure	2014-2015 Expenditure	2015-2016 Expenditure	2016-2017 Expenditure	2017-2017 Expenditure
< 25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
25-27	0.00%	28.00%	0.00%	1.57%	0.00%	0.00%	0.00%	1.32%
28-30	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	1.59%
31-33	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
34-36	0.00%	0.00%	9.09%	0.00%	0.00%	0.00%	0.00%	1.16%
37-39	0.00%	0.00%	4.54%	1.02%	0.00%	0.00%	0.00%	1.57%
40-42	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.14%	0.93%
43-45	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
46-48	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
49-51	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
52-54	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
55+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	0.00%	1.12%	2.02%	3.19%	0.00%	0.00%	3.23%	1.38%

Service	2008-2011 Expenditure	2011-2012 Expenditure	2012-2013 Expenditure	2013-2014 Expenditure	2014-2015 Expenditure	2015-2016 Expenditure	2016-2017 Expenditure	2017-2017 Expenditure
0-1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2-3	0.00%	0.00%	0.00%	3.57%	0.00%	0.00%	0.00%	2.40%
4-5	0.00%	6.67%	0.00%	0.00%	0.00%	0.00%	0.00%	1.37%
6-7	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	2.58%
8-9	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.14%	1.56%
10-11	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
12-13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
14-15	0.00%	0.00%	12.50%	10.00%	0.00%	0.00%	0.00%	3.73%
16-17	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.09%	1.49%
18-19	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	0.00%	1.12%	2.02%	3.19%	0.00%	0.00%	3.23%	1.38%

# Withdrawal Data - Non-public Safety

Age	2010-2011 Experience	2011-2012 Experience	2012-2013 Experience	2013-2014 Experience	2014-2015 Experience	2015-2016 Experience	2016-2017 Experience	2010-2017 Total Experience
< 25	0.00%	0.00%	33.33%	33.33%	0.00%	0.00%	0.00%	11.11%
26-27	0.00%	0.00%	25.00%	0.00%	25.00%	0.00%	25.00%	7.50%
28-30	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%	6.06%
31-33	42.86%	0.00%	25.00%	0.00%	16.67%	0.00%	0.00%	15.00%
34-36	0.00%	0.00%	22.22%	0.00%	0.00%	16.67%	0.00%	5.66%
37-39	0.00%	0.00%	14.29%	10.00%	0.00%	17.50%	0.00%	5.19%
40-42	5.00%	10.53%	20.00%	7.14%	0.00%	7.69%	0.00%	7.69%
43-45	4.17%	4.55%	4.00%	0.00%	6.67%	0.00%	0.00%	4.26%
46-48	10.00%	14.29%	15.00%	5.26%	0.00%	9.09%	5.56%	8.51%
49-51	0.00%	3.70%	0.00%	0.00%	4.35%	4.50%	0.00%	2.85%
52-54	3.70%	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	1.99%
55-57	0.00%	4.35%	0.00%	0.00%	0.00%	4.76%	0.00%	1.88%
58-60	0.00%	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	3.49%
61+	66.67%	4.52%	0.28%	25.00%	0.00%	0.00%	0.00%	10.20%
Total	5.08%	4.35%	11.35%	5.06%	0.00%	0.00%	2.38%	5.46%

Service	2010-2011 Experience	2011-2012 Experience	2012-2013 Experience	2013-2014 Experience	2014-2015 Experience	2015-2016 Experience	2016-2017 Experience	2010-2017 Total Experience
0-1	33.33%	0.00%	21.05%	0.00%	21.05%	15.38%	3.70%	13.39%
2-3	0.00%	0.00%	36.36%	13.33%	0.00%	0.00%	0.00%	10.00%
4-5	8.33%	3.57%	42.86%	0.00%	16.67%	14.29%	5.88%	13.39%
6-7	0.00%	5.88%	14.55%	0.00%	0.00%	16.67%	0.00%	3.89%
8-9	5.88%	8.33%	7.69%	10.00%	3.85%	0.00%	0.00%	5.63%
10-11	4.57%	4.50%	0.00%	0.00%	0.00%	4.50%	4.17%	3.16%
12-13	0.00%	5.00%	0.00%	11.76%	0.00%	0.00%	0.00%	2.63%
14-15	0.00%	5.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.82%
16-17	0.00%	0.00%	5.26%	7.14%	9.09%	10.00%	0.00%	4.40%
18-19	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
20-21	12.50%	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.35%
22-24	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	5.08%	4.35%	11.35%	5.06%	4.14%	5.39%	2.38%	5.46%

# Disability Data - Public Safety

Age	2010-2011 Experience	2011-2012 Experience	2012-2013 Experience	2013-2014 Experience	2014-2015 Experience	2015-2016 Experience	2016-2017 Experience	2010-2017 Total Experience
< 25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
26-27	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
28-30	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
31-33	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
34-36	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
37-39	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
40-42	0.00%	11.11%	11.11%	0.00%	0.00%	0.00%	0.00%	3.13%
43-45	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
46-48	9.09%	0.00%	0.00%	11.11%	0.00%	0.00%	0.00%	2.63%
49-51	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
52-54	14.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.03%
55-57	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
58-60	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
61+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	1.63%	1.79%	2.46%	0.83%	0.85%	0.00%	0.00%	1.08%

Service	2010-2011 Experience	2011-2012 Experience	2012-2013 Experience	2013-2014 Experience	2014-2015 Experience	2015-2016 Experience	2016-2017 Experience	2010-2017 Total Experience
0-1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2-3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4-5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
6-7	0.00%	0.00%	0.00%	0.00%	7.52%	0.00%	0.00%	7.52%
8-9	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
10-11	0.00%	0.00%	11.11%	0.00%	0.00%	0.00%	0.00%	3.13%
12-13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
14-15	0.00%	22.22%	12.50%	0.00%	0.00%	0.00%	0.00%	4.92%
16-17	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
18-19	0.00%	0.00%	7.69%	0.00%	0.00%	0.00%	0.00%	7.69%
20-21	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
22-23	0.00%	0.00%	0.00%	16.67%	0.00%	0.00%	0.00%	7.69%
24-25	14.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.03%
26-27	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
28-30	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.67%
31+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	1.63%	1.79%	2.46%	0.83%	0.85%	0.00%	0.00%	1.08%

# Disability Data - Non-public Safety

Age Group	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
< 25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
28-30	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
34-36	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
40-42	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
46-48	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
52-54	3.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.63%
Total	0.44%	0.00%	0.00%	0.00%	0.00%	0.54%	0.00%	0.15%

Age Group	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
0-1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2-3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4-5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
6-7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.63%
8-9	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
10-11	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
12-13	5.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.77%
14-15	0.00%	0.00%	0.00%	0.00%	0.00%	5.26%	0.00%	0.00%
16-17	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
18-19	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
20-21	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
22-23	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
24-25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
26-27	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
28-30	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
31-33	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	0.44%	0.00%	0.00%	0.00%	0.00%	0.54%	0.00%	0.15%