



City of Allentown Firemen's Pension Plan

Actuarial Valuation Report as of January 1, 2020

Produced by Cheiron

September 2020

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September 29, 2020

City of Allentown Pension Board
 Department of Finance, Room 227
 435 Hamilton Street
 Allentown, Pennsylvania 18101-1699

Dear Members of the Board:

At your request, we have conducted our annual actuarial valuation of the City of Allentown Firemen's Pension Plan as of January 1, 2020. The purpose of this report is to present the annual actuarial valuation of the City of Allentown Firemen's Pension Plan. This report is for the use of the City of Allentown's Pension Board and its auditors in preparing financial reports in accordance with applicable law and accounting requirements.

Your attention is called to the Foreword in which we refer to the general approach employed in the preparation of this report. We also comment on the sources and reliability of both the data and the actuarial assumptions on which our findings are based. The results of this report are only applicable to the funded status of the Plan as of January 1, 2020 and do not determine any past or future Minimum Municipal Obligation (MMO). The January 1, 2021 actuarial valuation results will be used to determine the Plan's 2022 and 2023 MMO. The final MMO for 2022 is also dependent upon the payroll of the active population as provided by the City. For budgetary purposes, we have provided the estimated MMO for 2022 using the results from the January 1, 2020 valuation. The table below summarizes the MMOs provided in this report:

	2020 MMO	2021 MMO	2022 MMO
Based on:			
-Valuation Date	1/1/2019	1/1/2019	1/1/2021*
-Payroll	2019	2020	2021**
Actual or Estimated MMO	Actual	Actual	Estimated

**Estimated using 1/1/2020 valuation results*

***Estimated by projecting current payroll*

Future actuarial valuation results may differ significantly from the current actuarial valuation results presented in this report due to such factors as the following: plan experience differing from that anticipated by the assumptions; changes in assumptions; and changes in plan provisions or applicable law. The results and projections provided in this report rely on future plan experience conforming to the underlying assumptions and methods outlined in this report. To the extent that the actual plan experience deviates from the underlying assumptions and methods, or there are any changes in plan provisions or applicable laws, the results would vary accordingly and projections may change materially.

Board of Trustees
City of Allentown
September 29, 2020

This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.

This report was prepared exclusively for the City of Allentown's Pension Board for the purpose described herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to such other users.

Sincerely,
Cheiron



Karen Zangara, FSA, EA, MAAA
Principal Consulting Actuary



Anastasia Dopko, FSA, EA, MAAA
Associate Actuary

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

FOREWORD

Cheiron has performed the actuarial valuation of the City of Allentown Firemen's Pension Plan as of January 1, 2020. The purpose of this report is to:

- 1) **Measure and disclose**, as of the valuation date, the financial condition of the Plan, in compliance with Act 205;
- 2) **Indicate trends** in the financial progress of the Plan; and
- 3) **Determine an estimated Minimum Municipal Obligation (MMO)** for calendar year 2022, and to provide the actual MMOs for 2020 and 2021 in accordance with Act 44 and Act 205.

An actuarial valuation establishes and analyzes Plan assets and liabilities on a consistent basis and traces the progress of both from one year to the next. It includes measurement of the Plan's investment performance, as well as an analysis of actuarial liability gains and losses.

Section I presents a summary containing our findings and disclosing important trends experienced by the Plan in recent years as well as a risk assessment, which includes a review of potential risk associated with the Plan.

Section II contains details on Plan assets, together with pertinent performance measurements.

Section III provides details on the Plan's liabilities.

Section IV provides the amortization requirements and provides the actual MMOs for 2020 and 2021 and the estimated MMO for 2022. The actual 2021 MMO is based on the January 1, 2019 valuation results. The actual 2022 MMO will be based on the January 1, 2021 valuation results and will require payroll provided by the City of Allentown.

The appendices to this report contain supplemental information: a summary of the Plan's membership at the valuation date, a summary of the major provisions of the Plan, and the actuarial methods and assumptions used in the valuation.

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

FOREWORD

In preparing our report, we relied on information (some oral and some written) supplied by the City of Allentown (“City”) and Zelenkofske Axelrod LLC. This information includes, but is not limited to, plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for the reasonableness and consistency in accordance with Actuarial Standards of Practice No. 23.

The actuarial assumptions were adopted by the Board. The mortality table adopted by the Board reflects projected mortality improvements and was reviewed by Cheiron for reasonability based on prior experience. The salary scale assumption adopted by the Board was reviewed by the City for reasonability based upon expected future salary increases and prior increases. The results of this report are dependent upon future experience conforming to these assumptions. To the extent that future experience deviates from the actuarial assumptions, the true cost of the Plan could vary from our results.

Finally, in preparing this report, we have conformed to generally accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board.

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION I – BOARD SUMMARY

The following table sets out the principal results of this year’s valuation and compares them to last year’s results.

Table I-1 Summary of Principal Plan Results			
Valuation as of:	1/1/2019	1/1/2020	% Change
<u>Participant Counts</u>			
Actives	121	121	0.0%
Terminated Vested and Inactive Members	0	1	N/A
In Pay Status	203	196	-3.4%
Total	324	318	-1.9%
Annual Salaries of Active Members (from prior year)*	\$ 9,992,977	\$ 10,187,331	1.9%
Average Annual Salary	82,587	84,193	1.9%
W-2 Wages for Active Members (from prior year)	10,607,240	11,684,319	10.2%
Annual Retirement Allowances for Retired Members and Beneficiaries	\$ 8,101,453	\$ 8,094,818	-0.1%
Average Monthly Retirement Benefit	3,326	3,442	3.5%
Financial Information			
Market Value of Assets (MVA)	\$ 99,749,099	\$ 115,969,814	16.3%
Actuarial Value of Assets (AVA)	107,080,303	110,546,468	3.2%
Actuarial Liability	\$ 127,317,052	\$ 129,965,868	2.1%
Unfunded Actuarial Liability	20,236,749	19,419,400	-4.0%
Funding Ratio (MVA)	78.3%	89.2%	
Funding Ratio (AVA)	84.1%	85.1%	
Contributions and Cash Flows			
Contribution (actual/expected)	\$ 4,380,612	\$ 4,638,401	5.9%
Prior Year Benefit Payments	8,032,161	8,031,919	0.0%
Prior Year Administrative Expenses	78,362	78,130	-0.3%
Prior Year Total Investment Income	(4,686,691)	19,950,152	

*Includes overtime pay up to 10% of base pay for members hired prior to January 1, 2012.

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION I – BOARD SUMMARY

General Comments

- For plans that are not distressed or are minimally distressed, the future gains and losses of the Plan are required to be amortized over the lesser of the maximum amortization periods, as outlined in Appendix C, or the average future service for the active participants in the Plan which is 11.25 years as of January 1, 2020 and, per Act 205, rounded up to 12 years. The City of Allentown was determined to be minimally distressed (86% funded on an aggregate basis for all plans) by the Pennsylvania Auditor General in 2020 and in accordance with Act 205 Section 502. Plan distress categories as outlined by Act 44 are provided below:

Funding Ratio	Distress Level
90% and above	None
70% to 89%	Minimal
50% to 69%	Moderate
Less than 50%	Severe

- The City adopted Ordinance 57 on September 16, 2015, as allowed under Section 202(b)(4) of Act 205, to change the plan’s amortization method. The amortization payments of the unfunded actuarial liability (UAL) will be the lesser of (1) the traditional amortization of individual bases or (2) the level dollar rolling amortization of the total UAL over 10 years, if the funding level of the Plan exceeds 70%.
- The Market Value of Assets returned 20.38% in 2019.
- For this valuation, the Actuarial Value of Asset (AVA) method which smooths gains and losses over 5 years was applied. For the AVA, the Plan experienced a loss of about \$698,095 recognizing prior years’ losses when coupled with this year’s market value gain and which yields the return of 6.84% versus the prior assumed return rate of 7.50%.
- During calendar year 2019, the Firemen’s Pension Plan received \$4,380,612 in contributions and paid out \$8,110,049 in benefits and expenses. Comparing these two amounts results in a negative cash flow of \$3,729,437 which means the Plan is currently using investment returns to pay for benefits and expenses not covered by contributions. Such a situation is expected for a mature plan.
- On the liability side, the Plan experienced a gain totaling \$507,438 mainly due to mortality, salary and COLA gains.
- Overall, the Plan experienced a net loss (investment losses and liability gains) of \$190,657 during 2019. Since the January 1, 2019 valuation there is a total loss of \$468,356 due to the explicit gains/losses over the 2019 period from experience as described above and the timing of contributions. The loss due to the timing of contributions was \$277,699.
- The total new loss base of \$468,356 in 2020 is amortized over 12 years as an estimate of the actual amortization base which will be determined from the January 1, 2021 actuarial valuation. Note that this average future service could decrease as of January 1, 2021, which would decrease the amortization period to 11 years or less.

SECTION I – BOARD SUMMARY

Risk Assessment

Significant risks that may result in actual future measurements deviating from those expected by this valuation include investment risk, as well as longevity and other demographic risk. Investment risk is the potential that future investment returns will deviate from those that are expected. Longevity and other demographic risk is the potential that mortality or other demographic experience will deviate from that which is expected by the valuation assumptions.

The volatility of the measurements due to differences in the actual investment returns is examined later in this section with projections that assume rates of return other than the valuation assumption. We anticipate that for this plan the demographic assumption that presents the most risk to future actual measurements deviating from expected is the rate of salary increase, which impacts the Cost of Living Adjustment (COLA) growth for retirees, and potentially the mortality rate.

- If salary/rank pay growth is generally lower than anticipated, the plan's future financial status will be improved while if salary/rank pay is generally higher than anticipated, it will be lower than expected by this valuation. Salary/rank pay growth is especially a risk for the plan because of how this impacts not only liabilities for active participants, but for retirees as well because their cost of living increase occurs when the pension allowance falls below half of the current salary for a firefighter of the same rank based upon rank at retirement.
- If mortality rates are generally higher than anticipated, the plan's future financial status will be improved while if mortality rates are generally lower than anticipated, then the funded status will be less than expected by this valuation.

In the "Trends" part of this section, there are a number of historical measures shown that demonstrate that the potential volatility of the Plan's actuarial measurements as a result of deviation of actual experience from assumptions has grown in recent years. For example, the proportion of the Plan's members that are in payment status has grown, which makes the volatility of mortality risk greater.

The remainder of this section analyzes past trends in the Plan's funding and presents projections under various economic outlooks.

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
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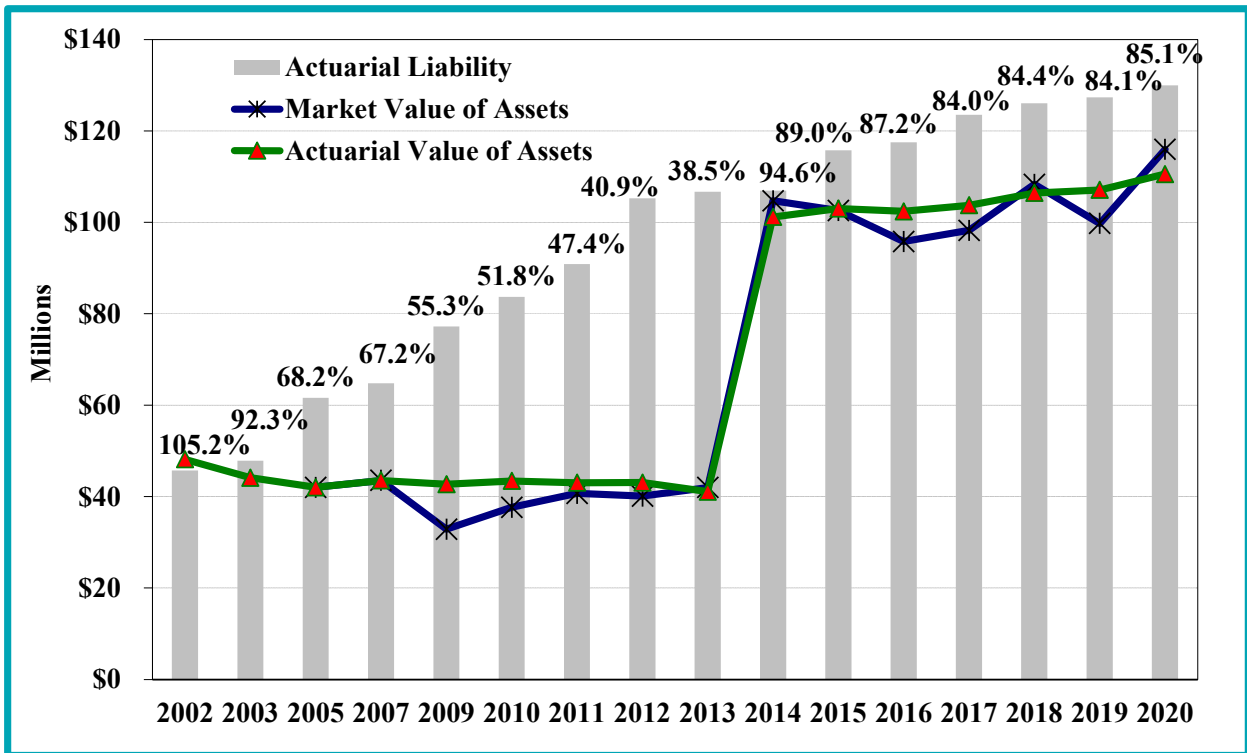
SECTION I – BOARD SUMMARY

Trends

It is important to take a step back from the latest results and view them in the context of the Plan’s recent history. Below we present a series of charts which display key factors in the valuations over the last several years.

Assets and Liabilities

The gray bars represent the Actuarial Liability mentioned in this report. The green and blue lines represent the asset values. The Market Value of Assets was unavailable for years prior to 2005. The funding ratios shown in the graph above each gray bar are equal to the Actuarial Value of Assets divided by the Actuarial Liability. The January 1, 2014 assets reflect the \$61.2 million pension obligation bond proceeds contributed in 2013 and increased the funding ratio to 94.6%.



Results before 2010 are from the prior actuary. Valuations performed biennially from 2003 - 2009. The Actuarial Liability results for 2014 reflect the 2013 actuarial assumptions, reflecting all assumption changes since the prior Act 205 filing from 2015 forward, as required under Act 205.

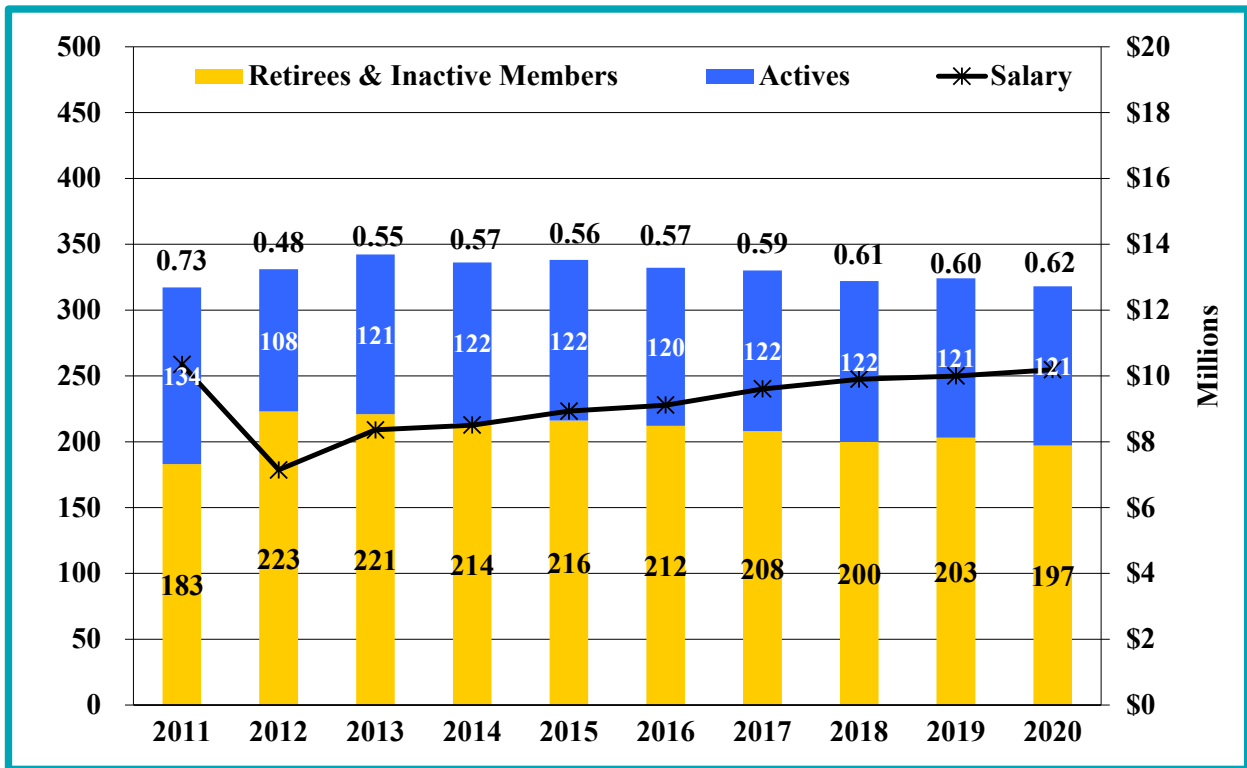
**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
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SECTION I – BOARD SUMMARY

Participant Trends

Here we compare the membership counts (left-hand scale) and the total salary (right-hand scale). The ratio (at the top of each bar) is the number of active participants divided by the number of inactive participants. The salary is represented by pensionable pay, which is the base pay plus overtime limited to 10% of base pay as applicable. The ratio of active to inactive participants is a measure of the maturity of the plan. When this ratio is below one, the fund is more mature and potentially at a higher risk of cost volatility. This is because the assets backing the retiree benefits have become large relative to the contribution base, i.e. the active participant payroll. As assets grow relative to the pensionable payroll, any experience gain or loss are funded over the future working life of the active population and can therefore have a significant impact and higher volatility of costs from year-to-year even with the application of asset smoothing methods.

The decrease in the 2012 payroll and active employee count was due to the increased number of retirements in December of 2011 due to future changes to the pension provisions.



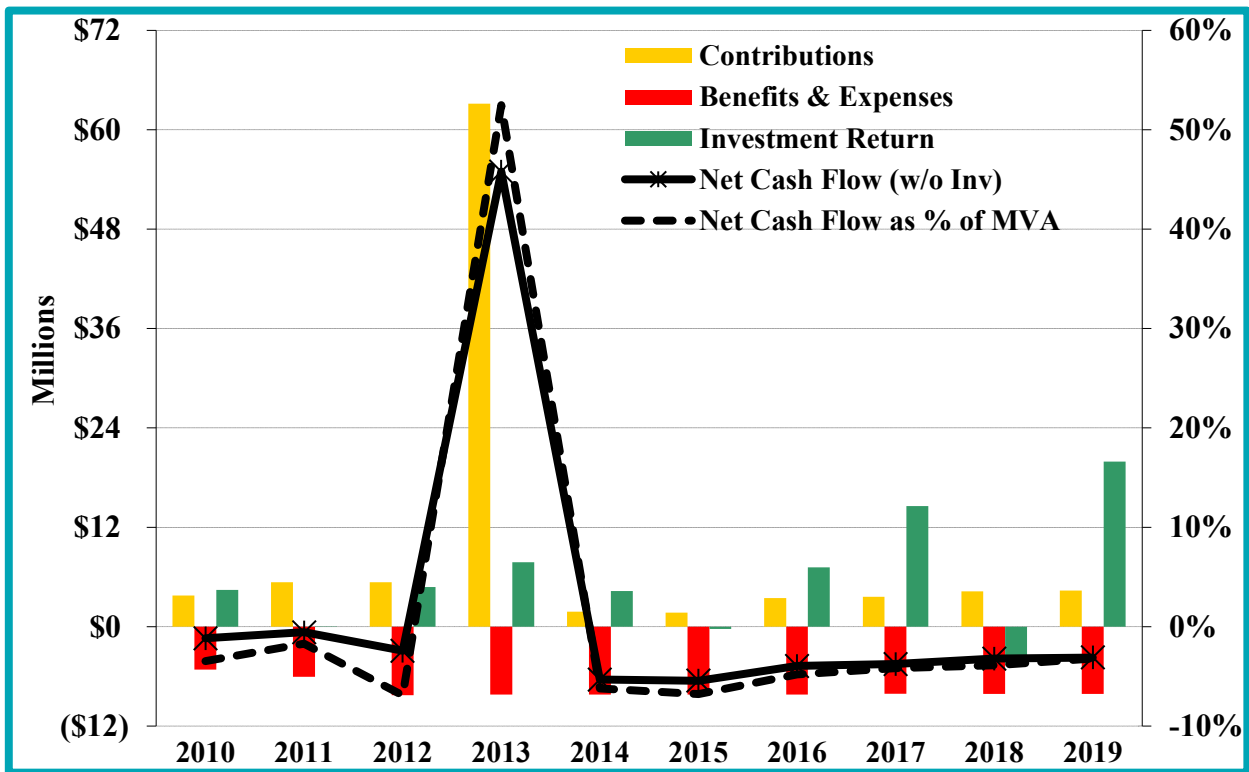
**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
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SECTION I – BOARD SUMMARY

Cash Flows

Plan cash flow is a critical measure, as it reflects the ability to make benefit payments without necessitating difficult investment decisions, especially during volatile markets. The laddered bond approach of investing, the Board has adopted for this plan, helps to mitigate this risk. Cash flow is defined as contributions received less benefit payments and expenses.

The Plan's net cash flow (NCF) has been negative except for 2013. Due to the \$63.1 million contribution, which includes \$61.2 million in pension obligation bond proceeds, the plan had a substantial positive net cash flow in 2013. As anticipated, the plan experienced a negative net cash flow from 2014-2019. The implication of a plan in a negative cash flow position is that return on investment must first cover the negative cash flow before the assets can increase. In this case the negative cash flow in 2019 was about 3.2% of the market value of assets, so the net assets will not increase unless investment returns exceed 3.2%, if there are similar cash flows in 2019.



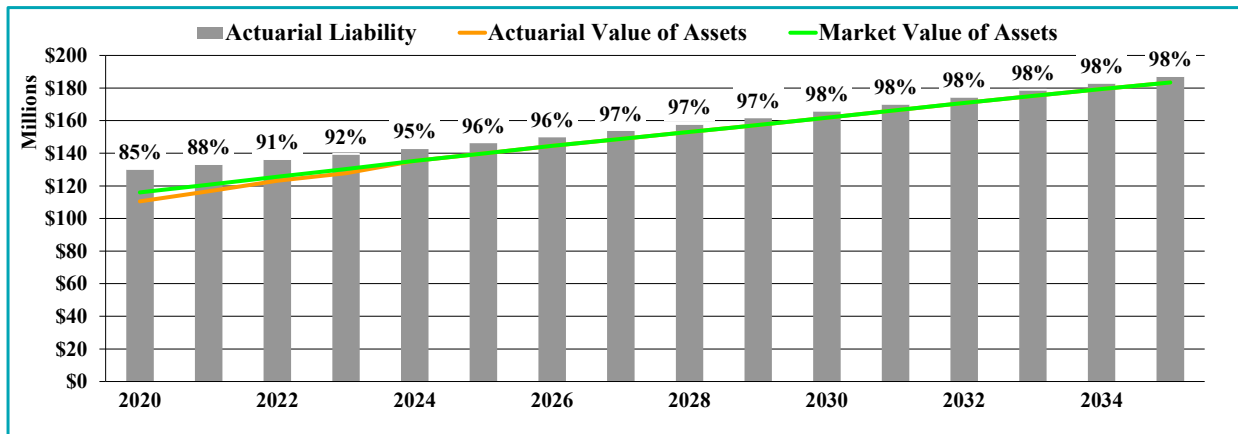
**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
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SECTION I – BOARD SUMMARY

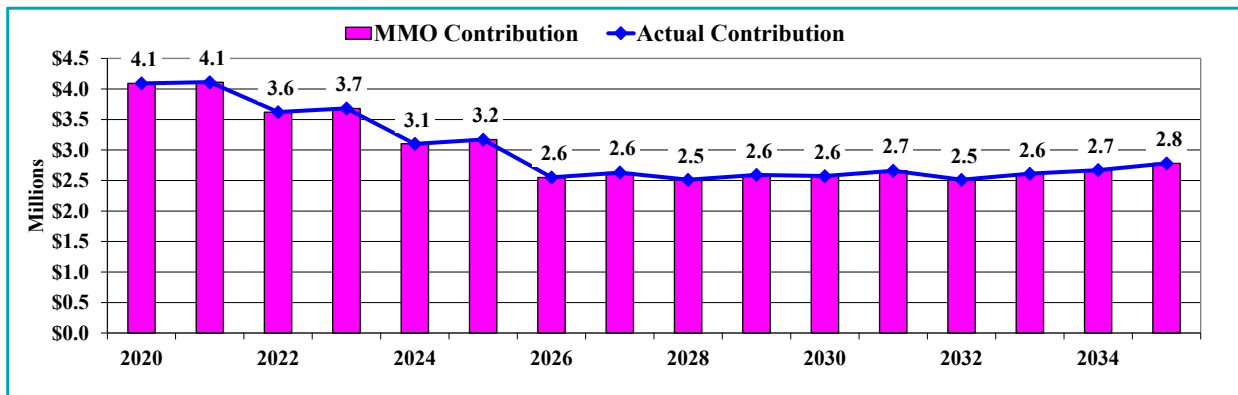
Baseline Projections

We have included two charts projecting the funded ratio and Minimum Municipal Obligations for the next 15 years, assuming that the Plan’s assets earn 7.5%.

The gray bars represent the liabilities with the orange and green lines representing the asset values. The Actuarial Value of Assets and the Market Value of Assets are expected to converge over the next five years. This projection assumes all assumptions outlined in Appendix C are fully realized. The funded ratio (Actuarial Value of Assets divided by liabilities) listed on top of each of the bars steadily increases to 98% at the end of the 15-year period. Due to the 10-year rolling amortization method, the funding ratio will not attain a 100% funded ratio but it will continue to approach the 100% level assuming all assumptions are met.



This next chart projects the MMO over the same period. On top of each bar is the projected MMO amount in millions of dollars. The 10-year rolling amortization is included in the calculation of the UAL amortization amount for the MMO. The traditional amortization amount is expected to be lower through 2021, after which the 10-year rolling amortization amount is expected to be lower. If all assumptions are met, the projected MMO after 15 years will be \$2.8 million.



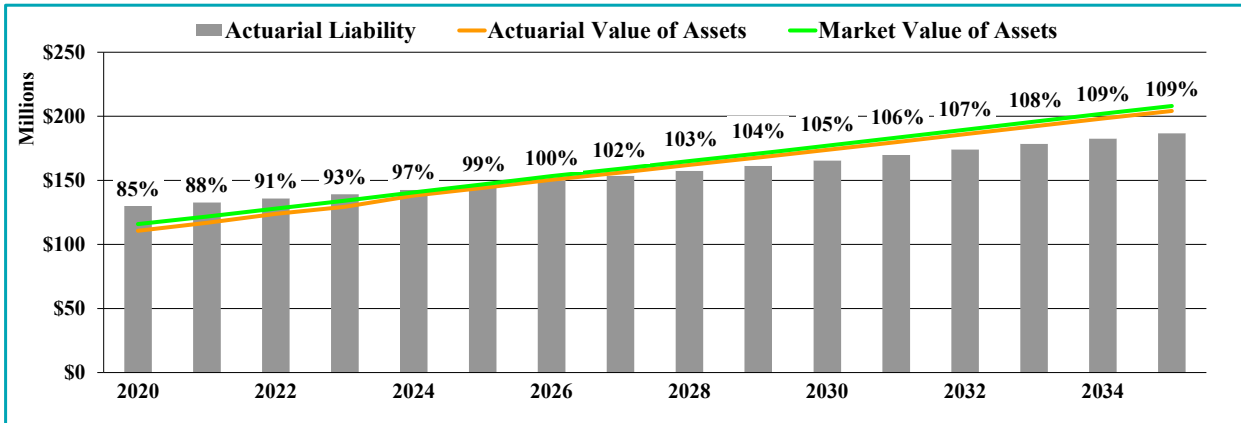
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SECTION I – BOARD SUMMARY

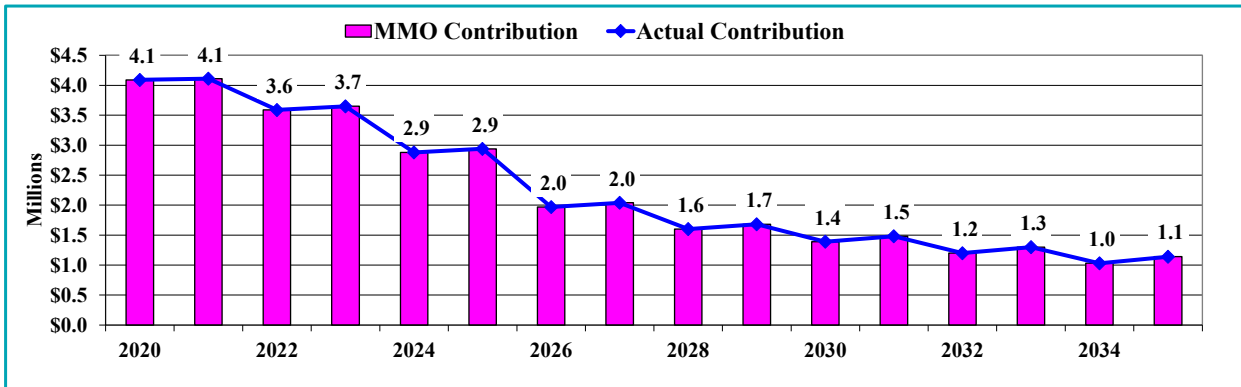
Projections with Asset Returns of 8.5%

The charts below show the expected progress of the Plan over 15 years, assuming that the plan’s assets earn 8.5%, 1.0% higher than the valuation assumption. All other assumptions are consistent with the Baseline projections.

The funded ratios (Actuarial Value of Assets divided by liabilities) listed on top of each of the bars steadily increase to 109% over the 15-year period as deferred investment losses are recognized.



This next chart projects the MMO over the same period. On top of each bar is the projected MMO amount in millions of dollars. The 10-year rolling amortization is included in the calculation of the UAL amortization amount for the MMO.



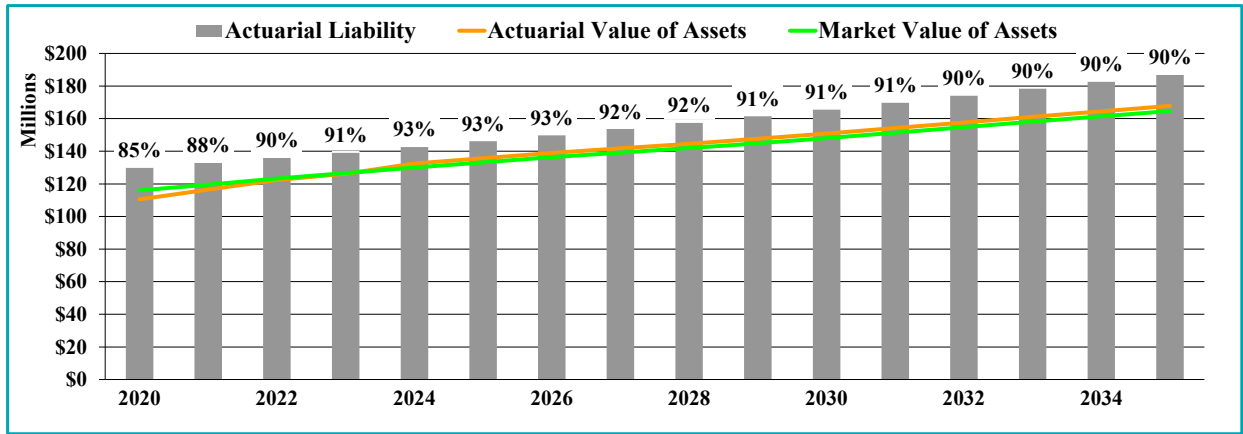
**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION I – BOARD SUMMARY

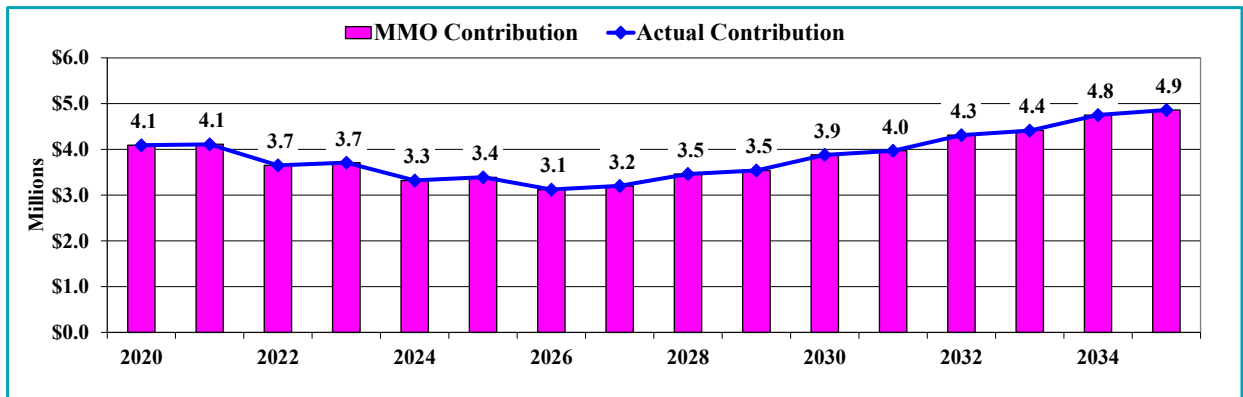
Projections with Asset Returns of 6.5%

The charts below show the expected progress of the Plan over 15 years, assuming that the plan’s assets earn 6.5%, 1.0% lower than the valuation assumption. All other assumptions are consistent with the Baseline projections.

The funded ratios (Actuarial Value of Assets divided by liabilities) listed on top of each of the bars increase to 93% by 2024 before slowly decreasing to 90% over the 15-year. This gradual decrease in the funding ratio is due to the 10-year rolling amortization being applied every year along with the annual underperformance of the asset returns. If in fact this scenario occurred, discussion with the pension board over the reduction in the discount rate assumption would likely occur.



This next chart projects the MMO over the same period. On top of each bar is the projected MMO amount in millions of dollars. The 10-year rolling amortization is included in the calculation of the UAL amortization amount for the MMO. If the funding ratio is less than 70%, then the amortization payments will need to be based on the layered amortization.



**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION I – BOARD SUMMARY

These projections are based upon the January 1, 2020 valuation and the methods, assumptions, plan provisions and data as outlined in this report. To the extent that the actual plan experience deviates from the underlying assumptions and methods, (for example, if the asset returns are less than expected, or there are any changes in plan provisions or applicable laws) *the results would vary accordingly and possibly materially*, resulting in potentially larger MMOs than currently expected. Please note that these projections should be replaced once new data and valuations are completed and new projections are provided in the future.

The MMO pay used in the MMO calculation in the table below is provided by the City of Allentown and may differ from the valuation pay provided throughout this report which is based upon actual participant data included in the actuarial valuation as of January 1 of each year.

Table I-2			
Minimum Municipal Obligation (Actual and <i>Estimated</i>)			
Based Upon Valuation Report Calendar Year	1/1/2019 2020	1/1/2019 2021	1/1/2021 2022
(1) MMO Pay (<i>Estimated</i>)	\$ 11,493,990	\$ 12,204,882	\$ 12,754,000
(2) Normal Cost %	16.97%	16.97%	15.52%
(3) Total Normal Cost	1,950,530	2,071,168	1,979,421
(4) Amortization of UAL	2,607,871	2,566,731	2,190,000
(5) Total Administration Expense	80,000	80,000	80,000
(6) Total Financial Requirement	<u>\$ 4,638,401</u>	<u>\$ 4,717,899</u>	<u>\$ 4,249,421</u>
(7) Estimated Employee Contributions	574,700	610,244	637,700
(8) Minimum Municipal Obligation [(6)-(7)]	<u>\$ 4,063,701</u>	<u>\$ 4,107,655</u>	<u>\$ 3,611,721</u>

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION II – ASSETS

Pension Plan assets play a key role in the financial operation of the Plan and in the decisions the Board may make with respect to future deployment of those assets. The level of assets, the allocation of assets among asset classes, and the methodology used to measure assets will likely have an impact upon benefit levels, contributions, and the ultimate security of participants' benefits.

In this section, we present detailed information on Plan assets including:

- **Disclosure** of Plan assets at January 1, 2019 and January 1, 2020;
- Statement of the **changes** in market values during the year;
- An assessment of **investment performance**; and
- Development of the **actuarial value of assets**.

Disclosure

The market value of assets represents the “snap-shot” or “cash-out” values which provide the principal basis for measuring financial performance from one year to the next. Market values, however, can fluctuate widely with corresponding swings in the marketplace.

Table II-1 Disclosure of Plan Assets*		
	1/1/2019	1/1/2020
<u>Assets</u>		
Investments	\$ 99,687,794	\$ 116,238,697
Receivables	55,124	51,454
Due from City's General Fund	19,835	0
Total Assets	\$ 99,762,753	\$ 116,290,151
<u>Liabilities</u>		
Accounts Payable	\$ 13,654	\$ 7,736
Due to City's General Fund	0	312,601
Total Liabilities	\$ 13,654	\$ 320,337
Net Assets Available for Benefits	\$ 99,749,099	\$ 115,969,814

*Assets are based on the Comprehensive Annual Financial Report (CAFR) for each year end.

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION II – ASSETS

Changes in Market Value

The components of asset change are:

- Contributions
- Benefit payments
- Expenses
- Investment income (realized and unrealized)

The specific changes during the 2018 and 2019 plan years are presented below:

Table II-2 Changes in Market Value		
	2018	2019
Beginning of Year Assets	\$ 108,294,162	\$ 99,749,099
<u>Additions</u>		
Employer Contributions	\$ 3,714,299	\$ 3,779,843
Member Contributions	537,852	600,769
Interest and Dividends	2,155,083	2,437,847
Net Appreciation / (Depreciation)	(6,841,774)	17,512,305
Total Additions	\$ (434,540)	\$ 24,330,764
<u>Deductions</u>		
Benefit Payments	\$ 8,032,161	\$ 8,031,919
Administrative expense	78,362	78,130
Total Deductions	\$ 8,110,523	\$ 8,110,049
Net Change in Market Value of Assets	\$ (8,545,063)	\$ 16,220,715
End of Year Assets	\$ 99,749,099	\$ 115,969,814

The two-year average of the administrative expenses paid from the plan assets, rounded to the nearest \$10,000, is \$80,000. This is the projected expense estimate for the 2022 MMO determination. The estimated benefit payments for the current plan year are \$8,462,127.

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
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SECTION II – ASSETS

Investment Performance

The following table calculates the investment related gain/loss for the most recent two calendar years on a market value basis. The market value gain/loss is an appropriate measure for comparing the actual asset performance to the long-term 7.50% assumption.

Table II-3			
Market Value of Assets Gain/(Loss)			
Item	2018	2019	Total Period
Beginning of Year Market Value	\$ 108,294,162	\$ 99,749,099	\$ 108,294,162
Contributions	4,252,151	4,380,612	8,632,763
Benefit Payments	(8,032,161)	(8,031,919)	(16,064,080)
Administrative Expenses	(78,362)	(78,130)	(156,492)
Expected Investment Earnings (7.50%)	7,979,989	7,343,857	16,273,847
Expected Market Value on December 31	<u>\$ 112,415,779</u>	<u>\$ 103,363,519</u>	<u>\$ 116,980,200</u>
Investment Gain / (Loss)	<u>(12,666,680)</u>	<u>12,606,295</u>	<u>(1,010,386)</u>
End of Year Market Value	\$ 99,749,099	\$ 115,969,814	\$ 115,969,814
Return	-4.41%	20.38%	7.05%

The Total Period reconciliation reflects total benefit payments, contributions and expenses during this two-year period. Investment earnings do not follow the additive property and instead are calculated based on the beginning and end of Total Period values.

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
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SECTION II – ASSETS

Assets at Actuarial Value

The Actuarial Value of Asset (AVA) method smooths gains and losses over five years. The resulting value is then limited to be no greater than 120% and no less than 80% of the Market Value of Assets on the valuation date.

The table below shows the development of the actuarial asset value applied to this valuation.

Table II-4 Development of Actuarial Value of Assets 5-Year Smoothing Method					
Market Value of Assets as of January 1, 2020					\$ 115,969,814
<u>Plan Year</u>	<u>Investment Gains / (Losses)</u>	<u>Percent Recognized</u>	<u>Percent Deferred</u>	<u>Amount Deferred</u>	
2015	\$ (7,988,092)	100%	0%	\$ 0	
2016	(77,203)	80%	20%	(15,441)	
2017	7,384,398	60%	40%	2,953,759	
2018	(12,666,680)	40%	60%	(7,600,008)	
2019	12,606,295	20%	80%	10,085,036	
					\$ 5,423,346
Preliminary Actuarial Value as of January 1, 2020					\$ 110,546,468
Corridor for Actuarial Value					
- Lower Limit			80%	\$ 92,775,851	
- Upper Limit			120%	\$ 139,163,777	
Actuarial Value of Assets as of January 1, 2020					\$ 110,546,468
- as a percent of Market Value of Assets					95.3%

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION II – ASSETS

Table II-5			
Actuarial Value of Assets Gain/(Loss)			
Item	2018	2019	Total Period
Beginning of Year Actuarial Value	\$ 106,397,272	\$ 107,080,303	\$ 106,397,272
Contributions	4,252,151	4,380,612	8,632,763
Benefit Payments	(8,032,161)	(8,031,919)	(16,064,080)
Administrative Expenses	(78,362)	(78,130)	(156,492)
Expected Investment Earnings (7.50%)	<u>7,837,722</u>	<u>7,893,697</u>	15,978,643
Expected Actuarial Value on December 31	\$ 110,376,622	\$ 111,244,563	\$ 114,788,106
Investment Gain / (Loss)	<u>(3,296,319)</u>	<u>(698,095)</u>	<u>(4,241,638)</u>
End of Year Actuarial Value	\$ 107,080,303	\$ 110,546,468	\$ 110,546,468
Return	4.35%	6.84%	5.56%

The Total Period reconciliation reflects total benefit payments, contributions and expenses during this two-year period. Investment earnings do not follow the additive property and instead are calculated based on the beginning and end of Total Period values.

CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020

SECTION III – LIABILITIES

In this section, we present detailed information on Plan liabilities including:

- **Disclosure** of Plan liabilities at January 1, 2019 and January 1, 2020;
- Statement of **changes** in these liabilities during the year; and
- Development of the actuarial gain / loss for the year ending December 31, 2019.

Disclosure

Two types of liabilities are calculated and presented in this report.

- **Present Value of Benefits:** Used for analyzing the financial outlook of the Plan, this represents the amount of money needed today to fully fund all future benefits and expenses of the Plan, assuming participants continue to accrue benefits.
- **Actuarial Liability:** Used for funding calculations, this liability is calculated by taking the Present Value of Benefits above and subtracting the present value of future Member Contributions and future Employer Normal Costs under an acceptable actuarial funding method. Employer Normal Costs are developed under the **Entry Age Normal** funding method, with normal cost as a percent of pay determined to be level at each active participant's entry age.

The following table discloses both of these liabilities for the current and prior valuations. The liability is also compared to the Plan's assets to determine the **net surplus** or **unfunded liability**. The net surplus or unfunded liability shown in this report is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the Plan's benefit obligation in the event of a plan termination or other similar action.

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION III – LIABILITIES

Table III-1		
Liabilities/Net (Surplus)/Unfunded		
	January 1, 2019	January 1, 2020
Present Value of Future Benefits		
(1) Active Participant Benefits		
Retirement Benefits	\$ 51,780,689	\$ 53,632,610
Disability Benefits	1,416,207	1,442,834
Survivor Benefits	1,294,781	1,295,891
Refund of Members Contribution with Interest	0	0
Other: Vested Benefits	279,886	264,922
Total Active Participant Benefits*	<u>\$ 54,771,563</u>	<u>\$ 56,636,257</u>
(2) Inactive Participant Benefits		
Retirement Benefits	\$ 78,297,448	\$ 78,766,868
Disability Benefits	\$ 2,187,343	\$ 2,491,488
Survivor Benefits	9,721,248	9,263,475
Terminated Vested and Inactive Members	0	70,850
Total Inactive Participant Benefits	<u>\$ 90,206,039</u>	<u>\$ 90,592,681</u>
(3) Present Value of Benefits (PVFB)	\$ 144,977,602	\$ 147,228,938
[(1) +(2)]		
Actuarial Value of Assets (AVA)	\$ 107,080,303	\$ 110,546,468
Present Value of Future Contributions	37,897,299	36,682,470
Total Resources	\$ 144,977,602	\$ 147,228,938
Actuarial Liability		
Present Value of Benefits (PVFB)	\$ 144,977,602	\$ 147,228,938
Present Value of Future Normal Costs (PVFNC)	17,660,550	17,263,070
Actuarial Liability (AL = PVFB – PVFNC)	\$ 127,317,052	\$ 129,965,868
Actuarial Value of Assets (AVA)	107,080,303	110,546,468
Net (Surplus)/Unfunded (AL – AVA)	\$ 20,236,749	\$ 19,419,400

* The amount of the accumulated member contributions without accrued interest is \$6,406,738 for all active members as of January 1, 2020.

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION III – LIABILITIES

Changes in Liabilities

The Liabilities disclosed in the prior table are expected to change at each valuation. The components of that change, depending upon which liability is analyzed, can include:

- Benefits accrued since the last valuation
- Plan amendments changing benefits
- Passage of time which adds interest to the prior liability
- Benefits paid to retirees since the last valuation
- Participants retiring, terminating, or dying at rates different than expected
- A change in actuarial or investment assumptions
- A change in the actuarial funding method

Unfunded liabilities will change because of all of the above, and also due to changes in Plan assets resulting from:

- Contributions different than expected
- Investment earnings different than expected

In each valuation, we report on those elements of change which are of particular significance, potentially affecting the long-term financial outlook of the Plan. In the following table we present key changes in liabilities since the valuation as of January 1, 2019. The accrual of benefits is the normal cost under the Entry Age Normal cost method.

Table III-2 Change in Actuarial Liability	
Liabilities on 01/01/2019	\$ 127,317,052
Liabilities on 01/01/2020	<u>129,965,868</u>
Liability Increase (Decrease)	\$ 2,648,816
Change Due to:	
Plan Amendment	\$ 0
Assumption Change	0
Method Change	0
Accrual of Benefits	1,800,136
Benefit Payments	(8,031,919)
Passage of Time	9,388,037
Liability (Gain)/Loss	<u>(507,438)</u>
Total	\$ 2,648,816

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION III – LIABILITIES

Table III-3 Reconciliation of the Unfunded Actuarial Liability			
	Actuarial Liability	Actuarial Value of Assets	Unfunded Actuarial Liability
Beginning of the Year Values as of 01/01/2019	\$ 127,317,052	\$ (107,080,303)	\$ 20,236,749
Expected Normal Cost	1,800,136	N/A	1,800,136
Contributions (includes estimated expenses)	N/A	\$ (4,380,612)	\$ (4,380,612)
Benefit Payments	\$ (8,031,919)	8,031,919	0
Actual Expenses	N/A	78,130	78,130
Plan Amendment	\$ 0	\$ 0	\$ 0
Assumption Change	0	0	0
Expected Interest			
Interest on Initial Value	\$ 9,548,779	\$ (8,031,023)	\$ 1,517,756
Interest on Normal Cost	135,010	0	135,010
Interest on Contributions	0	(161,303)	(161,303)
Interest on Benefit Payments	(295,752)	295,752	0
Interest on Expenses	0	2,877	2,877
Total Expected Interest	\$ 9,388,037	\$ (7,893,697)	\$ 1,494,340
Expected End of Year Values as of 01/01/2020	\$ 130,473,306	\$ (111,244,563)	\$ 19,228,743
(Gain)/Loss	(507,438)	698,095	190,657
Actual End of Year Values as of 01/01/2020	\$ 129,965,868	\$ (110,546,468)	\$ 19,419,400

In addition to the explicit gains and losses determined in the prior tables, there are additional losses due to the timing of amortization payments.

The following table provides the Normal Cost, which can be considered the cost for the additional accrual of benefits during the year. The Normal Cost as a percent of payroll as of January 1, 2019 is used for the MMO calculations for 2020 and 2021.

Table III-4 Normal Cost and Normal Cost as Percentage of W-2 Payroll			
	2018	2019	2020
Normal Cost	\$ 1,789,346	\$ 1,800,136	\$ 1,813,315
W-2 Wages for active members from prior year	\$ 10,408,858	\$ 10,607,240	\$ 11,684,319
Normal Cost as a Percent of the Estimated Payroll	17.19%	16.97%	15.52%

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION IV – MINIMUM MUNICIPAL OBLIGATION

The actuarial funding method used to determine the normal cost and the unfunded actuarial liability is the **Entry Age Normal** (EAN) cost method. The normal cost is based upon the normal cost rate determined by taking the value, as of entry age into the plan, of each member's projected future benefits. This value is then divided by the value, also at entry age, of each member's expected future salary producing a normal cost rate as a percent of salary that should remain relatively constant over a participant's career. The normal cost rate is multiplied by current salary to determine each member's normal cost. The total normal cost of the plan is the summation of each member's normal cost. Finally, the normal cost is reduced by the total member contributions to produce the employer normal cost.

The actuarial liability for active participants is the present value of all future benefits expected to be earned under the plan minus the present value of future normal costs. The actuarial liability for inactive participants is the present value of all future pension benefits to be paid from the plan to the retirees and vested terminated participants. The unfunded actuarial liability is the difference between the EAN actuarial liability and the actuarial value of assets.

The amortization requirement is the annual contribution to reduce the unfunded actuarial liability recognized over a certain time period, as outlined in Act 205 and revised by Act 44. The amortization time periods are provided in Appendix C of this report.

In the following charts, we show the actual MMO for 2020 and 2021. The payroll amount shown reflects the information provided by the City for those years.

The MMO for 2022 has been estimated based on the results of the January 1, 2020 valuation, as well as the estimated 2021 payroll. Additionally, the amortization amount in the 2022 MMO calculation incorporates expected 2021 calendar year results, assuming all assumptions are realized as outlined in this report.

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION IV – MINIMUM MUNICIPAL OBLIGATION

The MMO pay used in the MMO calculation in the table below is provided by the City of Allentown and may differ from the valuation pay provided throughout this report which is based upon actual participant data included in the actuarial valuation as of January 1 of each year.

Table IV-1 Minimum Municipal Obligation (Actual and <i>Estimated</i>)			
Based on Valuation Report: Calendar Year:	1/1/2019 2020	1/1/2019 2021	1/1/2021 2022
1. MMO pay (actual/ <i>estimated</i>) (prior year W2 pay reported by the City)	\$ 11,493,990	\$ 12,204,882	\$ 12,754,000
2. Total Normal Cost Percentage	16.97%	16.97%	15.52%
3. Total Normal Cost [(1) x (2)]	\$ 1,950,530	\$ 2,071,168	\$ 1,979,421
4. Total Amortization Requirement	2,607,871	2,566,731	2,190,000
5. Total Administrative Expenses	<u>80,000</u>	<u>80,000</u>	<u>80,000</u>
6. Total Financial Requirement [(3) + (4) + (5)]	\$ 4,638,401	\$ 4,717,899	\$ 4,249,421
7. Estimated Member Contribution Rate	5.00%	5.00%	5.00%
8. Estimated Member Contributions [(1) x Member Contribution Rate]	<u>574,700</u>	<u>610,244</u>	<u>637,700</u>
9. Estimated Employer Portion of MMO [(6) - (8)]	\$ 4,063,701	\$ 4,107,655	\$ 3,611,721

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION IV – MINIMUM MUNICIPAL OBLIGATION

The following table summarizes the development of the gains and losses from 2019 to 2020.

Table IV-2	
Development of Actuarial Gain / (Loss)	
Unfunded Liability as of 01/01/2019	\$ 20,236,749
Normal Cost	\$ 1,800,136
Contributions made	
a. Employee Contributions	\$ (600,769)
b. Local Portion	(3,779,843)
Actual Expenses	\$ 78,130
Interest on above	1,494,340
Plan Changes	\$ 0
Assumption Changes	0
Method Changes	0
Expected Unfunded Liability as of 01/01/2020	\$ 19,228,743
Actual Unfunded Liability as of 01/01/2020	<u>19,419,400</u>
Actuarial Gain / (Loss)	\$ (190,657)
- Investment Gain / (Loss)	(698,095)
- Liability Gain / (Loss)	507,438

This table provides an analysis of the gains/(losses) for the new amortization base.

Table IV-3	
Total Gain/(Loss)	
Investment Gain / (Loss)	\$ (698,095)
Liability Gain / (Loss)	507,438
Timing and interest Gain / (Loss)	<u>(277,699)</u>
Total Gain/(Loss)	\$ (468,356)

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION IV – MINIMUM MUNICIPAL OBLIGATION

The following table provides the schedule of amortization bases as of January 1, 2020. The total \$468,356 actuarial loss reflects the explicit loss for 2019 as provided above and the timing and interest loss due to the delayed contributions as followed under Act 205. The January 1, 2021 valuation will reflect the final amortization bases and the unfunded liability, and the current 2020 amortization base will be absorbed by the 2021 amortization base.

Table IV-4a							
Schedule of Amortization Bases Including Bond Proceeds for Minimum Contributions as of January 1, 2020							
Original Date	Type	Original Amount	Original Period	Remaining Period	Payment	Balance	Date Fully Amortized
1/1/2003	Investment Loss	5,622,162	30	13	30,086	262,806	12/31/2032
1/1/2005	Plan Amendment	10,203,173	20	5	63,410	\$275,790	12/31/2024
1/1/2007	Assumption Change	(3,114,099)	20	7	(19,286)	(109,809)	12/31/2026
1/1/2007	Actuarial Loss	5,621,780	15	2	40,304	77,796	12/31/2021
1/1/2009	Assumption Change	(9,855,348)	20	9	(60,834)	(417,155)	12/31/2028
1/1/2009	Actuarial Loss	24,467,226	20	9	151,027	1,035,640	12/31/2028
1/1/2011	Actuarial Loss	15,494,705	20	11	95,349	749,833	12/31/2030
1/1/2013	Plan Amendment	(5,170,402)	10	3	(47,192)	(131,928)	12/31/2022
1/1/2013	Assumption Change	46,266	15	8	328	2,068	12/31/2027
1/1/2013	Actuarial Loss	27,694,316	20	13	169,932	1,484,400	12/31/2032
1/1/2015	Assumption Change	2,760,787	14	9	303,010	2,077,832	12/31/2028
1/1/2015	Actuarial Loss	1,436,184	14	9	157,628	1,080,906	12/31/2028
1/1/2017	Assumption Change	4,204,011	13	10	481,268	3,551,224	12/31/2029
1/1/2017	Actuarial Loss	7,896,896	13	10	904,023	6,670,687	12/31/2029
1/1/2019	Actuarial Loss	2,475,309	12	11	297,677	2,340,954	12/31/2030
1/1/2020	Actuarial Loss	468,356	12	12	56,324	468,356	12/31/2031
					\$ 2,623,054	\$ 19,419,400	

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION IV – MINIMUM MUNICIPAL OBLIGATION

In 2015, the City adopted Ordinance 57 changing the plan’s amortization method. The Unfunded Actuarial Liability Amortization is outlined in Appendix C and is the lesser of the traditional amortization of individual bases, or the 10-year level dollar rolling amortization of the total Unfunded Actuarial Liability. The chart below shows the determination of the UAL payment for 2020.

Table IV-4b UAL Amortization Payment	
1. Traditional Amortization	\$ 2,623,054
2. 10-year Rolling Amortization	\$ 2,631,752
3. Minimum of (1) or (2)	\$ 2,623,054

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX A – MEMBERSHIP INFORMATION

The data for this valuation was provided by the City as of January 1, 2020. Cheiron did not audit any of the data; however, we performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standards of Practice No. 23.

The following is a list of data charts contained in this section:

- Summary of Participant Data
- Age/Service Distribution for Active Participants, including counts and total salary
- Counts and Total Benefit Amount by Age for Retirees, Beneficiaries, and Disabled Participants
- Counts and Total Benefit Amount by Age for Terminated Vested Participants

SUMMARY OF PARTICIPANT DATA		
	1/1/2019	1/1/2020
Active Participants		
Count	121	121
New Entrants	2	4
Average Age	43.1	43.5
Average Benefit Service	13.6	14.0
Annual Payroll*	\$ 9,992,977	\$ 10,187,331
Retirees and Beneficiaries Receiving Payments		
Count	203	196
Average Age	70.4	69.9
Annual Benefits	\$ 8,101,453	\$ 8,094,818
Average Monthly Benefit	\$ 3,326	\$ 3,442
Terminated Vested Participants and Inactive Members		
Count	0	1
Accumulated Member Contributions w/o Interest	\$ 0	\$ 70,850
Annual Benefits	\$ 0	\$ 0
Average Monthly Benefit	\$ 0	\$ 0

*Includes overtime pay up to 10% of base pay for members hired prior to January 1, 2012.

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX A – MEMBERSHIP INFORMATION

Summary of Active Data with Pensionable Pay as of January 1, 2020

Attained Age	YEARS OF CREDITED SERVICE																			
	Under 1		1 to 4		5 to 9		10 to 14		15 to 19		20 to 24		25 to 29		30 to 34		35 to 39		40 & up	
	No.	Average Comp.	No.	Average Comp.	No.	Average Comp.	No.	Average Comp.	No.	Average Comp.	No.	Average Comp.	No.	Average Comp.	No.	Average Comp.	No.	Average Comp.	No.	Average Comp.
Under 25	1	\$ 44,391	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0
25 to 29	2	45,327	1	56,450	3	72,300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30 to 34	1	44,574	3	63,580	5	77,451	2	87,530	0	0	0	0	0	0	0	0	0	0	0	0
35 to 39	0	0	0	0	10	79,781	8	85,910	1	91,497	0	0	0	0	0	0	0	0	0	0
40 to 44	0	0	0	0	11	81,753	11	86,745	11	88,109	1	97,764	0	0	0	0	0	0	0	0
45 to 49	0	0	0	0	2	83,771	6	85,367	6	89,871	7	92,387	0	0	0	0	0	0	0	0
50 to 54	0	0	0	0	4	80,389	0	0	5	93,210	8	90,377	3	102,859	0	0	0	0	0	0
55 to 59	0	0	0	0	1	83,545	0	0	1	84,802	5	90,698	0	0	0	0	0	0	0	0
60 to 64	0	0	0	0	0	0	0	0	0	0	1	85,315	0	0	1	92,267	0	0	0	0
65 to 69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70 & up	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Summary of Inactive Data as of January 1, 2020

AGE DISTRIBUTION OF INACTIVE PARTICIPANTS PENSIONERS AND BENEFICIARIES RECEIVING BENEFITS AS OF JANUARY 1, 2020								
Age	Disability Retirements		Normal, Early Deferred Vested Retirements		Surviving Spouses and Beneficiaries Receiving Benefits		Total	
	Number	Monthly Benefit	Number	Monthly Benefit	Number	Monthly Benefit	Number	Monthly Benefit
Under 55	1	\$ 3,243	21	\$ 108,518	5	\$ 10,757	27	\$ 122,518
55-59	1	5,681	27	140,221	1	1,200	29	147,102
60-64	0	0	21	103,535	5	12,519	26	116,054
65-69	2	3,978	11	45,710	5	15,960	18	65,648
70-74	1	2,615	14	50,090	3	8,005	18	60,710
75-79	1	1,121	23	66,319	3	5,153	27	72,593
80 & Over	3	4,753	20	39,192	28	45,998	51	89,943
Total	9	\$ 21,391	137	\$ 553,585	50	\$ 99,592	196	\$ 674,568

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX A – MEMBERSHIP INFORMATION

PARTICIPANT RECONCILIATION FROM JANUARY 1, 2019 TO JANUARY 1, 2020

	Actives	Inactive	Disabled	Retired	Beneficiary	Total
January 1, 2019 valuation	121	0	9	138	56	324
Additions / QDROs	4					4
Reductions						
a. Terminated - not vested, refund due	(1)	1				
b. Deaths without beneficiary			(1)		(9)	(10)
Total	3	1	(1)		(9)	(10)
Changes in status						
a. Terminated - vested						
b. Retired	(2)			2		
c. Disabled	(1)		1			
d. Died with beneficiary				(3)	3	
e. Data corrections						
Total	(3)		1	(1)	3	
January 1, 2020 valuation	121	1	9	137	50	318

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX A – MEMBERSHIP INFORMATION

Active Members	Count	Annual Pay
As of last valuation date	121	\$ 9,992,977
Separations from active service		
Refund of contributions	1	\$ 92,042
Separation with deferred benefit	0	0
Separation due refund	0	0
Disability	1	79,126
Death	0	0
Retirement with service retirement benefit	2	184,126
Total separations	4	\$ 355,294
As of current valuation date using prior pay	117	\$ 9,637,683
As of current valuation date using current pay	117	\$ 10,007,712
New entrants	4	179,619
As of current valuation date	121	\$ 10,187,331

Service retirement benefit recipients	Count	Annual Benefit
As of last valuation date	138	\$ 6,575,519
New Benefit recipients	2	126,451
Total	140	\$ 6,701,970
Terminations	0	\$ 0
Deaths	3	64,660
Others	0	0
Total terminations	3	\$ 64,660
COLA increase		5,711
QDRO Decrease		0
As of current valuation date	137	\$ 6,643,021

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX A – MEMBERSHIP INFORMATION

Disability benefit recipients	Count	Annual Benefit
As of last valuation date	9	\$ 247,169
New Benefit recipients	1	38,920
Total	10	\$ 286,089
Terminations	0	\$ 0
Deaths	1	29,977
Others	0	0
Total terminations	1	\$ 29,977
COLA increase		582
As of current valuation date	9	\$ 256,694

Surviving Spouses	Count	Annual Benefit
As of last valuation date	56	\$ 1,278,765
New Benefit recipients	3	64,660
Total	59	\$ 1,343,425
Terminations	0	\$ 0
Deaths	9	148,322
Others	0	0
Total terminations	9	\$ 148,322
As of current valuation date	50	\$ 1,195,103

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX A – MEMBERSHIP INFORMATION

Inactive Refund Due	Count	Annual Benefit
As of last valuation date	0	\$ 0
New recipients	1	70,850
Total	1	\$ 70,850
Others	0	0
Total terminations	0	\$ 0
As of current valuation date	1	\$ 70,850

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX B – SUMMARY OF PLAN PROVISIONS

1. Normal Retirement

Participants hired prior to January 1, 2012:

Eligibility: 20 years of service.

Basic Benefit: The retirement benefit shall be determined by the rate of monthly pay of the employee at the time of retirement or the highest average annual salary during any five years of service. Salary will include base pay, longevity, holiday pay, festive pay, shift differential and overtime. Overtime shall be limited to 10% of base pay. The benefit will be a percent of pay in accordance with the following table:

Years of Service	Percent of Benefit
20	50.5%
21	54.0
22	58.0
23	62.0
24	66.0
25	70.0

The minimum benefit is \$10,400 per year.

Participants hired on or after January 1, 2012:

Eligibility: Age 50 with 20 years of service.

Basic Benefit: The retirement benefit shall be 50% of monthly pay at time of retirement or the highest average annual salary during any five years of service.

Service Increment: One-fortieth (1/40th) times the Basic Benefit for each year of service in excess of 20 years. The total Service Increment cannot exceed \$2,400 in total annual benefit increase (i.e. \$200 additional monthly benefit). Service after attaining age 65 is excluded.

Salary will include base pay plus longevity pay.

The minimum benefit is \$10,400 per year.

2. Early Retirement

None permitted.

3. Termination Benefits

For termination prior to eligibility for normal retirement: Refund of contributions (including any military buy-back contributions, if applicable) without interest.

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX B – SUMMARY OF PLAN PROVISIONS

4. Preretirement Death Benefits

Surviving spouse, dependent child(ren) or dependent parent(s): 100% of the pension benefit applicable to the member.

Other beneficiaries: Refund of contributions (including any military buy-back contributions, if applicable) without interest.

5. Disability Benefits

Less than 2 years of service: 10% of Salary
At least 2 years of service but less than 5 years: 20% of Salary
At least 5 years of service but less than 10 years: 30% of Salary
At least 10 years of service but less than 15 years: 40% of Salary
At least 15 years of service but less than 20 years: 50% of Salary
At least 20 years of service: Same as normal retirement

Salary is defined under normal retirement benefit.

6. Postretirement Death Benefits

Surviving spouse, dependent child(ren) or dependent parent(s): 100% of the pension benefit applicable to the member.

Other beneficiaries: None.

7. Credit for Military Service

Any member with military service prior to becoming a member in the Plan may purchase credited military service, not to exceed five (5) years of such service.

8. Purchased Service

Not applicable.

9. Employee Contributions

5% of salary per year. Salary will include base pay, longevity, holiday pay, festive pay, shift differential and overtime.

For new hires after 1/1/2012, additional contribution of \$24 per year for a service increment.

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX B – SUMMARY OF PLAN PROVISIONS

10. Cost of Living Adjustment

Participants retiring between January 1, 2005 and December 31, 2011 and their beneficiaries shall receive an annual COLA once each retiree is eligible for the COLA. Annual COLAs do not occur until the pension allowance falls below half of the current salary for a firefighter of the same rank based upon rank at retirement. Such increases shall be in conformity with the uniform scale, which may be based on the cost of living, but the total of such allowances shall not at any time exceed $\frac{1}{2}$ of the current salary benefit paid to the firefighter of the highest grade.

11. Changes Since Last Valuation (i.e., since January 1, 2019 under Act 205)

None.

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

A. Demographic and Economic Assumptions

It is our understanding that the demographic and economic assumptions are selected by the City of Allentown Pension Board. While some of these assumptions have been updated since Cheiron became the actuary to the Plan, an experience study has not been completed due to the size of the population and the associated lack of credible data.

1. Mortality Rates

Healthy Mortality: RP-2000 Blue Collar Combined Healthy Mortality Table projected generationally from base year 2000 using 50% Scale AA.

Disabled Mortality: RP-2000 Disabled Mortality Table.

The mortality assumption was set by the City of Allentown Pension Board, which has control over the selection of the pension valuation assumptions, rather than the actuary. Based upon limited data, this mortality assumption was reviewed and appears to be reasonable in terms of reflecting projected mortality improvement in the future.

2. Disability Rates

100% of the 1955 United Auto Workers Table.

Age	Male	Female
30	0.04%	0.06%
35	0.05%	0.08%
40	0.07%	0.10%
45	0.10%	0.15%
50	0.18%	0.26%
55	0.36%	0.49%
60	0.90%	1.21%
>=65	0.00%	0.00%

3. Termination Rates

Plan specific rates based, in part, on the following table:

Age	Male	Female
25	5.00%	7.50%
30	3.75%	5.00%
35	2.50%	3.75%
40	1.50%	2.50%
45	0.75%	1.25%
>=50	0.00%	0.00%

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

4. Retirement Rates for Active Employees

Immediately upon attainment of age 62 with 20 years of service. If younger than age 62, a select and ultimate table with increasing rates.

The retirement assumption was set by the City of Allentown Pension Board, which has control over the selection of the pension valuation assumptions, rather than the actuary. Based upon our best professional judgment and with limited data, we would be inclined to state that this retirement assumption may not represent the best estimate of future retirement experience under the Plan, although the impact of the recent plan change might change retirement behavior to better match this assumption in the future.

Age	Years of Service					
	<=20	21	22	23	24	>=25
<=46	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
47	0.0%	0.0%	0.0%	0.0%	15.0%	15.0%
48	0.0%	0.0%	0.0%	0.0%	15.0%	15.0%
49	0.0%	0.0%	0.0%	0.0%	15.0%	15.0%
50	0.0%	0.0%	0.0%	10.0%	20.0%	20.0%
51	0.0%	0.0%	0.0%	10.0%	20.0%	20.0%
52	0.0%	0.0%	0.0%	10.0%	20.0%	20.0%
53	0.0%	0.0%	0.0%	10.0%	20.0%	20.0%
54	0.0%	0.0%	0.0%	10.0%	25.0%	25.0%
55	0.0%	5.0%	5.0%	15.0%	25.0%	25.0%
56	0.0%	10.0%	10.0%	15.0%	25.0%	25.0%
57	0.0%	10.0%	10.0%	15.0%	25.0%	25.0%
58	0.0%	10.0%	10.0%	15.0%	25.0%	25.0%
59	0.0%	10.0%	10.0%	15.0%	25.0%	25.0%
60	0.0%	25.0%	25.0%	25.0%	25.0%	25.0%
61	0.0%	25.0%	25.0%	25.0%	25.0%	25.0%
>=62	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%

5. Percent Married

80% of active members are assumed to be married.

6. Age of Spouse

Female spouse is assumed to be two years younger than male spouse.

7. Investment Return

7.50% per annum, net of investment management expenses.

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

8. Salary Increase

Salary increases:

With Merit Increases: 4.5% compounded annually.
Without Merit Increases: 3.5% compounded annually.

9. Overtime

Participants hired prior to January 1, 2012 are assumed to attain overtime pay equal to 10% of base pay at retirement.

10. Credit for Military Service

Military service purchased as of the valuation date, as provided by the City, is reflected in the valuation results. Future possible military service purchases are not assumed.

11. Form of Annuity

Married participants: 100% Joint and Survivor Annuity.

Single participants: Life Annuity.

12. Cost of Living Adjustment

2.4% per year upon eligibility to receive a COLA.

For participants eligible to receive a COLA, the pay of the same rank as the participant as of their retirement date is projected into the future to determine the date that future benefit increases are expected to begin.

13. Expenses

Expenses are assumed to equal the two-year average of paid administrative expenses from the most recent even actuarial valuation, rounded to the nearest \$10,000. Expenses are assumed to increase based on without merit salary scale in the future for MMO projections.

14. Rationale for Assumptions

In accordance with Actuarial Standard of Practice No. 27, the rationale for the 7.50% discount rate is based on the Board's risk preference, the Plan's current asset allocation, and the investment manager's capital market outlook.

For the demographic assumptions, the rates of termination and retirement are based Plan experience. The rates of mortality and disability are standard tables. These rates are monitored annually for reasonability.

15. Changes since last biennial valuation (i.e., since January 1, 2019 under Act 205)

None.

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

B. Actuarial Methods

1. Funding Method

Under the entry age normal actuarial cost method, the individual entry age normal cost is determined for each participant by calculating the annual contribution rate as a level percent of pay required to fund that individual's expected benefits, based on the current plan provisions, over the participant's expected active working lifetime with the Plan at entry.

At the valuation date, the present value of future normal cost is calculated for each individual participant by multiplying the entry age normal cost rate by the present value of the participant's expected future salary based on the expected active working lifetime with the Plan. The cost for each participant is then summed to yield the present value of future normal costs.

The excess of the present value of future benefits for all individuals at the valuation date over the present value of future normal costs is called the actuarial liability, or past service liability.

2. Amortization Method

Under Act 44 of 2009, the unfunded actuarial liability is amortized as a level dollar amount over the lesser of:

- (a) (i) 30 years, with respect to the initial liability as of 1/1/85 (or first valuation);
- (ii) 20 years, with respect to actuarial gains and losses;
- (iii) 15 years, with respect to changes due to actuarial assumptions;
- (iv) 10 years, with respect to changes in benefits not mandated by the state for active members;
- (v) 1 year, with respect to changes in benefits not mandated by the state for currently retired members;
- (vi) 20 years, with respect to state mandated benefit changes;

or

- (b) The average assumed working lifetime of active employees as of the date the liability was established, rounded to the next highest whole year.

If the Plan for the prior biennial valuation was determined to be moderately or severely distressed, then the amortization period is only determined by (a).

**CITY OF ALLENTOWN FIREMEN'S PENSION PLAN
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APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

Due to the Ordinance 57 passed by City Council on September 16, 2015 if the Plan is greater than 70% funded, the amortization amount is the lesser of the traditional amortization of individual bases using the amortization periods described above or the 10-year level-dollar rolling amortization of the total unfunded actuarial liability. This comparison between the two amortization amounts occurs biennially, and the amortization method employed by the subsequent MMO amounts based upon the biennial valuation cannot change. For example, the 10 year rolling amortization cannot be applied to the 2020 MMO and then changed to the traditional amortization for the 2021 MMO.

This amortization method is asymptotic in nature, where 100% full funding of the UAL is not projected to occur if all assumptions are met, although the funding ratio is projected to improve.

3. Actuarial Value of Assets

The actuarial value of assets is determined in accordance with Section 3.16 of Revenue Procedure 2000-40, using a five-year smoothing period. Specifically, the actuarial value of assets as of January 1, 2008 is set equal to the market value of assets. For each subsequent plan year, the actuarial value shall be the market value minus a decreasing fraction ($4/5$, $3/5$, $2/5$, $1/5$) of each gain or loss for each of the preceding four plan years. Gains or losses prior to January 1, 2008 are ignored. The resulting actuarial value of assets is then limited to be no greater than 120% and no less than 80% of the market value of assets on the valuation date.

4. Changes in Method Since Last Valuation

None.