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Presentation of April 30, 2021 Actuarial Valuation Results

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September 9, 2021





The Actuarial Valuation Process

- The valuation process can be viewed as a *budgeting process*. Like a budget, we make use of information we know as of a certain date and using assumptions we estimate what we think will happen in the future.
- To the right are the inputs and results of the valuation process.
- Member data, asset data and benefit provisions are provided by staff. Thank you!!
- Assumptions and Funding Methodology are determined by the Board of Trustees, with input from the actuary and other professionals.

Inputs

Member Data
Asset Data
Benefit Provisions
Assumptions
Funding Methodology



Results

Actuarial Value of Assets
Actuarial Liability
Net Actuarial Gain or Loss
Funded Ratio
Projection Model

Events During FYE 2021 Impacting the April 30, 2021 Valuation



- **Actual vs expected experience:**
 - Return on the market value for FYE 2021 was 21.7%. This resulted in a return on the actuarial (smoothed) value of assets of 8.4% and created an actuarial asset gain of \$9 million for Police and \$1.5 million for Civilians.
 - Actuarial gain on liabilities (lower than expected)
 - Largely from lower salary increases than expected and no COLA
 - Police \$14 million and Civilians \$2.7 million
 - Aggregate experience resulted in a decrease in the unfunded actuarial accrued liability (UAAL)

- **Scheduled decrease in investment return assumption from 7.40% to 7.35%**
 - Increase unfunded actuarial accrued liability and actuarial contribution for both systems



Police: Key Valuation Results

Police	4/30/2021 Valuation	4/30/2020 Valuation	% Change
Unfunded Actuarial Accrued Liability (UAAL)	\$305.0M	\$318.3M	(4.2%)
Funded Ratio (Actuarial Assets)	76%	74%	2.7%
<u>Actuarial Contribution Rate:</u>			
Total Contribution Rate	46.12%	45.99%	0.3%
Employee Contribution Rate	<u>(11.55%)</u>	<u>(11.55%)</u>	<u>0.0%</u>
City Contribution Rate	34.57%	34.44%	0.4%
City Contribution Amount	\$33,589,155	\$34,741,680	(3.3%)



Civilians: Key Valuation Results

Civilians	4/30/2021 Valuation	4/30/2020 Valuation	% Change
Unfunded Actuarial Accrued Liability (UAAL)	\$40.2M	\$42.8M	(5.9%)
Funded Ratio (Actuarial Assets)	80%	78%	2.6%
<u>Actuarial Contribution Rate:</u>			
Total Contribution Rate	23.78%	24.27%	(2.0%)
Employee Contribution Rate	<u>(5.00%)</u>	<u>(5.00%)</u>	<u>0.0%</u>
City Contribution Rate	18.78%	19.27%	(2.5%)
City Contribution Amount	\$5,700,592	\$5,800,468	(1.7%)



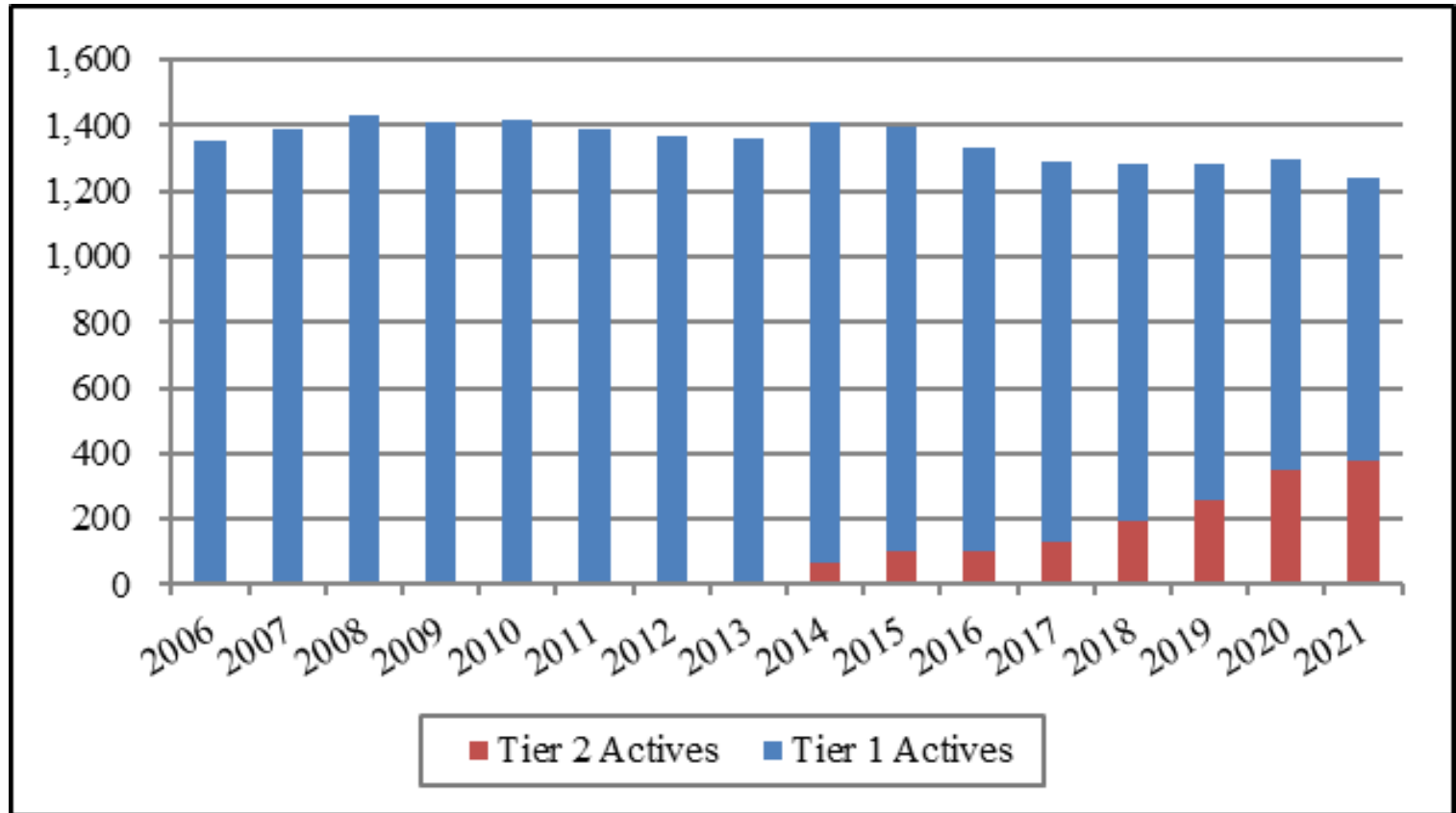
Membership Statistics

	Police	Civilians
Active Members		
• April 30, 2021	1,239	522
• April 30, 2020	1,297	537
• % Change	(4.5%)	(2.8%)
Payroll (\$M)		
• April 30, 2021	\$ 94.33	\$ 29.47
• April 30, 2020	\$ 97.94	\$ 29.22
• % Change	(3.7%)	0.8%
Retired Members		
• April 30, 2021	1,449	303
• April 30, 2020	1,404	290
• % Change	3.2%	4.5%
Average Benefit *		
• April 30, 2021	\$44,851	\$27,540
• April 30, 2020	\$44,230	\$27,492
• % Change	1.4%	0.2%

* Excludes supplemental benefit



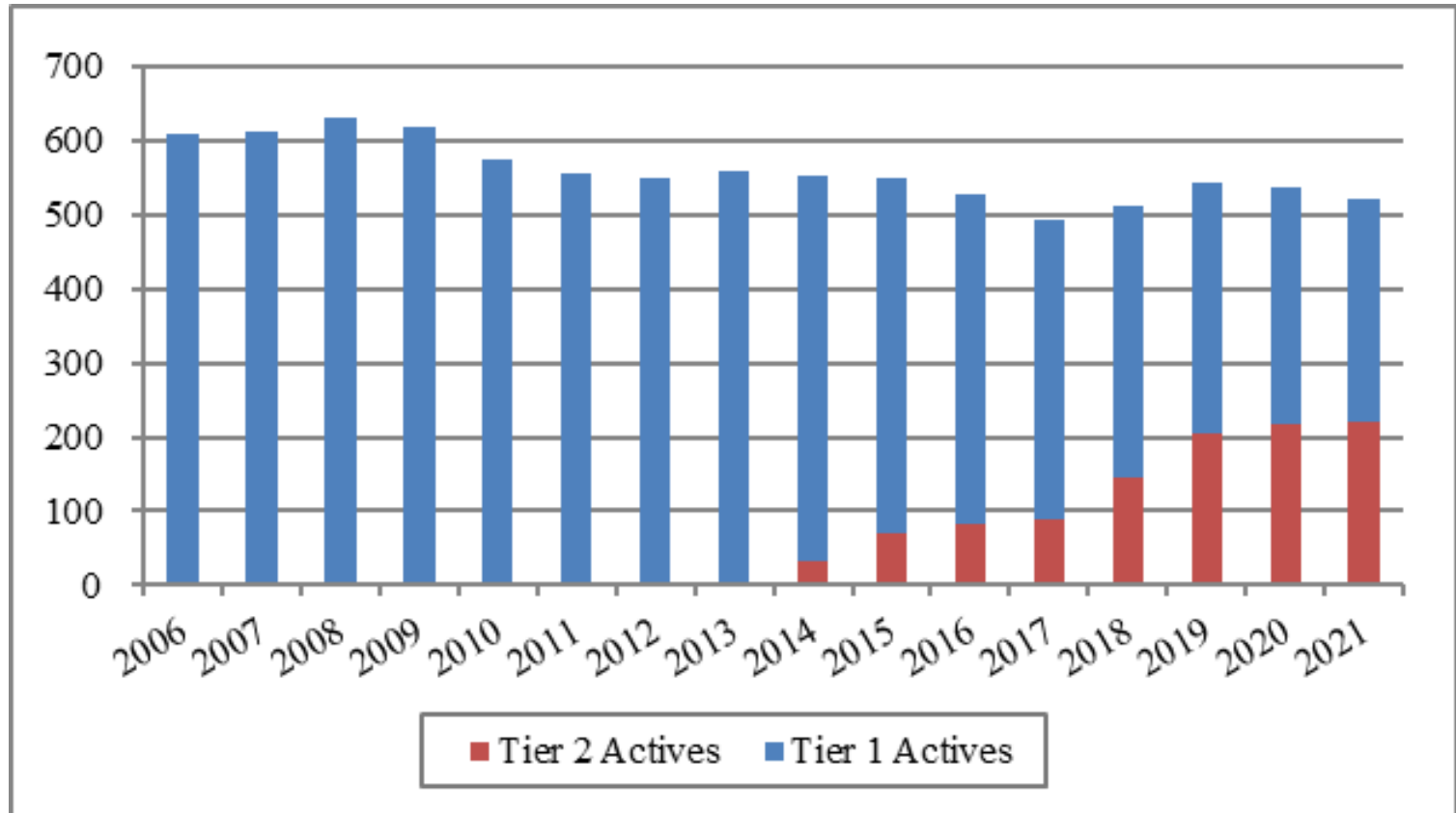
Police – Active Membership



As of April 30, 2021, there are 377 members in Tier 2 out of a total of 1,239 (about 30%).



Civilians - Active Membership



As of April 30, 2021, there are 219 members in Tier 2 out of a total of 522 (about 42%).

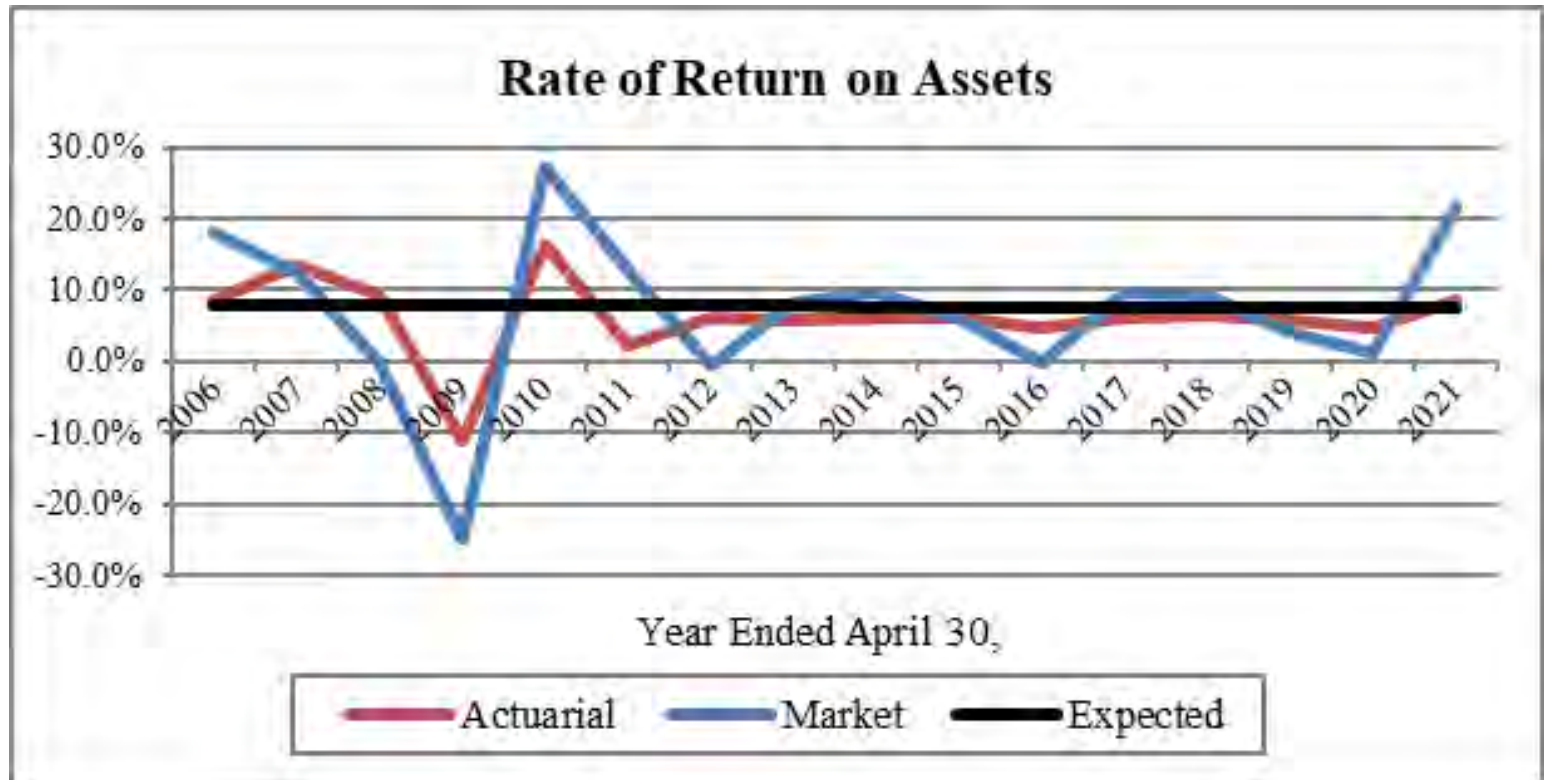


Actuarial Value of Assets

- Market value not used directly in valuation
- Asset valuation method is used to smooth the effect of market fluctuations
- Difference between the dollar amount of the expected and actual return on the market value of assets is spread evenly over a closed 5-year period



Historical Investment Returns



An asset smoothing method (which develops the actuarial value of assets) is used to mitigate the impact of investment return volatility on the Plan's funding.



Asset Values (\$M)

	Police	
	<u>Market</u>	<u>Actuarial</u>
Assets, 4/30/20	\$ 874.3	\$ 929.0
▪ Contributions	48.7	48.7
▪ Benefit Payments/Refunds	(75.0)	(75.0)
▪ Administrative Expenses	(1.0)	(1.0)
▪ Investment Income	186.6	76.6
Assets, 4/30/21	\$1,033.6	\$ 978.3
Estimated Net Return	21.7%	8.4%

The return of 8.4% on the actuarial value of assets resulted in an actuarial gain of \$9 million.

Police: Calculation of Actuarial Value of Assets



Plan Year Ended	Asset Gain/(Loss)	Gain/(Loss) Recognized in Prior Years	Gain/(Loss) Recognized This Year	Gain/(Loss) Deferred to Future Years
4/30/2018	12,859,972	7,715,984	2,571,994	2,571,994
4/30/2019	(30,192,446)	(12,076,979)	(6,038,489)	(12,076,978)
4/30/2020	(55,894,435)	(11,178,887)	(11,178,887)	(33,536,661)
4/30/2021	122,922,344	0	24,584,469	98,337,875
Total	49,695,435	(15,539,882)	9,939,087	55,296,230

A. Market Value of Assets as of April 30, 2021	\$	1,033,642,868
B. Total Deferred Investment Experience	\$	55,296,230
C. Actuarial Value of Assets as of April 30, 2021 (A. - B.)	\$	978,346,638
D. Ratio of Actuarial Value to Market Value		94.7%

Estimated rate of return on the actuarial value was 8.4%.



Asset Values (\$M)

	Civilians	
	<u>Market</u>	<u>Actuarial</u>
Assets, 4/30/20	\$ 145.4	\$ 154.6
▪ Contributions	6.9	6.9
▪ Benefit Payments/Refunds	(9.4)	(9.4)
▪ Administrative Expenses	(0.1)	(0.1)
▪ Investment Income	31.4	12.7
Assets, 4/30/21	\$ 174.2	\$ 164.7
Estimated Net Return	21.7%	8.4%

The return of 8.4% on the actuarial value of assets resulted in an actuarial gain of about \$1.5 million.

Unfunded Actuarial Accrued Liability (UAAL)



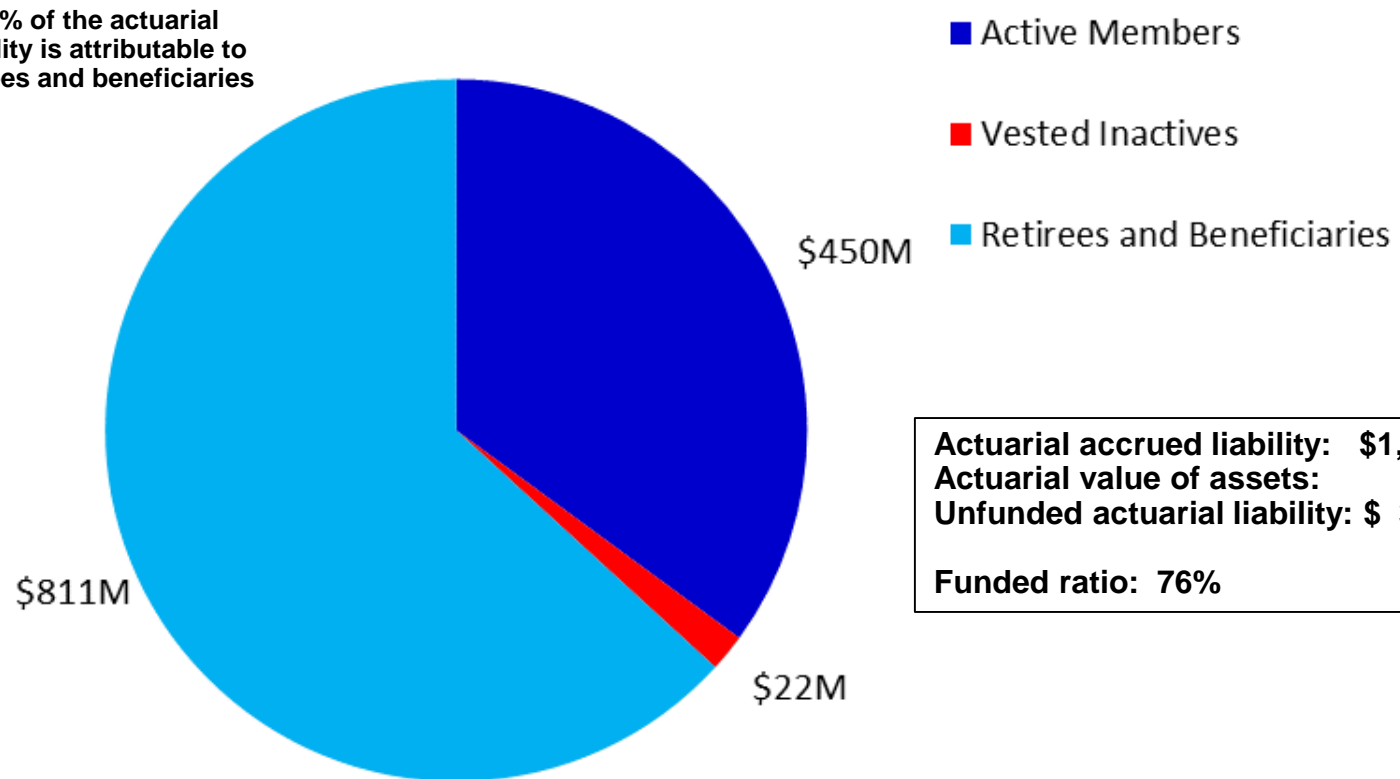
- Actuarial accrued liability less actuarial assets

- Impacted by:
 - Actual vs expected experience
 - Benefit provision changes
 - Assumption changes
 - Actual contributions



Actuarial Liability at April 30, 2021 (Police)

63% of the actuarial liability is attributable to retirees and beneficiaries



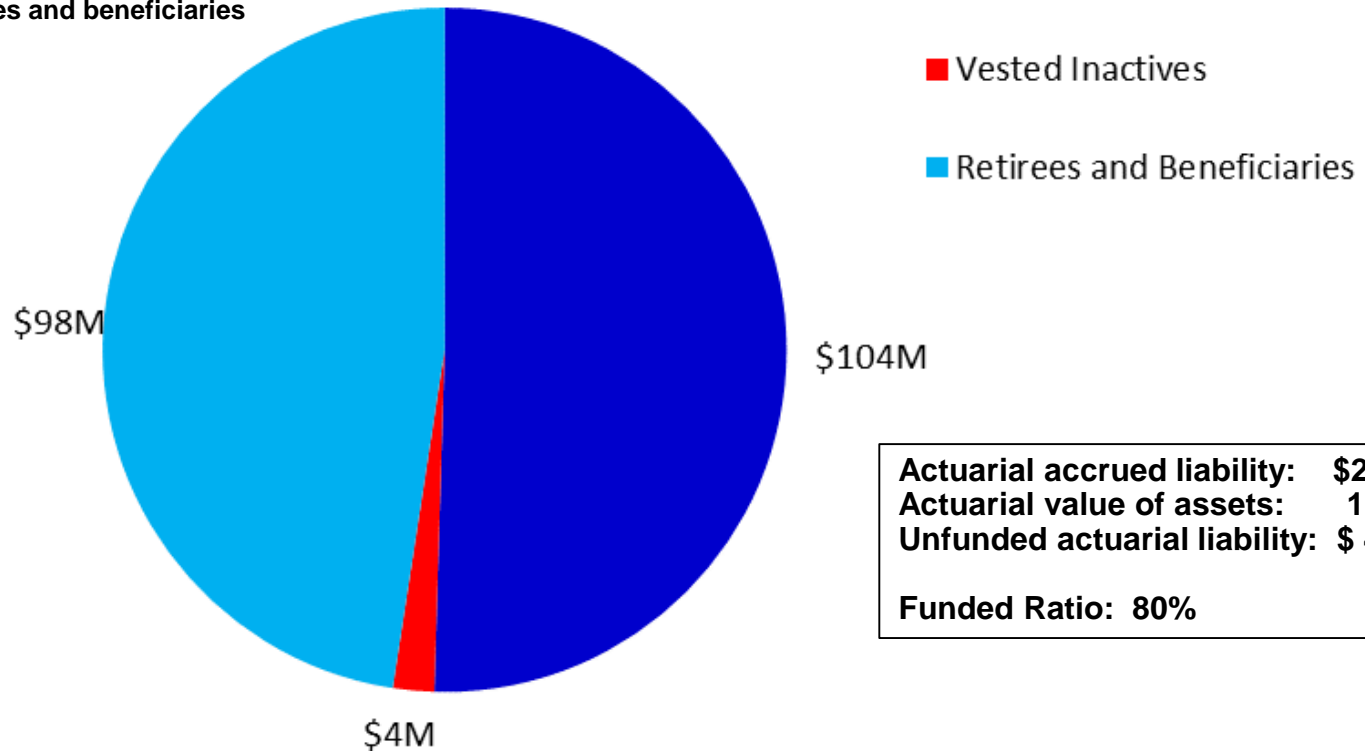
Actuarial accrued liability: \$1,283M
Actuarial value of assets: 978M
Unfunded actuarial liability: \$ 305M
Funded ratio: 76%

Note: Numbers may not add due to rounding.



Actuarial Liability at April 30, 2021 (Civilians)

48% of the actuarial liability is attributable to retirees and beneficiaries



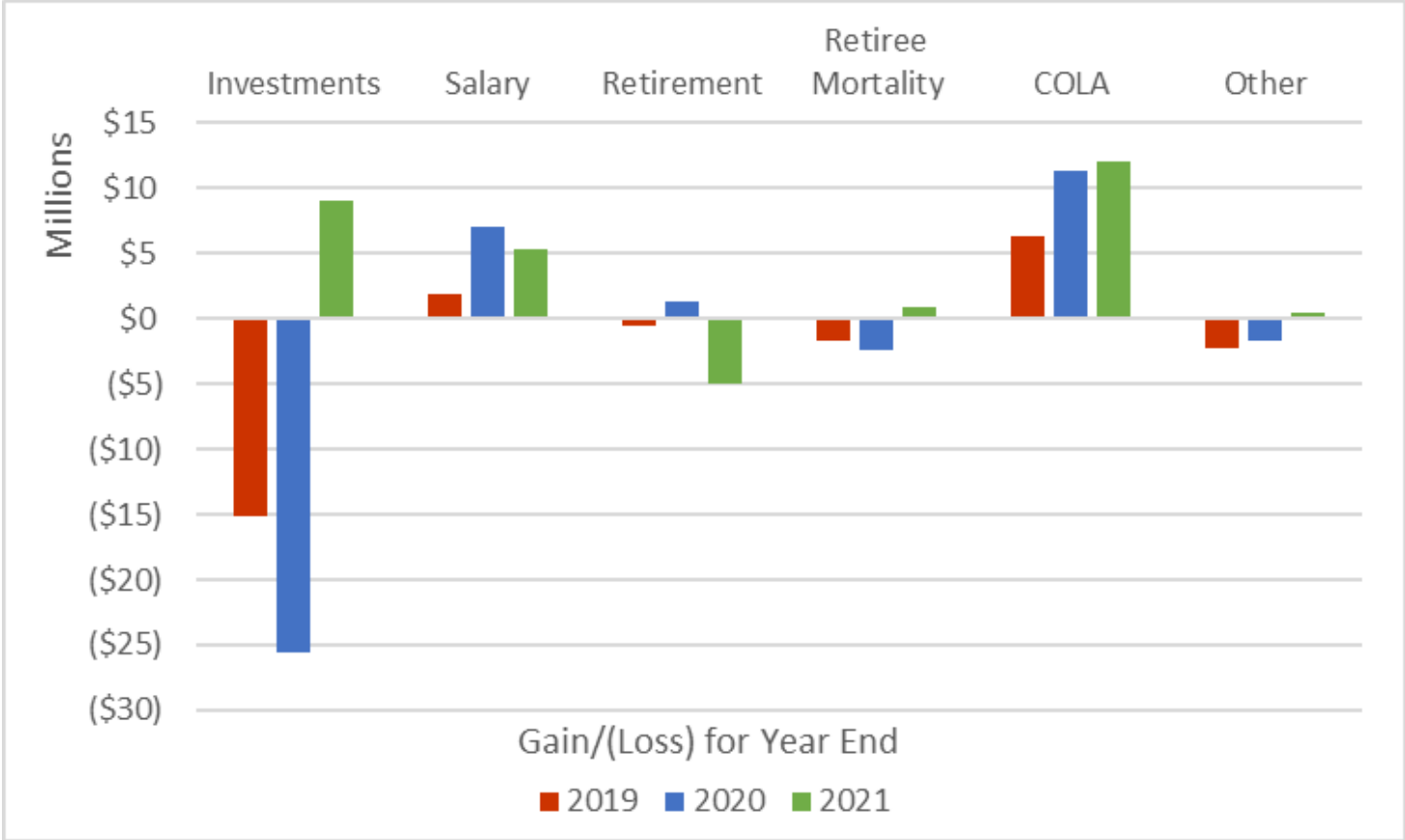
Note: Numbers may not add due to rounding.



Factors Impacting UAAL

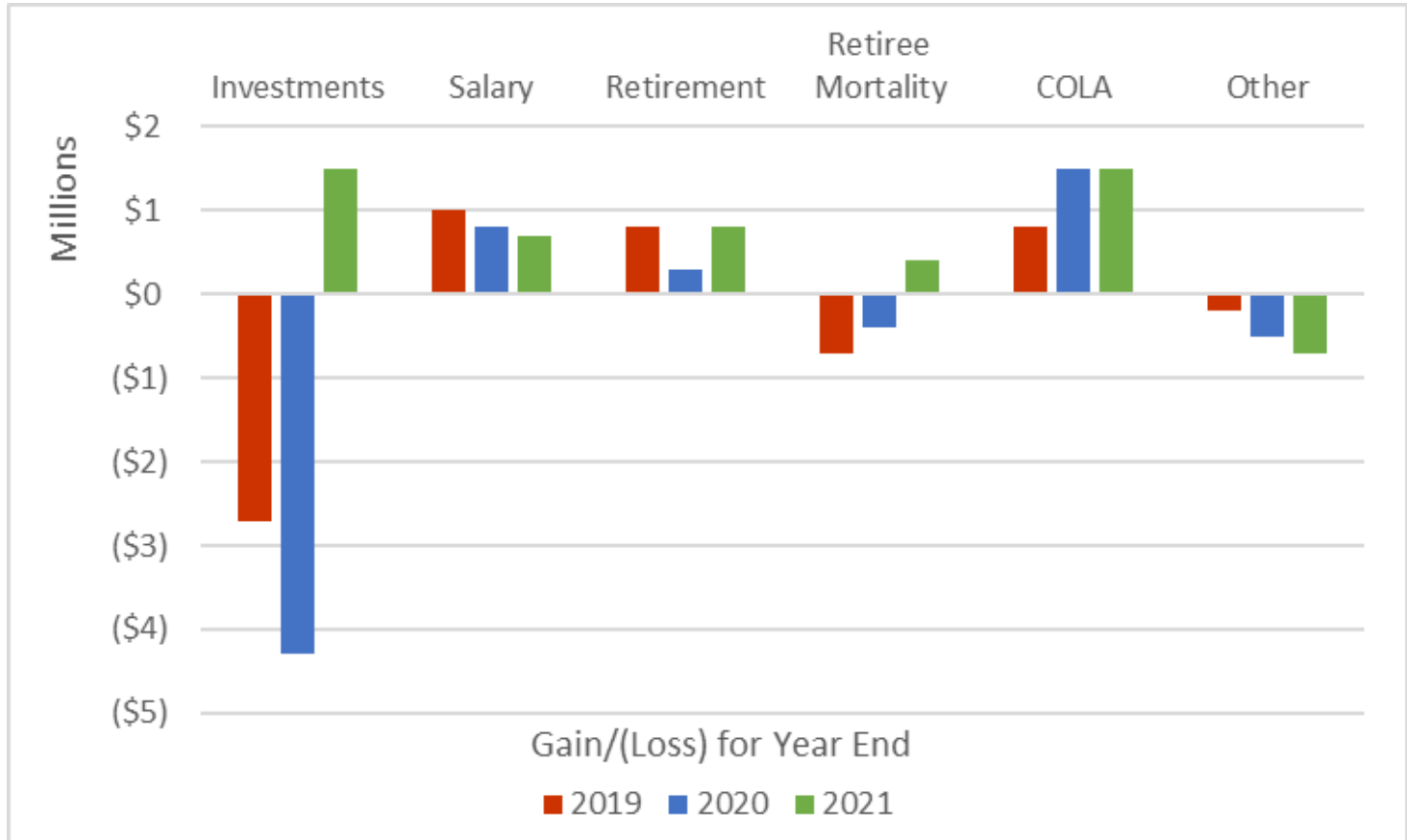
	Police	Civilians
UAAL at 4/30/20	\$ 318.3M	\$ 42.8M
Expected change due to amortization	4.5	0.7
Asset experience	(9.0)	(1.5)
Demographic experience	(13.6)	(2.7)
Assumption changes	7.3	1.3
All other experience	<u>(2.5)</u>	<u>(0.4)</u>
UAAL at 4/30/21	\$ 305.0M	\$ 40.2M

Police: Actuarial Gain/(Loss) By Source



“Other” category includes Active Mortality, Disability, Withdrawal, and all other liability experience.

Civilians: Actuarial Gain/(Loss) By Source

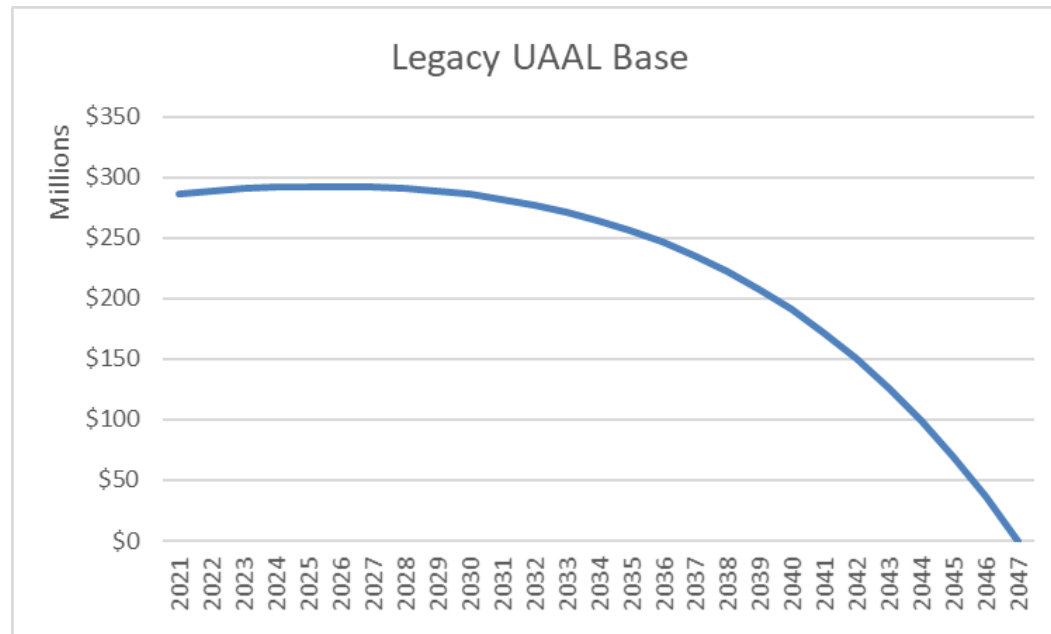


“Other” category includes Active Mortality, Disability, Withdrawal, and all other liability experience.

Police: Unfunded Actuarial Accrued Liability

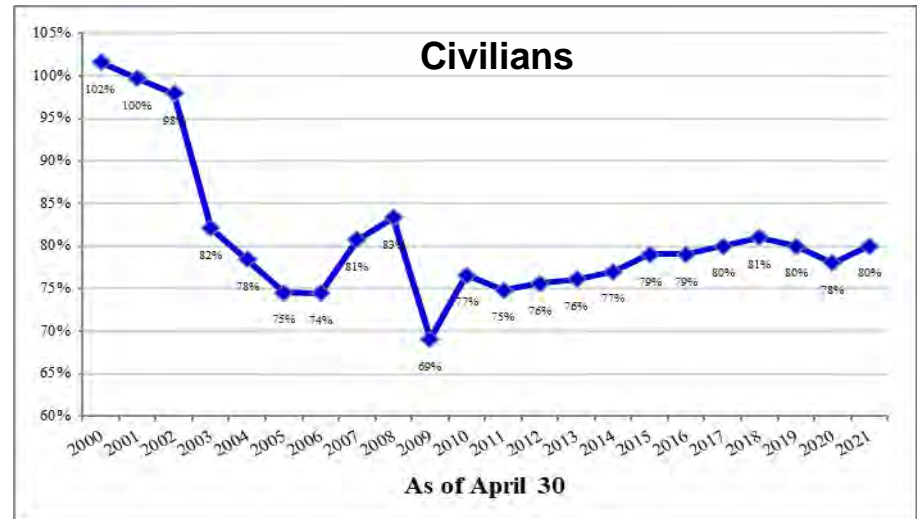
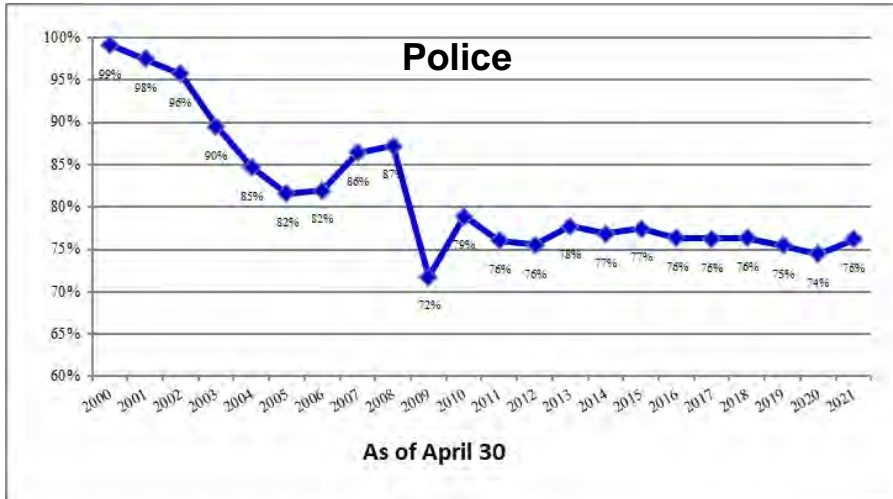


- Effective with the 2017 valuation, the Unfunded Actuarial Accrued Liability is amortized using a “Layered” approach
 - 8 “layers” in the current valuation, new layer(s) added each year
 - Payments in future years are assumed to increase 3.00% using the “Level percent of pay” amortization methodology
 - Balance increases slightly in the short term before ultimately declining





Historical Funded Ratio





Actuarial Contribution Rates

- Components of Contribution Rate:
 - Normal Cost
 - Amortization of UAAL

- Funding policy finances the 4/30/17 UAAL over a 30-year closed period. New layers each year (starting in 2018) are amortized over closed 20 year periods.

- 4/30/2021 valuation sets the contribution amount for May 1, 2022 to April 30, 2023



Actuarial Contribution Rate - Police

	2021	2020	% Change
Normal Cost	25.55%	25.38%	0.7%
UAAL Payment	<u>20.57%</u>	<u>20.61%</u>	<u>(0.2%)</u>
Total Actuarial Rate	46.12%	45.99%	0.3%
Less Member Rate	<u>(11.55)%</u>	<u>(11.55)%</u>	<u>0.0%</u>
Employer Actuarial Rate	34.57%	34.44%	0.4%
City Contribution Amount	\$33,589,155	\$34,741,680	(3.3%)

Note: Decrease in City Contribution from 2020 valuation is \$1,152,525



Actuarial Contribution Rate - Civilians

	2021	2020	% Change
Normal Cost	15.09%	14.91%	1.2%
UAAL Payment	<u>8.69%</u>	<u>9.36%</u>	<u>(7.2%)</u>
Total Actuarial Rate	23.78%	24.27%	(2.0%)
Less Member Rate	<u>(5.00)%</u>	<u>(5.00)%</u>	<u>0.0%</u>
Employer Actuarial Rate	18.78%	19.27%	(2.5%)
City Contribution Amount	\$5,700,592	\$5,800,468	(1.7%)

Note: decrease in City Contribution from 2020 valuation is \$99,876

Factors Impacting Actuarial Contribution Rate



	Police	Civilians
Actuarial Contribution Rate at 4/30/20	45.99%	24.27%
Change in normal cost rate	(0.10%)	0.01%
Asset experience	(0.74%)	(0.39%)
Demographic experience	(1.13%)	(0.71%)
Assumption changes	0.78%	0.47%
Payroll increase other than expected	1.30%	0.18%
All other experience	<u>0.02%</u>	<u>(0.05%)</u>
Actuarial Contribution Rate at 4/30/21	46.12%	23.78%

Police: Impact of Alternate Investment Return Assumptions



Valuation Results at	7.10%	7.25%	7.35%
Normal Cost Rate	27.09%	26.15%	25.55%
UAAL Contribution	<u>23.30%</u>	<u>21.66%</u>	<u>20.57%</u>
Total Actuarial Contribution	50.39%	47.81%	46.12%
Employee Contribution Rate	<u>(11.55%)</u>	<u>(11.55%)</u>	<u>(11.55%)</u>
City Contribution Rate	38.84%	36.26%	34.57%
City Contribution (\$M)	\$37.7	\$35.2	\$33.6
Funded Ratio	74%	75%	76%
Unfunded Actuarial Accrued Liability (\$M)	\$344	\$320	\$305

Civilians: Impact of Alternate Investment Return Assumptions



Valuation Results at	7.10%	7.25%	7.35%
Normal Cost Rate	16.05%	15.46%	15.09%
UAAL Contribution	<u>10.18%</u>	<u>9.29%</u>	<u>8.69%</u>
Total Actuarial Contribution	26.23%	24.75%	23.78%
Employee Contribution Rate	<u>(5.00%)</u>	<u>(5.00%)</u>	<u>(5.00%)</u>
City Contribution Rate	21.23%	19.75%	18.78%
City Contribution (\$M)	\$6.4	\$6.0	\$5.7
Funded Ratio	78%	79%	80%
Unfunded Actuarial Accrued Liability (\$M)	\$47	\$43	\$40



Ad Hoc COLA

- Board has new a formal policy to determine if COLA is granted. Must satisfy the following:
 - Funded ratio at least 75% and will not fall below 75% as a result of any COLA granted
- Policy also requires consideration of the following:
 - Actuarial impact on liabilities from any COLA granted
 - Current COLA matrix when determining amount of COLA that can be supported given the asset return and funded ratio
 - ✓ Police: 3% COLA
 - ✓ Civilians: 3% COLA



Projections

- Actuarial valuation is a snapshot measurement at a single point in time

- Provides important information, but no insight into future valuation results/trends
 - How will unrecognized investment experience impact contributions in the future
 - How does Funding Policy impact funded status over time
 - How will the new tier of benefits for new hires impact future funding requirements
 - Provides ability to perform some basic sensitivity analysis and risk evaluation



Limitations of Projections

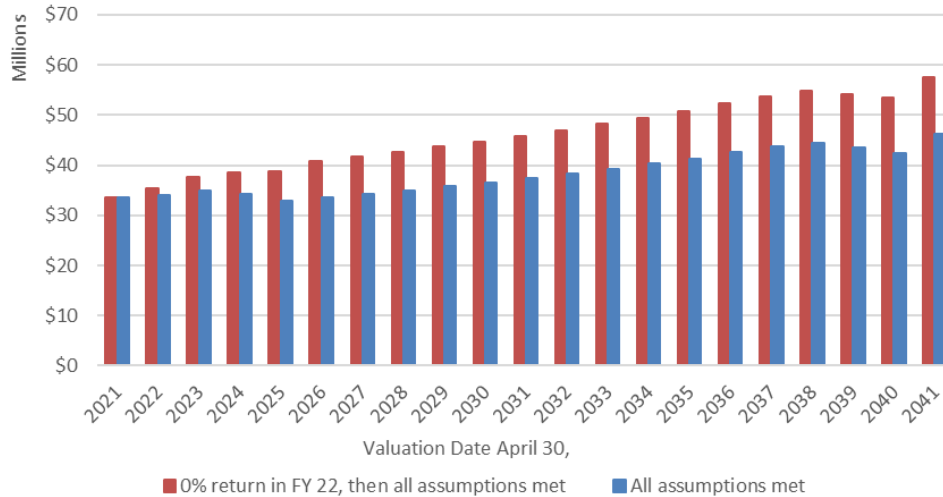
- Not precise predictions but rather general trends
- Projections based on many assumptions
 - Reflects step down of investment return assumption over next two years to 7.25%
 - Assumes the investment return assumption is met in all future years, unless otherwise noted
 - All other actuarial assumptions met in the future
 - Constant number of active members
 - No change in current plan provisions
 - Contributions are paid timely per Board's Funding Policy, including closed amortization periods



Police Retirement System

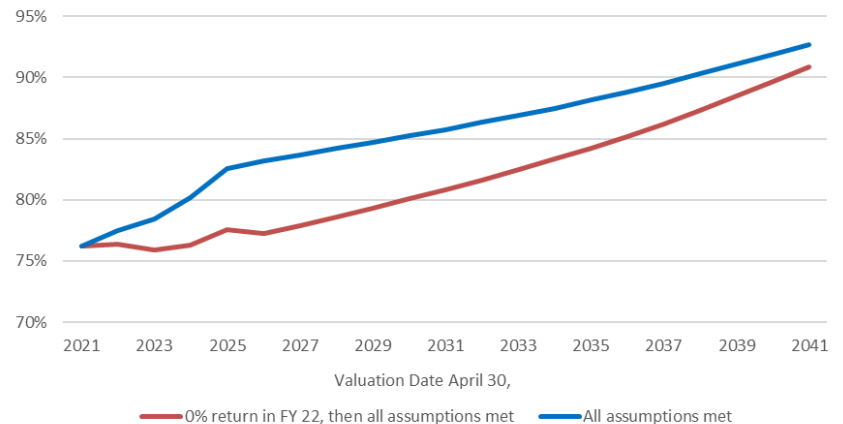
0% Return in FY 2022

City Contribution Amount



The alternate scenario with a return of 0% results in significantly higher contributions over time.

Funded Ratio

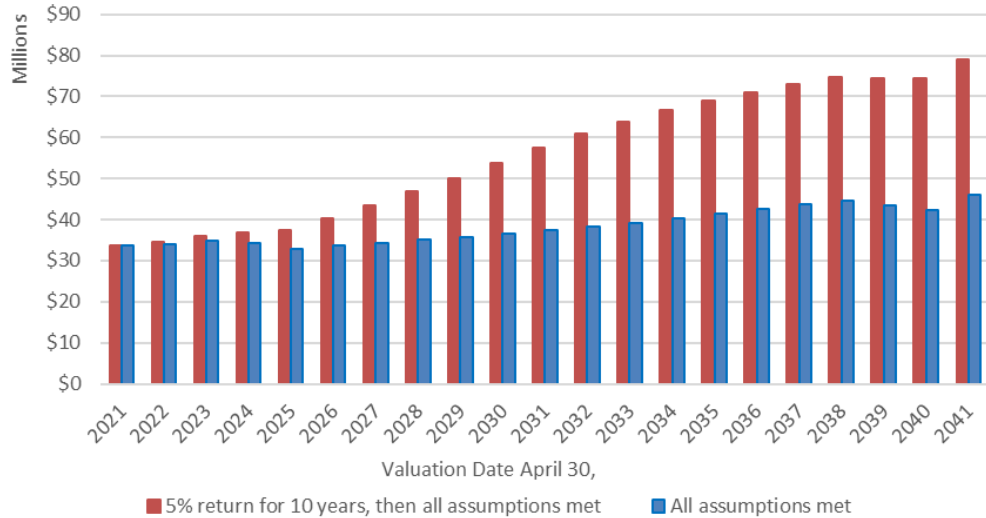




Police Retirement System

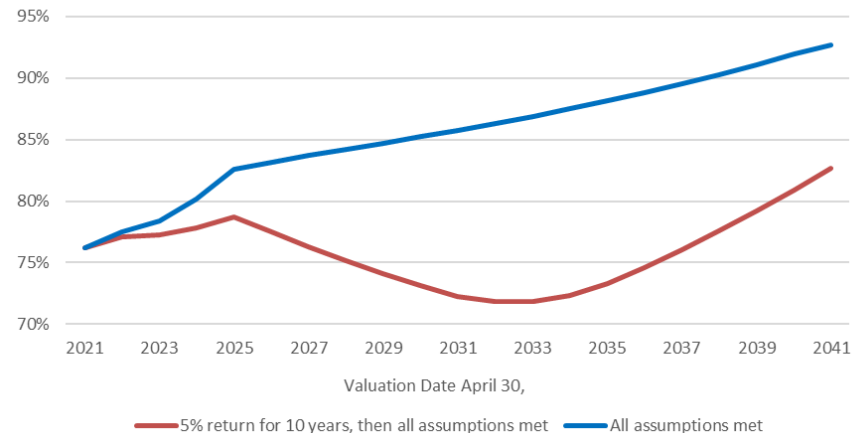
5% Return for 10 Years

City Contribution Amount



Low returns for the next 10 years, as predicted by most investment consultants, would have a dramatic impact on the System's funding.

Funded Ratio





Comments

- Actuarial gains on both assets and liabilities had a positive impact on 2021 valuation results
- It will take another 10-15 years before the impact of the plan changes (benefits and contributions) has a material impact on valuation results, and longer if there are fewer new hires in future years.
- Impact of the decrease in the investment return assumption is somewhat mitigated by deferred investment experience in the next few years, if all assumptions are met.
- COLA policy provides some relief on liabilities when assumptions are not met.

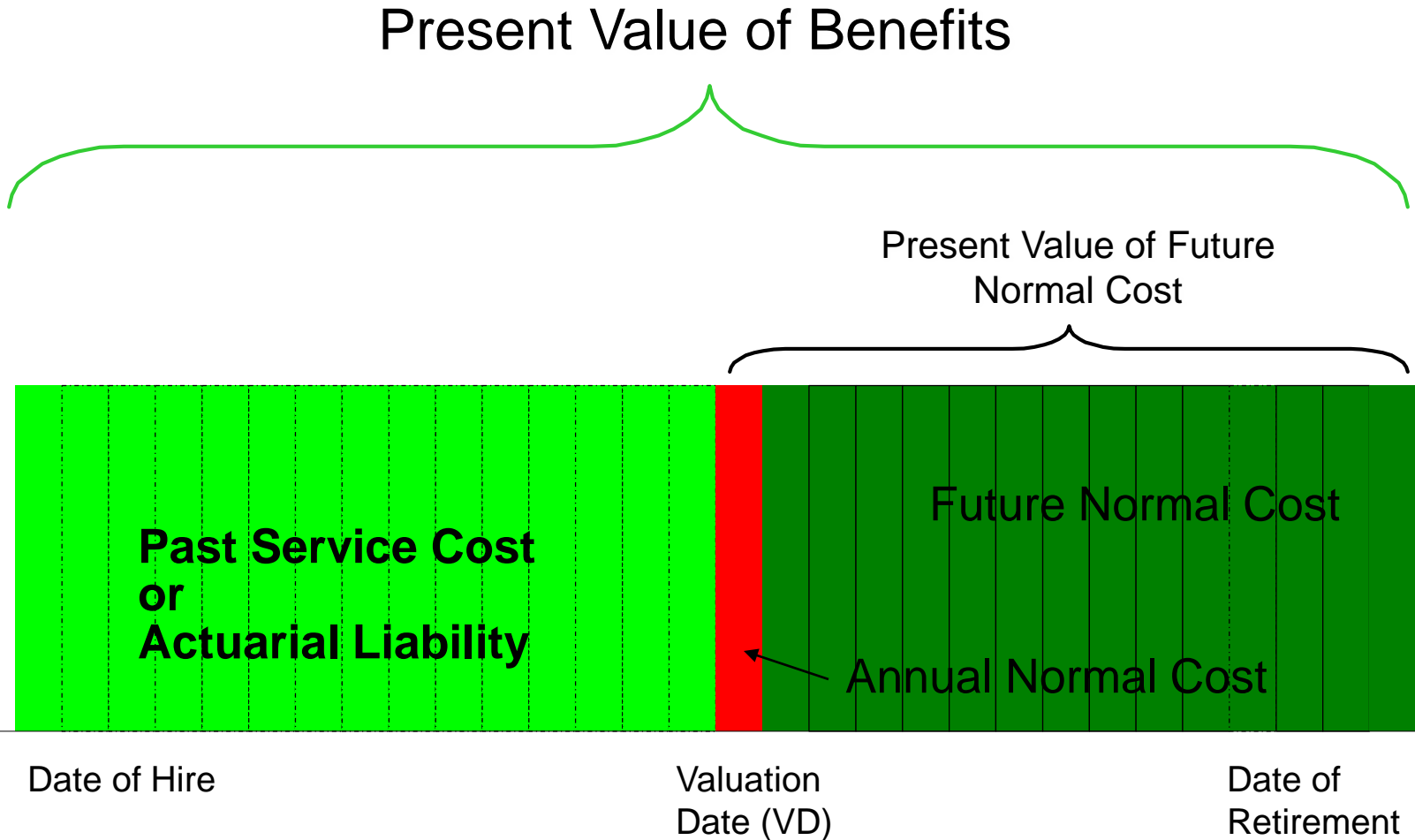


Appendix of Supplemental Information

Actuarial Funding Process



Contribution as
% of Pay



$$\text{Actuarial Accrued Liability} - \text{Actuarial Assets} = \text{Unfunded Actuarial Accrued Liability}$$

Unfunded Actuarial Accrued Liability (UAAL) at April 30, 2021



Dollars Shown in Millions

	Police	Civilians
Actuarial Accrued Liability	\$1,283	\$ 205
Actuarial Value of Assets	<u>978</u>	<u>165</u>
Unfunded Actuarial Accrued Liability*	305	40
Funded Ratio	76%	80%

* Numbers may not add or subtract due to rounding.

Unfunded Actuarial Accrued Liability Amortization Rate - Police



	Original Amount	Remaining Payment	5/1/2022 Balance	Annual Payment
2017 Legacy UAAL	\$271,513,914	26	\$286,415,326	\$18,250,803
2018 Experience	3,938,832	17	3,883,831	322,887
2019 Assumption Changes	7,029,844	18	6,961,812	556,668
2019 Experience	10,682,521	18	10,579,139	845,911
2020 Assumption Changes	7,234,995	19	7,208,770	556,035
2020 Experience	10,137,107	19	10,100,362	779,073
2021 Assumption Changes	7,807,241	20	7,807,241	582,438
2021 Experience	(25,536,400)	20	(25,536,400)	(1,905,075)
Total			\$307,420,081	\$19,988,740

1. Total UAAL Amortization Payment	\$ 19,988,740
2. Expected Payroll for FYE 2023	97,162,729
3. UAAL Payment Rate: (1)/(2)	20.57%

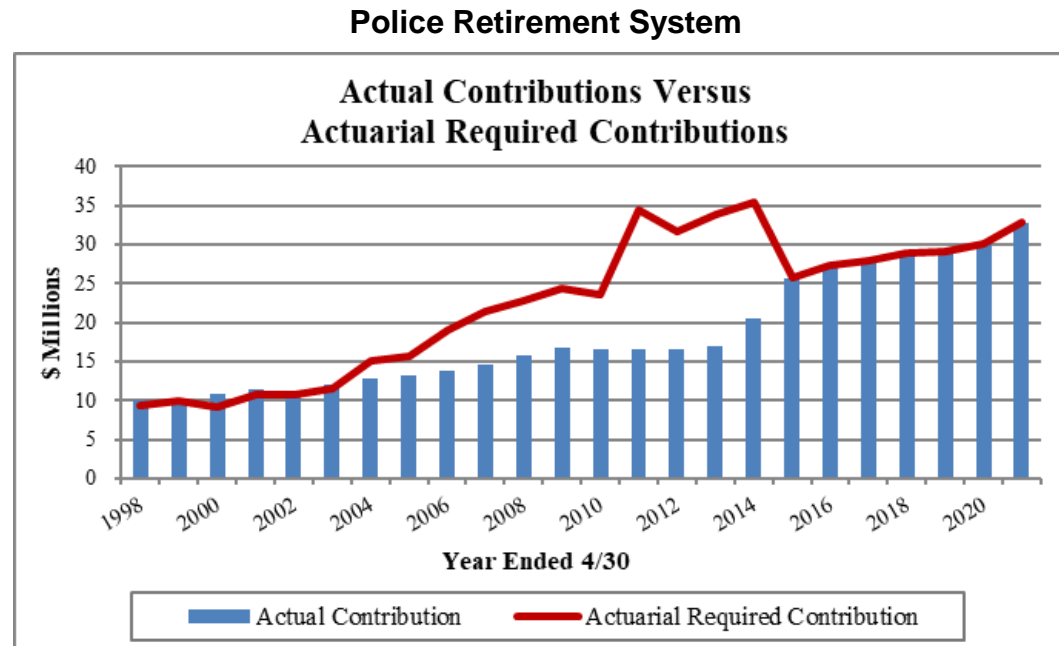


Risk Considerations

- “Risk” in this context means **uncertainty**
- Key risks include:
 - Investment risk
 - Demographic risks
 - External risks
- Most significant risk for most retirement systems is investment risk
- Although the majority of the risks are outside the control of the system, certain metrics can be tracked to help identify the impact of the risks and changes to policies to the extent possible

ASOP 51: Funding Risk

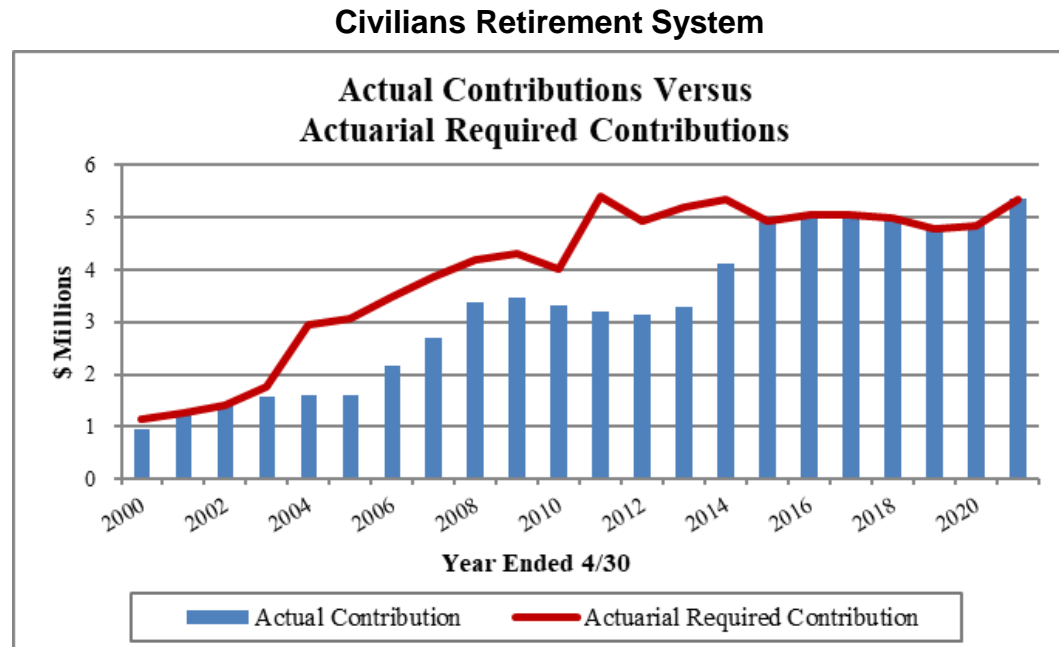
- Direct correlation between healthy, well-funded plans and consistently making full actuarial contributions



- Contributions less than actuarial amount for 2003 through 2014. Full actuarial contribution is now required by statute.

ASOP 51: Funding Risk

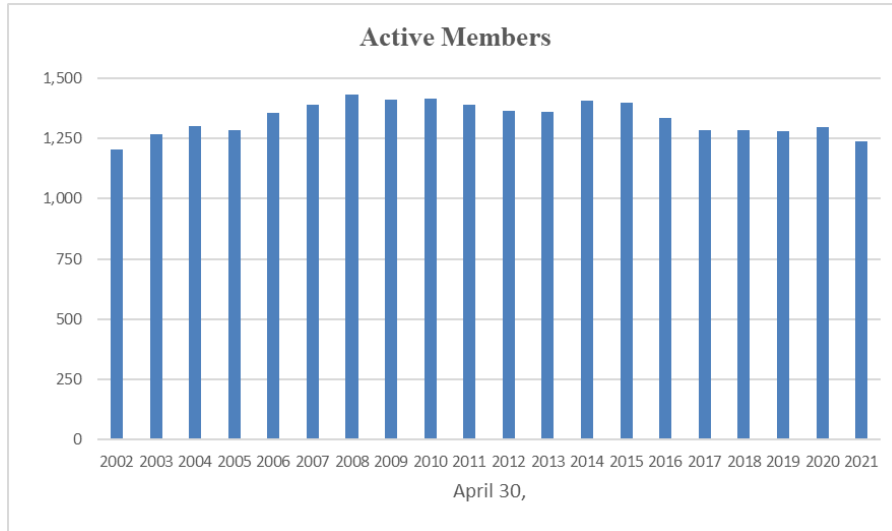
- Direct correlation between healthy, well-funded plans and consistently making full actuarial contribution



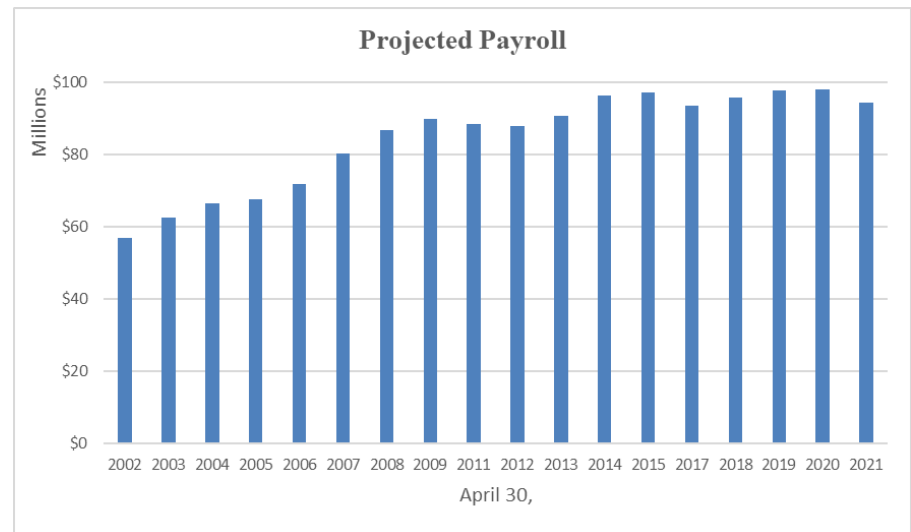
- Contributions less than actuarial amount for 2003 through 2014. Full actuarial contribution is now required by statute.



Police Payroll Growth Risk

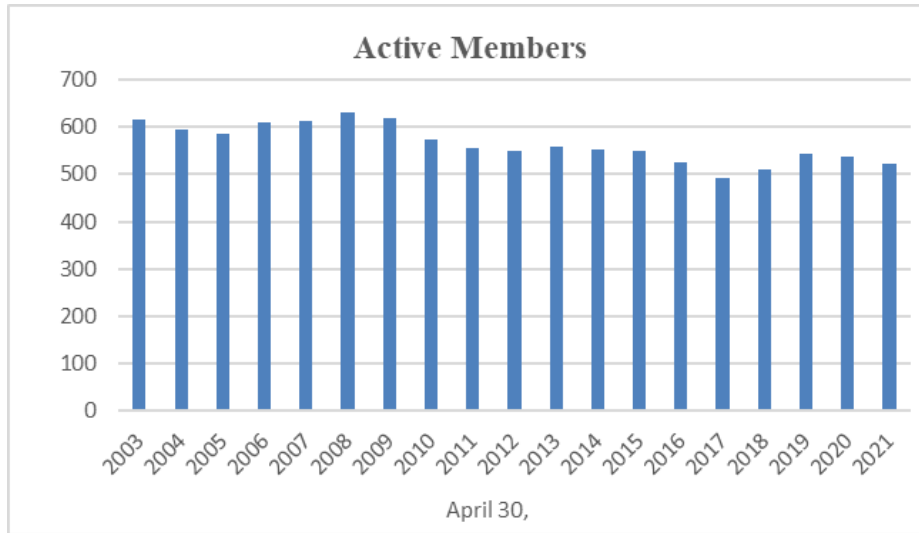


Any decrease in the size of the active membership puts pressure on the contribution rate largely because covered payroll does not increase as assumed.

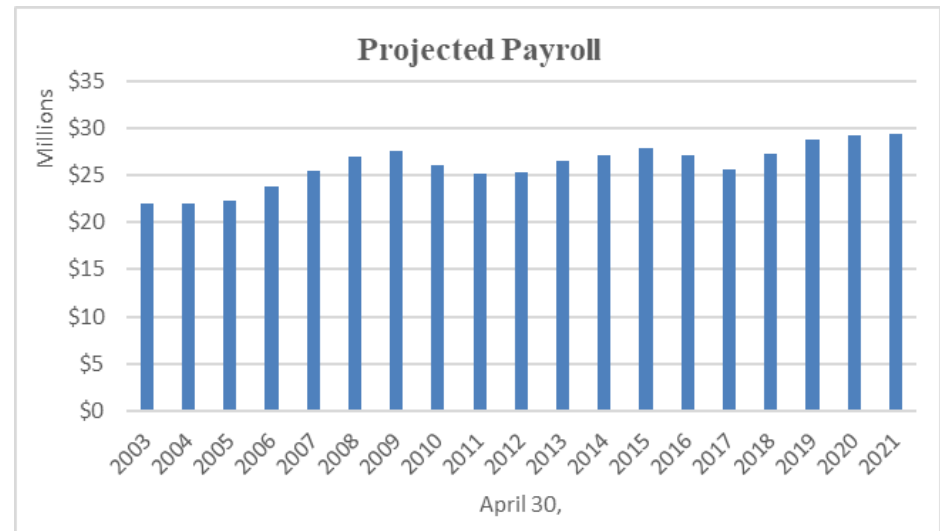




Civilians Payroll Growth Risk



Any decrease in the size of the active membership puts pressure on the contribution rate largely because covered payroll does not increase as assumed.



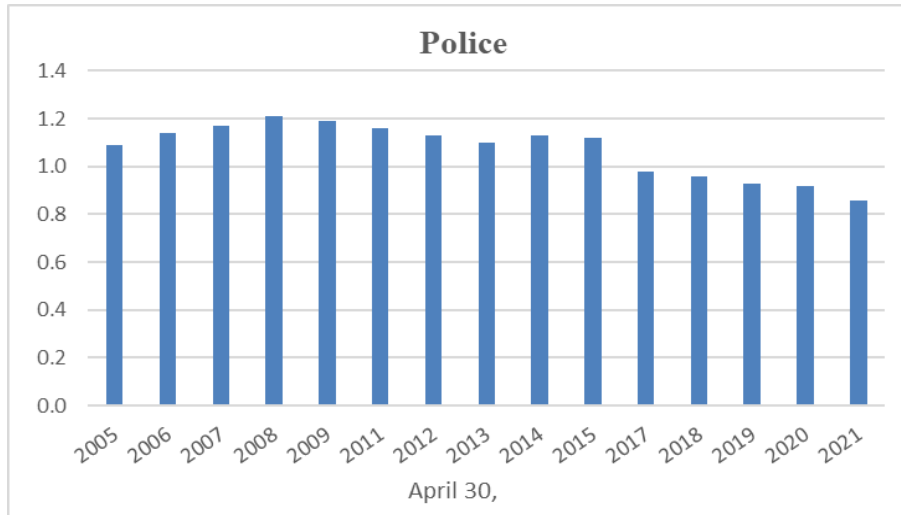


ASOP 51: Maturity Measurements

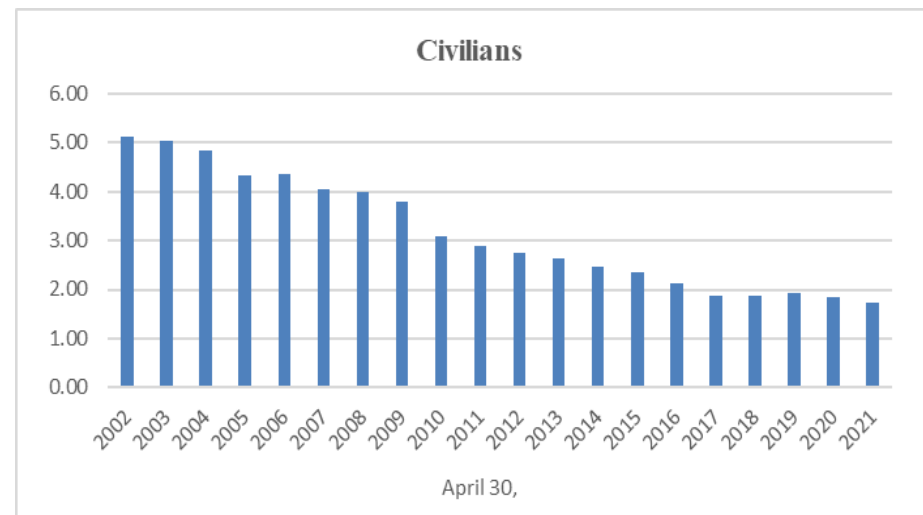
- Police Retirement System is a very mature System, having been created in 1946
 - The more mature the system, the more sensitive it is to investment volatility, i.e., harder to recover from investment losses with increased contributions
 - Significant differences between actual and expected returns, which are not unexpected, have a large impact on contribution amounts (volatility)
- Civilians' System is less mature (created in 1965) but demographics have still changed over time



Maturity Measure: Active to Retiree Ratio



Note: the scale of the two graphs is different, but the Police Plan is more mature than the Civilians Plan. Both have changed demographically over this period but Civilians more than the Police Plan.





Contribution Rate Volatility

- Asset Volatility Ratio is market value of assets divided by covered payroll

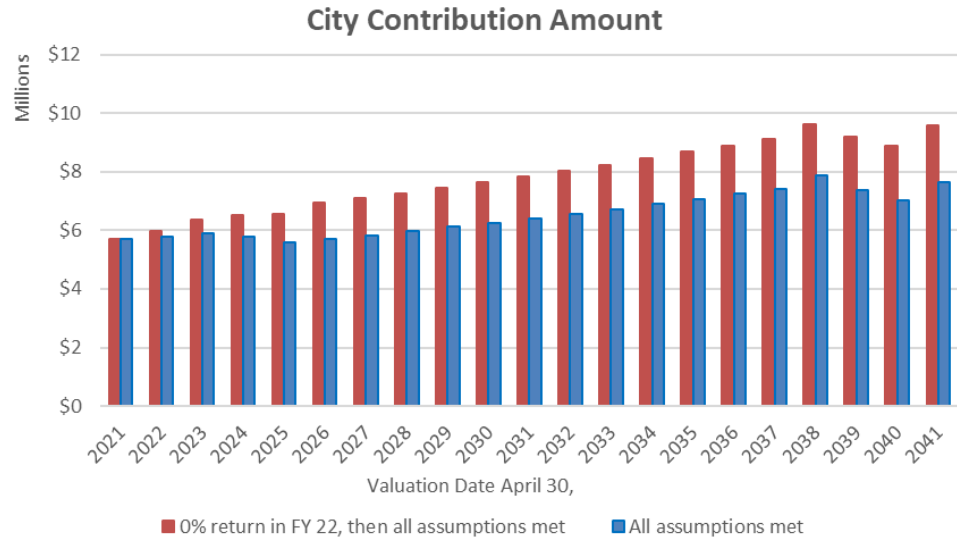
	Year	Assets	Payroll	Ratio
Police	2021	\$1,033.6M	\$94.3M	10.96
Civilians	2021	\$174.2M	\$29.5M	5.91

- Underperforming the investment return assumption by 10% (e.g., -2.65% for one year)
 - Police:
 - Actuarial loss of \$103 million or 110% of payroll
 - Increases contribution rate by 8.18% of pay (without smoothing)
 - Civilians:
 - Actuarial loss of \$17 million or 59% of payroll
 - Increases contribution rate by 4.41% of pay (without smoothing)
- Same investment experience has a more dramatic impact on the contribution rate for Police

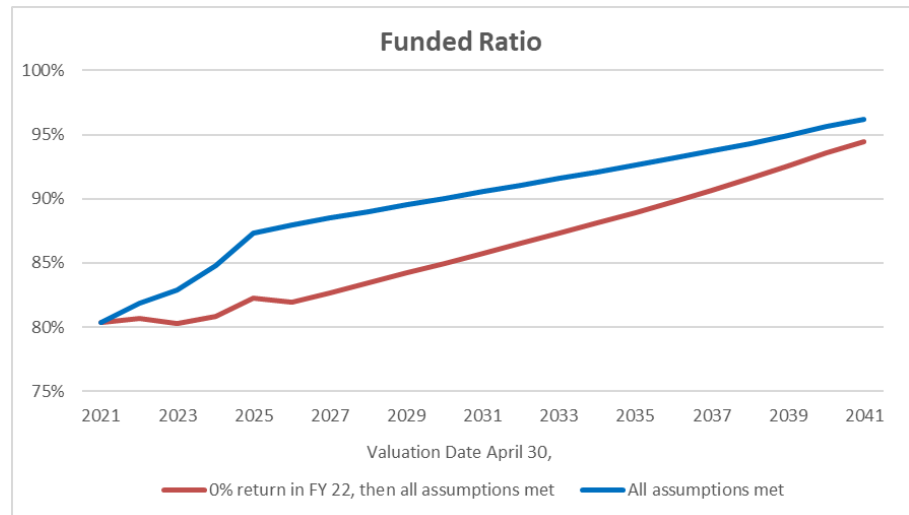


Civilians Retirement System

0% Return in FY 2022



The alternate scenario with a return significantly under the assumption has a dramatic impact on future contributions and funded ratios.

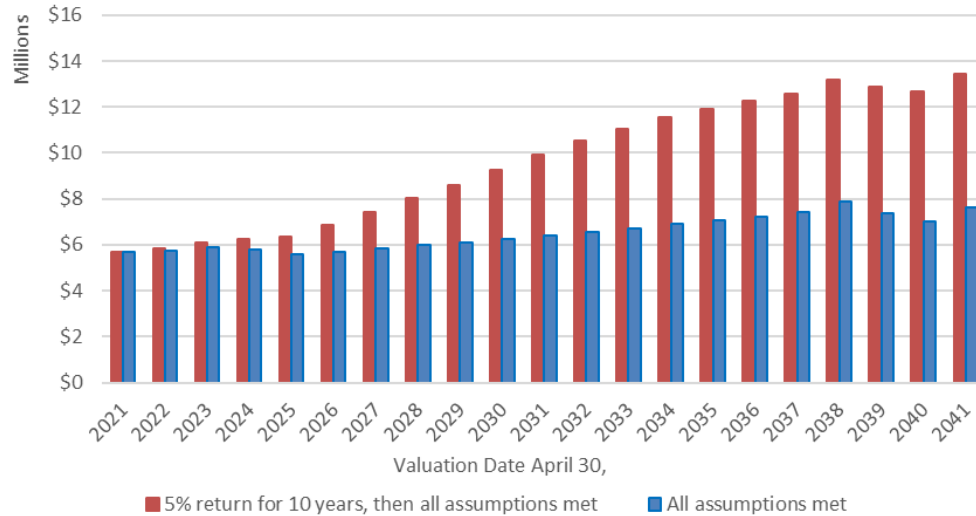




Civilians Retirement System

5% Return for 10 Years

City Contribution Amount



Low returns for the next 10 years, as predicted by most investment consultants, have a dramatic impact on the System's funding.

Funded Ratio

