



City of Allentown Police Pension Plan

Actuarial Valuation Report as of January 1, 2020

Produced by Cheiron

September 2020

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September 30, 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 Police Pension Plan as of January 1, 2020. The purpose of this report is to present the annual actuarial valuation of the City of Allentown Police 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 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 30, 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 any other user.

Sincerely,
Cheiron



Karen Zangara, FSA, EA, MAAA
Principal Consulting Actuary



Anastasia Dopko, FSA, EA, MAAA
Associate Actuary

**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

FOREWORD

Cheiron has performed the actuarial valuation of the City of Allentown Police 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 risks 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 and payroll provided by the City of Allentown. 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 POLICE 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 POLICE 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	208	207	-0.5%
Terminated Vested and Inactive Members	9	12	33.3%
In Pay Status	281	288	2.5%
Total	498	507	1.8%
Annual Salaries of Active Members (from prior year)*	\$ 17,108,536	\$ 17,877,177	4.5%
Average Annual Salary	82,253	86,363	5.0%
W-2 Wages for Active Members (from prior year)	19,088,373	20,181,769	5.7%
Annual Retirement Allowances for Retired Members and Beneficiaries	\$ 11,035,086	\$ 11,512,752	4.3%
Average Monthly Retirement Benefit	3,273	3,331	1.8%
<u>Financial Information</u>			
Market Value of Assets (MVA)	\$ 152,846,893	\$ 180,698,735	18.2%
Actuarial Value of Assets (AVA)	163,859,683	172,043,392	5.0%
Actuarial Liability	\$ 202,033,321	\$ 210,488,281	4.2%
Unfunded Actuarial Liability	38,173,638	38,444,889	0.7%
Funding Ratio (MVA)	75.7%	85.8%	
Funding Ratio (AVA)	81.1%	81.7%	
<u>Contributions and Cash Flows</u>			
Contribution (actual/expected)	\$ 8,116,224	\$ 8,998,519	10.9%
Prior Year Benefit Payments	10,833,661	11,133,444	2.8%
Prior Year Administrative Expenses	98,987	134,819	36.2%
Prior Year Total Investment Income	(7,348,535)	31,003,881	

* Prior year pay is base pay; current year pay is base pay plus the lesser of overtime pay and 10% of base pay.

**CITY OF ALLENTOWN POLICE 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 12.70 years as of January 1, 2020 and, per Act 205, rounded up to 13 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 Market Value of Assets returned 20.50% in 2019.
- The Actuarial Value of Asset (AVA) method smooths gains and losses over five years. For the AVA, the Plan experienced a loss of about \$837,663 recognizing prior years' losses when coupled with this year's market value gain and which yielded the return of 6.99% versus the assumed return rate of 7.50%.
- During calendar year 2019, the Police Pension Plan received \$8,116,224 in contributions and paid out \$11,268,263 in benefits and expenses. Comparing these two amounts results in a negative cash flow of \$3,152,039 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 loss totaling \$1,011,115 mainly due to new retirement losses offset by gains on mortality, salary, and COLA.
- Overall, the Plan experienced a net loss (investment losses and liability losses) of \$1,848,778 during 2019. Since the January 1, 2019 valuation there is a total loss of \$2,644,555 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 \$795,777.
- The total new loss base of \$2,644,555 in 2020 is amortized over 13 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 12 years or less.

**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

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, then the funded status will be less 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 police officer 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 POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

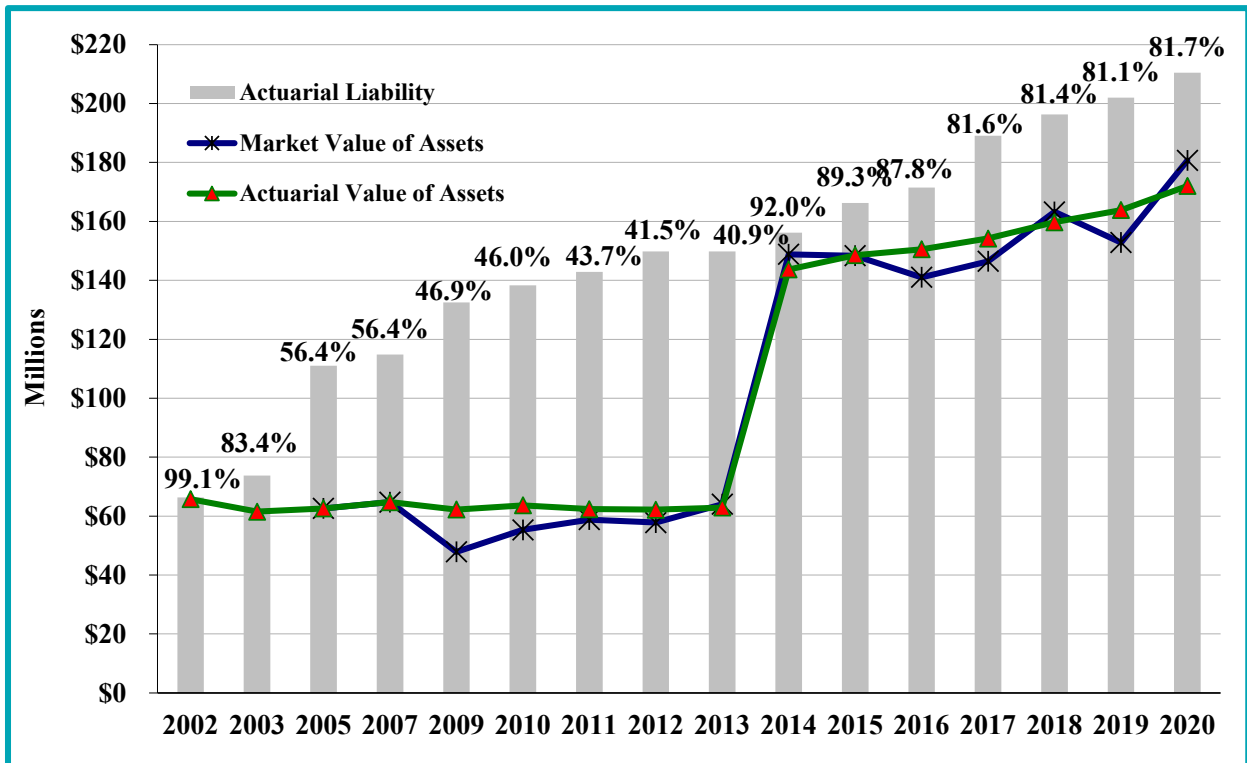
SECTION I – BOARD SUMMARY

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 \$84.5 million contribution in 2013 proceeds from the pension obligation bonds and increased the funding ratio to 92.0%.



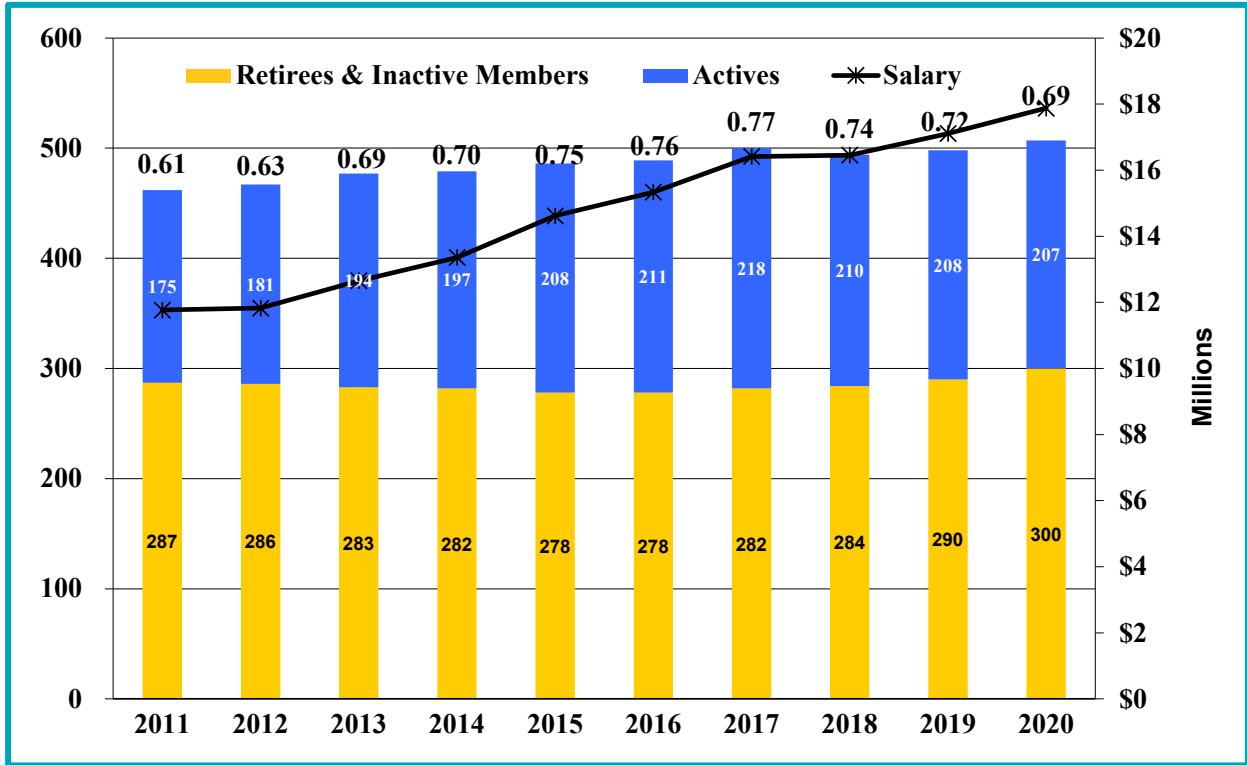
Results before 2010 are from the prior actuary. Valuations performed biennially from 2003 - 2009. The Actuarial Liability results for 2014 and 2016 reflect the 2013 and 2015 actuarial assumptions (respectively), reflecting all assumption changes since the prior Act 205 filing from 2015 forward, as is required under Act 205.

**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

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 the pensionable pay, which is the base pay plus overtime pay limited by 10% of the base pay. 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. This 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.



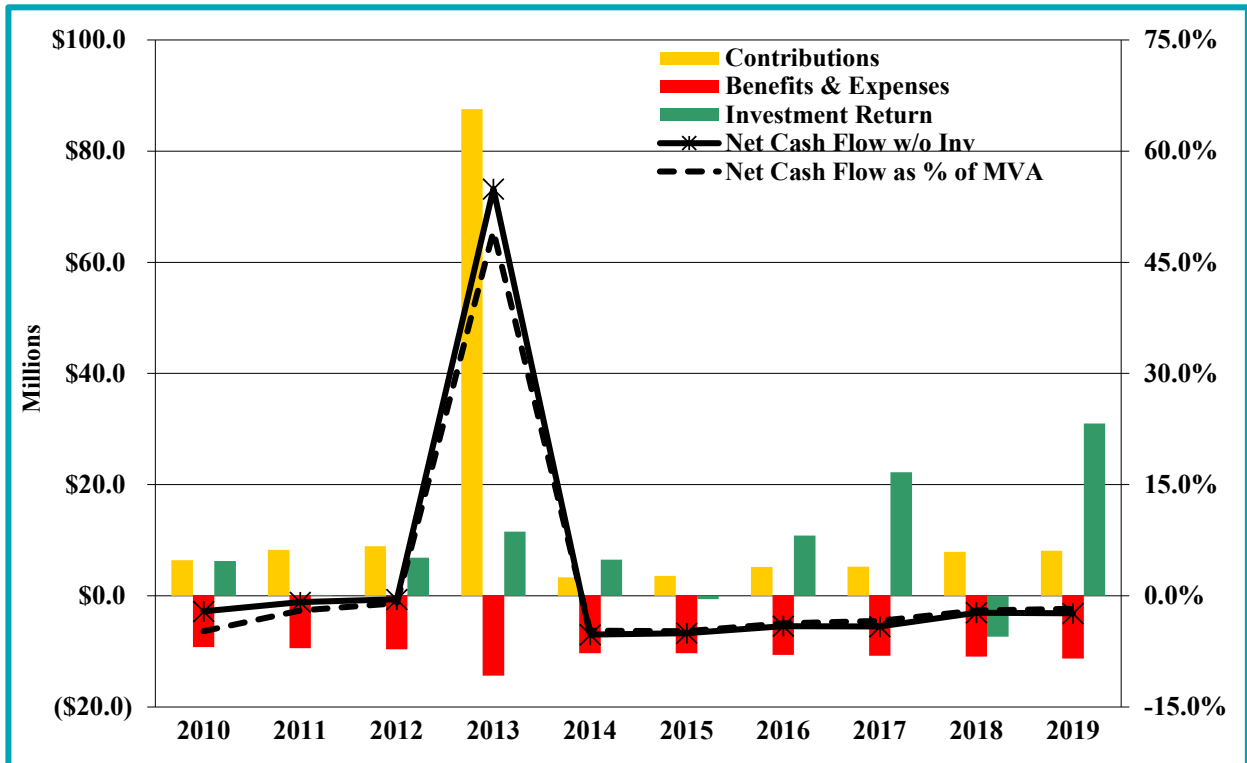
**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

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 that the Board 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 \$87.5 million contribution, which includes \$84.5 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. The negative cash flow in 2019 was about 1.8% of the market value of assets, so the net assets will not increase unless investment returns exceed 1.8%, if there are similar cash flows in 2020.



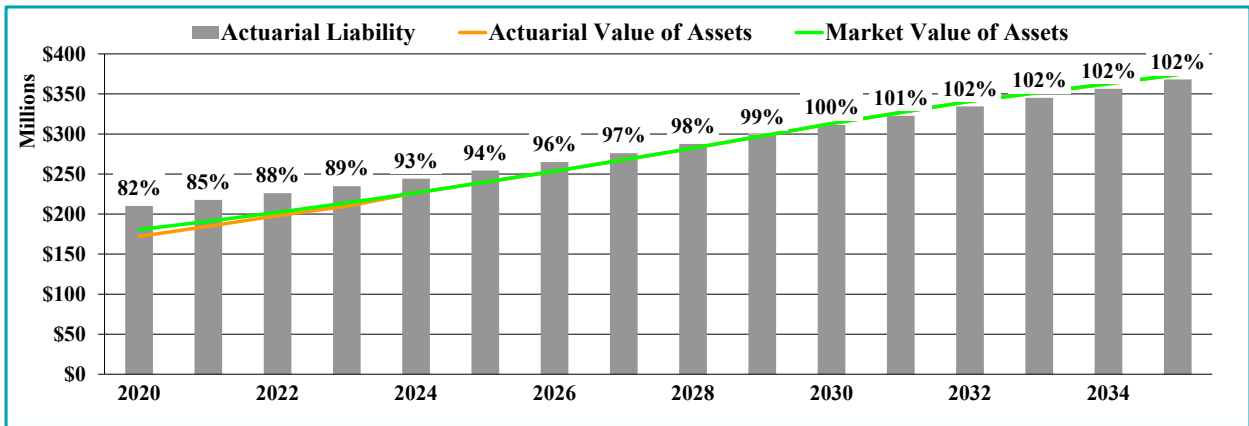
**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION I – BOARD SUMMARY

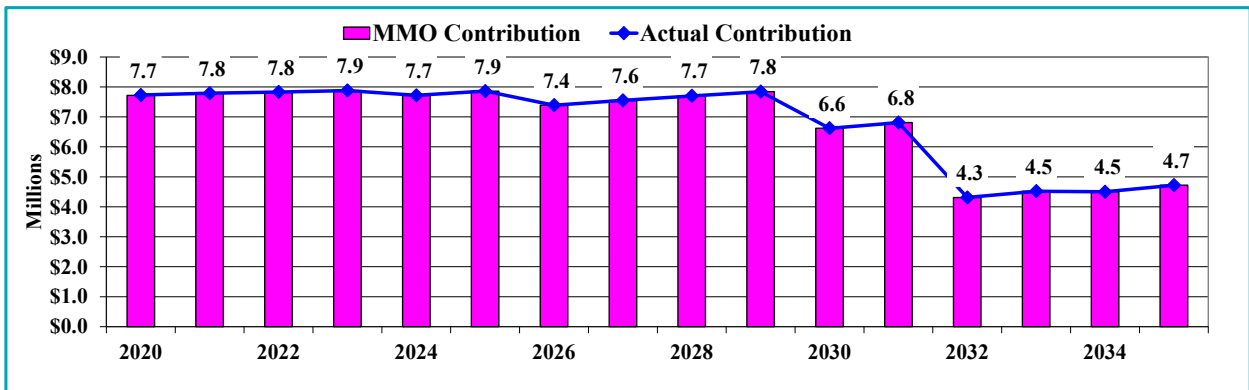
Baseline Projections

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 and that the MMO is paid in full each year. The funded ratio (Actuarial Value of Assets divided by liabilities) listed on top of each of the bars steadily increases to 102% at the end of the 15-year period.



This next chart projects the MMO over the same period. On top of each bar is the projected MMO amount in millions of dollars. If all assumptions are met, the projected MMO will increase to \$7.9 million in 2025 before dropping to \$4.3 million in 2032. The gradual increase in the MMO projections is due in part to the timing delay in the contribution payment and the annual expected increase in the normal cost as salaries are projected to increase. The projected MMO decreases near the end of the period as large amortization charge bases are recognized and the Plan becomes fully funded.



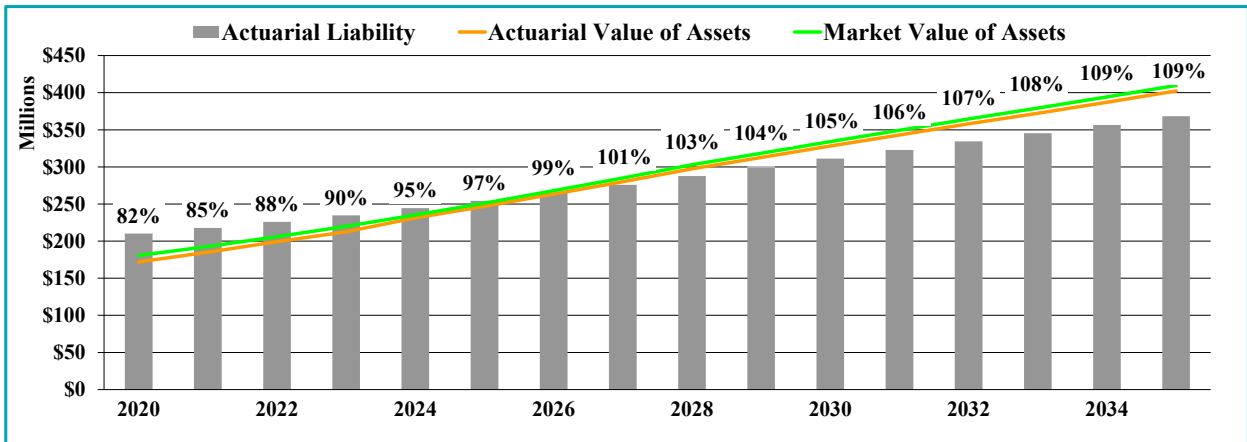
**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION I – BOARD SUMMARY

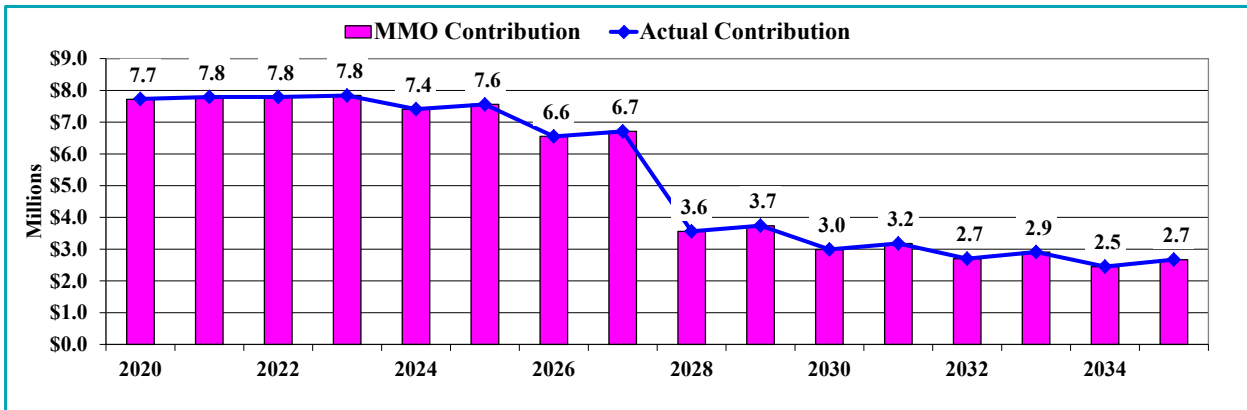
Projections with Asset Returns of 8.5%

These 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% at the end of the 15-year projection period.



This next chart projects the MMO over the same period. On top of each bar is the projected MMO amount in millions of dollars.



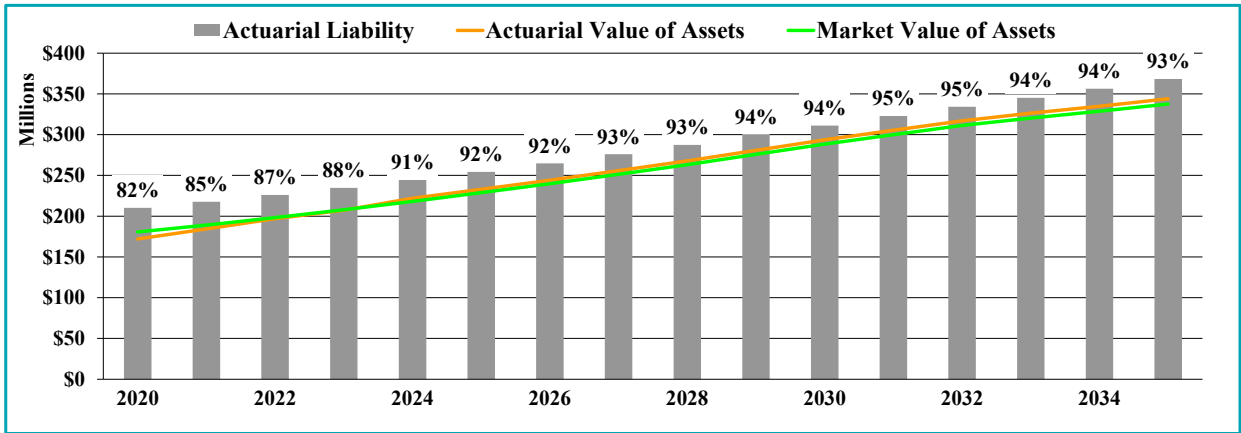
**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION I – BOARD SUMMARY

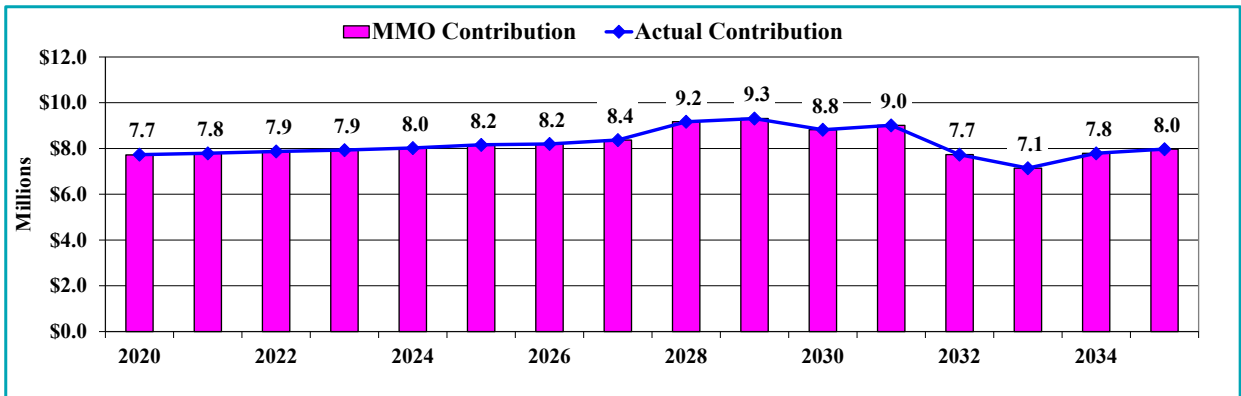
Projections with Asset Returns of 6.5%

These 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 steadily increase to 95% before slightly decreasing to 93% at the end of the 15-year projection period.



This next chart projects the MMO over the same period. On top of each bar is the projected MMO amount in millions of dollars.



**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION I – BOARD SUMMARY

The 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, the demographic data experience is different from the assumptions, 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>)	\$ 21,602,548	\$ 21,794,634	\$ 22,775,000
(2) Normal Cost %	18.69%	18.69%	18.15%
(3) Total Normal Cost	4,037,516	4,073,417	4,133,663
(4) Amortization of UAL	4,871,003	4,810,572	4,810,000
(5) Total Administration Expense	90,000	90,000	120,000
(6) Total Financial Requirement	<u>\$ 8,998,519</u>	<u>\$ 8,973,989</u>	<u>\$ 9,063,663</u>
(7) Estimated Employee Contributions	<u>1,080,127</u>	<u>1,089,732</u>	<u>1,138,750</u>
(8) Minimum Municipal Obligation	<u>\$ 7,918,392</u>	<u>\$ 7,884,257</u>	<u>\$ 7,924,913</u>
[(6)-(7)]			

**CITY OF ALLENTOWN POLICE 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	\$ 152,808,086	\$ 181,105,077
Receivables	40,124	37,516
Due from City's General Fund	34,648	0
Total Assets	\$ 152,882,858	\$ 181,142,593
<u>Liabilities</u>		
Accounts Payable	\$ 35,965	\$ 12,371
Due to City's General Fund	0	431,487
Total Liabilities	\$ 35,965	\$ 443,858
Net Assets Available for Benefits	\$ 152,846,893	\$ 180,698,735

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

**CITY OF ALLENTOWN POLICE 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	\$ 163,215,392	\$ 152,846,893
<u>Additions</u>		
Employer Contributions	\$ 6,924,460	\$ 7,046,609
Member Contributions	988,224	1,069,615
Interest and Dividends	3,429,492	3,897,395
Net Appreciation / (Depreciation)	(10,778,027)	27,106,486
Total Additions	\$ 564,149	\$ 39,120,105
<u>Deductions</u>		
Benefit Payments	\$ 10,833,661	\$ 11,133,444
Administrative expense	98,987	134,819
Total Deductions	\$ 10,932,648	\$ 11,268,263
Net Change in Market Value of Assets	\$ (10,368,499)	\$ 27,851,842
End of Year Assets	\$ 152,846,893	\$ 180,698,735

The two-year average of the administrative expenses paid from the plan assets, rounded to the nearest \$10,000, is \$120,000. This is the projected expense estimate for the 2022 MMO determination. The estimated benefit payments for the current plan year are \$11,788,401.

**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

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	\$ 163,215,392	\$ 152,846,893	\$ 163,215,392
Contributions	7,912,684	8,116,224	16,028,908
Benefit Payments	(10,833,661)	(11,133,444)	(21,967,105)
Administrative Expenses	(98,987)	(134,819)	(233,806)
Expected Investment Earnings (7.50%)	12,129,953	11,347,452	24,938,292
Expected Market Value on December 31	<u>\$ 172,325,381</u>	<u>\$ 161,042,306</u>	<u>\$ 181,981,681</u>
Investment Gain / (Loss)	<u>(19,478,488)</u>	<u>19,656,429</u>	<u>(1,282,946)</u>
End of Year Market Value	\$ 152,846,893	\$ 180,698,735	\$ 180,698,735
Return	-4.54%	20.50%	7.13%

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 POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

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				\$ 180,698,735
<u>Plan Year</u>	<u>Investment Gains / (Losses)</u>	<u>Percent Recognized</u>	<u>Percent Deferred</u>	<u>Amount Deferred</u>
2015	\$ (11,849,166)	100%	0%	\$ 0
2016	138,937	80%	20%	27,787
2017	11,473,764	60%	40%	4,589,506
2018	(19,478,488)	40%	60%	(11,687,093)
2019	19,656,429	20%	80%	15,725,143
				\$ 8,655,343
Preliminary Actuarial Value as of January 1, 2020				\$ 172,043,392
Corridor for Actuarial Value				
- Lower Limit			80%	\$ 144,558,988
- Upper Limit			120%	\$ 216,838,482
Actuarial Value of Assets as of January 1, 2020				\$ 172,043,392
- as a percent of Market Value of Assets				95.2%

**CITY OF ALLENTOWN POLICE 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	\$ 159,712,488	\$ 163,859,683	\$ 159,712,488
Contributions	7,912,684	8,116,224	16,028,908
Benefit Payments	(10,833,661)	(11,133,444)	(21,967,105)
Administrative Expenses	(98,987)	(134,819)	(233,806)
Expected Investment Earnings (7.50%)	<u>11,867,236</u>	<u>12,173,411</u>	<u>24,393,153</u>
Expected Actuarial Value on December 31	\$ 168,559,760	\$ 172,881,055	\$ 177,933,638
Investment Gain / (Loss)	<u>(4,700,077)</u>	<u>(837,663)</u>	<u>(5,890,246)</u>
End of Year Actuarial Value	\$ 163,859,683	\$ 172,043,392	\$ 172,043,392
Return	4.53%	6.99%	5.74%

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 POLICE 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 POLICE 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	\$ 94,364,278	\$ 96,898,116
Disability Benefits	2,295,566	2,381,497
Survivor Benefits	2,155,473	2,212,443
Refund of Members Contribution with Interest	0	0
Other: Vested Benefits	3,315,311	3,304,122
Total Active Participant Benefits*	<u>\$ 102,130,628</u>	<u>\$ 104,796,178</u>
(2) Inactive Participant Benefits		
Retirement Benefits	\$ 118,258,743	\$ 123,302,323
Disability Benefits	\$ 3,612,341	\$ 3,570,887
Survivor Benefits	13,539,448	14,275,538
Terminated Vested and Inactive Members	1,278,634	1,626,797
Total Inactive Participant Benefits	<u>\$ 136,689,166</u>	<u>\$ 142,775,545</u>
(3) Present Value of Benefits (PVFB)	\$ 238,819,794	\$ 247,571,723
[(1) +(2)]		
Actuarial Value of Assets (AVA)	\$ 163,859,683	\$ 172,043,392
Present Value of Future Contributions	74,960,111	75,528,331
Total Resources	<u>\$ 238,819,794</u>	<u>\$ 247,571,723</u>
Actuarial Liability		
Present Value of Benefits (PVFB)	\$ 238,819,794	\$ 247,571,723
Present Value of Future Normal Costs (PVFNC)	36,786,473	37,083,442
Actuarial Liability (AL = PVFB – PVFNC)	<u>\$ 202,033,321</u>	<u>\$ 210,488,281</u>
Actuarial Value of Assets (AVA)	163,859,683	172,043,392
Net (Surplus)/Unfunded (AL – AVA)	<u>\$ 38,173,638</u>	<u>\$ 38,444,889</u>

* The amount of the accumulated member contributions without accrued interest is \$9,917,135 for all active members as of January 1, 2020.

**CITY OF ALLENTOWN POLICE 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 is 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	\$ 202,033,321
Liabilities on 01/01/2020	<u>210,488,281</u>
Liability Increase (Decrease)	\$ 8,454,960
Change Due to:	
Plan Amendment	\$ 0
Assumption Change	0
Method Change	0
Accrual of Benefits	3,567,206
Benefit Payments	(11,133,444)
Passage of Time	15,010,083
Liability (Gain)/Loss	<u>1,011,115</u>
Total	\$ 8,454,960

**CITY OF ALLENTOWN POLICE 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	\$ 202,033,321	\$ (163,859,683)	\$ 38,173,638
Expected Normal Cost	3,567,206	N/A	3,567,206
Contributions (includes estimated expenses)	N/A	\$ (8,116,224)	\$ (8,116,224)
Benefit Payments	\$ (11,133,444)	11,133,444	0
Actual Expenses	N/A	134,819	134,819
Plan Amendment	\$ 0	\$ 0	\$ 0
Assumption Change	0	0	0
Expected Interest			
Interest on Initial Value	\$ 15,152,499	\$ (12,289,475)	\$ 2,863,024
Interest on Normal Cost	267,540	0	267,540
Interest on Contributions	0	(298,856)	(298,856)
Interest on Benefit Payments	(409,956)	409,956	0
Interest on Expenses	0	4,964	4,964
Total Expected Interest	\$ 15,010,083	\$ (12,173,411)	\$ 2,836,672
Expected End of Year Values as of 01/01/2020	\$ 209,477,166	\$ (172,881,055)	\$ 36,596,111
(Gain)/Loss	1,011,115	837,663	1,848,778
Actual End of Year Values as of 01/01/2020	\$ 210,488,281	\$ (172,043,392)	\$ 38,444,889

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	\$ 3,496,148	\$ 3,567,206	\$ 3,662,083
W-2 Wages for active members from prior year	\$ 18,700,480	\$ 19,088,373	\$ 20,181,769
Normal Cost as a Percent of the Estimated Payroll	18.70%	18.69%	18.15%

**CITY OF ALLENTOWN POLICE 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 MMOs for 2020 and 2021. The payroll amount shown reflects the information provided by the City.

The MMO for 2022 has been estimated based on the results of this 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 POLICE 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:	1/1/2019	1/1/2019	1/1/2021
Calendar Year:	2020	2021	2022
1. MMO pay (actual/ <i>estimated</i>) (prior year W2 pay reported by the City)	\$ 21,602,548	\$ 21,794,634	\$ 22,775,000
2. Total Normal Cost Percentage	18.69%	18.69%	18.15%
3. Total Normal Cost [(1) x (2)]	\$ 4,037,516	\$ 4,073,417	\$ 4,133,663
4. Total Amortization Requirement	4,871,003	4,810,572	4,810,000
5. Total Administrative Expenses	90,000	90,000	120,000
6. Total Financial Requirement [(3) + (4) + (5)]	\$ 8,998,519	\$ 8,973,989	\$ 9,063,663
7. Estimated Member Contribution Rate	5.00%	5.00%	5.00%
8. Estimated Member Contributions [(1) x Member Contribution Rate]	1,080,127	1,089,732	1,138,750
9. Estimated Employer Portion of MMO [(6) - (8)]	\$ 7,918,392	\$ 7,884,257	\$ 7,924,913

**CITY OF ALLENTOWN POLICE 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	\$ 38,173,638
Normal Cost	\$ 3,567,206
Contributions made	
a. Employee Contributions	\$ (1,069,615)
b. Local Portion	(7,046,609)
Actual Expenses	\$ 134,819
Interest on above	2,836,672
Plan Changes	\$ 0
Assumption Changes	0
Method Changes	0
Expected Unfunded Liability as of 01/01/2020	\$ 36,596,111
Actual Unfunded Liability as of 01/01/2020	<u>38,444,889</u>
Actuarial Gain / (Loss)	\$ (1,848,778)
- Investment Gain / (Loss)	(837,663)
- Liability Gain / (Loss)	(1,011,115)

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

Table IV-3	
Total Gain/(Loss)	
Investment Gain / (Loss)	\$ (837,663)
Liability Gain / (Loss)	(1,011,115)
Timing and interest Gain / (Loss)	<u>(795,777)</u>
Total Gain/(Loss)	\$ (2,644,555)

**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

SECTION IV – MINIMUM MUNICIPAL OBLIGATION

The following tables provide the schedule of amortization bases as of January 1, 2020. The total \$2,644,555 actuarial loss reflects the explicit loss for 2019 as provided above and the timing and interest loss due to the delayed amortization method 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-4							
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
1/1/2002	Investment Loss	\$ 480,106	30	12	\$ 2,657	\$ 22,090	12/31/2031
1/1/2003	Investment Loss	7,174,076	30	13	39,635	346,220	12/31/2032
1/1/2005	Plan Amendment	21,864,229	20	5	140,284	610,139	12/31/2024
1/1/2007	Actuarial Loss	10,623,640	15	2	78,630	151,775	12/31/2021
1/1/2009	Assumption Change	(14,353,695)	20	9	(91,471)	(627,246)	12/31/2028
1/1/2009	Actuarial Loss	38,047,505	20	9	242,464	1,662,646	12/31/2028
1/1/2011	Plan Amendment	(69,210)	10	1	(656)	(656)	12/31/2020
1/1/2011	Actuarial Loss	15,354,171	20	11	97,546	767,108	12/31/2030
1/1/2013	Assumption Change	4,976,960	15	8	36,439	229,443	12/31/2027
1/1/2013	Actuarial Loss	11,938,286	20	13	75,627	660,619	12/31/2032
1/1/2015	Assumption Change	4,837,709	14	9	530,962	3,640,971	12/31/2028
1/1/2015	Actuarial Loss	7,193,083	14	9	789,476	5,413,680	12/31/2028
1/1/2017	Assumption Change	8,027,201	14	11	879,612	6,917,342	12/31/2030
1/1/2017	Actuarial Loss	10,841,897	14	11	1,188,044	9,342,871	12/31/2030
1/1/2019	Actuarial Loss	6,999,770	13	12	801,322	6,663,332	12/31/2031
1/1/2020	Actuarial Loss	2,644,555	13	13	302,744	2,644,555	12/31/2032
					\$ 5,113,315	\$ 38,444,889	

**CITY OF ALLENTOWN POLICE 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 Inactive and Terminated Vested Participants

SUMMARY OF PARTICIPANT DATA		
	1/1/2019	1/1/2020
Active Participants		
Count	208	207
New Entrants	6	10
Average Age	39.8	40.0
Average Benefit Service	11.8	12.0
Annual Payroll*	\$ 17,108,536	\$ 17,877,177
Retirees and Beneficiaries Receiving Payments		
Count	281	288
Average Age	65.3	65.7
Annual Benefits	\$ 11,035,086	\$ 11,512,752
Average Monthly Benefit	\$ 3,273	\$ 3,331
Terminated Vested Participants and Inactive Members		
Count**	9	12
Accumulated Member Contributions w/o Interest	\$ 93,057	\$ 111,343
Annual Benefits	\$ 84,533	\$ 114,673
Average Monthly Benefit	\$ 3,522	\$ 3,185

* Prior year pay is base pay; current year pay is base pay plus the lesser of overtime pay and 10% of base pay.

** Includes members that are only entitled to contributions without interest.

**CITY OF ALLENTOWN POLICE 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	4	\$ 56,997	1	\$ 63,240	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0
25 to 29	3	56,999	15	71,394	2	85,421	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30 to 34	2	56,728	10	81,056	21	85,330	4	87,966	0	0	0	0	0	0	0	0	0	0	0	0
35 to 39	0	0	3	71,058	8	85,338	24	85,977	3	92,022	0	0	0	0	0	0	0	0	0	0
40 to 44	0	0	1	83,488	3	83,707	13	86,648	31	89,233	2	93,410	0	0	0	0	0	0	0	0
45 to 49	1	59,295	0	0	3	87,077	9	87,045	8	89,349	12	93,490	0	0	0	0	0	0	0	0
50 to 54	0	0	0	0	0	0	4	85,902	8	89,856	4	96,038	3	97,964	0	0	0	0	0	0
55 to 59	0	0	0	0	0	0	1	88,378	1	94,456	2	91,129	0	0	0	0	0	0	0	0
60 to 64	0	0	0	0	0	0	1	91,550	0	0	0	0	0	0	0	0	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

For purposes of this exhibit, years of credited service are based on date of hire and exclude any purchased military service.

**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX A – MEMBERSHIP INFORMATION

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	6	\$ 17,717	56	\$ 265,974	8	\$ 22,701	70	\$ 306,392
55-59	1	1,746	30	132,354	7	9,192	38	143,292
60-64	1	922	42	175,067	5	11,317	48	187,306
65-69	1	1,490	24	88,432	9	23,550	34	113,472
70-74	0	0	25	74,513	8	15,693	33	90,206
75-79	0	0	14	33,465	7	16,524	21	49,989
80 & Over	0	0	20	33,185	24	35,555	44	68,740
Total	9	\$ 21,875	211	\$ 802,990	68	\$ 134,532	288	\$ 959,397

CITY OF ALLENTOWN POLICE 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	Term. Vested	Disabled	Retired	Beneficiary	Total
January 1, 2019 valuation	208	7	2	9	207	65	498
Additions / QDROs	10					2	12
Reductions							
a. Terminated - not vested, refund due	(3)	2					(1)
b. Deaths without beneficiary						(2)	(2)
Total	(3)	2				(2)	(3)
Changes in status							
b. Terminated - vested	(1)		1				
c. Retired	(7)				7		
d. Disabled							
e. Died with beneficiary					(3)	3	
f. Data corrections							
Total	(8)		1		4	3	
January 1, 2020 valuation	207	9	3	9	211	68	507

**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX A – MEMBERSHIP INFORMATION

Active Members	Count	Annual Pay
As of last valuation date	208	\$ 17,108,536
Separations from active service		
Refund of contributions	1	\$ 83,043
Separation with deferred benefit	1	82,406
Separation due refund	2	128,399
Disability	0	0
Death	0	0
Retirement with service retirement benefit	7	625,705
Total separations	11	\$ 919,553
As of current valuation date using prior pay	197	\$ 16,188,983
As of current valuation date using current pay	197	\$ 17,325,090
New entrants	10	552,087
As of current valuation date	207	\$ 17,877,177

*Prior year pay is base pay; current year pay is base pay plus the lesser of overtime pay and 10% of base pay.

Service retirement benefit recipients	Count	Annual Benefit
As of last valuation date	207	\$ 9,252,208
New Benefit recipients	7	510,622
Total	214	\$ 9,762,830
Terminations	0	\$ 0
Deaths	3	94,235
Others	0	0
Total terminations	3	\$ 94,235
COLA increase		0
QDRO Decrease		32,721
As of current valuation date	211	\$ 9,635,874

**CITY OF ALLENTOWN POLICE 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	\$ 262,495
New Benefit recipients	0	0
Total	9	\$ 262,495
Terminations	0	\$ 0
Deaths	0	0
Others	0	0
Total terminations	0	\$ 0
COLA increase		0
As of current valuation date	9	\$ 262,495

Surviving Spouses	Count	Annual Benefit
As of last valuation date	65	\$ 1,520,383
New Benefit recipients	5	126,956
Total	70	\$ 1,647,339
Terminations	0	\$ 0
Deaths	2	32,956
Others	0	0
Total terminations	2	\$ 32,956
As of current valuation date	68	\$ 1,614,383

**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX A – MEMBERSHIP INFORMATION

Inactive Refund Due	Count	Balance
As of last valuation date	7	\$ 93,057
New recipients	2	18,286
Total	9	\$ 111,343
Refund	0	\$ 0
Total terminations	0	\$ 0
As of current valuation date	9	\$ 111,343

Deferred Benefits	Count	Annual Benefit
As of last valuation date	2	84,533
New recipients	1	30,140
Total	3	\$ 114,673
Retirees	0	\$ 0
Deaths	0	0
Others	0	0
Total terminations	0	\$ 0
As of current valuation date	3	\$ 114,673

**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX B – SUMMARY OF PLAN PROVISIONS

1. Normal Retirement

Participants hired prior to January 1, 2009:

Eligibility: 20 years of service.

Basic Benefit: The retirement benefit shall be 50.5% of 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.

Service Increment: 7.5% of salary for the first full year of service over 20 years, plus 3.0% of salary for each of the next four full years of service up to a maximum of 19.5% of salary. Service after attaining age 65 is excluded.

The maximum benefit is 70% of salary.

Salary will include base pay, longevity, holiday pay, festive pay, shift differential and overtime. Overtime shall be limited to 10% of base pay.

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

Participants hired on or after January 1, 2009:

Eligibility: Age 50 with 20 years of service.

Basic Benefit: The retirement benefit shall be 50% of 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.

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 \$6,000 in total annual benefit increase (i.e. \$500 additional monthly benefit). Service after attaining age 65 is excluded.

Salary will include base pay, longevity, holiday pay, festive pay, shift differential and overtime. Overtime shall be limited to 10% of base pay.

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

2. Early Retirement

None permitted.

3. Termination Benefits

Vesting: 100% after 12 years of service.

Termination before normal retirement eligibility: Member becomes eligible for retirement at the point he would have attained eligibility for normal retirement had he continued in employment. Prior to 20 years, the benefit is based upon a pro-rated portion of the normal retirement benefit. After 20 years, the benefit is the normal retirement benefit.

Non-Vested Benefit: Refund of contributions (including any military buy-back contributions, if applicable) without interest.

**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX B – SUMMARY OF PLAN PROVISIONS

4. Survivor Benefits

Members retired on or after December 17, 1969, active members dying in the line of duty, active members dying not in the line of duty with 10 or more years of service: 100% of the pension benefit applicable to the member.

Active members not dying in the line of duty with less than 10 years of service: 50% of the pension benefit applicable to the member.

Survivors include the spouse of the member, domestic partner, dependent children, or dependent parents approved by the Pension Board. If the spouse dies leaving dependent children, then the dependent children will continue to receive survivor benefits until age 18.

Killed-in-Service - The survivor shall receive 62.5% of officer's wages or 50.5% plus service increments which the officer would be entitled to receive at the time of death, whichever is higher.

5. Disability Benefits

Annual Benefit prior to Normal Retirement Eligibility: 50.5% of Salary plus any Service Increment earned.

Annual Benefit if Retirement Eligible: The normal retirement benefit.

6. 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.

7. Purchased Service

Not applicable.

8. Employee Contributions

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

**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX B – SUMMARY OF PLAN PROVISIONS

9. Cost of Living Adjustment

Participants and their beneficiaries retiring after January 1, 2007 shall receive an annual cost of living adjustment (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 police officer 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 patrolmen of the highest grade.

Participants and their beneficiaries retiring between January 1, 2005 and December 31, 2006 will receive the same COLA as those retiring after January 1, 2007 unless they opted out as of their benefit commencement date.

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

There have been no changes in plan provisions since the prior valuation.

**CITY OF ALLENTOWN POLICE 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% of 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%

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

4. Retirement Rates for Active Employees

Age 53 and 25 years of service or age on valuation date if later.

The retirement assumption was set by the City of Allentown Pension Board, which has control over the selection of the pension valuation assumptions. Cheiron analyzed the retirement data over the past eight years, which was limited to 21 new retirees, with the Board in reviewing this assumption. Based on our professional judgment from this review, the current retirement assumption does not appear to be optimal because it does not reflect the likelihood of the police retiring with less than 25 years of service.

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.

8. Salary Increase

Salary increases:

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

9. Overtime

Participants are assumed to attain overtime pay equal to a ratio of base pay at retirement. The ratio is calculated separately for each participant. The numerator of the ratio is the average of the participant's overtime earnings during the three year period prior to the valuation. The denominator is the individual's base pay during the year immediately preceding the valuation.

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.

**CITY OF ALLENTOWN POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

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.

Active participants:

If hired after 2008: COLA increases assumed to begin four years after retirement date.

If hired prior to 2009: COLA increases assumed to begin 15 years after retirement date.

13. Expenses

Expenses are assumed to equal the two-year average of paid administrative expenses, 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 are based Plan experience. Rates of retirement are based on the Board's expectation. 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 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 POLICE PENSION PLAN
ACTUARIAL VALUATION AS OF JANUARY 1, 2020**

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

3. Actuarial Value of Asset

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

There have been no changes in the methods since the last valuation.