City of Pittsburgh Policemen's Relief and Pension Fund

Actuarial Valuation as of January 1, 2021

Revised
September 16, 2022

Prepared by:

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Enrolled Actuary No. 20-8055

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Korn Ferry, Inc.
Philadelphia

for

The City of Pittsburgh

Revised
Date: September 16, 2022

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I. Introduction

In accordance with the City's request, we have completed an actuarial valuation of the Policemen's Relief and Pension Fund (the Plan) as of January 1, 2021. The valuation was based on personnel data as supplied by the City and on financial data as supplied by the City's auditor. The valuation results are presented in this report.

This report relies on a model to determine liabilities which require forecasting into the future. To the best of our knowledge, this report, including the model used, is complete and accurate and all costs and liabilities have been determined in conformance with generally accepted actuarial principles and on the basis of actuarial assumptions and methods which are reasonable (taking into account past experience under the plan and reasonable expectations) and which represent our best estimate of anticipated experience under the plan.

Act 205

The Pennsylvania Municipal Pension Fund Funding Standard and Recovery Act was signed into law as Act 205 of 1984. As required, we have prepared the January 1, 2021 valuation and this report thereon in accordance with the provisions of Act 205. For the 2021 filing period, the actuarial valuation reporting forms are required to be submitted to the Municipal Pension Reporting Program by March 31, 2022.

Preamble

Please read the Preamble to the report very carefully. It contains important general information and concepts. It also explains how the results of the January 1, 2021 valuation, as published in this report, normally form the basis for the Plan's 2023 and 2024 Minimum Municipal Obligation (MMO).

Changes in Actuarial Assumptions and Plan Provisions Since the Last (1/1/2019) Valuation

The actuarial assumptions have been updated to reflect the changes detailed in the most recent experience study for the period from January 1, 2017 to December 31, 2020. This includes updates to the assumed rate of return, mortality rates, salary scale, retirement rates, disability rates, termination rates, and asset smoothing method.

Other important results and products of the January 1, 2021 valuation are presented in the Actuarial, Financial and Demographic Exhibits which make up the bulk of the report.

Certification

Assumptions used for the valuation were selected by the City based on a completed experience study through December 31, 2020. We believe the assumptions are reasonable and appropriate for this valuation.

The report was prepared under our supervision. We are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,

By:

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Enrolled Actuary No. 20-8055

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Enrolled Actuary No. 20-8969

II. Preamble

The Plan

The City of Pittsburgh sponsors a defined benefit pension plan for its City Police known as the Policemen's Relief and Pension Fund. A summary of the Plan's provisions is set forth in Appendix B of this report. The Plan is subject to the funding and reporting requirements of the Pennsylvania Municipal Pension Plan Funding Standard and Recovery Act (Act 205 of 1984, or Act 205). Act 205 requires that an actuarial valuation of the Plan be performed every other year. Actuarial valuations are performed for the Plan as of January 1 of each odd-numbered year. The January 1, 2021 valuation would normally form the basis for the Plan's 2023 and 2024 Financial Requirements and the City's 2023 and 2024 Minimum Municipal Obligation (MMO).

MMO Reporting Deadline

For a particular year, the City's Chief Administrative Officer must report the Plan's Financial Requirements and the City's MMO to the City Council by the last business day in September of the year preceding the particular year in question. Thus, the Plan's Financial Requirements and the City's MMO for 2023 are required to be reported to City Council by September 30, 2022.

Financial Requirements

The Plan's 2022 Financial Requirements would normally consist of the following elements:

Normal Cost. This is the cost of benefits allocated to the year 2022 under the Plan's actuarial cost method and the methodology of Act 205. It would normally be determined by multiplying the Normal Cost Rate as determined in the 2019 valuation by an estimate of 2021 W-2 wages of Plan members.

Administrative Expenses. This is an estimate of the administrative expenses of the Plan expected to be paid from Plan assets in 2022 and would normally be determined by multiplying the Administrative Expense Rate as determined in the 2019 valuation by the estimate of 2021 W-2 wages of Plan members.

Amortization Requirement (if applicable). This would normally be determined in the 2019 valuation and is the amount required to amortize the Plan's Unfunded Actuarial Accrued Liability as of January 1, 2019 over the number of years prescribed under Act 205 as amended by Act 44 of 2009.

II. Preamble (continued)

Minimum Municipal Obligation (MMO)

The City's MMO for 2022 is set equal to the Plan's Financial Requirements for 2022 less the sum of estimated member contributions for 2022 less, if applicable, a funding adjustment equal to 10% of the Plan's surplus with regard to accrued liabilities. The actual contribution that the City would be required to make in 2022 would be the 2022 MMO less State Aid deposited in the Plan in 2022.

As shown on page 5, the City's 2022 MMO is $14,990,492, prior to reflecting the receipt of any State Aid.

Actuarially Recommended Contribution (ARC)

One of the cost components of the Minimum Municipal Obligation is an amortization payment calculated according to rules prescribed in Act 205. The minimum amortization under Act 205 reflects the utilization of provisions of Act 82 of 1998 for which the City qualified. Under those provisions, the Unfunded Actuarial Accrued Liability as of January 1, 1998 is being amortized over 40 years calculated pursuant to special procedures (described in Appendix C: Glossary). Bases for subsequent years are established according to the normal procedures of Act 205 and amortized over various periods according to the source of the change in unfunded liability such as experience gains or losses, benefit changes, and assumption changes These periods are not limited by average future service because the City qualifies for Distress Level II (funded ratio more than 50% but less than 70%) according to the requirements under Act 205.

Since the Act 82 amortization methodology does not result in an actuarially appropriate funding level, this report also presents and Actuarially Recommended Contribution (ARC) reflecting a recommended amortization payment. The ARC is based on a 30-year "fresh start" amortization payment commencing as of January 1, 2011 and additional amortization bases added thereafter according to the normal procedures of Act 205.

As shown on page 5, the City's 2022 ARC is $26,598,269, prior to reflecting the receipt of any State Aid.

III. City's Minimum Municipal Obligation (MMO) for 2022

1.	Estimated 2021 W-2 Wages of Active Members	$	90,040,689
2.	Normal Cost Rate (from 2019 valuation)		10.4818%
3.	Administrative Expense Rate (from 2019 valuation)		1.0081%
4.	Normal Cost for 2022: (1) x (2)	$	9,437,885
5.	Administrative Expense for 2022: (1) x (3)		907,700
6.	Amortization Requirement (from 2019 valuation)		9,269,143
7.	Plan's 2022 Financial Requirements: (4) + (5) + (6)	$	19,614,728
8.	Estimated 2022 Member Contributions		4,624,236
9.	Funding Adjustment		N/A
10.	City's 2022 Minimum Municipal Obligation: (7) - (8) - (9)	$	14,990,492*

City's Actuarially Recommended Contribution (ARC) for 2022

1.	City's 2022 MMO (line 10 above)		$ 14,990,492
2.	a) Actuarially Recommended Amortization Payment (from 2019 valuation)	$20,876,920	
	b) Amortization Requirements for MMO (from 2019 valuation)	$ 9,269,143	
3.	Difference in Amortization: (2a) – (2b)		$ 11,607,777
4.	City's Actuarially Recommended Contribution for 2022: (1) + (3)		$ 26,598,269*

As shown above, the difference between the MMO and ARC is the difference between the required amortization (MMO) and the recommended amortization (ARC).

*City's actual contribution will be equal to the MMO/ARC less the actual amount of State Aid received in 2022.

IV. Valuation Highlights

	1/1/2021	1/1/2019
Funding		
Present Value of Benefits	$ 614,967,530	$ 570,127,271
Actuarial Accrued Liability	$ 508,061,164	$ 482,008,624
Actuarial Value of Assets	$ 333,128,662	$ 265,925,503
Funding Ratio	65.57%	55.17%
Market Value of Assets	$ 333,128,662	$ 264,759,897
Demographic		
Total Active	986	955
Total Pensionable Compensation	$ 72,253,689	$ 59,686,894
Average Annual Pensionable Compensation	$ 73,280	$ 62,499
Total In-Payment Status		
Retirement	710	716
Total Retirement Benefits	$ 22,841,214	$ 22,531,829
Average Annual Benefit	$ 32,171	$ 31,469
Disabled	273	295
Total Disabled Benefits	$ 7,047,981	$ 7,627,655
Average Annual Benefit	$ 25,817	$ 25,856
Survivor	432	455
Total Survivor Benefits	$ 4,531,709	$ 4,541,169
Average Annual Benefit	$ 10,490	$ 9,981
Total Deferred	17	24
Cost Components		
Normal Cost as percentage of total payroll	9.8229%	10.4818%
Administrative Expense as percentage of total payroll	0.8146%	1.0081%
Minimum Amortization Payment for MMO	$ 3,526,068	$ 9,269,143
Actuarially Recommended Amortization Payment for ARC	$ 18,361,372	$ 20,876,920

V. Actuarial Exhibits

Exhibit A-1: Normal Cost of Plan Benefits

	Normal Cost Expressed As A	
Type of Plan Benefit	*Dollar Amount*	*% of 2020 W-2 Wages*
Retirement	$ 7,599,268	7.5635%
Disability	1,343,196	1.3369
Survivor	140,778	0.1401
Refund of Member Contributions	622,822	0.6199
Vested Terminations	163,262	0.1625
Sub Total	$ 9,869,326	9.8229%
Estimated Average Administrative Fees for 2020 and 2021	818,496	0.8146%
Grand Total	$ 10,687,822	10.6375%

NOTES:

1. The normal cost for Plan Benefits is the portion of total Plan liabilities for current active members assigned to a particular plan year in accordance with the Entry Age Actuarial Cost Method, and the actuarial assumptions described in Appendix A.
2. In accordance with Act 205 the administrative expenses of the Plan (actuarial, legal, investment, etc.) may be paid from Plan assets.
3. 2020 W-2 wages for the Plan's 986 active members as of 1/1/2021 was $100,472,983.

V. Actuarial Exhibits (continued)

Exhibit A-2: Actuarial Accrued Liability as of January 1, 2021

1.	Present Value of Benefits of Active Members		
	(a) Retirement Benefits	$	235,340,384
	(b) Disability Benefits		25,568,998
	(c) Survivor Benefits		2,767,402
	(d) Refund of Member Contributions		4,348,527*
	(e) Vested Termination		2,699,054
	(f) Total	$	270,724,365
2.	Present Value of Benefits of Deferred Vested Benefits	$	6,102,646
3.	Member Refunds Due and Unpaid	$	0
4.	Present Value of Benefits of Benefit Recipients		
	(a) Retirement Benefits	$	229,843,187
	(b) Disability Benefits		73,479,696
	(c) Surviving Spouse Benefits		34,817,635
	(d) Surviving Child Benefits		0
	(e) Other		0
	(f) Total	$	338,140,518
5.	Present Value of Other Plan Benefits	$	0
6.	Present Value of All Plan Benefits: (1.f) + (2) + (3) + (4.f) + (5)	$	614,967,529
7.	Present Value of Future Normal Costs	$	106,906,365
8.	Actuarial Accrued Liability at 1/1/2021: (6) - (7)	$	508,061,164

* The amount of accumulated active member contributions without interest as of January 1, 2021 is $48,064,306.

V. Actuarial Exhibits (continued)

Exhibit A-3: Unfunded Actuarial Liability as of January 1, 2021

As of January 1, 2021, the Plan had an Unfunded Actuarial Accrued Liability (UAAL) since the Actuarial Value of Plan Assets did not exceed the Plan's Actuarial Accrued Liability, as follows:

1.	Actuarial Accrued Liability at 1/1/2021 (Exhibit A-2)	$	508,061,164
2.	Actuarial Value of Assets at 1/1/2021 (Exhibit F-1)		333,128,662
3.	UAAL at 1/1/2021: (1) - (2)	$	174,932,502

Analysis of Change in the Plan's Unfunded Actuarial Liability from January 1, 2019 to January 1, 2021

1.	Unfunded Actuarial Accrued Liability at 1/1/2019	$ 216,083,121
2.	Normal Cost (including expenses) due 1/1/2019	9,711,316
3.	Normal Cost (including expenses) due 1/1/2020	9,770,699
4.	Net interest to 1/1/2021	33,271,787
5.	Total Expected Contributions with interest through 1/1/21	(39,228,694)
6.	Increase (decrease) due to change in assumptions	(8,921,200)
7.	Increase (decrease) due to Plan amendments	0
8.	Expected Unfunded Actuarial Accrued Liability at 1/1/2021	$ 220,687,030
9.	Net actuarial loss (gain) for 2019 and 2020	(45,754,528)
10.	Actual Unfunded Actuarial Accrued Liability at 1/1/2021	$ 174,932,502

V. Actuarial Exhibits (continued)

Exhibit A-4: Development of Actuarial (Gain)/Loss from January 1, 2019 – December 31, 2020

1.	(Gain)/Loss on Actuarial Value of Assets	$	(14,436,951)
2.	(Gain)/Loss on Demographics		(15,468,881)
3.	(Gain)/Loss on Contributions (in excess of expected MMOs with interest)		(15,848,696)*
4.	2019/2020 Total (Gain)/Loss		(45,754,528)**

*Contribution (gain)/loss over expected ARCs was $11,612,878.
**Total gain on ARC amortization for the period was $(18,292,954).

V. Actuarial Exhibits (continued)

Exhibit A-5: Costs to Amortize the Unfunded Actuarial Accrued Liability

a. Amortization of Unfunded Actuarial Accrued Liability

Source		Original Amount	Year Established	Target Year		Unamortized Balance		Annual Amortization Amount
Initial	$	131,617,548	1998	2037	$	228,352,350	$	7,746,181
Assumption Change	$	597,864	2002	2021	$	56,055	$	56,055
Investment Loss	$	18,838,751	2002	2032	$	12,097,417	$	1,423,448
Assumption Change	$	(4,706,925)	2003	2022	$	(847,961)	$	(438,318)
Investment Loss	$	26,217,850	2003	2032	$	17,429,581	$	2,050,859
Assumption Change	$	(369,251)	2005	2024	$	(123,163)	$	(33,983)
Experience Gain	$	(542,011)	2007	2021	$	(57,693)	$	(57,693)
Assumption Change	$	(544,220)	2009	2028	$	(313,246)	$	(49,027)
Experience Loss	$	40,957,810	2009	2028	$	23,574,725	$	3,689,726
Assumption Change	$	(3,468,835)	2011	2025	$	(1,588,645)	$	(362,108)
Experience Gain	$	(124,186,299)	2011	2030	$	(83,551,103)	$	(11,117,568)
Assumption Change	$	41,759,441	2013	2027	$	24,965,269	$	4,329,333
Experience Gain	$	(11,222,672)	2013	2032	$	(8,488,558)	$	(998,810)
Experience Loss	$	4,893,338	2015	2034	$	4,062,721	$	434,160
Assumption Change	$	21,067,579	2017	2031	$	17,402,785	$	2,168,955
Experience Gain	$	(2,118,853)	2017	2036	$	(1,894,736)	$	(187,451)
Experience Gain	$	(10,412,913)	2019	2038	$	(9,900,697)	$	(919,864)
Experience Gain	$	(37,321,398)	2021	2040	$	(37,321,398)	$	(3,292,407)
Assumption Changes	$	(8,921,200)	2021	2035	$	(8,921,200)	$	(915,420)
Total					$	174,932,502	$	3,526,068

b. Recommended Amortization for Actuarially Recommended Contribution (ARC)

The following amortization schedule was established with the January 1, 2011 actuarial valuation to develop a more appropriate amortization of the Plan's unfunded liability.

Source		Original Amount	Year Established	Target Year		Unamortized Balance		Annual Amortization Amount
Initial	$	155,241,257	2011	2040	$	133,911,398	$	11,813,354
Experience Gain	$	(3,000,313)	2013	2032	$	(2,269,360)	$	(267,025)
Assumption Change	$	41,759,441	2013	2027	$	24,965,269	$	4,329,333
Experience Loss	$	15,435,952	2015	2034	$	12,815,787	$	1,369,552
Experience Loss	$	9,830,314	2017	2036	$	8,790,540	$	869,669
Assumption Change	$	21,067,579	2017	2031	$	17,402,785	$	2,168,955
Experience Loss	$	6,284,401	2019	2038	$	6,530,237	$	606,718
Experience Gain	$	(18,292,954)	2021	2040	$	(18,292,954)	$	(1,613,762)
Assumption Changes	$	(8,921,200)	2021	2035	$	(8,921,200)	$	(915,420)
Total					$	174,932,502	$	18,361,372

VI. Financial Exhibits

Exhibit F-1: Pension Plan Assets at Fair Market Value as of January 1, 2021

Asset Description		*Fair Market Value*
Investments in City of Pittsburgh Aggregated Pension Trust	$	181,407,881
Parking tax revenue receivable	$	151,720,781
Total	$	333,128,662

Note: Accounting Method is Accrual Basis

Actuarial Value of Assets as of January 1, 2021

The Actuarial Value of Assets as of January 1, 2021 is determined in accordance with the method described in Appendix A, but has been set to the market value in the initial year of implementation.

VI. Financial Exhibits (continued)

Exhibit F-2: Asset Reconciliation January 1, 2019 to December 31, 2020

		Year Beginning January 1	
		2019	*2020*
1.	Market Value at January 1	$ 264,759,897	$ 292,509,191
2.	Revenues During Year		
a)	Member Contributions	$ 4,277,685	$ 4,823,424
b)	Municipal Contributions - State Aid Portion	9,590,628	9,579,648
c)	Municipal Contribution - Local Portion*	16,369,926	11,299,568
d)	Interest on Late City Contributions	0	0
e)	Parking-tax contribution	12,097,254	12,097,254
f)	Dividends and Interest	1,998,959	1,659,305
g)	Net Appreciation	20,826,286	18,790,646
h)	Net Realized Capital Gains	0	0
i)	Net Unrealized Capital Gains	0	0
j)	Other Revenues	0	19,812,983
k)	Adjustment	0	0
l)	Total Revenues	$ 65,160,738	$ 78,062,828
3.	Expenses During Year		
a)	Benefit Payments*	$ 36,295,161	$ 36,372,415
b)	Contributions Withdrawn	344,538	270,457
c)	Administrative Costs	771,745	800,485
d)	Net Realized Capital Losses	0	0
e)	Net Unrealized Capital Losses	0	0
f)	Other Expenses	0	0
g)	Total Expenses	$ 37,411,444	$ 37,443,357
4.	Market Value at December 31: (1) + (2.l) - (3.g)	$ 292,509,191	$ 333,128,662
•	Total Investment Growth During Year	$ 22,825,245	$ 20,449,951
•	Average Assets on Deposit During Year	$ 267,221,922	$ 302,593,951
•	Approximate Annual Rate of Return	8.54%	6.76%

**Excludes pass-through contributions of $1,502,262 in 2019 and $1,574,929 in 2020.*

VI. Financial Exhibits (continued)

Exhibit F-3: Administrative Costs Paid from Pension Plan During 2019 and 2020

Type	*2019*	*2020*
Administrative Expense	$ 507,292	$ 537,713
Investment Expense	264,453	262,772
Total	$ 771,745	$ 800,485

VII. Demographic Exhibits

Exhibit D-1: Active Members Demographic Data as of January 1, 2021

	Number
1. Active members @ 1/1/2019	955
2. New entrants	120
3. Separations from active service	
a) Refund of contributions	48
b) Separation with deferred benefit	9
c) Separation with neither refund or deferred benefit	0
d) Disability	2
e) Death	0
f) Retirement with service retirement benefit	30
g) Total separations	89
4. Active members @ 1/1/2021: (1) + (2) - (3.g)	986

VII. Demographic Exhibits (continued)

Exhibit D-2: Benefit Recipients Demographic Data as of January 1, 2021

			Number
1.	Benefit recipients @ 1/1/2019		1,466
2.	New benefit recipients (including beneficiaries)		81
3.	Terminations		
	a)	Death	132
	b)	Other	0
	c)	Total Terminations	132
4.	Benefit recipients @ 1/1/2021: (1) + (2) - (3.c)		1,415*

*includes 432 beneficiaries and 273 disabled

Appendix A

Summary of Economic and Demographic Actuarial Assumptions and Cost Method

I. Economic Actuarial Assumptions

A. ***Interest.*** 7.00% per annum compounded annually

B. ***Salary Scale.*** 4.75% per annum compounded annually (includes inflation)

C. ***Inflation.*** 2.75% per annum compounded annually

D. ***Social Security Benefits.*** Not applicable.

E. ***Workmen's Compensation.*** Not applicable.

F. ***Actuarial Value of Assets*** The actuarial value of assets is developed by recognizing the difference between the expected actuarial value of assets and the market value of assets over a six-year period. The expected actuarial value is last year's actuarial value brought forward to reflect actual contributions, benefit payments and expenses, and assumed investment income. Each year, 16.67 percent of the difference between this expected value and the market value is recognized in determining the current actuarial value of assets with the remaining 83.33 percent to be recognized over the next five years.

As of the 1/1/2021 valuation, the market value of assets was set to the actuarial value of assets.

G. ***Administrative Expenses:*** Administrative expenses payable from Plan assets during the year beginning on the valuation date are assumed to equal 104.5% of such expenses in the preceding year.

II. Demographic Actuarial Assumptions

Mortality. Public Safety Pub-2010 amount weighted table with generational projection using MP2020. The adjusted rates are based on the following:

a. *Active Participants*. Public Safety Pub-2010 amount weighted table with base rates set forward 1 year and generational projection using MP2020.
b. *Retired/Term Vested Participants*. Public Safety Pub-2010 amount weighted table with base rates set forward 1 year and generational projection using MP2020.
c. *Disability Retirees*. Disabled Pub-2010 amount weighted table with generational projection using MP2020.
d. *Surviving Beneficiaries*. Contingent Annuitant Pub-2010 amount weighted table with generational projection using MP2020.

Appendix A (continued)

Summary of Economic and Demographic Actuarial Assumptions and Cost Method (continued)

Disablement.

Sample Rates						
Age	Male	Female		Age	Male	Female
25	0.17%	0.09%		45	0.31%	0.43%
30	0.13%	0.13%		50	0.50%	0.58%
35	0.16%	0.18%		55	0.85%	0.75%
40	0.22%	0.29%		60	1.37%	1.05%

Duty Related Mortality. 20% of deaths in active service are assumed to be duty related.

Duty Related Disability. 50% of disabilities occurring during employment are assumed to occur in the line of duty.

Withdrawal.

Sample Rates					
	Years of Service				
Age	0-2	3	4	5	6+
20	6.63%	7.36%	6.31%	5.26%	4.08%
25	6.45%	7.16%	6.14%	5.12%	3.97%
30	6.18%	6.86%	5.88%	4.90%	3.80%
35	5.73%	6.36%	5.45%	4.54%	3.52%
40	4.27%	4.74%	4.06%	3.39%	2.22%
45	2.16%	2.39%	2.05%	1.71%	1.04%
50	0.49%	0.55%	0.47%	0.39%	0.24%
55	0.00%	0.00%	0.00%	0.00%	0.00%

Retirement.

Age	Percentage
50	15.0%
51-53	10.0%
54-59	8.0%
60-62	10.0%
63	8.0%
64	15.0%
65	100.0%

Appendix A (continued)

Summary of Economic and Demographic Actuarial Assumptions and Cost Method (continued)

Marital Status. 80% of male participants and 65% of female participants are assumed to be married with female spouses assumed to be two years younger.

III. Cost Method

Liabilities and costs were determined by the Entry Age Actuarial Cost Method.

Changes in Assumptions Since the Last (1/1/2019) Valuation

The actuarial assumptions have been updated to reflect the changes detailed in the most recent experience study for the period from January 1, 2017 to December 31, 2020. This includes updates to the assumed rate of return, mortality rates, salary scale, retirement rates, disability rates, termination rates, and asset smoothing method.

Appendix B

Summary of Plan Provisions as of January 1, 2021

The Summary of Plan Provisions below is included to clarify the basis of our actuarial valuation and is not meant to govern the operation of the Plan. The summary represents our understanding of the benefits provided by the Plan, based upon documentation provided by the Plan Sponsor and our understanding of the way in which the Plan Sponsor operates the Plan.

Plan Year. Twelve-month period beginning January 1 and ending December 31

Plan Established. September 1, 1935

Principal Definitions

Member. Any uniformed employee of the City of Pittsburgh Bureau of Police

Retirement Benefit Commencement Date. Assumed to be the first day of the month coincident with or next following eligibility for and election to retire; however, can elect to commence upon eligibility a date other than the first day of month.

Service Increment.

- Additional monthly benefit of $20 for each completed year of service between 20 and 25 years, plus $25 for each completed year of service in excess of 25 years

Service. Completed years of service calculated from date of hire through date of retirement or severance, plus periods of service purchased

Normal Form of Payment. Monthly pension benefit payable for life

Participation Requirements

Entry Date. Date of hire

Compensation

- Base wages and longevity pay

Average Compensation

- Compensation averaged over the 12-month period prior to retirement or severance

Appendix B (continued)

Summary of Plan Provisions (continued)

Late Retirement

Eligibility. Employment beyond normal retirement

Amount of Benefit. Normal retirement benefit based upon average compensation as calculated at actual retirement

Disability

Eligibility.

- Permanent disablement in line of duty or
- Permanent disablement (not in line of duty) after completing 10 years of service

Benefit Amount. 50% of earnings in year prior to occurrence of disablement. For members hired after December 31, 1991, the sum of the disability benefit plus the member's workers' compensation benefit shall not exceed member's regular salary at time of disablement

Benefit Commencement Date.

- First day of calendar month following determination of disablement, and
- Continuing for the duration of disability prior to normal retirement date and life thereafter

Vesting

- If member completed 20 years of service, may collect normal retirement benefit based on average compensation at termination (providing terminate member continues contribution at rate in effect at termination)
- Benefit deferred to age 50

Death Benefits

Accidental Death

- Benefit plus return of member's accumulated contributions
- Benefit is equal to 50% of member's wages at death
- Payable for 500 weeks or until surviving spouse dies or remarries
- If no surviving spouse or unmarried children, dependent parents receive payments

Appendix B (continued)

Summary of Plan Provisions (continued)

Children Benefits (No surviving spouse/or discontinued payment to surviving spouse)

- Each unmarried child under age 18 receives payments equal to 25% of payments to spouse
- Total payments to one family may not exceed 50% of member's wages at time of death
- $60 minimum monthly payment if only one child
- If maximum amount payable, divide equally among entitled children
- Payments terminate when child reaches age 18, dies, marries
- Payments may continue indefinitely to incompetent child

Death Prior to Retirement Active service/not accidental

- If so elected, spouse paid benefit equal to 50% of pension member would have received if retired on date of death
- No election, accumulated contributions without interest paid to beneficiary or estate
- Must be married for at least two years at time of death

Death After Retirement

- If so elected, spouse paid benefit equal to 50% of pension member was receiving
- No surviving spouse, benefit may be paid to surviving children or dependent parents

Employee Contributions

- 6.0 percent of compensation plus $1 per month
- $1 per month ceases at age 65
- If surviving spouse benefit elected, add ½ percent of compensation

Changes Since Last (1/1/2019) Valuation

There have been no changes in Plan provisions since the last actuarial valuation.

Appendix C

Glossary

Accrued Benefit. The portion of the participant's retirement that is attributable to service completed before the calculation date. The calculation typically uses actual service as of the calculation date and may involve other factors such as average pay at the determination date and projected service through the retirement eligibility date.

Act 205 of 1984. Municipal Pension Plan Funding Standard and Recovery Act of December 18, 1984, P.L. 1005, No. 205. The Act control pension funding in Pennsylvania. This Act also provides for reporting of actuarial information and for a recovery program for qualifying municipalities.

Actuarial Accrued Liability. This is the plan's liability for all benefits accrued as of the valuation date. It includes the liability for all benefits currently payable to retired members (since such benefits are 100% accrued) plus the liability for benefits accrued by active members as of the valuation date, i.e., future benefit accruals, are not included.

Actuarial Assumptions. Factors used by the actuary to forecast future events. These factors include items relating to future economic conditions, the survival of the participants and their beneficiaries, and the length of employment.

Actuarial Cost Method. A means of assigning costs to periods of employment. This method is used to determine a funding level that will provide sufficient assets to pay benefits for each participant upon retirement. Act 205 specifies that the entry age normal cost method, as described in the Act, should be used for this determination.

Actuarial Experience Gain or Loss. The effect on the actuarial accrued liability of differences between events as predicted by the actuarial assumptions and those that actually occurred. This difference can increase or decrease the contribution in future years.

Actuarial Present Value. The lump sum value that is equivalent to an expected series of future payments. This value is determined by using the actuarial assumptions. An actuarial present value, as of the valuation date, represents the amount of funds that would be sufficient to provide the series of payments, if experience precisely matches the actuarial assumptions.

Actuarial Value of Assets. The value of current plan assets which is used by the actuary to evaluate the current funding status and determine future funding requirements. Under Act 205, a corridor limitation requires that this value be between 80 to 120 percent of the fair market value of the assets.

Administrative Expenses. This is an estimate of the administrative expenses that will be paid from plan assets. The average of the actual administrative expenses for the year preceding the valuation year and estimated administrative expenses for the valuation year is expressed as a percentage of active members' total payroll and this percentage is used to determine the plan's estimated administrative expense for the two years following the valuation year.

Glossary (continued)

Amortization Payment. The annual payment required to eventually eliminate the unfunded actuarial accrued liability according to the schedule established in Act 205.

Amortization Requirement. This is the additional contribution (i.e., in addition to the Normal Cost and Administrative Expenses) that will fund the plan's Unfunded Accrued Liability over the number of years prescribed by Act 205.

"Fresh-Start" Amortization. A process of taking the unfunded actuarial accrued liability at the valuation date and amortizing over a prescribed number of years, usually 30. This would replace the pre-existing amortization schedule and be used as the new amortization schedule going forward.

Funded Ratio. The actuarial value of assets divided by the actuarial accrued liability.

Funding Adjustment. If the plan has a surplus with regard to its Actuarial Accrued Liability, there is no Amortization Requirement. Rather, the plan's Financial Requirements are, in accordance with Act 205, reduced by an amount equal to 10% of the surplus. Note that the Funding Adjustment is equivalent to a negative Amortization Requirement. The 10% credit allowance is equivalent to amortizing the surplus over a period of approximately 17 years based on typical valuation interest rates.

General Municipal Pension System State Aid. Annually municipalities receive a portion of the insurance premium tax levied on casualty insurance companies headquartered outside of Pennsylvania. If they have paid Police, they also receive a portion of the premium tax on out-of-state Police insurance companies. These taxes are distributed according to formulae contained in Act 205.

Minimum Municipal Obligation. The amount that must be contributed to a pension plan b a municipality for a given year. The calculation of this amount uses the normal cost, anticipated administrative expenses, amortization payment or funding adjustment, and anticipated employee contributions to determine a municipality's contribution requirement. General Municipal Pension System State Aid may be used to reduce the contribution.

Normal Cost. This is the portion of total plan liabilities for current active members assigned to a particular plan year. I may be thought of as the cost of benefits that will be accrued by active members during the year. The Normal Cost is expressed as a percentage of active members' total payroll in the valuation and this percentage is used to determine the Normal Cost for the two years following the valuation year.

Present Value of Plan Benefits (PVB). This is the discounted value based on the valuation interest assumption) at the valuation date of all plan benefits expected to be paid on or after the valuation date. The amount of expected benefits and date of payment for a particular individual is determined by plan provisions and the valuation assumptions with regard to salary increases, mortality (i.e., life expectancy), turnover, disability, retirement, etc., i.e., any contingency which can affect the amount and timing of future benefit payments.

Appendix C (continued)

Glossary (continued)

Unfunded Actuarial Accrued Liability. This is equal to the excess of the plan's Actuarial Accrued Liability over Valuation assets. Note that, if the Valuation Assets exceed the Actuarial Accrued Liability, the plan has a negative Unfunded Actuarial Accrued Liability, i.e., a surplus with regard to its Actuarial Accrued Liability.

Valuation Assets. This is the actuarial value of plan assets as of the valuation date. Valuation Assets are usually set equal to the fair market value of assets although assets are sometimes valued under a method that smooths the effect of market fluctuations.

Vesting. The participant's non-forfeitable right to receive a benefit, provided that the participant survives until benefit eligibility.

Appendix D

Debt Service Schedule by Plan Year Pension Bond Issue of March 10, 1998

	Date of Original Borrowing	Total Principal Borrowed	Total Principal to this Plan	Percentage to this Plan	Date of Refinancing
	3/10/1998	$255,865,000.00	$120,512,415.10	47.6%	N/A
Plan Year	Required Principal Payment	Required Interest Payment	Annual Debt Service	Premium or Discount Amortized	Principal Balance at Valuation Date
1998		$3,921,658.75	$3,921,658.75	$0	$120,512,415.10
1999	$471,000.00	7,830,011.75	8,301,011.75	0	120,512,415.10
2000	471,000.00	7,803,518.00	8,274,518.00	0	120,041,415.10
2001	471,000.00	7,776,882.95	8,247,882.95	0	119,570,415.10
2002	471,000.00	7,749,753.35	8,220,753.35	0	119,099,415.10
2003	471,000.00	7,722,411.80	8,193,411.80	0	118,628,415.10
2004	471,000.00	7,694,787.65	8,165,787.65	0	118,157,415.10
2005	1,179,855.01	7,645,426.83	8,825,281.84	0	117,686,415.10
2006	1,092,720.01	7,576,976.41	8,669,696.42	0	116,506,560.09
2007	1,158,660.01	7,508,582.50	8,667,242.51	0	115,413,840.08
2008	1,208,115.01	7,436,244.85	8,644,359.86	0	114,255,180.07
2009	1,304,670.00	7,353,582.89	8,658,252.89	0	113,047,065.06
2010	1,417,710.00	7,263,616.00	8,681,326.00	0	111,742,395.06
2011	1,521,330.00	7,171,771.00	8,693,101.00	0	110,324,685.06
2012	3,716,190.01	7,007,169.44	10,723,359.45	0	108,803,355.06
2013	5,173,935.00	6,725,837.03	11,899,772.03	0	105,087,165.05
2014	5,505,990.01	6,382,619.91	11,888,609.92	0	99,913,230.05
2015	5,988,765.01	6,009,040.37	11,997,805.38	0	94,407,240.04
2016	6,386,760.00	5,606,835.82	11,993,595.82	0	88,418,475.03
2017	8,593,395.01	5,119,980.78	13,713,375.79	0	82,031,715.03
2018	6,233,685.01	4,638,100.67	10,871,785.68	0	73,438,320.02
2019	9,434,130.01	4,124,179.63	13,558,309.64	0	67,204,635.01
2020	10,079,400.01	3,480,233.14	13,559,633.15	0	57,770,505.00
2021	10,767,060.01	2,792,299.96	13,559,359.97	0	47,691,104.99
2022	11,504,175.00	2,057,349.21	13,561,524.21	0	36,924,044.98
2023	12,290,744.99	1,272,116.86	13,562,861.85	0	25,419,869.98
2024	13,129,124.99	433,261.15	13,562,386.14	0	13,129,124.99

Appendix E

Plan Maturity Measures

Assets are accumulated over participants' careers to pay future benefits. The natural growth of liabilities and assets is referred to as plan maturity. As the plan matures, the size of the plan grows relative to the active members' payroll and will cause changes in the assets or liabilities to have a larger effect on the Actuarially Recommended Contribution (ARC). The following table shows a history of the plan's maturity and the effect of a 1% change in plan assets or liabilities on the ARC.

Calendar Year	Actives Per Retirees	Ratio of Assets to Payroll	Effect on MMO of a 1% Change in Assets	Ratio of Actuarial Accrued Liability to Payroll	Effect on MMO of a 1% Change in Liability
2019	0.6	4.5	$240,000	8.1	$430,000
2020	0.7	4.6	$290,000	7.0	$450,000

The primary risks associated with plan maturity are listed below:

Investment Risk – Risk that the assumed rate of return is not achieved, and the plan funding level deteriorates

Contribution Risk – Risk that the Borough does not pay the full MMO

Liquidity Risk – Risk that investments cannot be liquidated timely to pay benefit payments due to plan participants

Longevity Risk – Risk that plan participants live longer than expected causing annuities to cost the Plan more