General Government Retirement Board
Regular Meeting
Thursday March 10, 2021
5:00 pm City Hall Council Chambers

Zoom Access:

https://bristolct-gov.zoom.us/j/85031076164?pwd=QUphOEhPNlgzSmxMajkxV3VrbkhrZz09

Meeting ID: 850 3107 6164

Passcode: 123456

One tap mobile

+13126266799,,85031076164# US (Chicago)

+19292056099,,85031076164# US (New York)

1. Call To Order
   Pledge of Allegiance

2. Public Participation

3. Approval Of The Minutes: Regular Meeting Of The General Government Retirement Board February 10, 2022.

   Documents:

   FEBRUARY2022MINUTES.PDF

4. Treasurer's Report February 2022.

   Documents:

   FEBRUARY 2022 TREASURER REPORT.PDF

5. Consideration Of A Request To Approve The Vested Retirement From Marriya Connelly, City Clerk, Local 233 Effective May 1, 2034.

6. Consideration Of A Request To Approve The Vested Retirement With 100% Contingent Annuitant Option From Jason Gagnon, Public Works Department, Local 233 Effective April 1, 2036.

7. Consideration Of A Request To Approve The Normal Retirement From Richard Guerrera, The Bristol Police Union, Effective February 16, 2022.

8. Consideration Of A Request To Approve A Deferred Retirement Option Pension (DROP) For John Ingellis Sr., Fire Department, Local 773 Effective July 8, 2023.

9. Consideration Of A Request To Approve A Deferred Retirement Option Pension (DROP) For Kenneth Miffitt, Fire Department, Local 773 Effective July 1, 2022.

10. Investment Review - Beirne Wealth Consulting, LLC

- General Retirement Fund

Documents:

BEIRNE 2022.02 BRISTOL.PDF
BEIRNE 2021.12 BRISTOL QUARTER FOR MARCH MEETING.PDF
BEIRNE BRISTOL PENSION RECON.PDF
BEIRNE BRISTOL PENSION 1Q2022.PDF
BEIRNE BRISTOL OPEB RECON.PDF
BEIRNE BRISTOL OPEB 1Q2022.PDF
BEIRNE BRISTOL-RECOMMENDATIONS-2022.03.10.PDF

11. Presentation By Arsenal

Documents:

PRESENTATION ARSENAL GROWTH - BRISTOL UPDATE.PDF

12. Discussion Regarding An RFP For Custodial Services And To Take Any Action As Necessary.

13. Accept The Actuarial Valuation By Milliman And Place On File.

Documents:

ESP2021PENSIONVALUATIONREPORT_SIGNED (002).PDF

14. Any Other Business Proper To Come Before Meeting.

15. Adjournment

16. Signature

Per order of:

Thomas Barnes Jr., Chairman

Diane M. Waldron

Comptroller & Secretary, Retirement Board

MEETING OF THE GENERAL

GOVERNMENT RETIREMENT BOARD

February 10, 2022

A Regular meeting of the General Government Retirement Board was held on **February 10, 2022 at 5:00 p.m.** in the City Council Chambers at City Hall, Bristol, CT. Members present: Chairman Tom Barnes, Jr., Vice Chairman David Preleski (Zoom), Mayor Jeffrey Caggiano, Council Member Olsen, Comptroller Diane M. Waldron, Commissioner's David Butkus, Paul Keegan, David Maikowski, and Frank Rossi. Absent: Commissioner's Peter Dauphinais, Thomas DeNoto, and William Veits.

Also present: John Oliver Beirne from Beirne Wealth Consulting
Brian Gevry from Boyd Watterson Asset Management, LLC

1. **Call to Order.**

Pledge of Allegiance

The meeting was called to order at 5:00 p.m. by Chairman Barnes.

2. Item 2-Public Participation.

None.

3. Item 3 - Minutes for the Regular meeting of January 13, 2022 were approved.

A motion was made by Commissioner Butkus and seconded by Commissioner Rossi and it was unanimously voted to:

> "Approve the minutes of the Regular General Government Retirement Board meeting of January 13, 2022 and place them on file."

4. Item 4 - Treasurer's report January 2022.

A motion was made by Commissioner Keegan and seconded by Comptroller Waldron and it was unanimously voted to:

> "Accept the Treasurer's Report for January 2022 and place it on file."

5. Item 5 – Consideration of a request to approve the Normal Retirement from Cynthia Pelletier, Bristol Burlington Health Department, Local 1303 effective January 4, 2022.

A motion was made by Commissioner Keegan and seconded by Commissioner Butkus and it was unanimously voted to:

> "Approve the request for Normal Retirement from Cynthia Pelletier, Bristol Burlington Health Department, Local 1303 effective January 4, 2022 with an annual pension amount of $34,386.03 or $2,865.50 monthly."

6. Item 6- Consideration of a request to approve the Normal Retirement from Garrie Dorman, The Bristol Police Union effective January 18, 2022.

A motion was made by Commissioner Rossi and seconded by Commissioner Butkus and it was unanimously voted to:

> "Approve the request for Normal Retirement from Garrie Dorman, Bristol Police Union, effective January 18, 2022 with an annual pension amount of $70,731.55 or $2,712.99 bi weekly."

7. Item 7- Consideration of a request to approve the Normal Retirement from Bradley Thurston, The Bristol Police Union effective January 22, 2022.

A motion was made by Commissioner Butkus and seconded by Mayor Caggiano and it was unanimously voted to:

> "Approve the request for Normal Retirement from Bradley Thurston, Bristol Police Union, effective January 22, 2022 with an annual pension amount of $67,374.61 or $2,584.23 bi weekly."

8. Item 8– Investment Review – Beirne Wealth Consulting, LLC.

- **General Retirement Fund**

John Oliver Beirne, of Beirne Wealth, provided an overview of the portfolio. John Oliver also supplied the Board with a handout regarding the Capital Calls as of September 30, 2021.An updated one will be provided for year end. Beirne Wealth is trying to build towards the policy targets and has diversified away from high quality bonds. John Oliver also discussed the different allocations and how Beirne Wealth will try to hit the target ranges. The portfolio was up approximately 16.1% at year end and ended in the 15th percentile (among similar plans in the country). The portfolio achieved one of its highest levels ever. Some of the larger funds dropped this month due to volatility in the Equities market. John Oliver discussed current issues with the international and bond markets and stated that the portfolio will have to get more defensively oriented if these trends continue.

The portfolio is currently priced at $797,010,546 with about 30% unpriced. It is down about 4% for the month and 3.25% for the quarter. The Equity portion of the portfolio was about 65% and has dropped to 57.8% of the total portfolio. This is an area where the portfolio can become more defensively oriented and be readjusted into other assets. Interest Rates were discussed and Beirne Wealth will continue to provide updates as needed. Private Equities is currently missing a lot of pricing. Arsenal will be providing updates on the two new funds (Sayari and Cart.com) which are supposedly doing well. There was additional discussion on Private Equities and the allocation of small/mid/large cap stocks in the portfolio. The portfolio is set up to represent where the best value is as opposed to getting stuck in a box. Beirne Wealth has been focused on growth/momentum but they're working to move back to neutral. There was some discussion on Fixed Income and how the Entrust fund is structured. Beirne Wealth will request a year end update from Heitman and may ask them to present to the Board. There was no pricing on Alternatives and Chairman Barnes asked that the pricing be supplied quarterly.

Council Member Olsen joined the meeting at 5:52pm.

9. Item 9–Presentation by Boyd Watterson Asset Management, LLC.

Brian Gevry, of Boyd Watterson, addressed the Board and provided an overview of the fund & the assets under their management (the GSA Fund and the State Government Fund). The GSA Fund is comprised of high security/mission critical federal government buildings. The fund is approximately 95% occupied and targets returns from 7-9% with low volatility. The fund came through the pandemic with generally no issues. The City's position in this fund is just under $40 million. The State Government Fund is comprised of essential and law enforcement buildings at the State & Local level and is equally as in demand as the GSA Fund. The State Government Fund returns are approximately 9.7% and the City's position is about $12 million. Boyd Watterson takes credit quality seriously and has expertise in all aspects of the fund. Their goal is to have a broad portfolio with a lot of opportunity, especially in State & Local buildings. Currently the fund is just under $18 billion with $10 billion in Real Estate and $8 billion in Fixed Income.

Boyd Watterson has recently launched and additional strategy which would include government overseen contractors such as clean energy, grid security, etc. By stepping beyond the State & Local sector, the opportunities for investment would increase significantly. There are currently some complexities with these types of buildings, but Boyd Watterson is looking into strategies to simplify them. As of right now, to invest in this new fund there would be a flat fee for the first year. The fund is currently positioned to mitigate any risk and allows for optionality to move into other investments when needed. The City's portfolio was a bit ahead of the curve with changing the allocations. With the new strategy, there will be a large amount of new opportunities and timing is very important. This new fund has the capacity to be as successful as the GSA Fund.

John Oliver Beirne addressed the Board and stated that the City is currently under allocated in the State Fund. If the portfolio invests 3% into this new fund, the Real Estate portion of the portfolio will sit at approximately 9% and there would be one firm with about 9% of the total portfolio. This fund would be a much safer investment opportunity than other asset classes such as Equities.

The Board will discuss this opportunity further at the March Retirement Board meeting and John Oliver will bring the tentative numbers of investing about 3% (or $25 million) of the portfolio into the new fund. A formal request will be brought to the March meeting.

10. Item 10- Update on Contract Negotiations with Beirne Wealth Consulting for Advisory Services and to take any action as necessary.

The contract was sent out to the Retirement Board members for review.
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A motion was made by Commissioner Butkus and seconded by Mayor Caggiano and it was unanimously voted to:

> "Accept the Contract with Beirne Wealth Consulting Services, LLC as presented."

11 Item 11- Review of Administrative Budget for FY 2022-23 and to take any action as necessary.

Comptroller Waldron provided the Board with an overview of the yearly administrative expenses for the pension fund. The estimated budget will be submitted to the Board annually and the Board of Finance has also asked for a yearly summary. Comptroller Waldron noted that some of the values on the budget are estimated (i.e. the custodial fees).

A motion was made by Mayor Caggiano and seconded by Commissioner Keegan and it was unanimously voted to:

> "Accept the Administrative Budget for FY 2022-23 as presented and place on file."

12. Item 12- Discussion regarding an RFP for Custodial Services and to take any action as necessary.

The current custodian is Fidelity and there has been no RFP or review in a while. John Oliver Beirne was asked for his insight and stated that every manager would need to be approved and the process would take six months to one year. There was also discussion on Fidelity's fees in comparison to other custodians.

Beirne Wealth will put together a report showing the universe of custodians and provide it to the Retirement Board. Based on the report, the Board will do research before launching a full RFP.

13. Item 13- Review and Accept Scott & Scott 4th Quarter Report and place on file.

A motion was made by Commissioner Keegan and seconded by Commissioner Butkus and it was unanimously voted to:

> "Accept the Scott & Scott 4th Quarter Report as presented and place on file."

14. Item 14- Any other business proper to come before meeting.

None.

15. Item 15- Adjournment

At 6:35 p.m. a motion was made by Commissioner Keegan and seconded by Commissioner Butkus and it was unanimously voted to: "Adjourn."

Respectively submitted,

Diane M. Waldron
Comptroller and Secretary, Retirement Board

Treasurer's Report
Police, Firefighters, Retirement System Fund
FEBRUARY 2022

	Police 710	Firefighter 711	Retirement 712/715	Total
<u>Pension Funds in Pension Bank Accounts</u>				
CASH & CASH EQUIVALENTS: 2/1/2022	$ 8,877.51	$ 182,583.33	$ 184,711.80	$ 376,172.64
<u>RECEIPTS:</u>				
Employee Contributions City/BDA/WPC	34,844.24	12,077.29	72,468.09	119,389.62
Employee Contributions BOE			84,208.33	84,208.33
Employee Contributions Health Dept			8,943.22	8,943.22
Employee Contributions Water Dept			9,539.17	9,539.17
Employer Contributions BOE				-
Employer Contributions City/BDA/WPC				-
Employer Contributions Water Dept				-
Employee Contributions Buy Back			80.00	80.00
Employee Contributions Fire Dept Healthcare 1.00%			4,026.18	4,026.18
Employee Contributions Police Healthcare 1.625%,1.875%			11,614.24	11,614.24
Employee Contributions Retiree Healthcare -Health Dept - 1.5%			2,421.57	2,421.57
Employee Contributions Retiree Healthcare 233 - 1.5%, 1.75%			8,544.24	8,544.24
Employee Contributions Retiree Healthcare BPSA - 1.5%, 1.75%			6,343.87	6,343.87
Employee Contributions Retiree Healthcare - 1338 -1.5%, 1.75%			10,461.96	10,461.96
Employee Contributions Retiree Healthcare -NBAR - 1.5%, 1.75%			1,853.65	1,853.65
Employee Contributions Retiree Healthcare -BOE NBAR / 818- 1.5%			4,243.96	4,243.96
Miscellaneous Income				-
Interest	2.16	12.96	10.84	25.96
Total Receipts, Contributions and Interest	34,846.40	12,090.25	224,759.32	271,695.97
<u>EXPENDITURES:</u>				
Pensions Paid *P , F, R .... **total retirees***	634,403.62	363,727.06	1,466,478.39	2,464,609.07
Refund of Contributions / Interest	-	-	14,622.91	14,622.91
Fiduciary Insurance	-	-	-	-
Legal- Robinson & Cole	1,617.00	1,617.00	1,617.00	4,851.00
Actuary- Milliman	1,120.00	1,120.00	1,120.00	3,360.00
Medical Disability	-	-	-	-
Accountant/Bookkeeper Salaries **(Note 1)**	2,676.54	2,676.53	2,676.53	8,029.60
Comptroller/Assistant to Comptroller Salaries **(Note 1)**	2,493.45	2,493.45	2,493.45	7,480.35
Postage **(Note 1)**	18.91	20.17	148.40	187.48
Other Expenses / (Revenue) (Tyler Technologies)	-	-	-	-
Total Expenditures	642,329.52	371,654.21	1,489,156.68	2,503,140.41
CURRENT MONTH, Surplus/(deficit)	(607,483.12)	(359,563.96)	(1,264,397.36)	(2,231,444.44)
TRSFR IN-FIDELITY TO PENSION	635,000.00	445,000.00	1,275,000.00	2,355,000.00
CASH & CASH EQUIVALENTS: 2/28/2022 (Beginning Bal+Current Month+Transfer in)	$ 36,394.39	$ 268,019.37	$ 195,314.44	$ 499,728.20

Pension Trust Funds

Market Value at July 1, 2021 **(Note 2)**	$ 807,524,800
Actuarial Value at July 1, 2021 **(Note 2)**	$ 716,586,956
Accrued Liability	$ 521,591,781
Pension Surplus (Unfunded Liability)	$ 194,995,175
Funded Ratio= Actuarial Value divided by Accrued Liability	137.4%

Note 1: Amount will be invoiced quarterly by the Comptroller's office to the Pension fund.
Note 2: Source: Preliminary Milliman Actuarial Valuation as of July 1, 2021 projected for fiscal year 2022-23, as of January 13, 2022.

REPORT PREPARED FOR:

Bristol CONNECTICUT All Heart

Beirne Wealth Consulting Services, LLC

Your Strategic Partner for Defined Benefit Plans

Month Ending 2/28/2022

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Periods Ending 02/28/22

Name	1 Month	Last 3 Months	YTD	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
US Equity									
Russell 3000 Index	-2.5	-4.6	-8.3	12.3	17.6	14.7	14.3	9.9	14.9
S&P 500 Index	-3.0	-3.9	-8.0	16.4	18.2	15.2	14.6	10.1	15.5
Russell 1000 Index	-2.7	-4.5	-8.2	13.7	18.1	15.1	14.5	10.1	15.2
Russell 1000 Growth Index	-4.2	-10.6	-12.5	12.5	23.2	20.2	17.0	12.7	14.0
Russell 1000 Value Index	-1.2	2.6	-3.5	15.0	12.2	9.5	11.7	7.3	15.8
Russell Midcap Index	-0.7	-4.3	-8.0	7.1	14.3	12.0	12.8	9.4	15.4
Russell 2000 Index	1.1	-6.6	-8.7	-6.0	10.5	9.5	11.2	8.0	12.2
Russell 2000 Growth Index	0.4	-12.6	-13.0	-17.4	9.2	10.5	11.4	8.8	8.9
Russell 2000 Value Index	1.7	-0.4	-4.3	6.6	10.9	8.0	10.7	6.9	15.2
International Equity									
MSCI AC World Index	-2.6	-3.6	-7.3	8.3	14.0	12.0	10.4	7.0	-
MSCI AC World ex USA	-2.0	-1.6	-5.6	0.0	8.2	7.8	5.9	3.8	-
MSCI EAFE Index	-1.8	-1.7	-6.5	3.3	8.3	7.7	6.6	3.5	11.6
MSCI Emerging Markets Index	-3.0	-3.0	-4.8	-10.4	6.4	7.4	3.6	4.6	-
Fixed Income									
90 Day U.S. Treasury Bill	0.0	0.0	0.0	0.0	0.9	1.1	0.6	0.8	6.5
Blmbg. U.S. Aggregate	-1.1	-3.5	-3.2	-2.6	3.3	2.7	2.5	3.8	10.6
Blmbg. U.S. Gov't/Credit	-1.2	-3.9	-3.6	-2.6	3.8	3.0	2.7	3.9	10.4
Bloomberg U.S. Municipal Bond Index	-0.4	-2.9	-3.1	-0.7	3.2	3.2	3.2	3.9	9.8
Blmbg. U.S. Corp: High Yield Index	-1.0	-1.9	-3.7	0.6	5.3	4.9	5.9	6.6	-
Real Estate									
FTSE NAREIT All REITs Index	-3.9	-3.2	-11.3	20.6	10.1	8.5	10.1	5.9	10.8
NCREIF Property Index	-	-	-	-	-	-	-	-	-
Alternatives									
HFRI Fund of Funds Composite Index	-0.7	-3.2	-3.5	0.3	5.9	4.5	3.8	2.4	-
Inflation									
CPI - All Urban Consumers (SA)	-	-	-	-	-	-	-	-	3.2

Total Portfolio

February 28, 2022

	Market Value ($)	% of Portfolio	Month	Quarter	YTD	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	15 Years	Inception (%)	Inception Date
Total Portfolio	784,777,019	100.00	-0.84	-3.19	-5.16	8.32	11.72	9.87	7.60	6.66	8.94	Jan-92
Policy Index Blended New			*-1.82*	*-3.45*	*-5.54*	*3.94*	*9.79*	*8.30*	*7.39*	*5.97*	*7.49*	
60% MSCI ACWI/40% BC Agg			*-2.00*	*-3.56*	*-5.73*	*3.63*	*9.64*	*8.16*	*7.06*	*5.73*	*6.97*	
Credit	165,715,104	21.12	-0.40	-2.60	-2.59	10.89	8.02	-	-	-	8.37	Jan-19
Blmbg. U.S. Aggregate			*-1.12*	*-3.49*	*-3.25*	*-2.64*	*3.30*	*2.71*	*2.47*	*3.75*	*3.45*	
High Quality Credit	97,409,936	12.41	-0.62	-2.58	-2.34	3.44	5.76	-	-	-	6.20	Jan-19
Blmbg. U.S. Aggregate			*-1.12*	*-3.49*	*-3.25*	*-2.64*	*3.30*	*2.71*	*2.47*	*3.75*	*3.45*	
Boyd Watterson Fixed Income	35,618,026	4.54	-1.10	-3.42	-3.38	-2.42	3.76	3.25	2.85	4.32	5.98	Apr-90
Blmbg. U.S. Aggregate			*-1.12*	*-3.49*	*-3.25*	*-2.64*	*3.30*	*2.71*	*2.47*	*3.75*	*5.65*	
GoldenTree High Grade Floating Rate Fund, Ltd.[CE]	32,794,910	4.18	-0.65	-0.59	-0.61	0.65	2.36	-	-	-	2.21	Feb-18
Blmbg. U.S. Aggregate Float Adjusted			*-1.13*	*-3.58*	*-3.32*	*-2.62*	*3.38*	*2.75*	*2.50*	*-*	*3.00*	
EnTrust Structured Income II-A	28,997,000	3.69	0.00	-3.64	-2.90	13.82	12.80	-	-	-	8.95	Jul-17
Blmbg. U.S. Aggregate			*-1.12*	*-3.49*	*-3.25*	*-2.64*	*3.30*	*2.71*	*2.47*	*3.75*	*2.60*	
Multi-Credit	68,305,168	8.70	-0.09	-2.64	-2.96	25.17	11.66	-	-	-	11.88	Jan-19
Blmbg. U.S. Corp: High Yield Index			*-1.03*	*-1.93*	*-3.73*	*0.64*	*5.31*	*4.88*	*5.86*	*6.62*	*7.06*	
OCO Opportunities Offshore Fund, Ltd.	20,371,581	2.60	0.00	-8.26	-6.62	48.44	29.65	13.34	-	-	10.99	Feb-14
Blmbg. U.S. Corp: High Yield Index			*-1.03*	*-1.93*	*-3.73*	*0.64*	*5.31*	*4.88*	*5.86*	*6.62*	*5.03*	
Prytania Athena Fund	13,928,093	1.77	0.00	0.59	0.21	9.73	-1.23	4.07	-	-	3.54	Mar-14
Blmbg. Global High Yield Index			*-2.39*	*-3.11*	*-4.87*	*-3.91*	*3.03*	*3.53*	*5.02*	*6.13*	*3.64*	
EnTrust Structured Income Fund	10,964,137	1.40	0.00	-5.55	-4.72	28.35	13.56	11.05	-	-	8.00	Mar-13
Blmbg. U.S. Aggregate			*-1.12*	*-3.49*	*-3.25*	*-2.64*	*3.30*	*2.71*	*2.47*	*3.75*	*2.40*	
Beach Point TR Offshore Fund II[CE]	9,108,393	1.16	-0.66	-0.92	-1.25	5.64	6.90	5.25	5.90	-	6.23	Jan-12
Blmbg. U.S. Corp: High Yield Index			*-1.03*	*-1.93*	*-3.73*	*0.64*	*5.31*	*4.88*	*5.86*	*6.62*	*6.31*	
Greywolf Distressed Opp Fund, LP	13,932,964	1.78	0.00	5.75	0.00	15.47	-	-	-	-	12.12	Aug-20
Blmbg. U.S. Universal Index			*-1.36*	*-3.59*	*-3.53*	*-2.73*	*3.39*	*2.86*	*2.80*	*3.97*	*-2.61*	

Total Portfolio

	Market Value ($)	% of Portfolio	Month	Quarter	YTD	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	15 Years	Inception (%)	Inception Date
Equity	457,093,353	58.24	-1.35	-5.22	-7.83	7.30	15.96	-	-	-	19.05	Jan-19
MSCI AC World Index			-2.55	-3.58	-7.32	8.26	13.96	11.99	10.41	7.04	16.94	
Public Equity	420,698,998	53.61	-1.46	-5.63	-8.40	5.99	15.25	-	-	-	18.42	Jan-19
MSCI AC World Index			-2.55	-3.58	-7.32	8.26	13.96	11.99	10.41	7.04	16.94	
Neuberger Berman Large Cap Growth	138,531,819	17.65	-3.28	-13.14	-14.17	8.76	24.32	22.25	16.46	12.75	14.67	Feb-79
Russell 1000 Growth Index			-4.25	-10.61	-12.47	12.55	23.18	20.24	16.97	12.67	12.06	
iShares Russell 1000 Value ETF(IWD)	5,868,396	0.75	-1.20	2.54	-3.54	14.79	11.98	-	-	-	12.79	Feb-19
Russell 1000 Value Index			-1.16	2.63	-3.46	14.99	12.22	9.45	11.71	7.28	13.03	
Columbia Dividend Income	14,433,065	1.84	-2.49	-0.21	-6.11	16.41	-	-	-	-	13.26	May-19
Russell 1000 Value Index			-1.16	2.63	-3.46	14.99	12.22	9.45	11.71	7.28	11.34	
Eagle Equity	23,365,589	2.98	-4.21	-5.78	-9.10	9.57	-	-	-	-	16.21	Apr-19
Russell 1000 Value Index			-1.16	2.63	-3.46	14.99	12.22	9.45	11.71	7.28	12.31	
Robeco LCV	61,136,345	7.79	-0.77	6.01	-0.74	21.14	13.97	11.11	-	-	10.88	Oct-13
Russell 1000 Value Index			-1.16	2.63	-3.46	14.99	12.22	9.45	11.71	7.28	10.45	
Miller Opportunity Trust Class I(LMNOX)	7,214,595	0.92	-2.69	-10.57	-8.53	-23.63	-	-	-	-	13.72	Apr-19
Russell 1000 Value Index			-1.16	2.63	-3.46	14.99	12.22	9.45	11.71	7.28	12.31	
Fiera SMID Growth	49,958,412	6.37	1.44	-5.91	-8.24	1.75	20.22	17.74	-	-	13.00	Nov-14
Russell 2500 Growth Index			0.30	-12.51	-12.93	-13.74	12.63	13.22	12.80	10.04	11.44	
Neuberger Berman International	51,937,476	6.62	-3.13	-5.32	-10.10	2.14	9.99	8.48	7.57	4.72	6.96	Feb-05
MSCI EAFE Index			-1.76	-1.70	-6.50	3.30	8.29	7.67	6.65	3.52	5.54	
Vanguard Developed Mkts Ind(VTMNX)	13,146,128	1.68	-2.47	-1.82	-6.32	3.05	-	-	-	-	13.21	Mar-20
FTSE Developed x North America Index			-1.56	-1.73	-6.57	1.92	8.42	7.76	6.70	3.76	13.23	
GAMCO Gold	13,283,272	1.69	14.31	8.06	5.92	13.82	16.76	7.41	-2.60	-	-2.65	Feb-12
Philadelphia Gold and Silver Index			14.28	9.96	7.91	10.80	24.87	12.10	-2.46	-0.96	-2.69	
Sprott Asset Management	13,675,706	1.74	13.29	4.31	3.96	8.41	16.51	6.74	-3.62	-	-3.79	Feb-12
Philadelphia Gold and Silver Index			14.28	9.96	7.91	10.80	24.87	12.10	-2.46	-0.96	-2.69	
iShares MSCI Emerging Markets ETF(EEM)	11,889,958	1.52	-4.32	-2.84	-4.29	-11.30	5.48	6.44	-	-	6.69	Feb-17
MSCI Emerging Markets Index			-2.98	-2.97	-4.81	-10.40	6.40	7.37	3.61	4.57	7.89	
Glovista Emerging Markets	16,258,237	2.07	-4.91	-1.68	-3.46	-12.10	5.55	6.01	-	-	2.63	May-14
MSCI Emerging Markets Index			-2.98	-2.97	-4.81	-10.40	6.40	7.37	3.61	4.57	4.87	

Total Portfolio

	Market Value ($)	% of Portfolio	Month	Quarter	YTD	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	15 Years	Inception (%)	Inception Date
Private Equity	36,394,355	4.64	0.00	0.22	0.00	30.83	32.05	17.52	7.77	-	7.64	Jan-12
7.5% Annual Return			*0.60*	*1.82*	*1.21*	*7.50*	*7.50*	*7.50*	*7.50*	*7.50*	*7.50*	
Arsenal III, LP($15 mill)	26,694,283	3.40	0.00	0.00	0.00	32.43	52.73	-	-	-	50.99	Feb-19
Arsenal-Cart Investors II, LLC	2,000,000	0.25	0.00	0.00	0.00	-	-	-	-	-	0.00	Nov-21
Arsenal-Sayari Investors, LLC	2,000,000	0.25	0.00	0.00	0.00	-	-	-	-	-	0.00	Nov-21
Zephyr Peacock India Fund III Limited ($5 million)	3,186,942	0.41	0.00	3.83	0.00	14.28	3.23	3.88	-	-	1.40	Jun-12
Zephyr Peacock India Growth Fund US, LP	2,513,130	0.32	0.00	-1.94	0.00	44.81	7.07	-	-	-	1.71	Jul-18
Alternatives	146,828,476	18.71	0.21	2.33	0.24	7.78	4.90	-	-	-	4.81	Jan-19
HFRI Fund of Funds Composite Index			*-0.70*	*-3.17*	*-3.47*	*0.25*	*5.89*	*4.55*	*3.84*	*2.37*	*6.78*	
Real Estate	54,004,485	6.88	0.00	1.35	0.00	8.73	6.37	-	-	-	6.30	Jan-19
NCREIF Property Index			*0.00*	*6.15*	*0.00*	*17.70*	*8.37*	*7.75*	*9.32*	*7.21*	*7.91*	
Boyd Titanium GSA Fund ($10 million)	38,994,394	4.97	0.00	1.32	0.00	8.08	7.03	7.30	-	-	7.39	Oct-13
Boyd Watterson State Govt Fund, LP	11,514,390	1.47	0.00	1.76	0.00	9.72	9.41	-	-	-	8.47	Feb-18
Invesco Realty ($10 million)	137,776	0.02	0.00	0.00	0.00	0.54	-1.37	2.07	8.18	-	8.38	Dec-09
Invesco Mortgage Recovery Fund II, LP($10 million)	3,268,546	0.42	0.00	0.00	0.00	10.33	-16.50	-4.76	-	-	-1.69	Apr-15
Heitman Value Partners III, LP($7 million)	54,390	0.01	0.00	6.93	0.00	73.27	28.42	22.61	-	-	21.61	May-15
Lone Star ($10 million)	34,989	0.00	0.00	7.49	0.00	0.58	1.01	1.35	14.35	-	7.30	Jun-11
Commodities	6,776,053	0.86	0.00	0.00	0.00	4.50	-7.94	-	-	-	-7.54	Jan-19
Bloomberg Commodity Index Total Return			*6.23*	*19.63*	*15.56*	*34.43*	*12.89*	*6.63*	*-1.94*	*-1.88*	*14.43*	
Corrum Capital Real Assets, LP ($10 million)	6,776,053	0.86	0.00	0.00	0.00	4.50	-7.94	0.34	-	-	0.56	Jun-15
Differentiated Return Stream	86,047,938	10.96	0.35	3.16	0.41	7.35	4.17	-	-	-	3.95	Jan-19
CPI+2%			-	-	-	-	-	-	-	-	-	
Kelly Park Capital	18,538,441	2.36	0.00	0.25	0.00	-3.11	-	-	-	-	4.08	Jan-20
Verition International Multi-Strategy Fund, Ltd.[CE]	24,497,196	3.12	1.25	2.86	1.47	6.61	-	-	-	-	18.37	Jan-20
Corrum Capital Railcar Partners, LP	331,428	0.04	0.00	-1.08	0.00	-5.75	-67.69	-	-	-	-59.48	Jun-18
Entrust Blue Ocean Fund, LP	14,067,559	1.79	0.00	15.43	0.00	31.77	-	-	-	-	20.15	Apr-20
Longford Capital ($15 million)	7,545,950	0.96	0.00	0.00	0.00	13.92	16.86	14.43	-	-	0.09	Jul-13
Longford Capital Fund II, LP ($30 million)	15,842,326	2.02	0.00	0.00	0.00	3.38	9.09	2.25	-	-	1.26	Dec-16
Longford Capital Fund III, LP($30 million)	5,225,038	0.67	0.00	0.00	0.00	5.81	-	-	-	-	-9.64	Apr-20
Cash	15,140,086	1.93	0.00	0.00	0.00	0.01	0.60	-	-	-	0.68	Jan-19
Cash Account	15,140,086	1.93	0.00	0.00	0.00	0.01	0.60	0.85	0.51	-	0.50	Jan-12
90 Day U.S. Treasury Bill			*0.01*	*0.02*	*0.01*	*0.04*	*0.87*	*1.13*	*0.62*	*0.84*	*0.62*	

Total Portfolio

Approx. 12% of portfolio is unvalued as of 2/28. Additionally, there is 20% which is only valued quarterly.

Policy Index-Blended New = MSCI ACWI 55% / BBgBarc US Aggregate TR 25% / HFRI Fund of Funds Composite Index 20%.

Prior to 1/1/2019 the Policy Index Blended New consists of 15% Russell 1000 Growth, 15% Russell 1000 Value, 5% Russell MidCap, 13.6% MSCI EAFE, 7.5% MSCI Emerging Markets, 21.3% BC US Aggregate, 7.6% BofA HY BB-B Rated Constrained Index, 10% HFRX Global Hedge Fund Index, 5% Private Equity Actual.

Total Portfolio

December 31, 2021

	Market Value ($)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	15 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Total Portfolio	834,360,066	100.00	4.84	16.43	16.32	11.94	8.91	7.17	7.71	9.18	Jan-92
Policy Index Blended New			*3.79*	*11.07*	*14.41*	*10.37*	*8.75*	*6.46*	*7.09*	*7.74*	
Over/Under			1.05	5.36	1.91	1.57	0.16	0.71	0.62	1.44	
60% MSCI ACWI/40% BC Agg			*4.02*	*10.20*	*14.31*	*10.24*	*8.42*	*6.21*	*6.83*	*7.22*	
Over/Under			0.82	6.23	2.01	1.70	0.49	0.96	0.88	1.96	
Credit	173,740,206	20.82	1.68	16.74	9.82	-	-	-	-	9.82	Jan-19
Blmbg. U.S. Aggregate			*0.01*	*-1.55*	*4.79*	-	-	-	-	*4.79*	
Over/Under			1.67	18.29	5.03	-	-	-	-	5.03	
High Quality Credit	101,340,186	12.15	0.18	6.39	7.40	-	-	-	-	7.40	Jan-19
Blmbg. U.S. Aggregate			*0.01*	*-1.55*	*4.79*	-	-	-	-	*4.79*	
Over/Under			0.17	7.94	2.61	-	-	-	-	2.61	
Boyd Watterson Fixed Income	36,865,214	4.42	-0.01	-1.54	5.56	4.14	3.34	4.67	4.86	6.13	Apr-90
Blmbg. U.S. Aggregate			*0.01*	*-1.55*	*4.79*	*3.57*	*2.90*	*4.09*	*4.33*	*5.79*	
Over/Under			-0.02	0.01	0.77	0.57	0.44	0.58	0.53	0.34	
GoldenTree High Grade Floating Rate Fund, Ltd.	32,996,849	3.95	0.33	2.16	3.16	-	-	-	-	2.46	Feb-18
Blmbg. U.S. Aggregate Float Adjusted			*0.05*	*-1.58*	*4.91*	-	-	-	-	*4.02*	
Over/Under			0.28	3.74	-1.75	-	-	-	-	-1.56	
EnTrust Structured Income II-A	31,478,123	3.77	0.26	21.54	15.12	-	-	-	-	10.02	Jul-17
Blmbg. U.S. Aggregate			*0.01*	*-1.55*	*4.79*	-	-	-	-	*3.45*	
Over/Under			0.25	23.09	10.33	-	-	-	-	6.57	
Multi-Credit	72,400,020	8.68	4.06	38.03	13.72	-	-	-	-	13.72	Jan-19
Blmbg. U.S. Corp: High Yield Index			*0.71*	*5.28*	*8.83*	-	-	-	-	*8.83*	
Over/Under			3.35	32.75	4.89	-	-	-	-	4.89	
OCO Opportunities Offshore Fund, Ltd.	23,316,902	2.79	9.18	82.04	34.84	16.02	-	-	-	12.20	Feb-14
Blmbg. U.S. Corp: High Yield Index			*0.71*	*5.28*	*8.83*	*6.30*	-	-	-	*5.64*	
Over/Under			8.47	76.76	26.01	9.72	-	-	-	6.56	
Prytania Athena Fund	13,991,242	1.68	0.34	17.46	-0.75	5.74	-	-	-	3.59	Mar-14
Blmbg. Global High Yield Index			*-0.71*	*0.99*	*6.76*	*5.21*	-	-	-	*4.38*	
Over/Under			1.05	16.47	-7.51	0.53	-	-	-	-0.79	
EnTrust Structured Income Fund	11,934,769	1.43	-1.14	38.17	15.64	11.79	-	-	-	8.75	Mar-13
Blmbg. U.S. Aggregate			*0.01*	*-1.55*	*4.79*	*3.57*	-	-	-	*2.83*	
Over/Under			-1.15	39.72	10.85	8.22	-	-	-	5.92	
Beach Point TR Offshore Fund II	9,224,143	1.11	0.75	10.83	8.79	5.87	6.47	-	-	6.47	Jan-12
Blmbg. U.S. Corp: High Yield Index			*0.71*	*5.28*	*8.83*	*6.30*	*6.83*	-	-	*6.82*	
Over/Under			0.04	5.55	-0.04	-0.43	-0.36	-	-	-0.35	
Greywolf Distressed Opp Fund, LP	13,932,964	1.67	5.75	15.47	-	-	-	-	-	13.64	Aug-20
Blmbg. U.S. Universal Index			*-0.03*	*-1.10*	-	-	-	-	-	*-0.41*	
Over/Under			5.78	16.57	-	-	-	-	-	14.05	

Total Portfolio

	Market Value ($)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	15 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Equity	495,418,136	59.38	6.77	18.81	23.52	-	-	-	-	23.52	Jan-19
MSCI AC World Index			*6.77*	*19.04*	*20.97*	-	-	-	-	*20.95*	
Over/Under			0.00	-0.23	2.55	-	-	-	-	2.57	
Public Equity	461,640,017	55.33	7.25	18.21	23.08	-	-	-	-	23.08	Jan-19
MSCI AC World Index			*6.77*	*19.04*	*20.97*	-	-	-	-	*20.95*	
Over/Under			0.48	-0.83	2.11	-	-	-	-	2.13	
Neuberger Berman Large Cap Growth	161,396,848	19.34	10.87	29.69	36.28	28.29	19.56	13.85	12.40	15.14	Feb-79
Russell 1000 Growth Index			*11.64*	*27.60*	*34.08*	*25.32*	*19.79*	*13.72*	*10.86*	*12.45*	
Over/Under			-0.77	2.09	2.20	2.97	-0.23	0.13	1.54	2.69	
iShares Russell 1000 Value ETF(IWD)	6,083,960	0.73	7.77	24.88	-	-	-	-	-	14.98	Feb-19
Russell 1000 Value Index			*7.77*	*25.16*	-	-	-	-	-	*15.18*	
Over/Under			0.00	-0.28	-	-	-	-	-	-0.20	
Columbia Dividend Income	15,372,755	1.84	10.68	26.56	-	-	-	-	-	16.88	May-19
Russell 1000 Value Index			*7.77*	*25.16*	-	-	-	-	-	*13.55*	
Over/Under			2.91	1.40	-	-	-	-	-	3.33	
Eagle Equity	25,704,284	3.08	3.35	28.09	-	-	-	-	-	21.41	Apr-19
Russell 1000 Value Index			*7.77*	*25.16*	-	-	-	-	-	*14.53*	
Over/Under			-4.42	2.93	-	-	-	-	-	6.88	
Robeco LCV	61,592,450	7.38	9.43	30.38	17.99	12.28	-	-	-	11.21	Oct-13
Russell 1000 Value Index			*7.77*	*25.16*	*17.64*	*11.16*	-	-	-	*11.13*	
Over/Under			1.66	5.22	0.35	1.12	-	-	-	0.08	
Miller Opportunity Trust Class I(LMNOX)	7,887,732	0.95	-7.13	-3.01	-	-	-	-	-	18.39	Apr-19
Russell 1000 Value Index			*7.77*	*25.16*	-	-	-	-	-	*14.53*	
Over/Under			-14.90	-28.17	-	-	-	-	-	3.86	
Fiera SMID Growth	56,802,979	6.81	6.50	17.89	31.01	21.27	-	-	-	14.68	Nov-14
Russell 2500 Growth Index			*0.20*	*5.04*	*25.09*	*17.65*	-	-	-	*13.89*	
Over/Under			6.30	12.85	5.92	3.62	-	-	-	0.79	
Neuberger Berman International	57,775,608	6.92	4.21	13.11	18.31	11.86	9.84	5.48	-	7.71	Feb-05
MSCI EAFE Index			*2.74*	*11.78*	*14.08*	*10.07*	*8.53*	*4.09*	-	*6.01*	
Over/Under			1.47	1.33	4.23	1.79	1.31	1.39	-	1.70	
Vanguard Developed Mkts Ind(VTMNX)	14,032,767	1.68	3.00	11.45	-	-	-	-	-	18.65	Mar-20
FTSE Developed x North America Index			*2.29*	*10.40*	-	-	-	-	-	*18.77*	
Over/Under			0.71	1.05	-	-	-	-	-	-0.12	
GAMCO Gold	12,541,016	1.50	10.75	-9.39	16.47	8.16	-	-	-	-3.26	Feb-12
Philadelphia Gold and Silver Index			*11.56*	*-6.79*	*24.67*	*11.97*	-	-	-	*-3.48*	
Over/Under			-0.81	-2.60	-8.20	-3.81	-	-	-	0.22	
Sprott Asset Management	13,154,645	1.58	11.93	-10.68	18.71	8.04	-	-	-	-4.23	Feb-12
Philadelphia Gold and Silver Index			*11.56*	*-6.79*	*24.67*	*11.97*	-	-	-	*-3.48*	
Over/Under			0.37	-3.89	-5.96	-3.93	-	-	-	-0.75	
iShares MSCI Emerging Markets ETF(EEM)	12,422,791	1.49	-1.59	-3.64	10.03	-	-	-	-	7.88	Feb-17
MSCI Emerging Markets Index			*-1.24*	*-2.22*	*11.33*	-	-	-	-	*9.25*	
Over/Under			-0.35	-1.42	-1.30	-	-	-	-	-1.37	

Total Portfolio

	Market Value ($)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	15 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Glovista Emerging Markets	16,872,182	2.02	-0.96	-4.48	10.05	8.35	-	-	-	3.16	May-14
MSCI Emerging Markets Index			*-1.24*	*-2.22*	*11.33*	*10.26*	-	-	-	*5.65*	
Over/Under			0.28	-2.26	-1.28	-1.91	-	-	-	-2.49	
Private Equity	**33,778,119**	**4.05**	**0.22**	**30.83**	**32.05**	**17.58**	**7.77**	-	-	**7.77**	**Jan-12**
7.5% Annual Return			*1.82*	*7.50*	*7.50*	*7.50*	*7.50*	-	-	*7.50*	
Over/Under			-1.60	23.33	24.55	10.08	0.27	-	-	0.27	
Arsenal III, LP($15 mill)	23,985,555	2.87	0.00	32.43	-	-	-	-	-	54.59	Feb-19
Arsenal-Cart Investors II, LLC	2,000,000	0.24	-	-	-	-	-	-	-	-	Oct-21
Arsenal-Sayari Investors, LLC	2,000,000	0.24	-	-	-	-	-	-	-	-	Oct-21
Zephyr Peacock India Fund III Limited ($5 million)	3,279,434	0.39	3.83	14.28	3.23	3.88	-	-	-	1.42	Jun-12
Zephyr Peacock India Growth Fund US, LP	2,513,130	0.30	-1.94	44.81	7.07	-	-	-	-	1.79	Jul-18
Alternatives	**146,622,371**	**17.57**	**2.21**	**8.40**	**4.99**	-	-	-	-	**4.99**	**Jan-19**
HFRI Fund of Funds Composite Index			*0.34*	*6.08*	*8.43*	-	-	-	-	*8.43*	
Over/Under			1.87	2.32	-3.44	-	-	-	-	-3.44	
Real Estate	**54,671,575**	**6.55**	**1.35**	**8.73**	**6.66**	-	-	-	-	**6.66**	**Jan-19**
NCREIF Property Index			*6.15*	*17.70*	*8.37*	-	-	-	-	*8.37*	
Over/Under			-4.80	-8.97	-1.71	-	-	-	-	-1.71	
Boyd Titanium GSA Fund ($10 million)	39,521,064	4.74	1.32	8.08	7.40	7.62	-	-	-	7.55	Oct-13
Boyd Watterson State Govt Fund, LP	11,654,800	1.40	1.76	9.72	9.79	-	-	-	-	8.85	Feb-18
Invesco Realty ($10 million)	137,776	0.02	0.00	0.54	-1.37	2.07	8.18	-	-	8.50	Dec-09
Invesco Mortgage Recovery Fund II, LP($10 million)	3,268,546	0.39	0.00	10.33	-16.50	-4.76	-	-	-	-1.73	Apr-15
Heitman Value Partners III, LP($7 million)	54,400	0.01	6.93	73.27	28.42	22.61	-	-	-	22.20	May-15
Lone Star ($10 million)	34,989	0.00	7.49	0.58	1.01	1.35	14.35	-	-	7.42	Jun-11
Commodities	**6,776,053**	**0.81**	**0.00**	**4.50**	**-7.94**	-	-	-	-	**-7.94**	**Jan-19**
Bloomberg Commodity Index Total Return			*-1.56*	*27.11*	*9.86*	-	-	-	-	*9.86*	
Over/Under			1.56	-22.61	-17.80	-	-	-	-	-17.80	
Corrum Capital Real Assets, LP ($10 million)	6,776,053	0.81	0.00	4.50	-7.94	0.34	-	-	-	0.58	Jun-15
Differentiated Return Stream	**85,174,743**	**10.21**	**2.95**	**8.53**	**4.03**	-	-	-	-	**4.03**	**Jan-19**
CPI+2%			*2.14*	*9.18*	*5.60*	-	-	-	-	*5.60*	
Over/Under			0.81	-0.65	-1.57	-	-	-	-	-1.57	
Kelly Park Capital	18,538,441	2.22	-0.12	-1.58	-	-	-	-	-	4.43	Jan-20
Verition International Multi-Strategy Fund, Ltd.	24,141,654	2.89	2.42	8.61	-	-	-	-	-	19.17	Jan-20
Corrum Capital Railcar Partners, LP	331,428	0.04	-1.08	-5.75	-67.69	-	-	-	-	-61.14	Jun-18
Entrust Blue Ocean Fund, LP	14,449,906	1.73	15.43	31.77	-	-	-	-	-	22.27	Apr-20
Longford Capital ($15 million)	7,545,950	0.90	0.00	13.92	16.86	14.43	-	-	-	0.10	Jul-13
Longford Capital Fund II, LP ($30 million)	15,842,326	1.90	0.00	3.38	9.09	2.25	-	-	-	1.30	Dec-16
Longford Capital Fund III, LP($30 million)	4,325,038	0.52	0.00	5.81	-	-	-	-	-	-10.51	Apr-20
Cash	**18,579,353**	**2.23**	**0.00**	**0.01**	**0.72**	-	-	-	-	**0.72**	**Jan-19**
Cash Account	18,579,353	2.23	0.00	0.01	0.72	0.86	0.51	-	-	0.51	Jan-12
90 Day U.S. Treasury Bill			*0.01*	*0.05*	*0.99*	*1.14*	*0.61*	-	-	*0.63*	
Over/Under			-0.01	-0.04	-0.27	-0.28	-0.10	-	-	-0.12	

Approx. 7% of portfolio is unvalued as of 12/31.

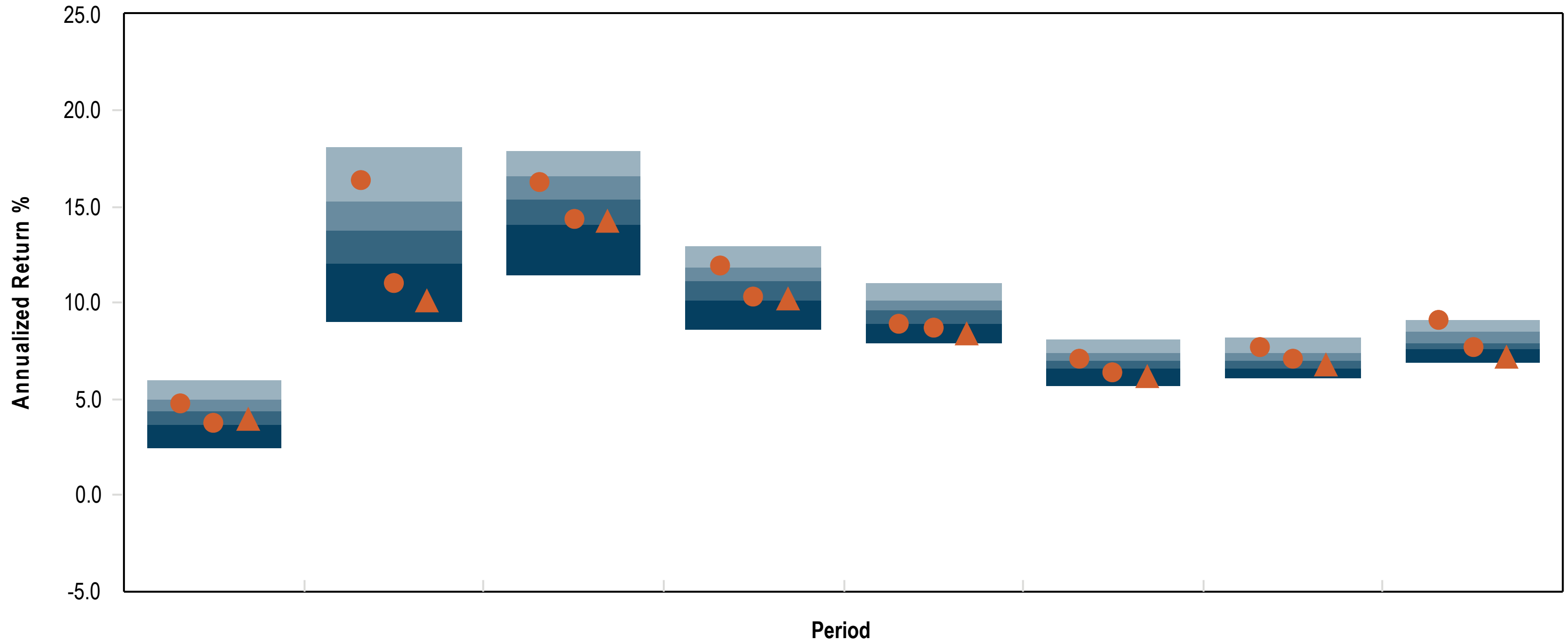
Policy Index-Blended New = MSCI ACWI 55% / BBgBarc US Aggregate TR 25% / HFRI Fund of Funds Composite Index 20%

Prior to 1/1/2019 the Policy Index Blended New consists of 15% Russell 1000 Growth, 15% Russell 1000 Value, 5% Russell MidCap, 13.6% MSCI EAFE, 7.5% MSCI Emerging Markets, 21.3% BC US Aggregate, 7.6% BofA HY BB-B Rated Constrained Index, 10% HFRX Global Hedge Fund Index, 5% Private Equity Actual.

City of Bristol Unpriced Assets as of 12/31/2021

Account Name	% of Total
Arsenal III, LP($15 mill)	2.87%
Arsenal-Cart Investors II, LLC	0.24%
Arsenal-Sayari Investors, LLC	0.24%
Invesco Realty ($10 million)	0.02%
Invesco Mortgage Recovery Fund II, LP($10 million)	0.39%
Longford Capital ($15 million)	0.90%
Longford Capital Fund II, LP ($30 million)	1.90%
Longford Capital Fund III, LP($30 million)	0.52%
TOTAL	**7.08%**

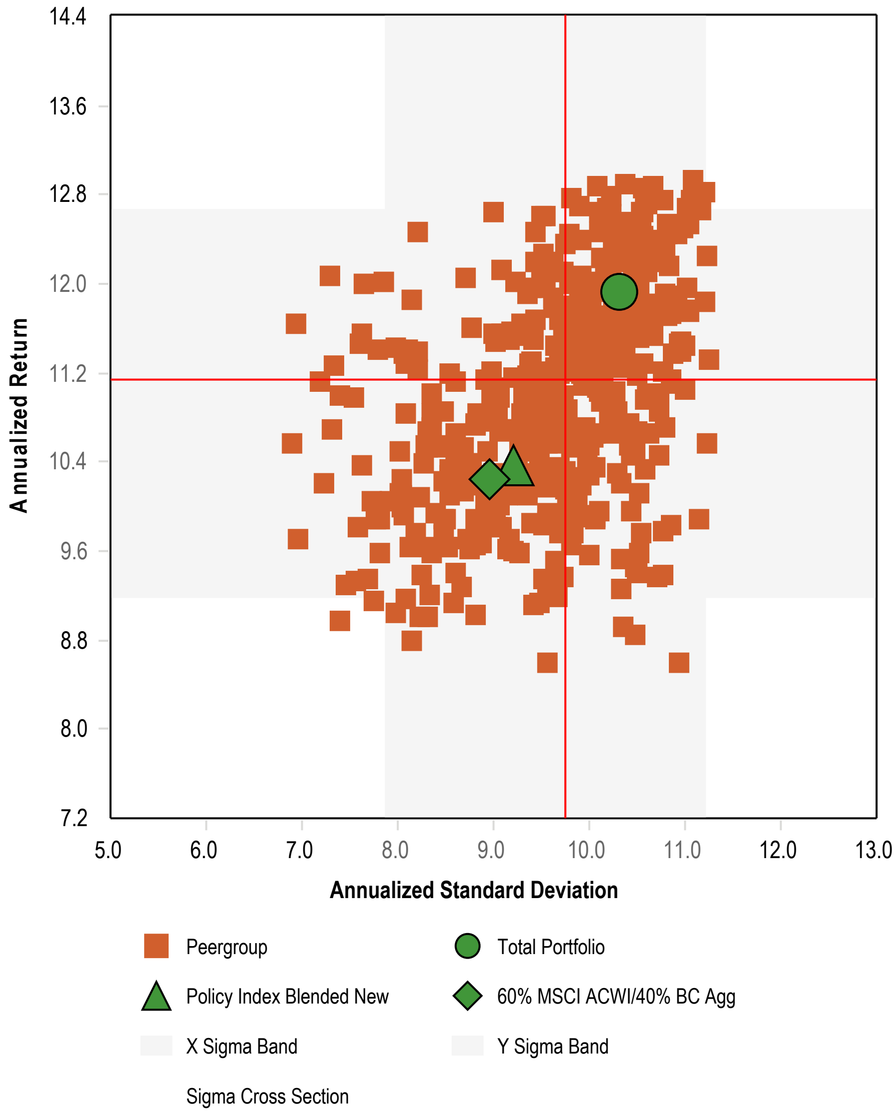
Total Portfolio vs. All Public Plans-Total Fund



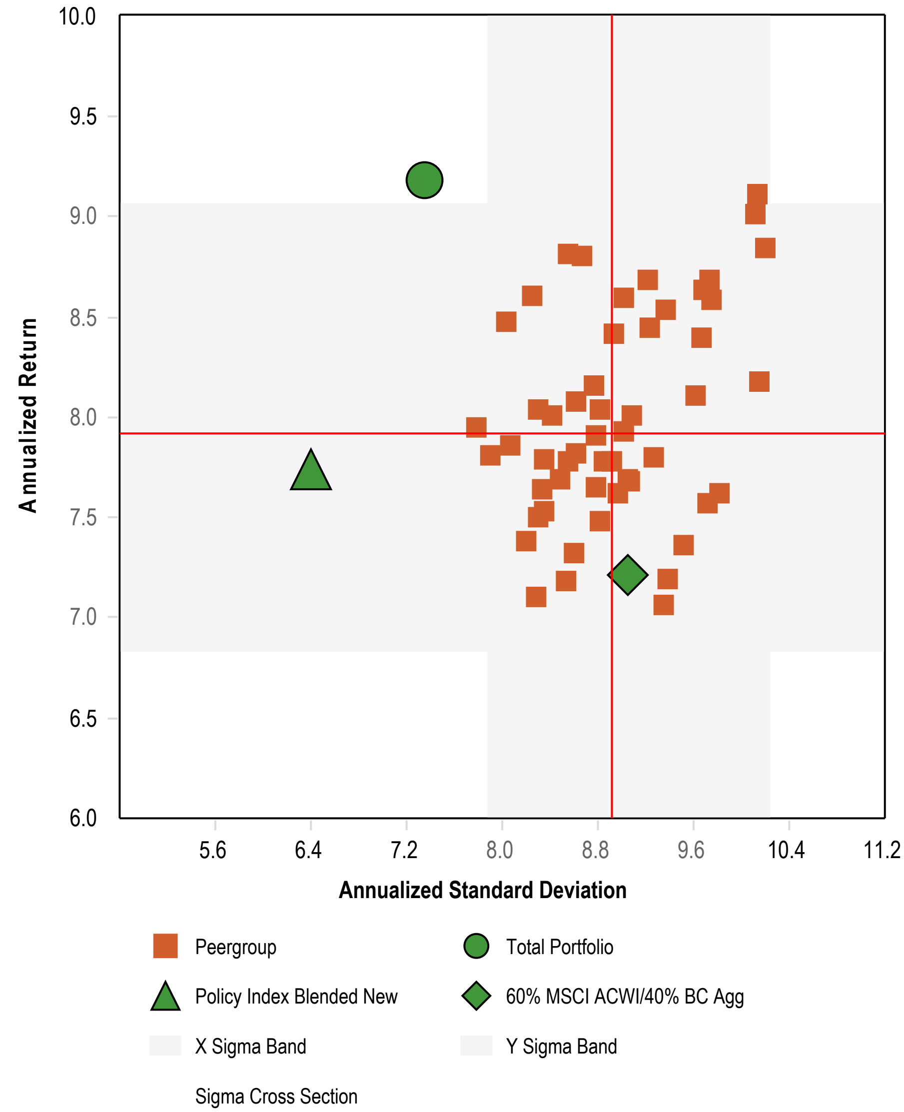
	Quarter	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years	Since Inception
Total Portfolio	4.8 (33)	16.4 (15)	16.3 (31)	11.9 (23)	8.9 (76)	7.2 (40)	7.7 (14)	9.2 (4)
Policy Index Blended New	*3.8 (72)*	*11.1 (88)*	*14.4 (71)*	*10.4 (70)*	*8.7 (80)*	*6.5 (78)*	*7.1 (45)*	*7.7 (65)*
60% MSCI ACWI/40% BC Agg	*4.0 (64)*	*10.2 (92)*	*14.3 (72)*	*10.2 (74)*	*8.4 (89)*	*6.2 (88)*	*6.8 (65)*	*7.2 (87)*
5th Percentile	6.0	18.1	18.0	12.9	11.1	8.1	8.2	9.1
1st Quartile	5.0	15.3	16.6	11.9	10.2	7.4	7.4	8.6
Median	4.4	13.8	15.4	11.1	9.6	7.0	7.0	7.9
3rd Quartile	3.7	12.0	14.1	10.2	8.9	6.6	6.6	7.6
95th Percentile	2.5	9.0	11.4	8.6	7.9	5.7	6.1	6.9
Population	626	621	605	579	478	328	229	64

Parentheses contain percentile rankings.
Calculation based on quarterly periodicity.

Annualized Return vs. Annualized Standard Deviation
5 Years Ending December 31, 2021



Annualized Return vs. Annualized Standard Deviation
Since Inception Ending December 31, 2021



INVOICE

Date: 1/10/2022
Invoice #: 7

City of Bristol
111 North Main Street
Bristol, CT 06010

For the period 1-1-22 through 3-31-22
Client Annual Fee: $400,000

PERIOD	*DESCRIPTION*		*AMOUNT*
For the period 1-1-22 through 3-31-22	**Quarterly Consulting Fee to be charged**		**$100,000.00**
Rebate from 4Q Invoice and reconciltion to paid paid back			**($37,188.10)**
	Net Amount		**$62,811.90**

We will debit the accounts accordingly
Mail To: Beirne Wealth Consulting Services, LLC, Attn: Richard DeFrancesco 3 Enterprise Drive, Suite 410 Shelton, CT 06484

On a timely basis, please inform your Advisor, in writing, of any material changes in your financial situation and/or investment objectives, which might affect the investment of your assets.

INVOICE

Date: 1/10/2022
Invoice #: 7

City of Bristol
111 North Main Street
Bristol, CT 06010

For the period 1-1-22 through 3-31-22
Client Annual Fee: $400,000

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On a timely basis, please inform your Advisor, in writing, of any material changes in your financial situation and/or investment objectives, which might affect the investment of your assets.

INVOICE

Date: 1/5/2022
Invoice #: 6R

City of Bristol OPEB Plan
111 North Main Street
Bristol, CT 06010

For the periods 2013-2021

PERIOD		*BILLED AMOUNT*	*RECONCILIATED AMOUNT*	*REVISED*
For the periods 2013-2021	**Annual Consulting Fee**			
Year	**Account Description**			
2013		$ 5,589.78	$ 5,764.46	$174.68
2014		$ 5,943.18	$ 5,796.94	($146.24)
2015		$ 9,250.21	$ 9,094.77	($155.44)
2016		$ 14,391.76	$ 14,248.97	($142.79)
2017		$ 17,538.09	$ 17,728.73	$190.64
2018		$ 20,651.06	$ 21,313.93	$662.87
2019		$ 23,646.36	$ 24,869.08	$1,222.72
2020		$ 25,925.62	$ 27,893.32	$1,967.70
2021		$ 33,003.57	$ 36,005.58	$3,002.01
2022 (awaiting CPI Calculation)		$ 8,923.65		
				$6,776.16

We will debit the accounts accordingly
Mail To: Beirne Wealth Consulting Services, LLC, Attn: Richard DeFrancesco 3 Enterprise Drive, Suite 410 Shelton, CT 06484

On a timely basis, please inform your Advisor, in writing, of any material changes in your financial situation and/or investment objectives, which might affect the investment of your assets.

INVOICE

Date: 1/10/2022
Invoice #: 7

City of Bristol OPEB Plan
111 North Main Street
Bristol, CT 06010

For the period 1-1-22 through 3-31-22
Based on Portfolio Value as of 12/31/2021

PERIOD	*DESCRIPTION*	*BILLABLE VALUE*	*ADVISOR FEE (%)*	*ADVISOR FEE ($)*	*CLIENT FEE (%)*	*CLIENT FEE ($)*
For the period 1-1-22 through 3-31-22	**Quarterly Consulting Fee**					
Account#	**Account Description**					
XXX560952	BWC Managed Account	$13,211,273	0.1717%	$5,593.25	0.17%	$5,593.25
XXX208365	Boyd Watterson Fixed Income	$2,043,709	0.1717%	$841.66	0.51%	$2,578.60
BRISTOL OPEB-BOYD STATE	Boyd State Government Fund	$326,153	0.1717%	$138.08	0.17%	$138.08
OPEB-BOYD GSA	Boyd GSA Fund	$511,025	0.1717%	$216.35	0.17%	$216.35
OPEB-CORRUM	Corrum Capital Global Credit Fund	$304,206	0.1717%	$128.79	0.17%	$128.79
OPEB-ENTRUST 2A	EnTrust Structured Income Fund II-A	$634,383	0.1717%	$268.58	0.17%	$268.58
	TOTAL	**$17,030,748**		**$7,186.71**		**$8,923.65**

We will debit the accounts accordingly
Mail To: Beirne Wealth Consulting Services, LLC, Attn: Richard DeFrancesco 3 Enterprise Drive, Suite 410 Shelton, CT 06484

On a timely basis, please inform your Advisor, in writing, of any material changes in your financial situation and/or investment objectives, which might affect the investment of your assets.

March 8, 2022

Proposal for City of Bristol Employee Pension Plan

<u>Equity > Public Equity $59,000,000 (7.5%) decrease (dependent on market conditions)</u>

<u>Alternatives > Real Estate $24,000,000 (3.1%) increase</u>

- ❖ $24,000,000 investment to Boyd Watterson Diversified Government REIT

<u>Equity > Private Equity $35,000,000 (4.4%) increase</u>

- ❖ $35,000,000 investment to Arsenal Growth Equity Fund IV

John-Oliver Beirne

City of Bristol Employee Pension Board

ARSENAL GROWTH EQUITY

City of Bristol Employee Pension Plan – Fund III Update & Fund IV Strategy

Arsenal Team

20+ YEARS INVESTING TOGETHER IN 70+ COMPANIES

PARTNERS

JASON ROTTENBERG

HARVARD BUSINESS SCHOOL

JOHN TRBOVICH

HARVARD BUSINESS SCHOOL

ORLANDO MENDOZA

Yale SCHOOL OF MANAGEMENT

INVESTMENTS

OPERATIONS

JENNIFER DUNHAM

AMY BROOKS

JEFF GOLDSTEIN

GUY SCOTT

MARIA THOMPSON

ADVISORS

MAJOR GENERAL ELDER GRANGER

ADAM GOOBIC

STEVE MILLER

JOHN NOLAN

ASHLEY LYONS

We invest in software.

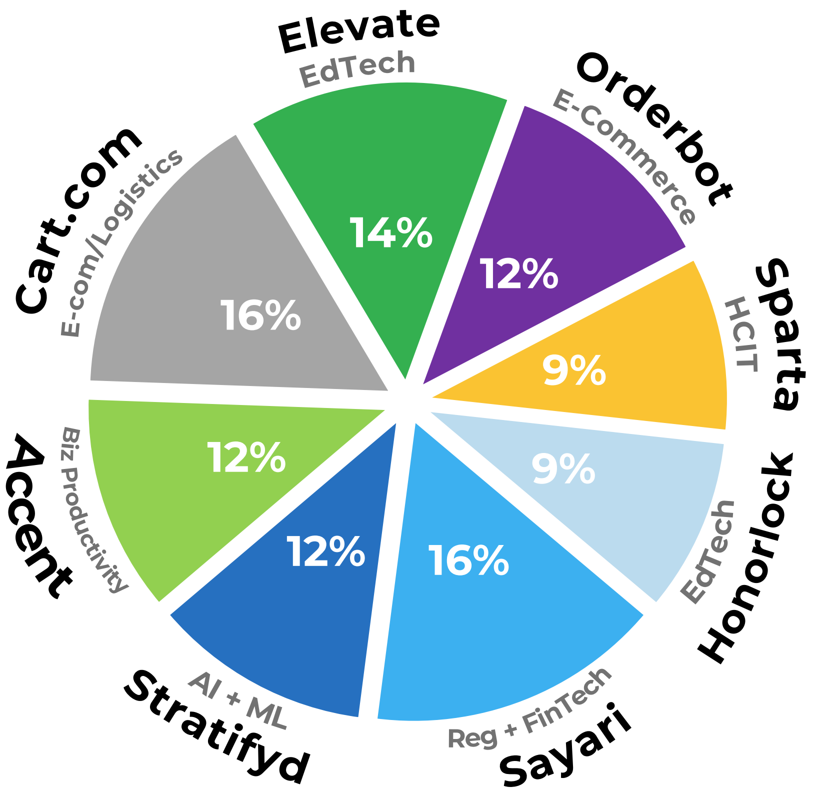
Targeting capital-efficient, execution-stage businesses where we can leverage our operational and strategic network to scale.

MID-MARKET ACCELERATING COMPANIES

- High gross margins **70%+**
- Healthy growth rates **20-50%+**
- Targeting ARR of **$5-20M**
- Limited capital intensity
- Minimal institutional capital raised
- Reasonable entry valuations

- **NO** Startups
- **NO** Public/Large PE Companies

DIVERSIFIED BY INDUSTRY AND ALLOCATION*



*Fund III.

Sourcing

OVER 8,000 DEALS REVIEWED FOR FUND III

	Sourced Through:	Lead:	Board Role:
accent	Arsenal Operating Network Attorney	Lead	Board Seat
stratifyd™	Arsenal Operating Network Venture Banker	Follow	Observer
SAYARI	Arsenal Operating Network Late-Stage PE Firm	Lead	Board Seat + Observer
Honorlock	Arsenal Operating Network Portfolio Company CEO	Follow	Observer
SPARTA SCIENCE	Arsenal Operating Network Attorney	Follow	Observer
orderbot	Arsenal Operating Network Corp. Dev Software Exec	Lead	2 Board Seats + Observer
ELEVATE K-12	Arsenal Operating Network Limited Partner	Lead	Board Seat + Observer
cart.com	Thematic Investment Approach Direct Outreach	Lead	Board Seat

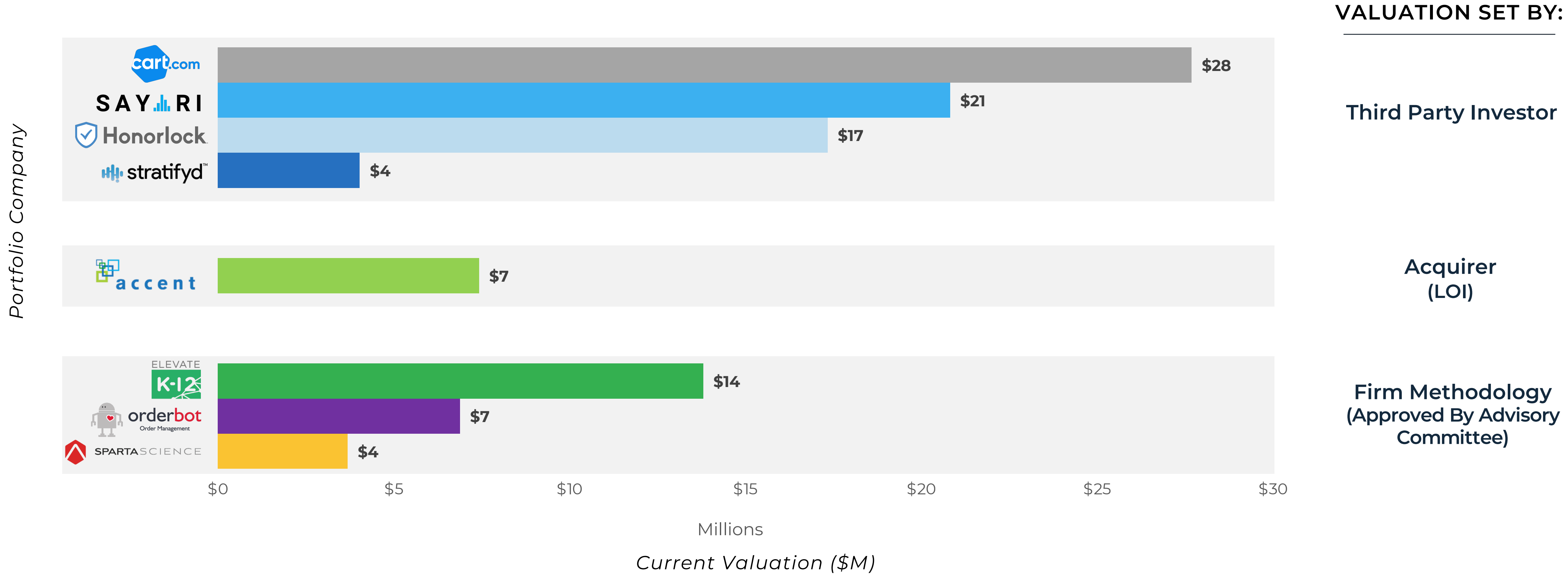
Arsenal Growth Performance AS OF 12/31/21

FUND III

TVPI	NET IRR	GROSS IRR	CAPITAL CALLED	CURRENT VALUE
3.03x	75%	92%	$31.7m	$96.1m

BRISTOL

CAPITAL INVESTED TO DATE*	CURRENT VALUE
$10.5m	$27.6m



*As of 12/31/21.

Co-Investments

AS OF 12/31/21

	DATE OF INVESTMENT	SECURITY	CAPITAL INVESTED TO DATE*	GROSS VALUE*	VALUATION METHODOLOGY	REVENUE GROWTH TO DATE**
cart.com Arsenal Cart Investors II, LLC.	8/3/21	Series B Preferred Stock	$2.0m	$4.0m	Series B-1 Preferred Stock Pricing	204%

	DATE OF INVESTMENT	SECURITY	CAPITAL INVESTED TO DATE*	GROSS VALUE*	VALUATION METHODOLOGY	REVENUE GROWTH TO DATE***
SAYARI Arsenal Sayari Investors I, LLC.	8/31/21	Series C Preferred Stock	$2.0m	$2.0m	Last Round Pricing	247%

Simple SPV Structures

- Single Capital Commitment
- 0% Ongoing Management Fee
- 20% Carried Interest
- Efficient Expense Structure - Floated by Manager

- Ongoing Expenses Accrue Over Time
- All Expenses Paid by Manager
  - Legal
  - Accounting
  - Audit
  - Insurance
  - Tax
  - Filing Fees
  - Compliance
  - Regulatory
- Quarterly/Annual Expenses Charged
- Expenses Reimbursed at Liquidity

*As of 12/31/21.
**Cart Initial Investment = 3/31/21
***Sayari Initial Investment = 12/20/19

Arsenal Growth III CASE STUDIES

COMPLIANCE & REGULATION

SAYARI

INVESTMENT:	$6.5M
CURRENT VALUATION:	$20.8M
CURRENT MOIC:	3.2x
REVENUE GROWTH '19-'20:	89%
REVENUE GROWTH '20-'21:	83%
REVENUE GROWTH '21-'22E:	83%

Sayari has continued stellar growth after a standout performance in FY '20 with a 74% growth in YoY ARR and 61% YoY growth of new logos (121 new clients). An additional round of offensive capital closed August 2021. Sayari is currently on pace for 80%+ growth in ARR for the third year in a row.

EDTECH

ELEVATE K-12

INVESTMENT:	$4.3M
CURRENT VALUATION:	$13.8M
CURRENT MOIC:	3.2x
REVENUE GROWTH '19-'20:	34%
REVENUE GROWTH '20-'21:	108%
REVENUE GROWTH '21-'22E:	166%

Elevate K-12 is aiming to solve the teacher shortage crisis by bringing high-quality, live instruction into K-12 classrooms across the nation. The company saw a 208% YoY increase in booked sales in 2021 and a 3x increase in live class delivery over the same time period with demand continuing to soar.

CUSTOMER TRACTION

facebook, Honeywell, Cerberus, Thomson Reuters, Raymond James, John Hancock, Deloitte.

- Live in 26 States
- 180 School Districts
- 293 Schools
- 42,495 Students

KIPP, Dougherty County School System, uplifteducation, Marlboro County School District, Douglas County School District, caddo parish public schools, Democracy Prep Public Schools, Gestalt Community Schools

Data as of 12/31/21.

Arsenal Growth IV

CONSISTENTCY

FUND IV CONSISTENT WITH FUND III

- Investment Strategy
- Market Sectors Focus
- Investment Team
- Investment Pace
- Fund Investors

LEVERAGE PROVEN SUCCESS OF ARSENAL GROWTH III

Arsenal Growth IV STRATEGY

- 12-15 Portfolio Companies
- Reserving Capital for Follow-Ons & Secondaries
- Company Board Presence (Seat or Observer)
- Meaningful Ownership Position
- 5-7 Year Target Hold Period
- Target Exits: Strategic Buyers & Financial Sponsors
- Targeting Q1 Launch
- First Capital Call Anticipated Q3 22

SECTORS OF FOCUS

- CYBERSECURITY
- EDTECH
- LOGISTICS
- AI & MACHINE LEARNING
- COMMERCE
- MOBILITY
- COMPLIANCE & REGULATION
- FINTECH & PAYMENTS
- BUSINESS PRODUCTIVITY
- HR TECH
- DIGITAL HEALTH
- CLOUD SOFTWARE & INFRASTRUCTURE

Arsenal Growth IV STRUCTURE

- $100M Target Fund Size
- Ten-Year Fund Life
- Four-Year Investment Period
- $2M GP Commitment
- Industry Standard Fee Structure
  - 2% Management Fee
    - Reduced By 10% Per Year Post-investment Period
  - 20% Carried Interest
    - Entire LP Contributed Capital Returned Before GP Participates
    - Beirne Wealth Negotiated a Preferred Return of 7%

SEEKING $20M BRISTOL COMMITMENT

CITY OF BRISTOL
RETIREMENT SYSTEM

Actuarial Valuation as of July 1, 2021
To Determine Funding for Fiscal Year 2022-23

Prepared by

Rebecca A. Sielman, FSA
Consulting Actuary

Michelle L. Boyles, FSA
Consulting Actuary

February 28, 2022

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Certification

We have performed an actuarial valuation of the Plan as of July 1, 2021 to determine funding for fiscal year 2022-23. This report presents the results of our valuation.

The ultimate cost of a pension plan is the total amount needed to provide benefits for plan members and beneficiaries and to pay the expenses of administering the plan. Pension costs are met by contributions and by investment return on plan assets. The principal purpose of this report is to set forth an actuarial recommendation of the contribution, or range of contributions, which will properly fund the plan, in accordance with applicable government regulations. In addition, this report provides:

- A valuation of plan assets and liabilities to review the year-to-year progress of funding.
- Information needed to meet disclosure requirements.
- Review of plan experience for the previous year to ascertain whether the assumptions and methods employed for valuation purposes are reflective of actual events and remain appropriate for prospective application.
- Assessment of the relative funded position of the plan, i.e., through a comparison of plan assets and projected plan liabilities.
- Comments on any other matters which may be of assistance in the funding and operation of the plan.

This report may not be used for purposes other than those listed above without Milliman's prior written consent. If this report is distributed to other parties, it must be copied in its entirety, including this certification section.

Milliman's work is prepared solely for the internal business use of the City of Bristol ("City"). To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exceptions: (a) the City may provide a copy of Milliman's work, in its entirety, to the City's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit the City; and (b) the City may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law. No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

In preparing this report, we relied on employee census data and financial information as of the valuation date, furnished by the City. We performed a limited review of the data used directly in our analysis for reasonableness and consistency and have found them to be reasonably consistent and comparable with data used for other purposes. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete and our calculations may need to be revised. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

Certification

The calculations reported herein have been made on a basis consistent with our understanding of ERISA and the related sections of the tax code. Additional determinations may be needed for purposes other than meeting funding requirements, such as judging benefit security at plan termination or meeting employer accounting requirements. On the basis of the foregoing, we hereby certify that, to the best of our knowledge, this report is complete and accurate and all costs and liabilities were determined in conformance with generally accepted actuarial principles and practices.

The valuation results were developed using models intended for valuations that use standard actuarial techniques. In addition to these models, Milliman has developed certain models to develop the expected long term rate of return on assets used in this analysis. We have reviewed the models, including their inputs, calculations, and outputs for consistency, reasonableness, and appropriateness to the intended purpose and in compliance with generally accepted actuarial practice and relevant actuarial standards of practice (ASOP). The models including all input, calculations, and output may not be appropriate for any other purpose.

We further certify that, in our opinion, each actuarial assumption, method and technique used is reasonable taking into account the experience of the Plan and reasonable expectations. Future actuarial measurements may differ significantly from the current measurements presented in this report due to factors such as, but not limited to, the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of the actuarial assignment, we did not perform an analysis of the potential range of such future measurement.

The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impact the objectivity of our work.

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.

Rebecca A. Sielman, FSA
Consulting Actuary

Michelle L. Boyles, FSA
Consulting Actuary

Section I - Executive Summary
Changes Since the Prior Valuation

Plan Changes

None.

Change in Actuarial Methods and Assumptions

The following actuarial method and assumption changes were reflected in this valuation based on recommendations resulting from the most recent experience study.

- We have decreased the interest rate assumption from 7.00% to 6.50%.
- The recognition of gains and losses in the Actuarial Value of Assets has been changed from a four year period to a five year period.
- The load for compensated absences has been increased from 5.0% to 6.0% for the Board of Education and increased from 13.0% to 14.0% for General City.
- The rate of turnover for City was changed from age-based to service-based while the rate of turnover for Fire and Police was removed.
- The retirement rates were adjusted to better reflect actual experience.
- The pension escalation assumption for Fire and Police was reduced from 3.25% per year to 3.00% per year.
- The salary scale assumptions were changed from age-based to service-based to reflect bargained increases and recent experience.
- The mortality assumption was changed from RP-2000 Mortality Table for Employees and Healthy Annuitants with generational projection per Scale BB to Pub-2010 Mortality Table with generational projection per the MP-2019 ultimate scale, with employee rates before benefit commencement and healthy or disabled annuitant rates after benefit commencement. The Public Safety variant is assumed for Fire and Police while the General table is used for all other groups.

The net effect of these changes was an increase in the Accrued Liability of $30.9 million and a decrease in the Actuarial Value of Assets of $4.5 million.

Other Significant Changes

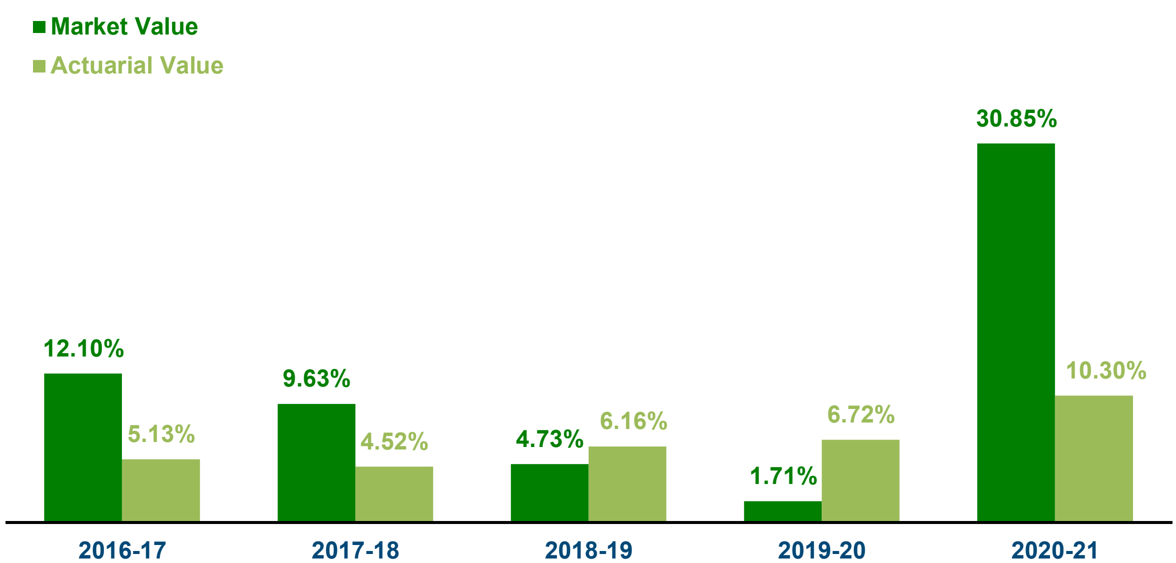
Although it is possible that the COVID-19 pandemic could have a material impact on the projected mortality, liabilities, and contribution requirements, we have chosen not to make an adjustment in the projections at this time, given the substantial current uncertainty regarding the impact of COVID-19 on mortality and plan costs, including whether the pandemic will increase or decrease mortality during the term of our projections. We will be monitoring this development closely and may adjust future projections to reflect the impact of COVID-19, if and when it becomes appropriate.

Section I - Executive Summary
Assets

There are two different measures of the plan's assets that are used throughout this report. The Market Value is a snapshot of the plan's investments as of the valuation date. The Actuarial Value is a smoothed asset value designed to temper the volatile fluctuations in the market by recognizing investment gains or losses non-asymptotically over five years.

	Market	Actuarial
Value as of July 1, 2020	$640,210,473	$670,545,781
City and Member Contributions	2,613,269	2,613,269
Investment Income	193,469,277	67,746,014
Benefit Payments and Administrative Expenses	(28,768,219)	(28,768,219)
Value as of July 1, 2021	807,524,800	712,136,845

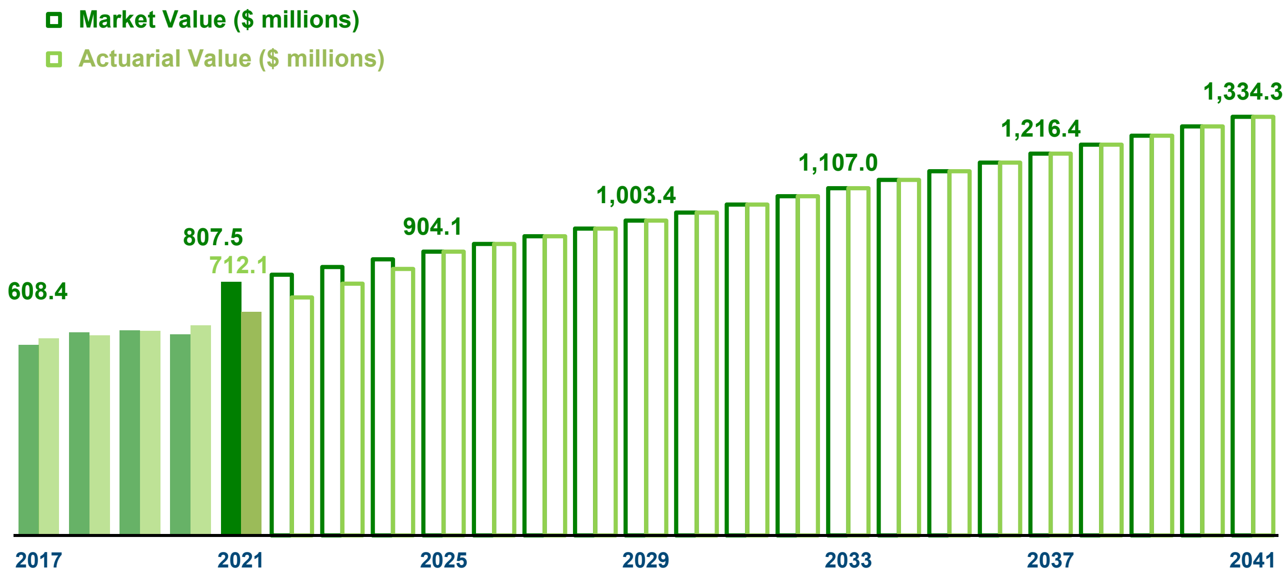
For fiscal year 2020-21, the plan's assets earned 30.85% on a Market Value basis and 10.30% on an Actuarial Value basis. The actuarial assumption for this period was 7.00%; the result is an asset gain of about $149.6 million on a Market Value basis and a gain of about $21.7 million on an Actuarial Value basis. Historical rates of return are shown in the graph below.



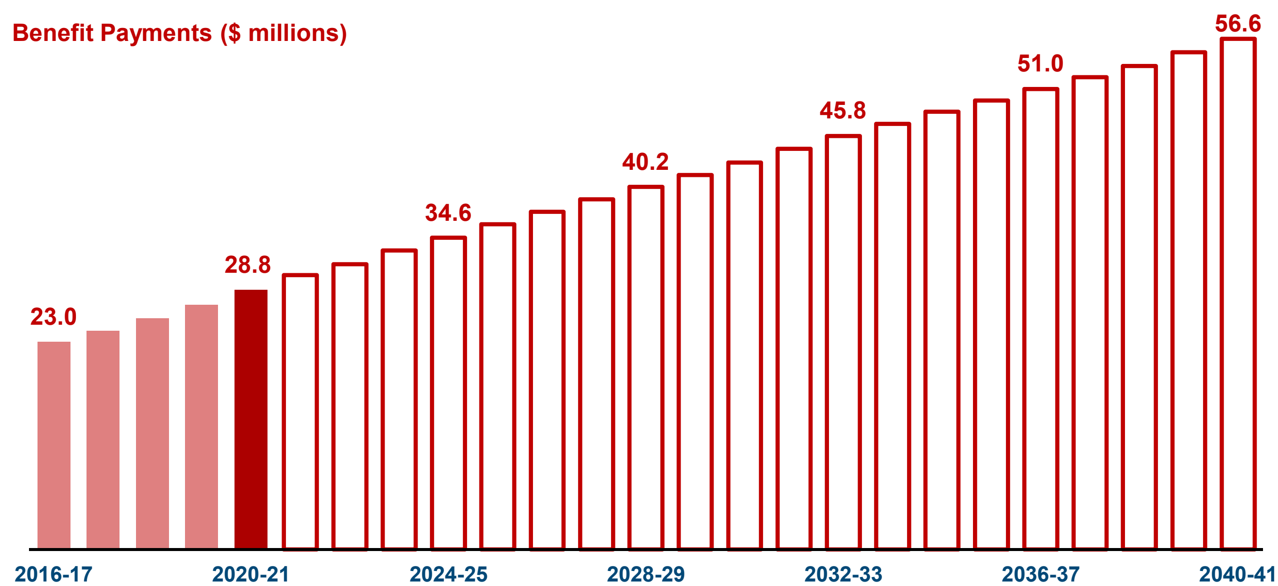
Please note that the Actuarial Value currently is less than the Market Value by $95.4 million. This figure represents investment gains that will be gradually recognized in future years. This process will exert downward pressure on the City's contribution, unless there are offsetting market losses.

Section I - Executive Summary
Assets (continued)

The graph below shows how this year's asset values compare to where the plan's assets have been over the past several years and how they are projected to change over the next 20 years. For purposes of this projection, we have assumed that the City always contributes the Actuarially Determined Contribution and the investments always earn the assumed interest rate each year.

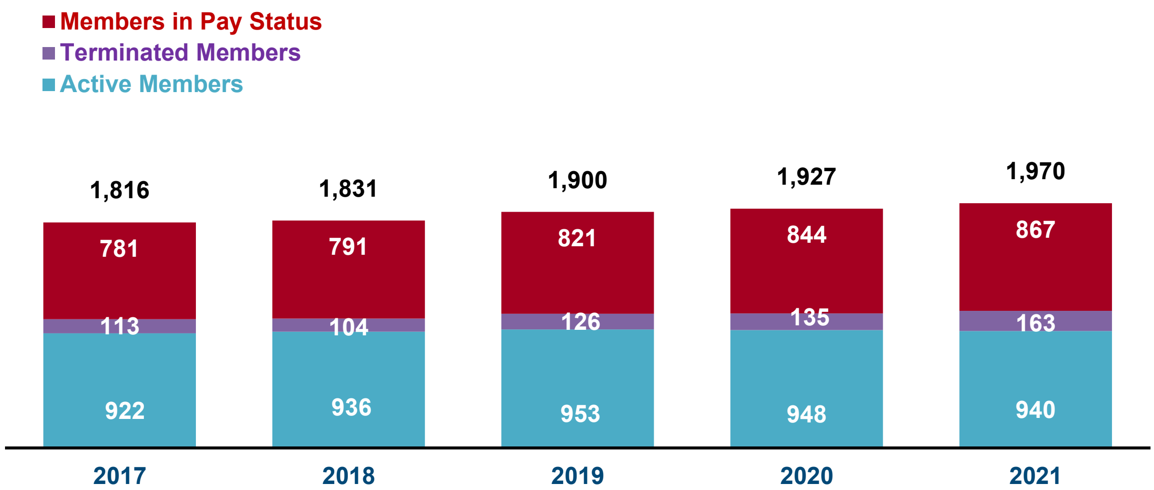


In 2020-21, the plan paid out $28.8 million in benefits to members. Over the next 20 years, the plan is projected to pay out a total of $871 million in benefits to members.



Section I - Executive Summary
Membership

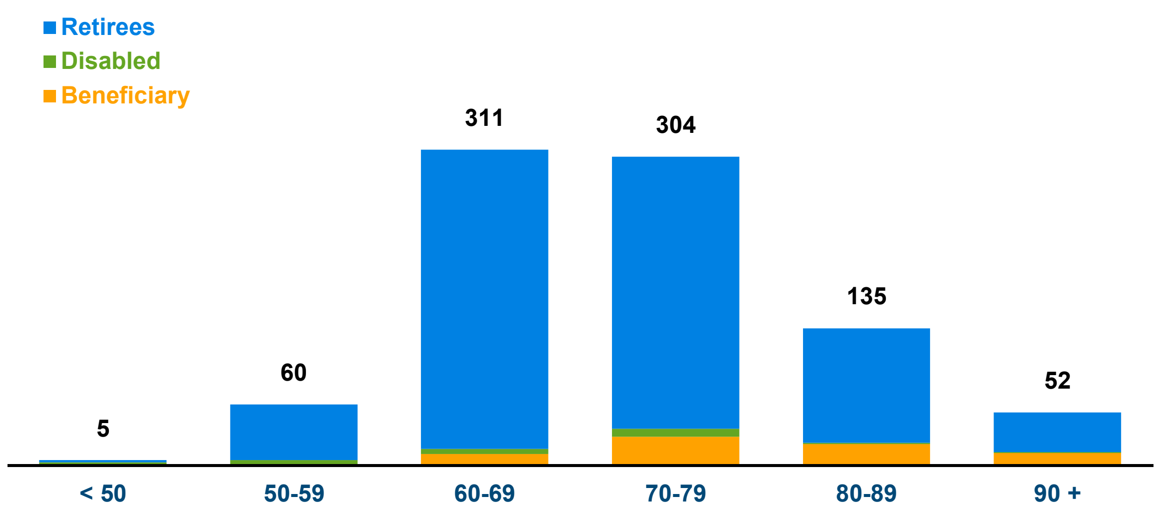
There are three basic categories of plan members included in the valuation: (1) members who are receiving monthly pension benefits, (2) former employees who have a vested right to benefits but have not yet started collecting, and (3) active employees who have met the eligibility requirements for membership.



Members in Pay Status on July 1, 2021

City	642	Average Age	72.1
Fire	91	Total Annual Benefit	$28,940,427
Police	134	Average Annual Benefit	33,380
Total	867		

The members in pay status fall across a wide distribution of ages:



Section I - Executive Summary
Membership (continued)

Terminated Vested Members on July 1, 2021

City	39	Average Age	45.1
Fire	0	Total Annual Benefit	$630,834
Police	6	Average Annual Benefit	14,019
Total	45		

Nonvested Members Due Refunds on July 1, 2021

City	117
Fire	1
Police	0
Total	118

Active Members on July 1, 2021

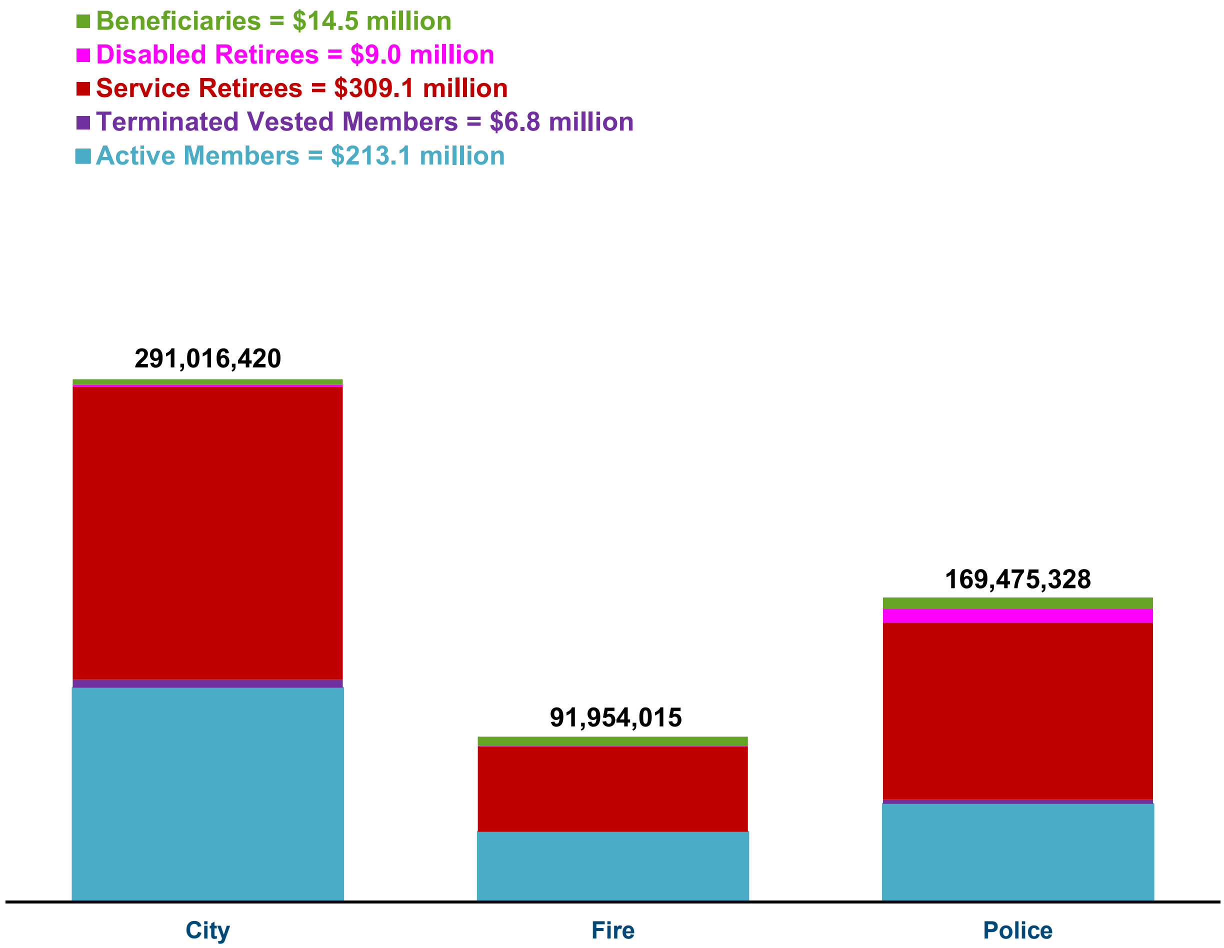
City	737	Average Age	47.4
Fire	86	Average Service	11.5
Police	117	Payroll	$56,446,054
Total	940	Average Payroll	60,049

The table below illustrates the age and years of service of the active membership:

	Years of Service							
Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30+**	**Total**
< 25	10							10
25-29	59	5						64
30-34	47	50	5					102
35-39	34	25	27	5				91
40-44	34	26	14	27	4			105
45-49	27	16	25	22	5	4		99
50-54	27	21	25	28	29	7	12	149
55-59	26	24	25	30	34	12	14	165
60-64	13	16	15	34	23	6	10	117
65+	3	9	14	5	4		3	38
Total	280	192	150	151	99	29	39	940

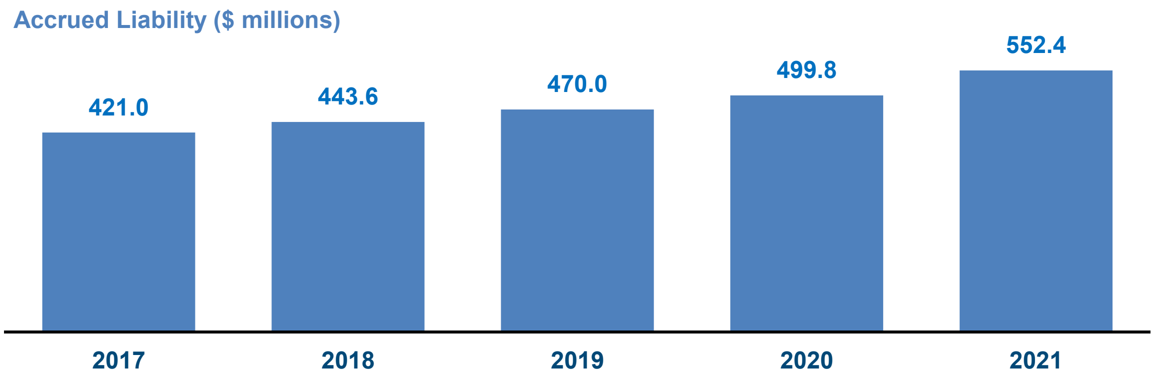
Section I - Executive Summary
Accrued Liability

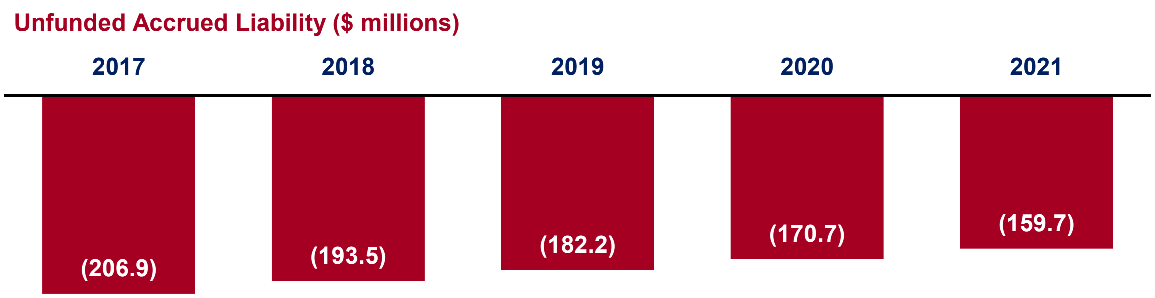
The Accrued Liability as of July 1, 2021 equals $552,445,763, which consists of the following pieces:

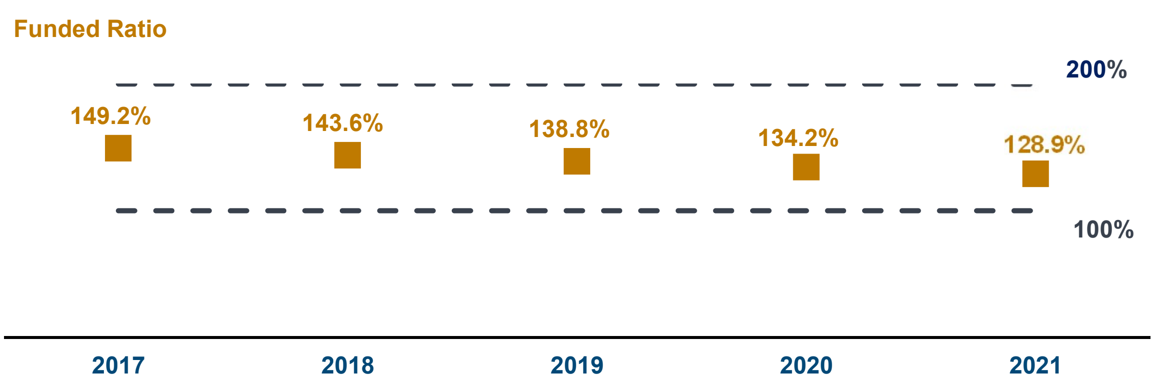


Section I - Executive Summary
Funded Status

The Accrued Liability grows over time as active members earn additional benefits, and goes down over time as members receive benefits; it may also change when there are changes to the plan provisions or changes in the actuarial assumptions. The Unfunded Accrued Liability is the dollar difference between the Accrued Liability and the Actuarial Value of Assets; the Funded Ratio is the ratio of the two.



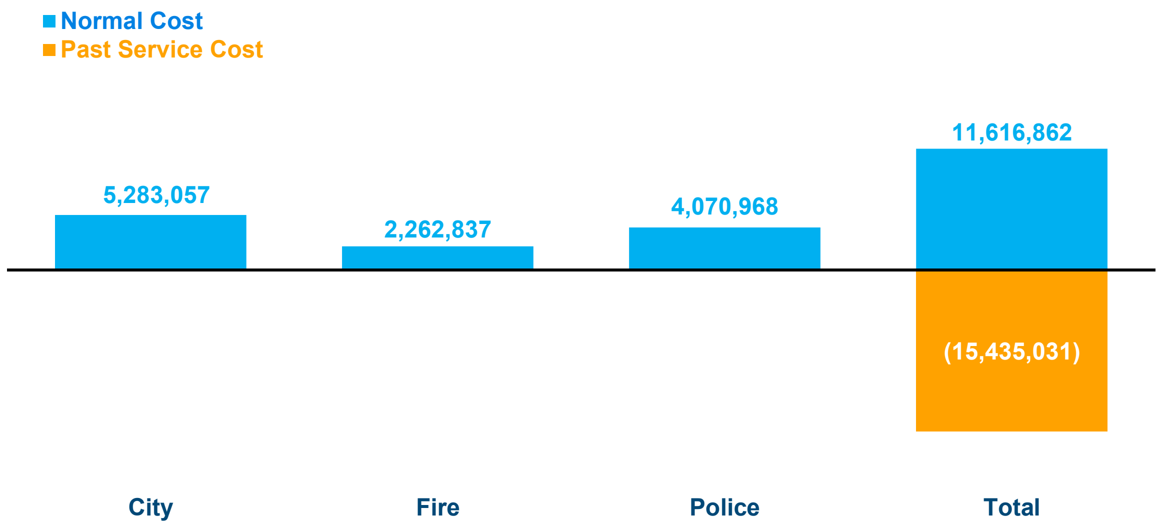




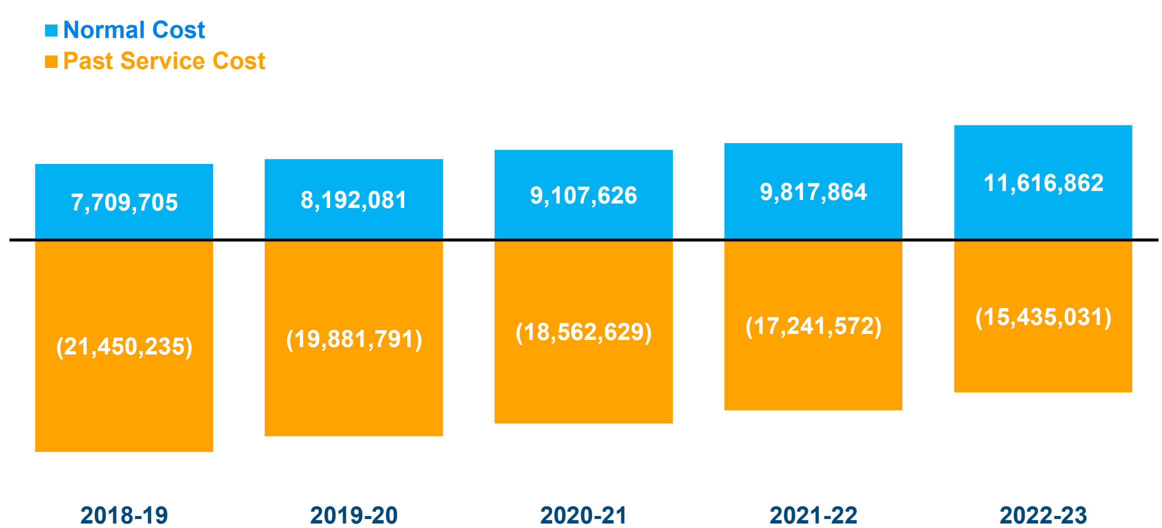
Section I - Executive Summary
Actuarially Determined Contribution

The Actuarially Determined Contribution consists of two pieces: a **Normal Cost** payment to fund the benefits earned each year, and a **Past Service Cost** to gradually reduce any unfunded or surplus liability. If the surplus is sufficiently large, it can be used to subsidize the Normal Cost and little or no contribution may be necessary to maintain the funded status of the plan.

The Actuarially Determined Contribution for fiscal year 2022-23 is shown graphically below.

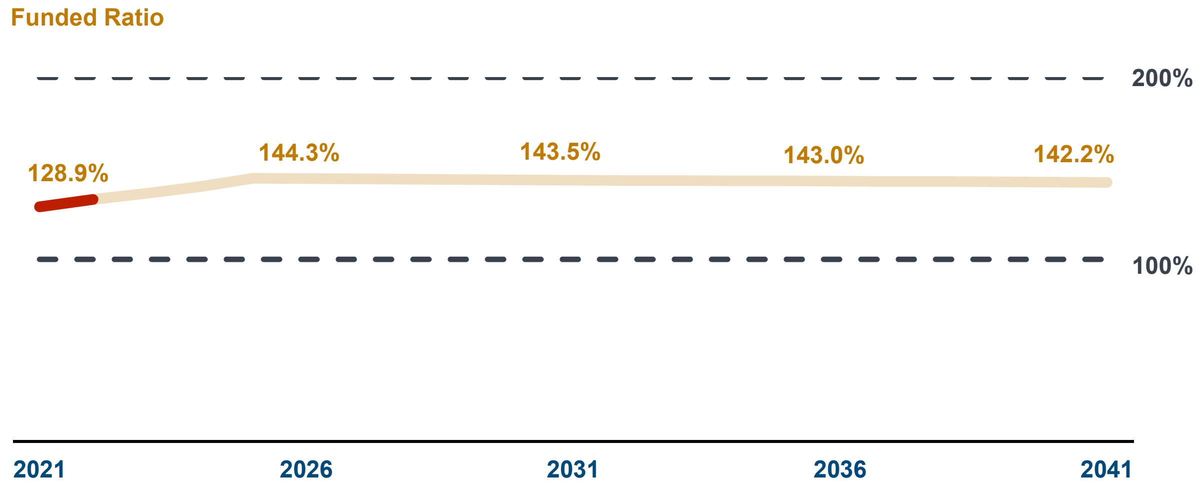


The chart below shows the Actuarially Determined Contribution for the past five fiscal years. Note that the Normal Cost is relatively consistent from year to year, whereas the Past Service Cost tends to be more volatile since it reflects the impact of asset performance.



Section I - Executive Summary
Long-Range Forecast

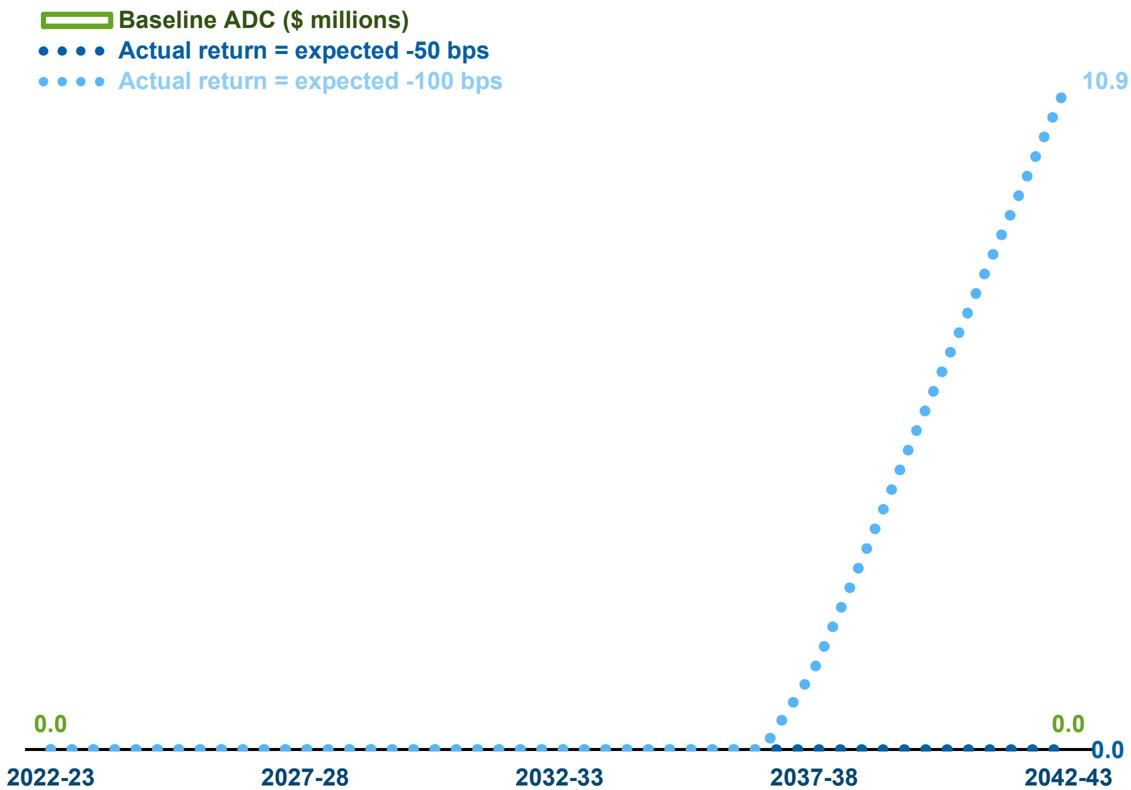
If the City pays the Actuarially Determined Contribution each year, the investments earn exactly the assumed interest rate each year, and there are no changes in the plan provisions or in the actuarial methods and assumptions, then we project the following changes in the plan's funded status:



To the extent that there are future investment or liability gains or losses, changes in the actuarial assumptions or methods, or plan changes, the actual valuation results will differ from these forecasts. Please see Section III C for more details of the long range forecast.

Section I - Executive Summary
Long-Range Forecast (continued)

Pension benefits are paid for through a combination of contributions from the City and from employees, and from investment income. If the investments persistently earn less than the assumed interest rate, then the plan's funded status would suffer, and to compensate, the City's contribution levels would be pushed higher. The risks of the investments underearning are illustrated in the hypothetical scenarios below:



The scenarios illustrated above are based on deterministic projections that assume emerging plan experience always exactly matches the actuarial assumptions; in particular that actual asset returns will be constant in every year of the projection period. Variation in asset returns, contribution amounts, and many other factors may have a significant impact on the long-term financial health of the plan, the liquidity constraints on plan assets, and the City's future contribution levels. Stochastic projections could be prepared that would enable the City to understand the potential range of future results based on the expected variability in asset returns and other factors. Such analysis was beyond the scope of this engagement.

Section I - Executive Summary
Summary of Principal Results

Membership as of	July 1, 2020	July 1, 2021
Active Members	948	940
Terminated Members	135	163
Members in Pay Status	844	867
Total Count	1,927	1,970
Payroll	$53,660,972	$56,446,054

Assets and Liabilities as of	July 1, 2020	July 1, 2021
Market Value of Assets	$640,210,473	$807,524,800
Actuarial Value of Assets	670,545,781	712,136,845
Accrued Liability for Active Members	200,711,261	213,093,949
Accrued Liability for Terminated Members	5,503,226	6,787,648
Accrued Liability for Members in Pay Status	293,623,385	332,564,166
Total Accrued Liability	499,837,872	552,445,763
Unfunded Accrued Liability	(170,707,909)	(159,691,082)
Funded Ratio	134.2%	128.9%

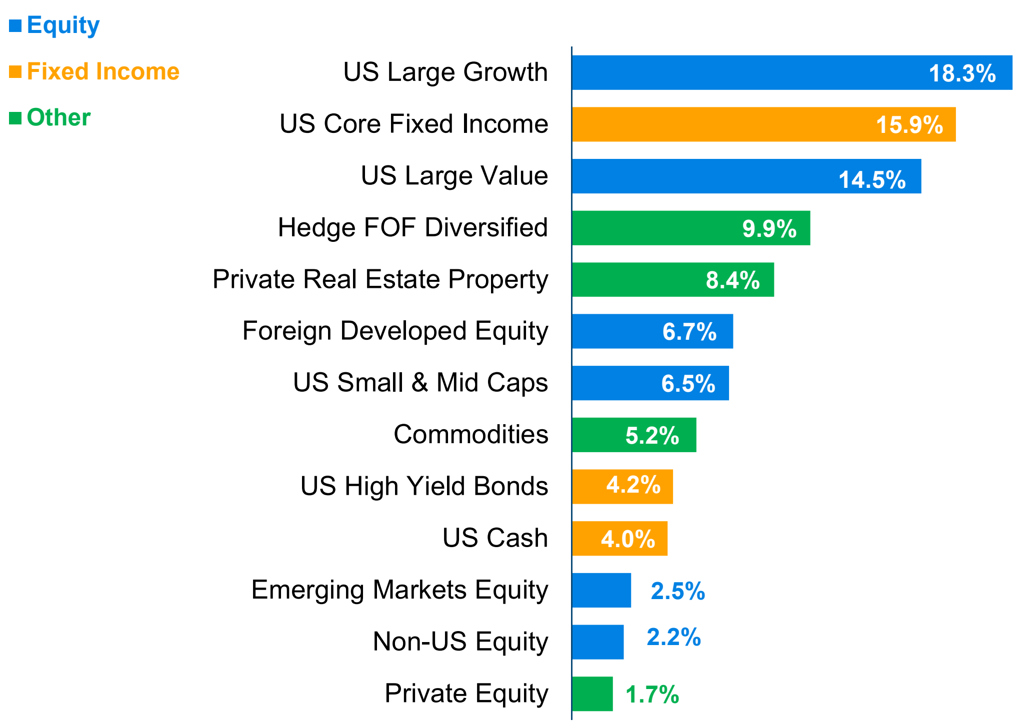
Actuarially Determined Contribution for Fiscal Year	2021-22	2022-23
Normal Cost	$9,817,864	$11,616,862
Past Service Cost	(17,241,572)	(15,435,031)
Actuarially Determined Contribution	0	0

Section II - Plan Assets
A. Summary of Fund Transactions

Market Value as of July 1, 2020	$640,210,473
City Contributions	0
Member Contributions	2,613,269
Net Investment Income	193,469,277
Benefit Payments	(28,768,219)
Administrative Expenses	0
Market Value as of June 30, 2021	807,524,800
Expected Return on Market Value of Assets	43,899,026
Market Value (Gain)/Loss	(149,570,251)
Approximate Rate of Return *	30.85%

* The rate shown here is not the dollar or time weighted investment yield rate which measures investment performance. It is an approximate net return assuming all activity occurred on average midway through the fiscal year.

Actual Asset Allocation as of June 30, 2021



Section II - Plan Assets
B. Development of Actuarial Value of Assets

In order to minimize the impact of market fluctuations on the contribution level, we use an Actuarial Value of Assets that recognizes gains and losses in equal installments ('non-asymptotically') over a five year period. The Actuarial Value of Assets as of July 1, 2021 is determined below.

1.	Expected Market Value of Assets:	
	a. Market Value of Assets as of July 1, 2020	$640,210,473
	b. City and Member Contributions	2,613,269
	c. Benefit Payments	(28,768,219)
	d. Expected Earnings Based on 7.00% Interest	43,899,026
	e. Expected Market Value of Assets as of July 1, 2021	657,954,549
2.	Actual Market Value of Assets as of July 1, 2021	807,524,800
3.	Market Value (Gain)/Loss: (2) - (1e)	(149,570,251)
4.	Delayed Recognition of Market (Gains)/Losses	

Plan Year End	(Gain)/Loss	Percent Not Recognized	Amount Not Recognized
06/30/2021	($149,570,251)	80%	($119,656,201)
06/30/2020	34,628,219	60%	20,776,931
06/30/2019	15,702,936	40%	6,281,174
06/30/2018	(13,949,295)	20%	(2,789,859)

(95,387,955)

5.	Preliminary Actuarial Value of Assets as of July 1, 2021: (2) + (4)	712,136,845
6.	Approximate Rate of Return on Actuarial Value of Assets	10.30%
7.	Actuarial Value (Gain)/Loss	(21,705,034)

Section III - Development of Contribution
A. Past Service Cost

In determining the Past Service Cost, the Unfunded Accrued Liability is amortized over an open period of 20 years.

		City	Fire	Police	Total
1.	Accrued Liability				
	Active Members	$119,348,527	$39,068,906	$54,676,516	$213,093,949
	Terminated Members	4,582,763	14,072	2,190,813	6,787,648
	Service Retirees	162,907,466	47,533,987	98,653,002	309,094,455
	Disabled Retirees	1,074,678	262,033	7,627,283	8,963,994
	Beneficiaries	3,102,986	5,075,017	6,327,714	14,505,717
	Total Accrued Liability	291,016,420	91,954,015	169,475,328	552,445,763
2.	Actuarial Value of Assets (see Section IIB)				712,136,845
3.	Unfunded Accrued Liability: (1) - (2)				(159,691,082)
4.	Funded Ratio: (2) / (1)				128.9%
5.	Amortization Period				20
6.	Amortization Growth Rate				0.00%
7.	Past Service Cost: (3) amortized over (5)				(14,492,987)
8.	Interest on (7) to Following Fiscal Year				(942,044)
9.	Past Service Cost for Following Fiscal Year: (7) + (8)				(15,435,031)

Section III - Development of Contribution
B. Actuarially Determined Contribution for FY 2022-23

		City	Fire	Police	Total
1.	Total Normal Cost	$6,681,922	$2,145,340	$4,038,461	$12,865,723
2.	Expected Member Contributions	2,024,066	150,288	449,254	2,623,608
3.	Net Normal Cost: (1) - (2)	4,657,856	1,995,052	3,589,207	10,242,115
4.	Interest on (3) to Following Fiscal Year	625,201	267,785	481,761	1,374,747
5.	Normal Cost for Following Fiscal Year (3) + (4)	5,283,057	2,262,837	4,070,968	11,616,862
6.	Past Service Cost (see Section IIIA)				(15,435,031)
7.	Actuarially Determined Contribution for FY 2022-23: (5) + (6), not less than zero				0

Section III - Development of Contribution
C. Long Range Forecast

This forecast is based on the results of the July 1, 2021 actuarial valuation and assumes that the City will pay the Actuarially Determined Contribution each year, the assets will return the assumed interest rate on a market value basis each year, and there are no future changes in the actuarial methods or assumptions or in the plan provisions. Actual results at each point in time will yield different values, reflecting the actual experience of the plan membership and assets.

	Values as of the Valuation Date					Cash Flows Projected to the Following Fiscal Year			
Valuation Date	Accrued Liability	Actuarial Value of Assets	Unfunded Accrued Liability	Funded Ratio	Fiscal Year	City Contributions	Member Contributions	Benefit Payments	Net Cash Flows
07/01/2021	$552,445,763	$712,136,845	($159,691,082)	128.9%	2022-23	$0	$2,647,886	($31,615,322)	($28,967,436)
07/01/2022	570,696,000	758,595,000	(187,899,000)	132.9%	2023-24	0	2,707,000	(33,132,000)	(30,425,000)
07/01/2023	589,047,000	802,586,000	(213,539,000)	136.3%	2024-25	0	2,756,000	(34,551,000)	(31,795,000)
07/01/2024	607,190,000	849,783,000	(242,593,000)	140.0%	2025-26	0	2,829,000	(36,047,000)	(33,218,000)
07/01/2025	625,304,000	904,065,000	(278,761,000)	144.6%	2026-27	0	2,889,000	(37,446,000)	(34,557,000)
07/01/2026	643,319,000	928,550,000	(285,231,000)	144.3%	2027-28	0	2,924,000	(38,824,000)	(35,900,000)
07/01/2027	661,390,000	953,242,000	(291,852,000)	144.1%	2028-29	0	3,001,000	(40,179,000)	(37,178,000)
07/01/2028	679,543,000	978,154,000	(298,611,000)	143.9%	2029-30	0	3,040,000	(41,506,000)	(38,466,000)
07/01/2029	697,834,000	1,003,368,000	(305,534,000)	143.8%	2030-31	0	3,084,000	(42,876,000)	(39,792,000)
07/01/2030	716,338,000	1,028,889,000	(312,551,000)	143.6%	2031-32	0	3,150,000	(44,402,000)	(41,252,000)
07/01/2031	735,037,000	1,054,702,000	(319,665,000)	143.5%	2032-33	0	3,222,000	(45,826,000)	(42,604,000)
07/01/2032	753,795,000	1,080,687,000	(326,892,000)	143.4%	2033-34	0	3,264,000	(47,184,000)	(43,920,000)
07/01/2033	772,692,000	1,106,964,000	(334,272,000)	143.3%	2034-35	0	3,348,000	(48,522,000)	(45,174,000)
07/01/2034	791,900,000	1,133,592,000	(341,692,000)	143.1%	2035-36	0	3,433,000	(49,760,000)	(46,327,000)
07/01/2035	811,282,000	1,160,657,000	(349,375,000)	143.1%	2036-37	0	3,458,000	(51,035,000)	(47,577,000)
07/01/2036	831,110,000	1,188,292,000	(357,182,000)	143.0%	2037-38	0	3,520,000	(52,350,000)	(48,830,000)
07/01/2037	851,504,000	1,216,432,000	(364,928,000)	142.9%	2038-39	0	3,567,000	(53,591,000)	(50,024,000)
07/01/2038	872,430,000	1,245,107,000	(372,677,000)	142.7%	2039-40	0	3,640,000	(55,113,000)	(51,473,000)
07/01/2039	893,985,000	1,274,415,000	(380,430,000)	142.6%	2040-41	0	3,751,000	(56,619,000)	(52,868,000)
07/01/2040	916,002,000	1,304,132,000	(388,130,000)	142.4%	2041-42	0	3,860,000	(57,944,000)	(54,084,000)

Section III - Development of Contribution
D. History of Funded Status

Valuation Date	Actuarial Value of Assets	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
July 1, 2012	$535,331,814	$332,042,091	($203,289,723)	161.2%
July 1, 2013	562,862,195	351,182,741	(211,679,454)	160.3%
July 1, 2014	597,487,036	363,225,204	(234,261,832)	164.5%
July 1, 2015	608,722,415	373,446,139	(235,276,276)	163.0%
July 1, 2016	616,089,755	403,937,301	(212,152,454)	152.5%
July 1, 2017	627,928,376	420,994,137	(206,934,239)	149.2%
July 1, 2018	637,056,310	443,592,523	(193,463,787)	143.6%
July 1, 2019	652,163,189	469,965,671	(182,197,518)	138.8%
July 1, 2020	670,545,781	499,837,872	(170,707,909)	134.2%
July 1, 2021	712,136,845	552,445,763	(159,691,082)	128.9%

Section III - Development of Contribution
E. History of City Contributions

Fiscal Year	Actuarially Determined Contribution	Actual City Contribution	Payroll	Actual Contribution as a Percent of Payroll
2013-14	$604,612	$227,500	$44,891,754	0.5%
2014-15	507,245	127,325	44,715,823	0.3%
2015-16	352,543	44,000	45,357,037	0.1%
2016-17	756,393	1,064,936	44,945,681	2.4%
2017-18	2,617,369	2,617,369	48,452,620	5.4%
2018-19	0	0	49,004,030	0.0%
2019-20	0	0	51,163,929	0.0%
2020-21	0	0	52,204,668	0.0%
2021-22	0	TBD	53,660,972	TBD
2022-23	0	TBD	56,446,054	TBD

Section IV - Membership Data
A. Reconciliation of Membership from Prior Valuation

Details of the changes in the Plan membership since the last valuation are shown below. Additional details on the Plan membership are provided in the remainder of Section IV.

	Active Members	Terminated Vested Members	Nonvested Members Due Refunds	Service Retirees	Disabled Retirees	Beneficiaries	Total
Count July 1, 2020	948	42	93	750	23	71	1,927
Terminated							
- no benefits due	-	-	-	-	-	-	0
- paid refund	(14)	-	-	-	-	-	(14)
- vested benefits due	(30)	4	26	-	-	-	0
Retired	(50)	(1)	-	51	-	-	0
Died							
- with beneficiary	(1)	-	-	(7)	-	8	0
- no beneficiary	(1)	-	-	(22)	(2)	(6)	(31)
Returned to Active	1	-	(1)	-	-	-	0
New member	86	-	-	-	-	-	86
Rehired	1	-	-	-	-	-	1
New Alternate Payee	-	-	-	-	-	-	0
Correction	-	-	-	-	-	1	1
Count July 1, 2021	940	45	118	772	21	74	1,970
Breakdown July 1, 2021							
City	737	39	117	599	12	31	1,535
Fire	86	0	1	67	1	23	178
Police	117	6	0	106	8	20	257
Total	940	45	118	772	21	74	1,970

Section IV - Membership Data
B. Statistics of Active Membership

		As of July 1, 2020	As of July 1, 2021
Number of Active Members	City	743	737
	Fire	86	86
	Police	119	117
	Total	948	940
Average Age	City	49.3	48.9
	Fire	46.8	45.7
	Police	39.7	38.9
	Total	47.8	47.4
Average Service	City	10.9	10.6
	Fire	18.2	17.5
	Police	13.7	13.0
	Total	11.9	11.5
Total Payroll	City	$36,603,071	$39,302,028
	Fire	6,584,485	6,621,608
	Police	10,473,416	10,522,418
	Total	53,660,972	56,446,054
Average Payroll	City	$49,264	$53,327
	Fire	76,564	76,995
	Police	88,012	89,935
	Total	56,604	60,049

Section IV - Membership Data
C. Distribution of Active Members as of July 1, 2021

City

	Years of Service							
Age	0-4	5-9	10-14	15-19	20-24	25-29	30+	Total
< 25	6							6
25-29	41	2						43
30-34	41	22	3					66
35-39	33	17	6	3				59
40-44	34	21	10	5	3			73
45-49	27	15	22	10	3	1		78
50-54	27	20	24	20	17	3	9	120
55-59	26	23	23	29	31	10	6	148
60-64	13	16	15	34	22	5	3	108
65+	3	9	14	5	4		1	36
Total	251	145	117	106	80	19	19	737

Fire

	Years of Service							
Age	0-4	5-9	10-14	15-19	20-24	25-29	30+	Total
< 25	2							2
25-29	3	2						5
30-34	3	3						6
35-39	1	3	7					11
40-44		2	4	12				18
45-49			2	7		1		10
50-54			1	5	5	2		13
55-59		1	1		2	1	7	12
60-64					1		6	7
65+							2	2
Total	9	11	15	24	8	4	15	86

Police

	Years of Service							
Age	0-4	5-9	10-14	15-19	20-24	25-29	30+	Total
< 25	2							2
25-29	15	1						16
30-34	3	25	2					30
35-39		5	14	2				21
40-44		3		10	1			14
45-49		1	1	5	2	2		11
50-54		1		3	7	2	3	16
55-59			1	1	1	1	1	5
60-64						1	1	2
65+								0
Total	20	36	18	21	11	6	5	117

Section IV - Membership Data
D. Statistics of Inactive Membership

	As of July 1, 2020	As of July 1, 2021
Terminated Vested Members		
Number	42	45
Total Annual Benefit	$600,078	$630,834
Average Annual Benefit	14,287	14,019
Average Age	45.3	45.1
Nonvested Members Due Refunds		
Number	93	118
Service Retirees		
Number	750	772
Total Annual Benefit	$25,216,454	$26,808,011
Average Annual Benefit	33,622	34,725
Average Age	71.8	71.7
Disabled Retirees		
Number	23	21
Total Annual Benefit	$641,025	$610,304
Average Annual Benefit	27,871	29,062
Average Age	67.6	67.2
Beneficiaries		
Number	71	74
Total Annual Benefit	$1,368,291	$1,522,113
Average Annual Benefit	19,272	20,569
Average Age	78.1	78.0

Section IV - Membership Data
E. Distribution of Inactive Members as of July 1, 2021

	Age	Number	Annual Benefits
Terminated Vested Members	< 30	19	$0
(counts include Terminated Nonvested	30 - 39	38	41,804
Members Due Refunds and	40 - 49	42	207,778
Deferred Beneficiaries)	50 - 59	45	272,588
	60 - 64	6	26,329
	65 +	13	82,335
	Total	163	630,834
Service Retirees	< 50	2	$121,728
	50 - 59	55	3,374,596
	60 - 69	295	10,970,189
	70 - 79	268	9,098,520
	80 - 89	113	2,625,478
	90 +	39	617,500
	Total	772	26,808,011
Disabled Retirees	< 50	2	$116,875
	50 - 59	4	240,675
	60 - 69	5	132,751
	70 - 79	8	80,192
	80 - 89	1	37,921
	90 +	1	1,890
	Total	21	610,304
Beneficiaries	< 50	1	$7,426
	50 - 59	1	84,491
	60 - 69	11	238,195
	70 - 79	28	527,197
	80 - 89	21	439,163
	90 +	12	225,641
	Total	74	1,522,113

Section V - Analysis of Risk
A. Introduction

The results of this actuarial valuation are based on one set of reasonable assumptions. However, it is almost certain that future experience will not exactly match these assumptions. As an example, the plan's investments may perform better or worse than assumed in any single year and over any longer time horizon. It is therefore important to consider the potential impacts of these likely differences when making decisions that may affect the future financial health of the plan, or of the plan’s members.

In addition, as plans mature they accumulate larger pools of assets and liabilities. The increase in size in turn increases the potential magnitude of adverse experience. As an example, the dollar impact of a 10% investment loss on a plan with $1 billion in assets and liabilities is much greater than the dollar impact for a plan with $1 million in assets and liabilities. Since pension plans make long-term promises and rely on long-term funding, it is important to consider how mature the plan is today, and how mature it may become in the future.

Actuarial Standard of Practice No. 51 (ASOP 51) directs actuaries to provide pension plan sponsors with information concerning the risks associated with the plan:

- Identify risks that may be significant to the plan.
- Assess the risks identified as significant to the plan. The assessment does not need to include numerical calculations.
- Disclose plan maturity measures and historical information that are significant to understanding the plan’s risks.

This section of the report uses the framework of ASOP 51 to communicate important information about significant risks to the plan, the plan’s maturity, and relevant historical plan data.

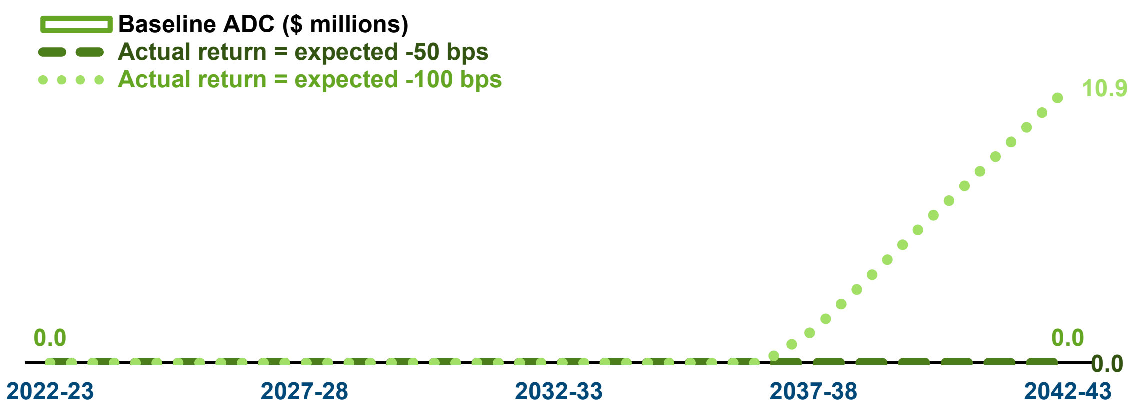
Please see Section III C for more information on the basis for the projected results shown on the following pages.

Section V - Analysis of Risk
B. Risk Identification and Assessment

Investment Risk

Definition: This is the potential that investment returns will be different than expected.

Identification: To the extent that actual investment returns differ from the assumed investment return, the plan's future assets, Actuarially Determined Contributions, and funded status may differ significantly from those presented in this valuation. The consequences of persistent underperformance on future Actuarially Determined Contribution levels are illustrated below:



Contribution Risk

Definition: This is the potential that actual future contributions will be less than the Actuarially Determined Contribution.

Identification: The Actuarially Determined Contribution for the Retirement System is $0 and is projected to remain at $0 over a 10 year projection period. Therefore this risk is not significant to the City.

Section V - Analysis of Risk
B. Risk Identification and Assessment

Liquidity Risk

Definition: This is the potential that assets must be liquidated at a loss earlier than planned in order to pay for the plan's benefits and operating costs. This risk is heightened for plans with negative cash flows, in which contributions are not sufficient to cover benefit payments plus expenses.

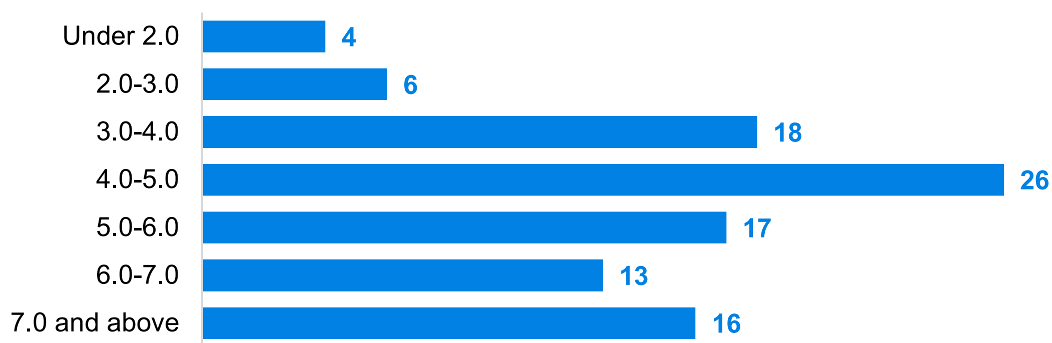
Identification: In 2020-21, the plan had negative cash flow, with city and member contributions to the plan of $2,613,269 compared to $28,768,219 of benefit payments and administrative expenses paid out of the plan. We suggest that you consult with your investment advisors with respect to the liquidity characteristics of the plan's investment holdings.

Maturity Risk

Definition: This is the potential for total plan liabilities to become more heavily weighted toward inactive liabilities over time, and for plan assets and/or liabilities to become larger relative to the active member liability.

Identification: The plan is subject to maturity risk because as plan assets and liabilities continue to grow, the dollar impact of any gains or losses on the assets or liabilities also becomes larger.

Assessment: As of July 1, 2021, the plan's Asset Volatility Ratio (the ratio of the market value of plan assets to payroll) is 14.3. According to Milliman's 2021 Public Pension Funding Study, the 100 largest US public pension plans have the following range of Asset Volatility Ratios:



Inflation Risk

Definition: This is the potential for a pension to lose purchasing power over time due to inflation.

Identification: The members of pension plans without fully inflation-indexed benefits are subject to the risk that their purchasing power will be reduced over time due to inflation.

Assessment: This plan provides for some postretirement benefit increases, but the increases are not directly tied to each year's rate of actual inflation and not all members are eligible for these increases; this leaves members bearing some inflation risk.

Section V - Analysis of Risk
B. Risk Identification and Assessment

Insolvency Risk

Definition: This is the potential that a plan will become insolvent; that is, assets will be fully depleted.

Identification: If a plan becomes insolvent, contractually required benefits must be paid from the plan sponsor's other remaining assets.

Assessment: Under the GASB 68 depletion date methodology, the plan is not projected to become insolvent. Please see the GASB 68 report for more details on the underlying analysis.

Demographic Risks

Definition: This is the potential that mortality, turnover, retirement, or other demographic experience will be different than expected.

Identification: The pension liabilities reported herein have been calculated by assuming that members will follow patterns of demographic experience as described in Appendix B. If actual demographic experience or future demographic assumptions are different from what is assumed to occur in this valuation, future pension liabilities, Actuarially Determined Contributions, and funded status may differ significantly from those presented in this valuation. Formal Experience Studies performed on a regular basis are helpful in ensuring that the demographic assumptions reflect emerging plan experience.

Retirement Risk

Definition: This is the potential for members to retire and receive subsidized benefits that are more valuable than expected.

Identification: This plan has valuable retirement benefits. If members retire at earlier ages than are anticipated by the actuarial assumptions, this will put upward pressure on subsequent Actuarially Determined Contributions.

Pensionable Earnings Risk

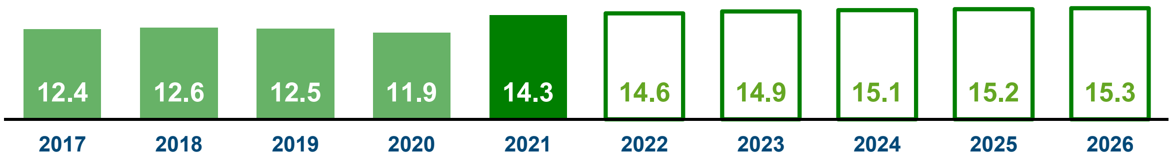
Definition: This is the potential for active members to add items to their pensionable earnings and receive pension benefits that are higher than expected.

Identification: Compensation for benefit purposes includes compensated absences paid out at retirement. This valuation includes an assumed load for compensated absences, based on the referenced experience study. To the extent that actual compensated absences are different from expected, this could put additional pressure on subsequent Actuarially Determined Contributions.

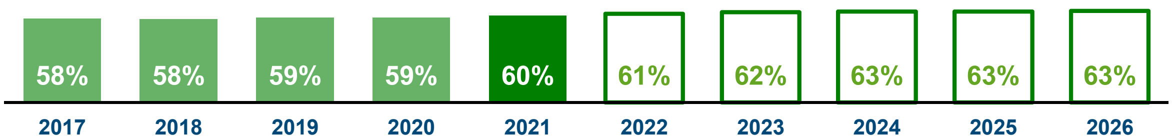
Section V - Analysis of Risk
C. Maturity Measures

The metrics presented below are different ways of understanding the plan's maturity level, both in the past and as it is expected to change in the coming years.

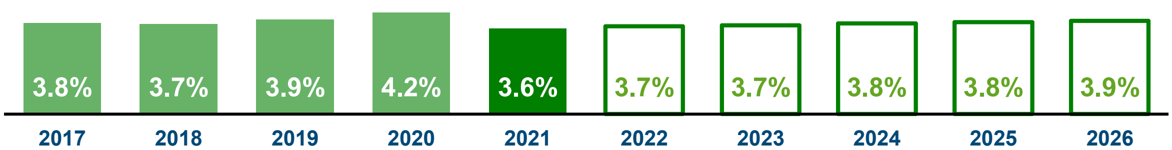
Asset Volatility Ratio: Market Value of Assets compared to Payroll



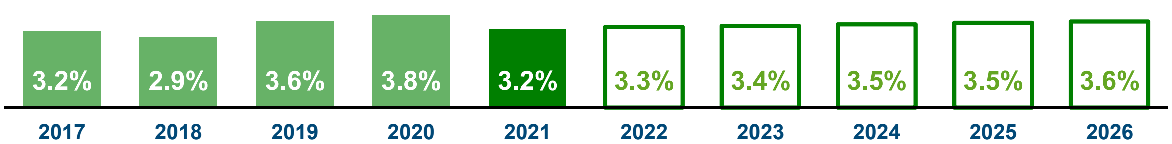
Accrued Liability for members in pay status compared to total Accrued Liability



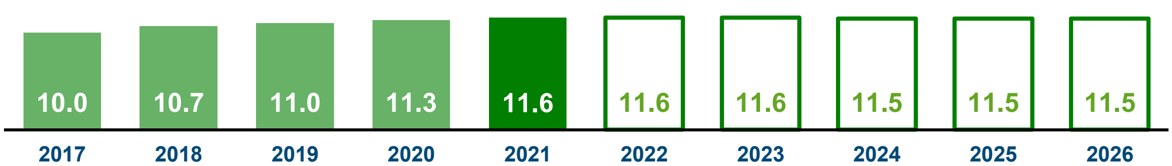
Benefit Payments compared to Market Value of Assets



Net Cash Flows compared to Market Value of Assets



Duration of Accrued Liability (based on GASB 68 sensitivity disclosures)



Appendix A - Actuarial Funding Method

The actuarial funding method used in the valuation of this Plan is known as the Entry Age Normal Method. Recommended annual contributions until the accrued liability is completely funded will consist of two pieces: Normal Cost plus a payment towards the Unfunded Accrued Liability; both pieces include interest to adjust for the lag between the valuation date and the end of the fiscal year.

The Normal Cost is determined by calculating the present value of future benefits for present active Members that will become payable as the result of death, disability, retirement or termination. This cost is then spread as a level percentage of earnings from entry age to termination as an Active Member. If Normal Costs had been paid at this level for all prior years, a fund would have accumulated. Because this fund represents the portion of benefits that would have been funded to date, it is termed the Accrued Liability. In fact, it is calculated by adding the present value of benefits for Retired Members and Terminated Vested Members to the present value of benefits for Active Members and subtracting the present value of future Normal Cost contributions.

The funding cost of the Plan is derived by making certain specific assumptions as to rates of interest, mortality, turnover, etc. which are assumed to hold for many years into the future. Since actual experience may differ somewhat from the assumptions, the costs determined by the valuation must be regarded as estimates of the true costs of the Plan.

The Unfunded Accrued Liability is the excess of the Accrued Liability over the assets which have been accumulated for the plan. This Unfunded Accrued Liability is amortized as a level dollar amount over an open period of 20 years.

The Actuarial Value of Assets is determined by recognizing market gains and losses non-asymptotically over a five year period.

Census data is gathered as of the January 1 preceding the valuation date. The benefits for retirees who are eligible for the pension escalator reflect the benefits payable as of the valuation date. No other adjustments are made to the census data except that age and service are measured as of the valuation date, assuming no change in status since the census date.

The long-range forecasts included in this report have been developed by assuming that members will terminate, retire, become disabled, and die according to the actuarial assumptions with respect to these causes of decrement, and that pay increases, cost of living adjustments, and so forth will likewise occur according to the actuarial assumptions. For those unions whose new employees are eligible to participate in this plan, members who are projected to leave active employment are assumed to be replaced by new active members with the same age, service, gender, and pay characteristics as those hired in the past few years.

Appendix B - Actuarial Assumptions

Each of the assumptions used in this valuation was set based on a formal study of the plan's experience for the period July 1, 2015 through June 30, 2020 which reflected industry standard published tables and data, the particular characteristics of the plan, relevant information from the plan sponsor or other sources about future expectations, and our professional judgment regarding future plan experience. We believe the assumptions are reasonable for the contingencies they are measuring, and are not anticipated to produce significant cumulative actuarial gains or losses over the measurement period.

Assumption Changes

This valuation reflects the assumption changes as approved by the Pension Board, based on the results of the 2015-2020 experience study. Please see the experience study dated December 9, 2021, for further details of the analysis supporting these assumption changes. Please also see the July 1, 2020 valuation report dated March 3, 2021 for complete details of the prior valuation assumptions.

Interest Rate

6.50% (Prior: 7.00%)

Inflation

2.40% (Prior: 2.70%)

Salary Scale

Service	Police	Fire	City
1	11.00%	10.00%	10.00%
2	7.00%	10.00%	5.00%
3	7.00%	7.00%	5.00%
4	3.25%	3.25%	5.00%
5	3.25%	3.25%	4.00%
10	4.00%	3.25%	4.00%
15	3.25%	3.25%	3.50%
26+	3.25%	3.25%	3.00%

Expenses

None.

Mortality

City

PubG-2010 Mortality Table with generational projection per the MP-2019 ultimate scale, with employee rates before benefit commencement and healthy or disabled annuitant rates after benefit commencement. This assumption includes a margin for improvements in longevity beyond the valuation date.

Fire and Police

PubS-2010 Mortality Table with generational projection per the MP-2019 ultimate scale, with employee rates before benefit commencement and healthy or disabled annuitant rates after benefit commencement. This assumption includes a margin for improvements in longevity beyond the valuation date.

Appendix B - Actuarial Assumptions

Turnover

City

Service	Rate
<5	10.00%
5-7	5.00%
8-9	2.00%
10-11	5.00%
12-14	3.00%
15-24	1.50%
25+	0.00%

Fire and Police

None

Retirement

Members who have satisfied normal retirement eligibility are assumed to retire according to the following rates:

City

Age	Attained Rule of 80	Not Yet Attained
55	50%	2%
56-59	20%	2%
60	22%	2%
61	25%	2%
62	40%	2%
63	30%	2%
64	25%	2%
65	28%	2%
66	40%	2%
67-69	25%	2%
70-74	30%	30%
75+	100%	100%

Fire

Age	Rate
50-54	10%
55-59	5%
60-64	10%
65+	100%

Police

Service	Rate
25	35%
26+	10%

Age	Rate
65+	100%

Appendix B - Actuarial Assumptions

Pre-Retirement Disability

City
50% of the 1985 Pension Disability Table (DP-85) Class 1. 40% of disabilities are assumed to be service-connected.

Fire and Police
1985 Pension Disability Table (DP-85) Class 4. 100% of disabilities are assumed to be service-connected.

Percent Married

80% of active members are assumed to have an eligible spouse.

Age of Spouse

The female spouse is assumed to be three years younger than the male spouse.

Form of Payment

City
100% of active members are assumed to elect a Life Annuity.

Fire and Police
85% of active members are assumed to elect a 50% Joint & Survivor Annuity and 15% of active members are assumed to elect a Life Annuity.

Deferred Retirement Option Plan (DROP)

Fire
Current active members are not assumed to elect the DROP. The DROP option was determined to have a de minimis impact on active liability. As members elect the DROP, their benefits are reflected accordingly, based on their status as of the January 1 census date preceding the valuation date.

City and Police
Not available.

Pension Escalation

Fire and Police
3% per year, limited based on date of retirement in accordance with the plan provisions.

City
None.

Compensated Absences

The Actuarial Accrued Liability for active members and Normal Cost have been increased by the following:

Group	Load
Board of Education	6.0%
City	14.0%
Fire	11.0%
Police	14.4%

Appendix C - Summary of Plan Provisions - City

This exhibit summarizes the major provisions of the Plan. It is not intended to be, nor should it be interpreted as a complete statement of all plan provisions. All eligibility requirements and benefit amounts shall be determined in strict accordance with the plan document itself. To the extent that this summary does not accurately reflect the plan provisions, then the results of this valuation may not be accurate.

Eligibility

Membership is compulsory for all full-time employees except firemen, policemen and teachers except that no employee over age 65 at date of hire shall be eligible. Membership is optional with officials.

Effective September 24, 1981, full-time definition means minimum employment of 720 hours and at least nine months a year and eligible for City payment of Health Insurance benefits.

Compensation

Salary for service with the City including grants and allowances for maintenance, but not including any general temporary increase or reduction thereof.

Final Average Earnings

The average of the 3 highest years out of the final 10 years.

Credited Service

Years and months of continuous service.

Normal Retirement Date

Any member who has attained age 55, whose age plus service total 80, or any member hired before November 23, 1988 whose age plus service total 85 is eligible for normal retirement.

Normal Retirement Benefit

For employees of BPSA, BBHD, and Non-Bargaining hired after June 30, 2018, Local 233 hired after June 30, 2019, and Local 1338 hired after January 30, 2020: 2.0% x Final Average Earnings x years of Credited Service.

For all others: 2.4% x Final Average Earnings x years of Credited Service.

Maximum Benefit

For employees of BPSA, BBHD, and Non-Bargaining hired after June 30, 2018, Local 233 hired after June 30, 2019, and Local 1338 hired after January 30, 2020: Maximum benefit of 72% of Final Average Earnings.

For employees of BPSA and Non-Bargaining hired before June 30, 2018, without 25 years of Credited Service or not eligible for Unreduced Early Retirement at January 1, 2018: Maximum benefit of 100% of Final Average Earnings.

For all others: No maximum benefit.

Appendix C - Summary of Plan Provisions - City

Early Retirement Eligibility	Age 55 with 10 years of Credited Service.
Early Retirement Benefit	Accrued Benefit, actuarially reduced if payments begin prior to the member's Normal Retirement Date.
Disability Retirement Eligibility	Ten years of continuous service and total and permanent disability.
Disability Retirement Benefit	The pension during continuance of disability is computed with the same formula as normal retirement except that if disability was service-connected, there is no service requirement and the minimum pension is 50% of the member's annual rate of regular compensation at date of disability, including Social Security and Workmens' Compensation payments.
Pre-Retirement Spouse's Death Benefit	If an employee works beyond the date of eligibility for early or normal retirement, and dies before actually retiring, then benefits shall be paid to his designated contingent annuitant, if any, as if the employee had retired immediately prior to his death. If no contingent annuitant has been designated, but the deceased employee leaves a surviving spouse from whom he has not been divorced, then benefits shall be paid to the surviving spouse as if the employee had designated such spouse as his contingent annuitant and had retired immediately prior to death. The benefits payable to a designated contingent annuitant or surviving spouse shall be 50% of the actuarially reduced benefit payable had the employee retired immediately prior to his death. This benefit is in lieu of the return of employee contributions with interest on death before retirement.
Vesting	A member terminating after at least 10 years of Credited Service, provided the member elects to leave all accumulated contributions in the retirement fund, is entitled to a vested deferred pension, to commence at the earliest normal retirement age.
Member Contributions	Board of Education Employees: 6.0% of pay. Employees of BPSA, BBHD, and Non-Bargaining hired after June 30, 2018, Local 233 hired after June 30, 2019, and Local 1338 hired after January 30, 2020: 5.5% of pay. All others: 4.5% of pay.

Appendix C - Summary of Plan Provisions - City

Normal Form of Annuity	Life Annuity.
Prior Service Purchase	Members' dates of participation are adjusted to reflect periods purchased.
Ad hoc Retiree Cost-of-Living Adjustment (COLA)	Effective January 1, 2002, the City granted ad hoc COLAs to General City retirees who were in pay status as of December 31, 2000 equal to 50% of CPI-W from year of retirement through September 2001, with a maximum increase per year equal to 3%. The minimum benefit increase equaled \$10 per month, and the maximum benefit increase equaled \$300 per month. Effective June 1, 2008, the City granted ad hoc COLAs to General City retirees who were in pay status as of December 31, 2006 equal to 75% of CPI-W from September 2001 (or year of retirement if later) through August 2007, with a minimum benefit increase of \$10 per month, and a maximum benefit increase of \$350 per month.

Appendix C - Summary of Plan Provisions - Fire

This exhibit summarizes the major provisions of the Plan. It is not intended to be, nor should it be interpreted as a complete statement of all plan provisions. All eligibility requirements and benefit amounts shall be determined in strict accordance with the plan document itself. To the extent that this summary does not accurately reflect the plan provisions, then the results of this valuation may not be accurate.

Eligibility

A member of the Fire Department.

Compensation

The annual rate of base salary for a member's rank and step as set in the applicable collective bargaining agreement, if any. This will include ¼ of a member's unused sick leave paid out at the time of retirement, if applicable.

Credited Service

Years and months of continuous service.

Normal Retirement Date

All members after the attainment of age 65.

Any member after 25 years of continuous service as a regular fireman, by the request of the member and with the approval of the Trustees.

Any regular member after 20 years of continuous service and attainment of age 65, by the request of the member.

Note: All members of the regular Fire Department shall be retired on the day following attainment of age 65.

Normal Retirement Benefit

A pension for life at 70% of Compensation paid to the member in the year prior to his retirement, adjusted for escalation.

Disability Retirement Benefit

If any member becomes permanently disqualified for active duty through age or physical disabilities incurred in the discharge of duties, the member may be transferred to the "Veteran Reserve" at the rate of 70% of Compensation at the time of transfer. Such transfer may be revoked and the member returned to active duty if the disability is removed. If permanently disqualified from performing all fire duties, the member may be permanently retired at 70% of Compensation.

If any member with at least 10 years of service who becomes disqualified for active duty due to a disability not incurred in the performance of duties, he shall be retired at a rate equal to 28% for the first 10 years plus 2.8% for each additional year, thereafter, subject to a maximum of 70% of Compensation.

Appendix C - Summary of Plan Provisions - Fire

Pre-Retirement Spouse's Death Benefit

In case of a service-connected death of a member, the surviving spouse shall receive annually a sum equal to 70% of Compensation until death or remarriage, with continuation to any children under age 18, share and share alike, or to any dependent if no surviving spouse or children exist. Worker's Compensation payments are deducted from amounts hereunder.

In case of the death of a member with at least 10 years of regular service, or of a retired member or a member placed on the "Veteran Reserve" at 70% of Compensation, one-half of the benefit that would have been payable to the member on retirement or, if a retired member, one-half of the benefit being paid to the member at time of death, shall be paid to the surviving spouse until death or remarriage.

Vesting

Effective July 1, 2003, a member terminating after at least 10 years of Credited Service as a regular firefighter, provided the member elects to leave all accumulated contributions in the retirement fund, is entitled to a vested deferred pension, to commence at the earliest normal retirement age. The vested deferred pension is based on 2.8% of Compensation per year of Credited Service completed prior to separation from employment. Such percentage shall be applied at the time of separation and the resulting allowance shall not be increased thereafter for any reason. This section shall not apply in the case of a discharge for just cause which is not reversed upon appeal or a resignation by a member who has been informed he is under investigation for an offense which constitutes just cause for discharge and from which the member is not exonerated. For purposes of this section, Compensation excludes sick leave payout as it is not applicable.

Member Contributions

Active members contribute 3.00% of Compensation on a pre-tax (Section 414(h)(2)) basis. Contributions cease upon the completion of 25 years of Credited Service.

Members' contributions are returnable on termination or death if active, or after retirement (less any benefits paid), provided in each case that no death benefits are otherwise payable.

Deferred Retirement Option Plan (DROP)

An active member who completes 25 years of service may elect to participate in the DROP. During the DROP period, the member will have 55% (or 25% if hired after ratification of the 2019-2023 Agreement) of pension benefits earned through the DROP date credited to the DROP, without interest, and paid at actual retirement as a lump sum payment. Pension benefits will not increase during the DROP period, but at the end of the DROP period, any escalator will be applied to the pension benefit.

Appendix C - Summary of Plan Provisions - Fire

Normal Form of Annuity
Life Annuity.

Prior Service Purchase
Members' dates of participation are adjusted to reflect periods purchased.

Pension Escalation
Benefits increase as active members' salaries increase.

Pension Escalation Limit
Pre-July 1, 1999 retirees: no limit.

Retirees between July 1, 1999 and June 30, 2003: 2.50% per year.

Post-June 30, 2003 retirees: 2.25% per year.

Appendix C - Summary of Plan Provisions - Police

This exhibit summarizes the major provisions of the Plan. It is not intended to be, nor should it be interpreted as a complete statement of all plan provisions. All eligibility requirements and benefit amounts shall be determined in strict accordance with the plan document itself. To the extent that this summary does not accurately reflect the plan provisions, then the results of this valuation may not be accurate.

Eligibility

Members of the Police Department. Includes the City's animal control officer and/or assistant animal control officer.

Compensation

Base Pay.

Credited Service

Years and months of continuous service.

Normal Retirement Date

Any member after 25 years of continuous service as a regular police officer, by the request of the member and with the approval of the Trustees.

Any member after 30 years of continuous service as a regular police officer, by the request of the member.

Any regular member after 25 years of continuous service and attainment of age 60, by the request of the member.

Any regular member after 20 years of continuous service and attainment of age 65, by the request of the member.

Note: All members of the regular Police Department shall be retired on the day following attainment of age 65.

Normal Retirement Benefit

A pension for life at 70% of Compensation paid to the member in the year prior to his retirement, adjusted for escalation.

Disability Retirement Benefit

If any member becomes permanently disqualified for active duty through age or physical disabilities incurred in the discharge of duties, the member may be transferred to the "Veteran Reserve" at the rate of 70% of Compensation at the time of transfer. Such transfer may be revoked and the member returned to active duty if the disability is removed. If permanently disqualified from performing all police duties, the member may be permanently retired at 70% of Compensation.

If any member with at least 10 years of service who becomes disqualified for active duty due to a disability not incurred in the performance of duties, he shall be retired at a rate equal to 28% for the first 10 years plus 2.8% for each additional year, thereafter, subject to a maximum of 70% of Compensation.

Appendix C - Summary of Plan Provisions - Police

Pre-Retirement Spouse's Death Benefit

In case of a service-connected death of a member, the surviving spouse shall receive annually a sum equal to 70% of Compensation until death or remarriage, with continuation to any children under age 18, share and share alike, or to any dependent if no surviving spouse or children exist. Worker's Compensation payments are deducted from amounts hereunder.

In case of the death of a member with at least 10 years of regular service, or of a retired member or a member placed on the "Veteran Reserve" at 70% of Compensation, 100% of the benefit that would have been payable to the member on retirement until the retiree would have attained age 75 and one-half of the benefit thereafter, shall be paid to the surviving spouse until death or remarriage.

Vesting

Effective July, 1 2003, a member terminating after at least 10 years of Credited Service as a regular police officer, provided the member elects to leave all accumulated contributions in the retirement fund, is entitled to a vested deferred pension, to commence at the earliest normal retirement age. The vested deferred pension is based on 2.8% of Compensation per year of Credited Service completed prior to separation from employment. Such percentage shall be applied at the time of separation and the resulting allowance shall not be increased thereafter for any reason. This section shall not apply in the case of a discharge for just cause which is not reversed upon appeal or a resignation by a member who has been informed he is under investigation for an offense which constitutes just cause for discharge and from which the member is not exonerated.

Pension Escalation

Benefits increase as active members' salaries increase.

Pension Escalation Limit

Pre-December 15, 2002 retirees: no limit.

Retirees between December 15, 2002 and June 30, 2018: 2.25% per year.

Post-June 30, 2018 retirees: 2.50% per year.

Appendix C - Summary of Plan Provisions - Police

Member Contributions

Members hired prior to March 10, 2020 contribute 4.875% (Prior: 6%) of Compensation on a pre-tax (Section 414(h)(2)) basis.

Members hired after March 9, 2020 contribute 5.875% of Compensation on a pre-tax (Section 414(h)(2)) basis.

Contributions cease upon the completion of 25 years of Credited Service.

Members' contributions are returnable on termination or death if active, or after retirement (less any benefits paid), provided in each case that no death benefits are otherwise payable.

Normal Form of Annuity

Life Annuity.

Prior Service Purchase

Members' dates of participation are adjusted to reflect periods purchased.

Appendix D - Glossary

Actuarial Cost Method - This is a procedure for determining the Actuarial Present Value of Benefits and allocating it to time periods to produce the Actuarial Accrued Liability and the Normal Cost.

Accrued Liability - This is the portion of the Actuarial Present Value of Benefits attributable to periods prior to the valuation date by the Actuarial Cost Method (i.e., that portion not provided by future Normal Costs).

Actuarial Assumptions - With any valuation of future benefits, assumptions of anticipated future events are required. If actual events differ from the assumptions made, the actual cost of the plan will vary as well. Some examples of key assumptions include the interest rate, salary scale, and rates of mortality, turnover and retirement.

Actuarial Present Value of Benefits - This is the present value, as of the valuation date, of future payments for benefits and expenses under the Plan, where each payment is: a) multiplied by the probability of the event occurring on which the payment is conditioned, such as the probability of survival, death, disability, termination of employment, etc.; and b) discounted at the assumed interest rate.

Actuarial Value of Assets - This is the value of cash, investments and other property belonging to the plan, typically adjusted to recognize investment gains or losses over a period of years to dampen the impact of market volatility on the Actuarially Determined Contribution.

Actuarially Determined Contribution ("ADC") - This is the employer's periodic contributions to a defined benefit plan, calculated in accordance with actuarial standards of practice.

Attribution Period - The period of an employee's service to which the expected benefit obligation for that employee is assigned. The beginning of the attribution period is the employee's date of hire and costs are spread across all employment.

Interest Rate - This is the long-term expected rate of return on any investments set aside to pay for the benefits. In a financial reporting context (e.g., GASB 68) this is termed the Discount Rate.

Normal Cost - This is the portion of the Actuarial Present Value of Benefits allocated to a valuation year by the Actuarial Cost Method.

Past Service Cost - This is a catch-up payment to fund the Unfunded Accrued Liability over time (generally 10 to 30 years). A closed amortization period is a specific number of years counted from one date and reducing to zero with the passage of time; an open amortization period is one that begins again or is recalculated at each valuation date. Also known as the Amortization Payment.

Return on Plan Assets - This is the actual investment return on plan assets during the fiscal year.

Unfunded Accrued Liability - This is the excess of the Accrued Liability over the Actuarial Value of Assets.