

# Ohio Public Employees Retirement System

Actuarial Valuation of Defined Benefit Allowances –  
Traditional, Combined and Member Directed Plans  
December 31, 2021



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August 24, 2022

The Retirement Board  
Ohio Public Employees Retirement System  
Columbus, Ohio

Ladies and Gentlemen:

The results of the **December 31, 2021 Annual Actuarial Valuation of Defined Benefit Allowances** of the Ohio Public Employees Retirement System (OPERS), based upon Chapter 145 of the Revised Code of Ohio (ORC) as amended, are presented in this report. The gain/loss analysis of experience by division, the annual actuarial valuation of retiree health and Medicare benefits, projections of defined benefit allowances and projections of retiree health and Medicare benefits are covered in separate reports. In conjunction with Chapter 145 of the ORC, the purposes of performing the annual valuation are as follows:

- Measure the financial position of OPERS,
- Assist the Board in establishing employer and employee contribution rates subject to statutory limits,
  - Employer contribution rates for the State are established for a two-year period based upon the results of odd-year valuations. The December 31, 2021 valuation is used to establish the contribution rates for the two-year period beginning July 1, 2023.
  - Employer contribution rates for local governments are established annually. The December 31, 2021 valuation establishes employer contribution rates for calendar year 2024.
- Assist the Board in establishing the employer rate allocation between pension and retiree health,
- Determine the number of years required to amortize the unfunded actuarial accrued liabilities based upon established contribution rates,
- Provide actuarial reporting and disclosure information for the System's financial report, and
- Analyze the experience of the System over the past year.

This report should not be relied on for any purpose other than those described above. It was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the System only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

The signing actuaries are independent of the plan sponsor.

The individual member statistical data required for the valuations was furnished by your Executive Director and Staff, together with pertinent data on financial operations. Their cooperation in furnishing these materials is acknowledged with appreciation. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the data.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as 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.

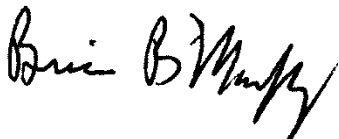
The actuarial assumptions used in the valuation are summarized in Section X of this report. The assumptions are established by the Retirement Board after consulting with the actuary.

This report was prepared using our proprietary valuation model and related software which, in our professional judgment, has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents the actuarial position of the Ohio Public Employees Retirement System as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

Brian B. Murphy and Mita D. Drazilov are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,  
Gabriel, Roeder, Smith & Company



Brian B. Murphy, FSA, EA, FCA, MAAA, PhD



Mita D. Drazilov, ASA, FCA, MAAA

BBM/MDD:rmn



**SECTION I**

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**EXECUTIVE SUMMARY**

# Introduction

Section 145.22 of the Revised Code of Ohio (ORC) provides in part as follows:

“(A) The public employees retirement board shall have prepared annually by or under the supervision of an actuary an actuarial valuation of the pension assets, liabilities, and funding requirements of the public employees retirement system as established pursuant to this chapter.”

This report presents the results of the December 31, 2021 annual actuarial valuation of the Ohio Public Employees Retirement System (OPERS) Defined Benefit Allowances of the Traditional, Combined and Member Directed Plans. In conjunction with Chapter 145 of the ORC, the purposes of performing the annual valuation are as follows:

- Measure the financial position of OPERS,
- Assist the Board in establishing employer and employee contribution rates subject to statutory limits,
  - Employer contribution rates for the State are established for a two-year period based upon the results of odd-year valuations. The December 31, 2021 valuation is used to establish the contribution rates for the two-year period beginning July 1, 2023.
  - Employer contribution rates for local governments are established annually. The December 31, 2021 valuation establishes employer contribution rates for calendar year 2024.
- Assist the Board in establishing the employer rate allocation between pension and retiree health,
- Determine the number of years required to amortize the unfunded actuarial accrued liabilities based upon established contribution rates,
- Provide actuarial reporting and disclosure information for the System’s financial report, and
- Analyze the experience of the System over the past year.

The report is presented as follows:

Section I	-	Executive Summary
Section II	-	Financial Information
Section III	-	Benefits and Conditions Evaluated
Section IV	-	Recommendations for Reserve Transfers
Section V	-	Valuation Results for State
Section VI	-	Valuation Results for Local Government
Section VII	-	Valuation Results for Public Safety
Section VIII	-	Valuation Results for Law Enforcement
Section IX	-	Allowances Being Paid to Retirees and Beneficiaries
Section X	-	Actuarial Methods and Assumptions
Section XI	-	Financial Principles
Section XII	-	Additional Schedules

There have been no significant benefit changes since the last valuation. Please see Section III for a detailed description of the benefit provisions.

Total employer and member contribution rates by division, as well as the allocation of the employer contribution rate between pension and retiree health was based upon information known as of the valuation date.



# Summary of Pension Defined Benefit Valuation Results

## Traditional, Combined, and Member Directed Plans

### December 31

### (\$ in Millions)

	2021						2020		
	General			Law			Assumptions		
	State	Local	Total General	Public Safety	Law Enforcement	Total Law	Grand Total	New Grand Total	Old Grand Total
<b>A. Demographic Information</b>									
1. Number Counts									
a. Active Members									
i. Traditional Plan (TP)	98,359	168,117	266,476	42	7,931	7,973	274,449	271,345	271,345
ii. Combined Plan (CP)	2,637	4,485	7,122	0	0	0	7,122	7,264	7,264
iii. Member Directed Plan (MD)	3,584	6,403	9,987	0	0	0	9,987	10,004	10,004
iv. Total	104,580	179,005	283,585	42	7,931	7,973	291,558	288,613	288,613
b. Retired Number Counts	77,330	143,775	221,105	185	5,746	5,931	227,036	223,652	223,652
c. Deferred/Inactive Number Counts	315,833	363,305	679,138	62	1,503	1,565	680,703	658,548	658,548
d. Total Number Counts	497,743	686,085	1,183,828	289	15,180	15,469	1,199,297	1,170,813	1,170,813
2. Active Payroll									
a. DB Active Members									
i. Traditional Plan (TP)	\$ 5,369	\$ 7,967	\$ 13,337	\$ 2	\$ 593	\$ 595	\$ 13,932	\$ 13,499	\$ 13,499
ii. Combined Plan (CP)	188	263	451	0	0	0	451	439	439
b. Other Payroll									
i. Reemployed Retirees	\$ 92	\$ 311	\$ 404				\$ 404	\$ 396	\$ 396
ii. Member Directed Plan (MD)	241	394	635				635	610	610
iii. Alternative Retirement Plan (ARP)	574	0	574				574	585	585
<b>B. Defined Benefit Assets</b>									
1. Market Value (MV)	\$ 41,810	\$ 62,945	\$ 104,756	\$ 37	\$ 5,419	\$ 5,455	\$ 110,211	\$ 98,853	\$ 98,853
2. Rate of Return on MV							15.46 %	11.60 %	11.60 %
3. Funding Value (FV)	\$ 37,827	\$ 56,948	\$ 94,775	\$ 33	\$ 4,902	\$ 4,935	\$ 99,710	\$ 93,969	\$ 93,969
4. Rate of Return on FV							10.18 %	10.15 %	10.15 %
5. Ratio of FV to MV							90.5%	95.1%	95.1%
<b>C. Defined Benefit Actuarial Results</b>									
1. TP & CP Normal Cost as a % of Payroll	14.12%	14.11%	14.11%	18.07%	20.43%	20.41%	14.37%	14.41%	14.50%
2. Actuarial Accrued Liability (AAL)									
a. Active	\$ 15,095	\$ 22,636	\$ 37,731	\$ 7	\$ 2,146	\$ 2,154	\$ 39,885	\$ 39,297	\$ 38,557
b. Retired	30,006	42,120	72,126	58	3,170	3,227	75,353	72,816	71,818
c. Deferred/Inactive	1,330	1,899	3,229	1	49	50	3,279	3,128	2,997
d. Total	\$ 46,431	\$ 66,655	\$ 113,086	\$ 66	\$ 5,365	\$ 5,431	\$ 118,517	\$ 115,241	\$ 113,372
3. Unfunded AAL (UAAL) (FV Basis)	\$ 8,604	\$ 9,707	\$ 18,311	\$ 33	\$ 463	\$ 496	\$ 18,807	\$ 21,272	\$ 19,402
4. Unfunded AAL (UAAL) (MV Basis)	\$ 4,621	\$ 3,710	\$ 8,330	\$ 29	\$ (54)	\$ (24)	\$ 8,306	\$ 16,388	\$ 14,519
5. Funded Ratio (FV Basis)	81.5 %	85.4 %	83.8 %	50.4 %	91.4 %	90.9 %	84.1 %	81.5 %	82.9 %
<b>D. Amortization Years to Fully Amortize UAAL *</b>									
	22	14	17	N/A	7	8	16	21	18
<b>E. Defined Benefit Contribution Rates (Percents of Payroll)</b>									
	CY 2024						CY 2023		
1. Pension Contributions									
a. Employer Normal Cost	4.50%	4.46%	4.47%	6.07%	7.43%	7.41%	4.59%	4.64%	4.73%
b. Member Contribution Rate #	9.62%	9.65%	9.64%	12.00%	13.00%	13.00%	9.78%	9.77%	9.77%
c. UAAL Contribution Rate	9.44%	9.48%	9.47%	12.03%	10.67%	10.69%	9.52%	9.54%	9.45%
d. Total	23.56%	23.59%	23.58%	30.10%	31.10%	31.10%	23.89%	23.95%	23.95%
2. Retiree Health Contribution Rate ^									
	0.06%	0.06%	0.06%	0.00%	0.00%	0.00%	0.06%	0.00%	0.00%
3. Total Employer Contribution Rate									
	14.00%	14.00%	14.00%	18.10%	18.10%	18.10%	14.17%	14.18%	14.18%

\* Based on i) schedule of employer and member contribution rates shown on page III-4 and ii) Entry age actuarial cost method reflecting additional future normal cost savings anticipated to occur as Traditional and Combined Plan Group A, B and C members are replaced by new hires subject to Traditional Plan Group C benefit provisions. For the December 31, 2021 results, the amortization years shown are from December 31, 2022. Amortization years are determined based upon scheduled contribution rate changes, if any, through calendar year 2024.

# CY 2023 and 2024 rates reflect 0% for Combined Plan members.

^ CY 2024 rates reflect Combined Plan Members contributing 2.0% of payroll to Retiree Health.



# Summary of Pension Defined Benefit Valuation Results

## Traditional Plan

### December 31

#### (\$ in Millions)

	2021						2020		
	General			Law			Assumptions		
	State	Local	Total General	Public Safety	Law Enforcement	Total Law	Grand Total	New Grand Total	Old Grand Total
<b>A. Demographic Information</b>									
1. Number Counts									
a. Active Members	98,359	168,117	266,476	42	7,931	7,973	274,449	271,345	271,345
b. Retired Number Counts	76,932	142,877	219,809	185	5,746	5,931	225,740	222,577	222,577
c. Deferred/Inactive Number Counts	314,780	361,842	676,622	62	1,503	1,565	678,187	656,193	656,193
d. Total Number Counts	490,071	672,836	1,162,907	289	15,180	15,469	1,178,376	1,150,115	1,150,115
2. Active Payroll									
a. DB Active Members	\$ 5,369	\$ 7,967	\$ 13,336	\$ 2	\$ 593	\$ 595	\$ 13,932	\$ 13,499	\$ 13,499
b. Other Payroll									
i. Reemployed Retirees	\$ 92	\$ 311	\$ 404				\$ 404	\$ 396	\$ 396
ii. Member Directed Plan (MD)	241	394	635				635	\$ 610	\$ 610
iii. Alternative Retirement Plan (ARP)	574	0	574				574	\$ 585	\$ 585
<b>B. Defined Benefit Assets</b>									
1. Market Value (MV)	\$ 41,398	\$ 62,356	\$ 103,754	\$ 37	\$ 5,419	\$ 5,455	\$ 109,210	\$ 98,025	\$ 98,025
2. Rate of Return on MV							15.46 %	11.60 %	11.60 %
3. Funding Value (FV)	\$ 37,451	\$ 56,410	\$ 93,861	\$ 33	\$ 4,902	\$ 4,935	\$ 98,796	\$ 93,180	\$ 93,180
4. Rate of Return on FV							10.18 %	10.15 %	10.15 %
5. Ratio of FV to MV							90.5%	95.1%	95.1%
<b>C. Defined Benefit Actuarial Results</b>									
1. Normal Cost as a % of Payroll	14.38%	14.34%	14.35%	18.07%	20.43%	20.41%	14.63%	14.63%	14.73%
2. Actuarial Accrued Liability (AAL)									
a. Active	\$ 14,888	\$ 22,366	\$ 37,254	\$ 7	\$ 2,146	\$ 2,154	\$ 39,407	\$ 38,857	\$ 38,120
b. Retired	29,970	42,055	72,024	58	3,170	3,227	75,251	72,735	71,737
c. Deferred/Inactive	1,318	1,883	3,201	1	49	50	3,251	3,104	2,975
d. Total	\$ 46,176	\$ 66,303	\$ 112,479	\$ 66	\$ 5,365	\$ 5,431	\$ 117,910	\$ 114,696	\$ 112,833
3. Unfunded AAL (UAAL) (FV Basis)	\$ 8,725	\$ 9,893	\$ 18,618	\$ 33	\$ 463	\$ 496	\$ 19,114	\$ 21,516	\$ 19,652
4. Unfunded AAL (UAAL) (MV Basis)	\$ 4,778	\$ 3,947	\$ 8,725	\$ 29	\$ (54)	\$ (24)	\$ 8,700	\$ 16,671	\$ 14,808
5. Funded Ratio (FV Basis)	81.1 %	85.1 %	83.4 %	50.4 %	91.4 %	90.9 %	83.8 %	81.2 %	82.6 %
<b>D. Amortization Years to Fully Amortize UAAL *</b>	<b>22</b>	<b>15</b>	<b>17</b>	<b>N/A</b>	<b>7</b>	<b>8</b>	<b>17</b>	<b>22</b>	<b>18</b>
<b>E. Contribution Rates (Percents of Payroll)</b>									
	CY 2024						CY 2023		
1. Pension Contributions									
a. Employer Normal Cost	4.38%	4.34%	4.35%	6.07%	7.43%	7.41%	4.50%	4.50%	4.60%
b. Member Contribution Rate	10.00%	10.00%	10.00%	12.00%	13.00%	13.00%	10.13%	10.13%	10.13%
c. UAAL Contribution Rate	9.62%	9.66%	9.65%	12.03%	10.67%	10.69%	9.67%	9.68%	9.58%
d. Total	24.00%	24.00%	24.00%	30.10%	31.10%	31.10%	24.30%	24.31%	24.31%
2. Retiree Health Contribution Rate	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3. Total Employer Contribution Rate	14.00%	14.00%	14.00%	18.10%	18.10%	18.10%	14.17%	14.18%	14.18%

\* Based on i) schedule of employer and member contribution rates shown on page III-4 and ii) Entry age actuarial cost method reflecting additional future normal cost savings anticipated to occur as Traditional and Combined Plan Group A, B and C members are replaced by new hires subject to Traditional Plan Group C benefit provisions. For the December 31, 2021 results, the amortization years shown are from December 31, 2022. Amortization years are determined based upon scheduled contribution rate changes, if any, through calendar year 2024.





# Summary of Pension Defined Benefit Valuation Results

## Combined Plan

### December 31

#### (\$ in Millions)

	2021			2020	
	General		Grand Total	Assumptions	
	State	Local		New Grand Total	Old Grand Total
<b>A. Demographic Information</b>					
1. Number Counts					
a. Active Members	2,637	4,485	7,122	7,264	7,264
b. Retired Number Counts	294	620	914	744	744
c. Deferred/Inactive Number Counts	1,053	1,463	2,516	2,355	2,355
d. Total Number Counts	3,984	6,568	10,552	10,363	10,363
2. Active Payroll	\$ 188	\$ 263	\$ 451	\$ 439	\$ 439
<b>B. Defined Benefit Assets</b>					
1. Market Value (MV)	\$ 396	\$ 561	\$ 958	\$ 789	\$ 789
2. Rate of Return on MV			15.42 %	11.57 %	11.57 %
3. Funding Value (FV)	\$ 362	\$ 513	\$ 875	\$ 752	\$ 752
4. Rate of Return on FV			10.28 %	9.82 %	9.82 %
5. Ratio of FV to MV			91%	95%	95%
<b>C. Defined Benefit Actuarial Results</b>					
1. Normal Cost as a % of Payroll	7.33%	7.47%	7.41%	7.40%	7.53%
2. Actuarial Accrued Liability (AAL)					
a. Active	\$ 207	\$ 271	\$ 478	\$ 440	\$ 437
b. Retired	23	39	62	44	44
c. Deferred/Inactive	12	16	28	24	22
d. Total	\$ 242	\$ 326	\$ 567	\$ 508	\$ 502
3. Unfunded AAL (UAAL) (FV Basis)	\$ (120)	\$ (187)	\$ (307)	\$ (244)	\$ (250)
4. Unfunded AAL (UAAL) (MV Basis)	\$ (154)	\$ (235)	\$ (391)	\$ (281)	\$ (287)
5. Funded Ratio (FV Basis)	149.9 %	157.4 %	154.2 %	148.1 %	149.8 %
<b>D. Amortization Years to Fully Amortize UAAL *</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>E. Contribution Rates (Percents of Payroll)</b>					
	CY 2024			CY 2023	
1. Total Normal Cost	7.33%	7.47%	7.41%	7.40%	7.53%
2. Member Contribution Rate	0.00%	0.00%	0.00%	0.00%	0.00%
3. Employer Normal Cost	7.33%	7.47%	7.41%	7.40%	7.53%
4. Other Contributions #	6.67%	6.53%	6.59%	6.60%	6.47%
5. Total Employer Contribution Rate	14.00%	14.00%	14.00%	14.00%	14.00%

\* Based on schedule of employer and member contribution rates shown on page III-4. For the December 31, 2021 results, the amortization years shown are from December 31, 2022. Amortization years are determined based upon scheduled contribution rate changes, if any, through calendar year 2024.

# Other contributions include: amortization payments for the pension UAAL, mitigating contributions, and contributions to the retiree health care fund. Combined Plan members contribute 2.00% of payroll to the retiree health care fund beginning July 1, 2022.



# Summary of Pension Defined Benefit Valuation Results

## DB Portion of Member Directed Plan

### December 31

	2021				2020	
	General			Grand Total	Assumptions	
	State	Local	Total General		New Grand Total	Old Grand Total
<b>A. Demographic Information</b>						
1. Number Counts						
a. Active Members	3,584	6,403	9,987	9,987	10,004	10,004
b. Retired Number Counts	104	278	382	382	331	331
c. Deferred/Inactive Number Counts	0	0	0	0	0	0
d. Total Number Counts	3,688	6,681	10,369	10,369	10,335	10,335
2. Active Payroll (\$ in Millions)	\$ 241	\$ 394	\$ 635	\$ 635	\$ 610	\$ 610
<b>B. Defined Benefit Assets</b>						
1. Market Value (MV)	\$ 15,192,901	\$ 28,235,558	\$ 43,428,459	\$ 43,428,459	\$ 38,895,284	\$ 38,895,284
2. Rate of Return on MV				16.02 %	12.15 %	12.15 %
3. Funding Value (FV)	\$ 13,794,329	\$ 25,636,352	\$ 39,430,681	\$ 39,430,681	\$ 37,150,719	\$ 37,150,719
4. Rate of Return on FV				10.59 %	10.05 %	10.05 %
5. Ratio of FV to MV				90.8%	95.5%	95.5%
<b>C. Defined Benefit Actuarial Results</b>						
1. Normal Cost as a % of Payroll						
2. Actuarial Accrued Liability (AAL)						
a. Active	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
b. Retired	13,794,329	25,636,352	39,430,681	39,430,681	37,150,719	37,150,719
c. Deferred/Inactive	0	0	0	0	0	0
d. Total	\$ 13,794,329	\$ 25,636,352	\$ 39,430,681	\$ 39,430,681	\$ 37,150,719	\$ 37,150,719
3. Unfunded AAL (UAAL) (FV Basis)	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
4. Unfunded AAL (UAAL) (MV Basis)	\$ (1,398,572)	\$ (2,599,206)	\$ (3,997,778)	\$ (3,997,778)	\$ (1,744,565)	\$ (1,744,565)
5. Funded Ratio (FV Basis)				100.0 %	100.0 %	100.0 %

## Comments and Conclusion

**The December 31, 2021 actuarial valuations of members indicate** the following about the portion of employer contribution rates allocated to financing retirement allowances:

- The employer rates, when combined with the member rates, are sufficient to fully fund the cost of benefit commitments being made to members for service currently being rendered (i.e., normal cost); and
- After satisfying normal cost requirements, the remaining portion of the employer rates provides sufficient funds to amortize unfunded actuarial accrued liabilities over a period of 16 years for the System in total.

**Experience.** The computed amortization period, taking into account all scheduled increases in contribution rates (currently none), is 16 years compared with the 21-year period that had been reported in the post-experience study December 31, 2020 valuation. In aggregate, experience was more favorable than expectations during the 2021 calendar year. Primary factors which typically would contribute to changes in the amortization years were:

- Measured on a market value basis, investment return was 15.46%. This figure is based upon an actuarial calculation and may not agree with figures reported elsewhere. The return on the funding value was 10.18%. The funding rate of return was lower than the market rate of return due to the four-year smoothing of gains and losses. Since the return on funding value of assets was higher than the 6.90% assumed return, there was downward pressure on the computed amortization period.
- Year over year increases in pay for the active membership was higher than expected, placing upward pressure on the computed amortization period.
- Active member decrement experience (e.g., retirement, disablement, death-in-service and other separations) resulted in a net liability gain, placing downward pressure on the computed amortization period.
- Retirees who retired after 1/7/2013 receive a 3.00% Cost-of-Living Adjustment (COLA) for the calendar year 2022, which is higher than the 2.05% COLA increase assumption. This resulted in a liability loss, placing upward pressure on the computed amortization period.
- Retiree mortality was greater than expected. This resulted in a liability gain, placing downward pressure on the computed amortization period.

Information concerning 2021 experience including other sources of gains and losses is presented on pages I-16 through I-19.

**Conclusion.** Based on the results of the December 31, 2021 regular annual actuarial valuation, it is our opinion that the Ohio Public Employees Retirement System continues to operate in accordance with actuarial principles of level percent of payroll financing.

## Other Observations

### General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 6.90% on the funding value of assets), it is expected that:

- (1) The employer normal cost as a percentage of pay will decrease to the level of the Group C normal cost as time passes as the majority of the active population is comprised of Group C members,
- (2) The unfunded actuarial accrued liabilities will be fully amortized after 16 years, and
- (3) The funded status of the plan will increase gradually towards a 100% funded ratio.

When selecting a contribution allocation procedure, the following three items should be considered, including the balance amongst the three items: (1) benefit security, (2) intergenerational equity, and (3) contribution stability and predictability. Generally, given the nature of public employee retirement systems (e.g., level contribution financing objective and perceived ongoing nature of the plan or plan sponsor), intergenerational equity and contribution stability and predictability have received more consideration than benefit security when contribution allocation procedures are selected. However, given the importance of benefit security to any retirement system, we suggest that contributions to the System in excess of those presented in this report be considered.

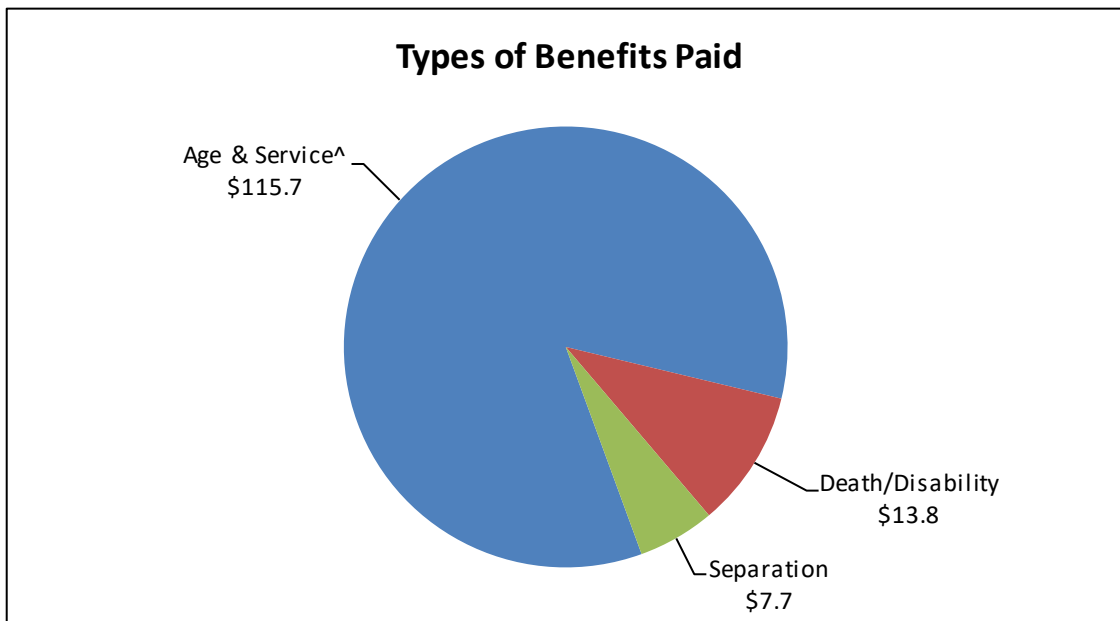
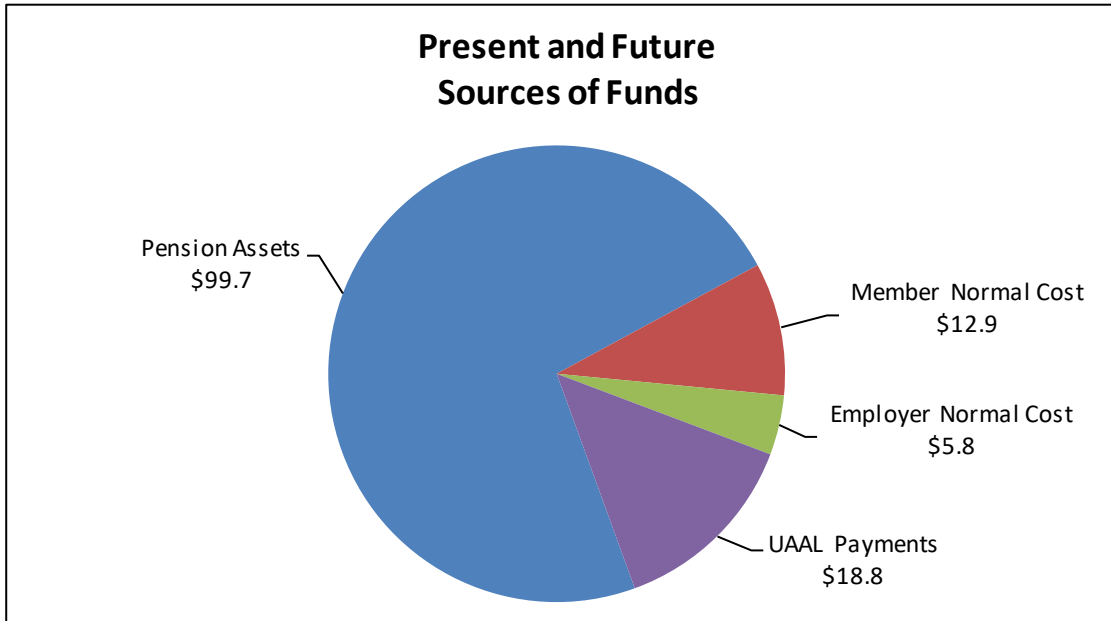
This valuation assumes the continuing ability of the employers to make the contributions necessary to fund the System. A determination regarding whether or not the employers are actually able to do so is outside our scope of expertise and was not performed.

### Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the funding value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

- (1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations; in other words, for transferring the obligations to an unrelated third party (e.g., insurance company) in a market value type transaction. In addition, the measurement is inappropriate for assessing benefit security for the membership.
- (2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).
- (3) The measurement would produce a different result if the market value of assets were used instead of the funding value of assets, unless the market value of assets is used in the measurement.

# Financing \$137.2 Billion\* of Defined Benefit Promises for Present Active and Retired Members December 31, 2021 (Dollar Amounts in Billions)



\* Present value of future benefits – all divisions combined.

^ Includes administrative expenses.

## Defined Benefit Active Members in Valuation Group Averages - Comparative Statement

Valuation Group	Dec. 31	No. of Active Members	Group Averages				
			Attained Age	Accrued Service Yrs.	Annual Payroll		
					Average	Increase	
STATE	1975	83,220	40.6 yrs.	6.5 yrs.	\$ 9,441	6.4 %	@
	1980	92,872	39.4	7.3	13,934	8.1 %	@
	1985	89,256	39.2	8.4	18,677	6.0 %	@
	1990	98,939	40.7	8.1	25,281	6.2 %	@
	1995	114,596	40.4	8.8	27,962	2.0 %	@
	2000	113,099	41.6	9.7	34,201	4.1 %	@
	2005	114,620	42.0	10.1	37,858	2.1 %	@
	2010	118,240	41.0	9.6	40,691	1.5 %	@
	2015	118,372	39.9	8.9	41,911	0.6 %	@
	2020	97,744	42.2	10.4	55,410	5.7 %	@#
	2021	100,996	41.7	9.9	55,026	(0.7)%	
LOCAL GOV'T	1975	149,557	40.8 yrs.	6.1 yrs.	8,771	4.3 %	@
	1980	160,797	40.7	7.4	13,035	8.2 %	@
	1985	158,285	40.1	8.3	15,983	4.2 %	@
	1990	173,220	41.5	7.9	19,506	4.1 %	@
	1995	223,431	41.2	7.6	20,384	0.9 %	@
	2000	245,831	41.8	8.1	24,401	3.7 %	@
	2005	236,073	43.3	9.2	29,933	4.2 %	@
	2010	215,144	44.6	10.1	33,447	2.2 %	@
	2015	202,779	44.4	10.0	37,008	2.0 %	@
	2020	172,805	46.6	11.0	45,954	4.4 %	@#
	2021	172,602	46.4	10.8	47,686	3.8 %	
LAW * (Includes Public Safety and Law Enforcement)	1975	2,111	35.0 yrs.	4.9 yrs.	10,467	-	
	1980	3,019	36.1	6.8	16,846	10.0 %	@
	1985	4,207	36.5	8.4	20,103	3.6 %	@
	1990	5,804	38.6	9.9	26,936	6.0 %	@
	1995	6,605	39.3	11.1	32,441	3.8 %	@
	2000	8,045	39.3	11.7	40,387	4.5 %	@
	2005	8,111	39.9	12.6	49,472	4.1 %	@
	2010	7,790	41.2	14.0	56,801	2.8 %	@
	2015	7,858	41.3	14.2	61,710	1.7 %	@
	2020	8,060	41.4	14.6	72,060	3.1 %	@#
	2021	7,973	41.3	14.3	74,592	3.5 %	
<b>TOTAL</b>	<b>2005</b>	<b>358,804</b>	<b>42.8 yrs.</b>	<b>9.5 yrs.</b>	<b>32,906</b>	<b>3.5 %</b>	<b>@</b>
	<b>2010</b>	<b>341,174</b>	<b>43.3</b>	<b>10.0</b>	<b>36,491</b>	<b>2.1 %</b>	<b>@</b>
	<b>2015</b>	<b>329,009</b>	<b>42.7</b>	<b>9.7</b>	<b>39,362</b>	<b>1.5 %</b>	<b>@</b>
	<b>2020</b>	<b>278,609</b>	<b>44.9</b>	<b>10.9</b>	<b>50,027</b>	<b>4.9 %</b>	<b>@#</b>
	<b>2021</b>	<b>281,571</b>	<b>44.6</b>	<b>10.6</b>	<b>51,081</b>	<b>2.1 %</b>	

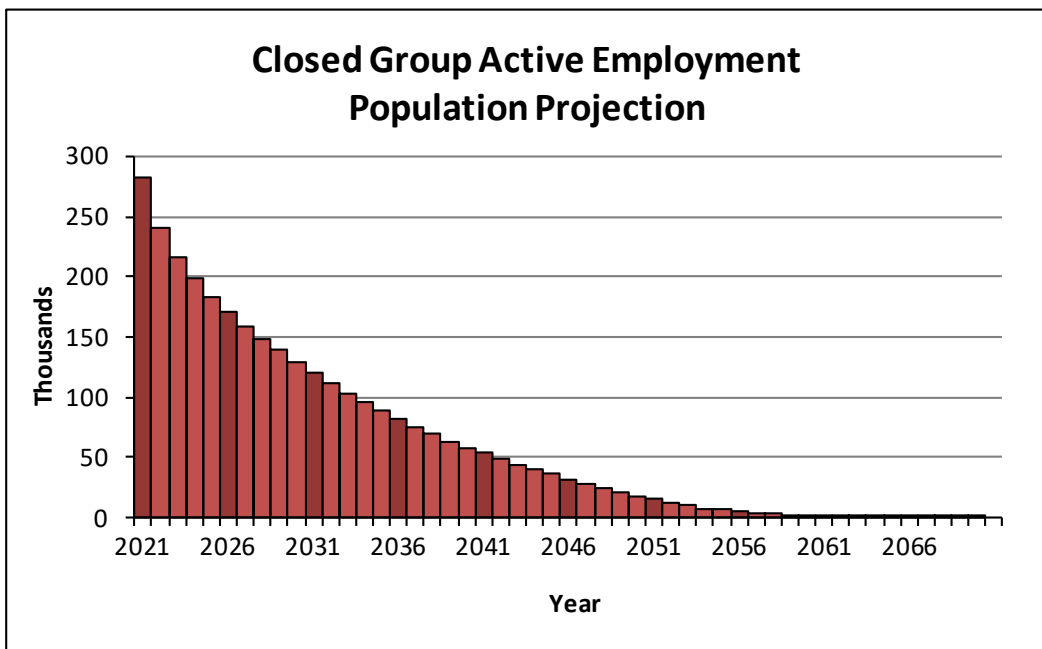
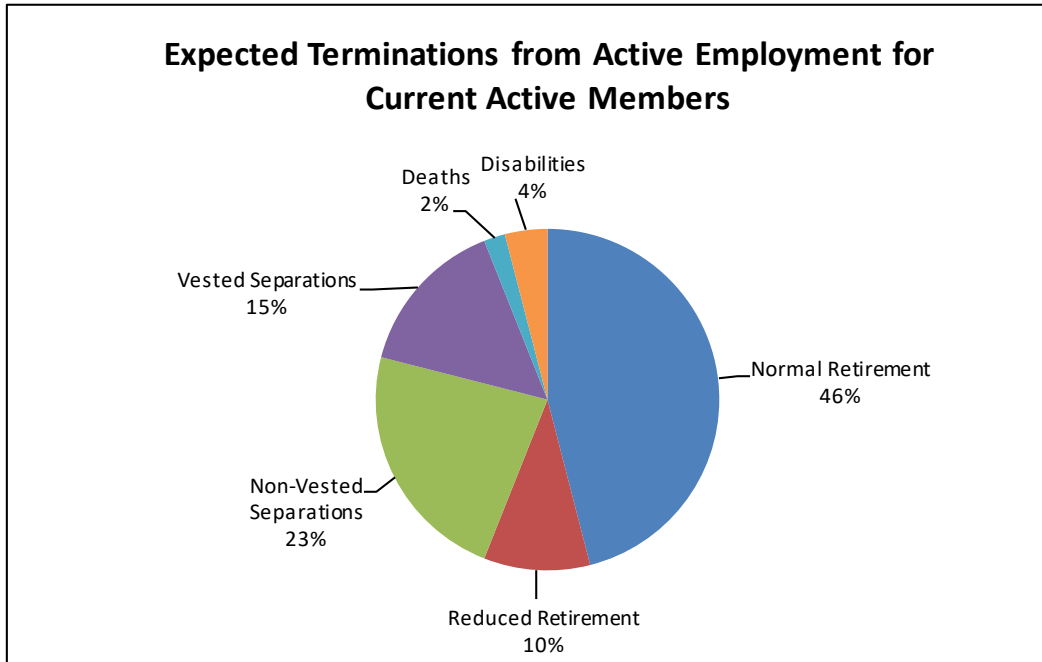
@ 5-year annual compound rate.

\* Beginning with the December 31, 2005 valuation report, valuation results for the Law division are shown separately for Public Safety and Law Enforcement.

# Reflects approximately 30,000 to 40,000 active members reclassified as inactive in the December 31, 2018 actuarial valuation.



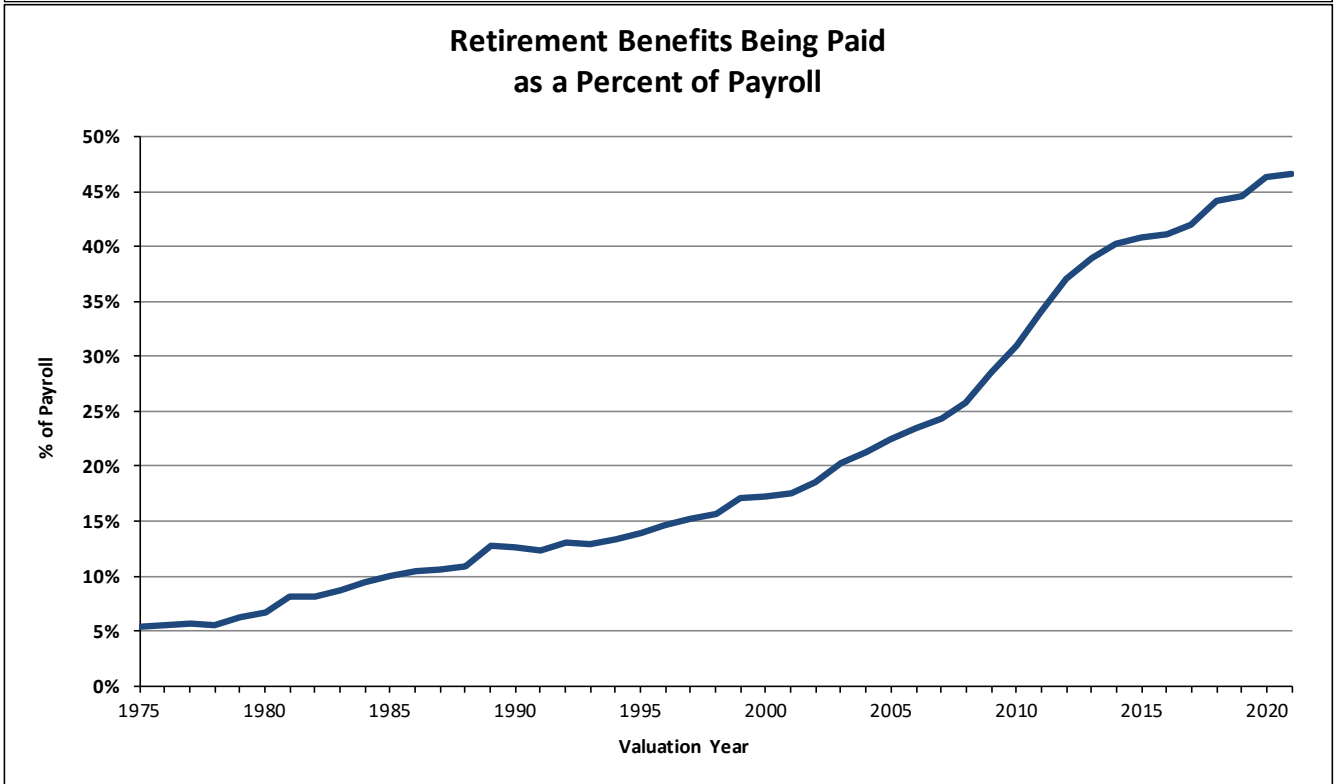
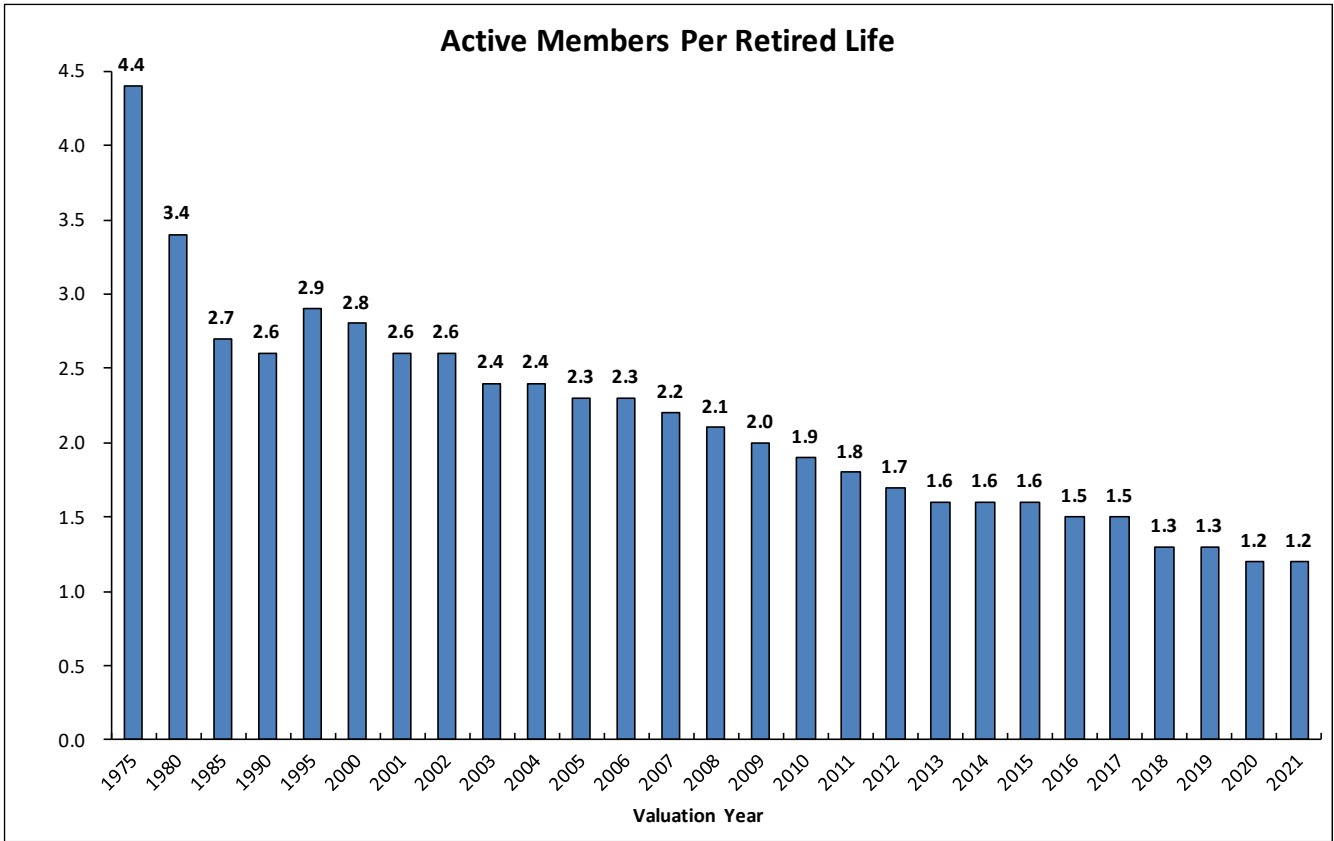
# Development of Present Defined Benefit Population December 31, 2021



The charts above show the expected future development of the present population in simplified terms. The defined benefit portion of the Retirement System presently covers 281,571 active members. Eventually, 23% of the population is expected to terminate covered employment prior to retirement and forfeit eligibility for a monthly benefit. 71% of the present population is expected to receive monthly retirement benefits either by retiring directly from active service, or by separating from service without withdrawing contributions. 6% of the present population is expected to become eligible for death-in-service or disability benefits. Within 8 years, over half of the covered membership is expected to consist of new hires.

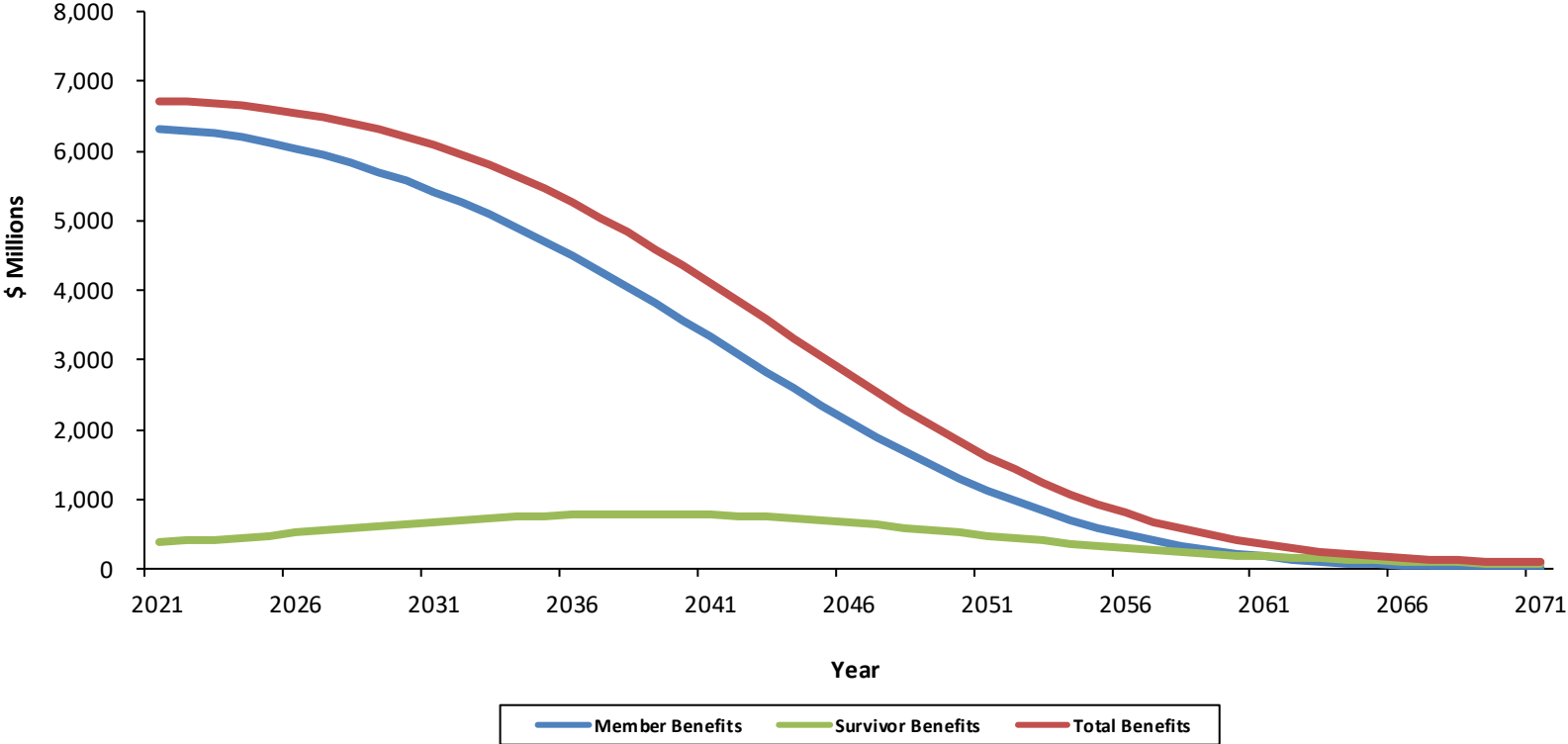
# Active/Retired Member Statistics

## December 31, 2021





# Projected Future Benefit Payments on Behalf of Present Retired Lives



Total future payments:	\$160.0 billion
From present assets:	\$ 75.3 billion
From future earnings:	\$ 84.7 billion

**All Divisions**  
**Defined Benefit Active Members in Valuation**  
**December 31, 2021**  
**by Attained Age and Years of Service**

Attained Ages	Years of Service To Valuation Date							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
15-19	5,018							5,018
Tot. Pay	\$53,934,436							\$53,934,436
Avg. Pay	\$10,748							\$10,748
20-24	21,128	168						21,296
Tot. Pay	\$445,721,957	\$6,917,600						\$452,639,557
Avg. Pay	\$21,096	\$41,176						\$21,255
25-29	20,029	4,253	78					24,360
Tot. Pay	\$774,570,161	\$217,736,241	\$3,712,956					\$996,019,358
Avg. Pay	\$38,672	\$51,196	\$47,602					\$40,887
30-34	15,453	10,122	2,369	117				28,061
Tot. Pay	\$644,216,233	\$570,089,761	\$143,512,257	\$6,402,799				\$1,364,221,050
Avg. Pay	\$41,689	\$56,322	\$60,579	\$54,725				\$48,616
35-39	11,165	8,287	5,787	2,615	168			28,022
Tot. Pay	\$489,597,217	\$477,693,904	\$376,394,431	\$172,370,549	\$10,360,882			\$1,526,416,983
Avg. Pay	\$43,851	\$57,644	\$65,041	\$65,916	\$61,672			\$54,472
40-44	9,300	6,410	4,721	6,066	2,921	121		29,539
Tot. Pay	\$395,013,949	\$364,509,373	\$304,601,611	\$425,906,004	\$200,276,904	\$7,577,275		\$1,697,885,116
Avg. Pay	\$42,475	\$56,866	\$64,521	\$70,212	\$68,564	\$62,622		\$57,479
45-49	7,878	5,322	3,920	4,775	6,433	2,276	103	30,707
Tot. Pay	\$326,685,419	\$298,807,164	\$251,404,954	\$334,596,689	\$468,476,867	\$167,109,275	\$6,730,974	\$1,853,811,342
Avg. Pay	\$41,468	\$56,146	\$64,134	\$70,073	\$72,824	\$73,422	\$65,349	\$60,371
50-54	7,756	5,277	4,008	4,555	6,105	6,252	2,126	36,079
Tot. Pay	\$310,730,718	\$286,806,875	\$245,291,346	\$303,544,579	\$429,572,424	\$479,670,198	\$161,557,495	\$2,217,173,635
Avg. Pay	\$40,063	\$54,350	\$61,200	\$66,640	\$70,364	\$76,723	\$75,991	\$61,453
55-59	6,212	4,294	3,615	4,286	5,291	5,047	4,029	32,774
Tot. Pay	\$233,324,294	\$221,898,899	\$208,362,708	\$268,314,993	\$350,313,649	\$363,594,530	\$314,808,467	\$1,960,617,540
Avg. Pay	\$37,560	\$51,677	\$57,638	\$62,603	\$66,209	\$72,042	\$78,136	\$59,822
60-64	4,672	3,503	3,124	3,820	4,486	3,914	3,231	26,750
Tot. Pay	\$147,050,229	\$169,098,288	\$168,039,389	\$220,235,814	\$277,758,145	\$261,952,850	\$244,193,929	\$1,488,328,644
Avg. Pay	\$31,475	\$48,272	\$53,790	\$57,653	\$61,917	\$66,927	\$75,578	\$55,638
65-69	2,949	1,663	1,347	1,641	1,687	1,305	1,462	12,054
Tot. Pay	\$61,037,699	\$69,534,134	\$65,664,997	\$91,477,410	\$98,303,289	\$81,961,975	\$102,795,732	\$570,775,236
Avg. Pay	\$20,698	\$41,812	\$48,749	\$55,745	\$58,271	\$62,806	\$70,312	\$47,352
70 & Over	2,806	1,124	708	666	564	437	606	6,911
Tot. Pay	\$40,276,784	\$24,280,233	\$21,740,764	\$27,652,213	\$24,438,283	\$23,417,536	\$39,279,173	\$201,084,986
Avg. Pay	\$14,354	\$21,602	\$30,707	\$41,520	\$43,330	\$53,587	\$64,817	\$29,096
<b>Totals</b>	114,366	50,423	29,677	28,541	27,655	19,352	11,557	281,571
<b>Tot. Pay</b>	\$3,922,159,096	\$2,707,372,472	\$1,788,725,413	\$1,850,501,050	\$1,859,500,443	\$1,385,283,639	\$869,365,770	\$14,382,907,883
<b>Avg. Pay</b>	\$34,295	\$53,693	\$60,273	\$64,837	\$67,239	\$71,583	\$75,224	\$51,081

**All Divisions**  
**Defined Benefit Active Members in Valuation**  
**December 31, 2021**  
**by Gender and Years of Service**

Service Years	Active Member Count			Active Member Pays	
	Males	Females	Total	Total	Average
0	20,064	25,657	45,721	\$ 1,067,915,654	\$23,357
1	9,074	11,095	20,169	706,420,199	35,025
2	8,664	10,289	18,953	780,649,371	41,189
3	7,233	8,464	15,697	708,720,337	45,150
4	6,273	7,553	13,826	658,453,535	47,624
5	5,553	6,959	12,512	633,959,288	50,668
6	5,008	6,105	11,113	578,860,582	52,089
7	4,580	5,118	9,698	529,258,382	54,574
8	4,273	4,810	9,083	501,998,549	55,268
9	3,662	4,355	8,017	463,295,671	57,789
10	3,261	3,367	6,628	391,020,034	58,995
11	2,836	3,126	5,962	360,474,293	60,462
12	2,422	2,347	4,769	288,109,701	60,413
13	2,593	3,144	5,737	346,179,019	60,341
14	3,084	3,497	6,581	402,942,366	61,228
15 & Up	42,168	44,937	87,105	5,964,650,902	68,477
<b>Totals</b>	<b>130,748</b>	<b>150,823</b>	<b>281,571</b>	<b>\$ 14,382,907,883</b>	<b>\$51,081</b>

# All Divisions Defined Benefit Members in Valuation December 31, 2021

## Active & Inactive Members by Transition Group

	Traditional Plan	Combined Plan	Total
<b>Active Counts</b>			
Transition Group A	18,561	310	18,871
Transition Group B	31,947	639	32,586
Transition Group C	223,941	6,173	230,114
Total	274,449	7,122	281,571
<b>Payroll</b>			
Transition Group A	\$ 1,100,997,083	\$ 18,350,695	\$ 1,119,347,778
Transition Group B	2,100,514,502	42,872,461	2,143,386,963
Transition Group C	10,730,047,619	390,125,523	11,120,173,142
Total	\$ 13,931,559,204	\$ 451,348,679	\$ 14,382,907,883
<b>Inactive Counts</b>			
Transition Group A	4,575	30	4,605
Transition Group B	8,929	144	9,073
Transition Group C	656,607	2,342	658,949
Other*	8,076	-	8,076
Total	678,187	2,516	680,703

\* Inactive members with reported service of 0 years or Final Average Salary of \$0.

Please refer to page III-2 for the definition of transition groups.

## Retired Members by COLA Provision

	December 31, 2021	
	Number Receiving	Monthly Benefits
3% Fixed Simple COLA	143,882	\$ 371,115,714
CPI Indexed Simple COLA	78,860	185,709,535
No COLA (Money Purchase)	4,294	1,902,468
<b>Total</b>	<b>227,036</b>	<b>\$ 558,727,717</b>

## Summary of Pension Experience Traditional, Combined, and Member Directed Plans (\$ in Millions)

	2021		2020	
	Total \$	% of Accrued Liabilities	Total \$	% of Accrued Liabilities
<b>Beginning of Year</b>				
1. Total Actuarial Accrued Liabilities*	\$115,241.25	100.00 %	\$111,371.30	100.00 %
2. Valuation Assets	93,969.09	81.54 %	88,571.72	79.53 %
3. Unfunded Actuarial Accrued Liabilities	\$21,272.16	18.46 %	\$22,799.58	20.47 %
<b>Experience Gains (Losses)</b>				
4. Gains (losses) in economic risk areas				
a. Pay increases	\$(427.58)	(0.37)%	\$484.66	0.44 %
b. Investment return	3,023.79	2.62 %	2,560.05	2.30 %
c. Total	\$2,596.21	2.25 %	\$3,044.71	2.74 %
5. Gains (losses) from active member decrement experience				
a. Service retirement	\$(99.75)	(0.09)%	\$(53.90)	(0.05)%
b. Disability retirement	61.43	0.05 %	102.22	0.09 %
c. Death-in-service	35.76	0.03 %	37.90	0.03 %
d. Other separations	100.72	0.09 %	41.32	0.04 %
e. Total	\$98.16	0.08 %	\$127.54	0.11 %
6. Gains (losses) from retiree COLA experience	\$(178.71)	(0.16)%	\$262.75	0.24 %
7. Gains (losses) from retiree mortality	\$139.83	0.12 %	\$231.37	0.21 %
<b>8. Total experience gains (losses): (4c) + (5e) + (6) + (7)</b>	<b>\$2,655.49</b>	<b>2.29 %</b>	<b>\$3,666.37</b>	<b>3.30 %</b>
<b>End of Year</b>				
9. Total Actuarial Accrued Liabilities	\$118,516.96	100.00 %	\$113,371.57	100.00 %
10. Valuation Assets	99,710.19	84.13 %	93,969.09	82.89 %
11. Unfunded Actuarial Accrued Liabilities	\$18,806.77	15.87 %	\$19,402.48	17.11 %

\* 2021 based upon new assumptions adopted by the Board in conjunction with the 2016-2020 Experience Study.

## Summary of Pension Experience Traditional Plan (\$ in Millions)

	2021		2020	
	Total \$	% of Accrued Liabilities	Total \$	% of Accrued Liabilities
<b>Beginning of Year</b>				
1. Total Actuarial Accrued Liabilities*	\$114,696.42	100.00 %	\$110,887.29	100.00 %
2. Valuation Assets	93,180.17	81.24 %	87,902.87	79.27 %
3. Unfunded Actuarial Accrued Liabilities	\$21,516.25	18.76 %	\$22,984.42	20.73 %
<b>Experience Gains (Losses)</b>				
4. Gains (losses) in economic risk areas				
a. Pay increases	\$(424.58)	(0.37)%	\$476.71	0.43 %
b. Investment return	2,996.30	2.61 %	2,541.78	2.29 %
c. Total	\$2,571.72	2.24 %	\$3,018.49	2.72 %
5. Gains (losses) from active member decrement experience				
a. Service retirement	\$(99.67)	(0.09)%	\$(53.31)	(0.05)%
b. Disability retirement	57.84	0.05 %	96.29	0.09 %
c. Death-in-service	34.72	0.03 %	37.44	0.03 %
d. Other separations	96.56	0.08 %	41.45	0.04 %
e. Total	\$89.45	0.08 %	\$121.87	0.11 %
6. Gains (losses) from retiree COLA experience	\$(178.19)	(0.16)%	\$262.11	0.24 %
7. Gains (losses) from retiree mortality	\$139.88	0.12 %	\$231.30	0.21 %
<b>8. Total experience gains (losses): (4c) + (5e) + (6) + (7)</b>	<b>\$2,622.86</b>	<b>2.28 %</b>	<b>\$3,633.77</b>	<b>3.28 %</b>
<b>End of Year</b>				
9. Total Actuarial Accrued Liabilities	\$117,910.07	100.00 %	\$112,832.54	100.00 %
10. Valuation Assets	98,795.85	83.79 %	93,180.16	82.58 %
11. Unfunded Actuarial Accrued Liabilities	\$19,114.22	16.21 %	\$19,652.38	17.42 %

\* 2021 based upon new assumptions adopted by the Board in conjunction with the 2016-2020 Experience Study.

## Summary of Pension Experience Combined Plan (\$ in Millions)

	2021		2020	
	Total \$	% of Accrued Liabilities	Total \$	% of Accrued Liabilities
<b>Beginning of Year</b>				
1. Total Actuarial Accrued Liabilities*	\$507.68	100.00 %	\$461.19	100.00 %
2. Valuation Assets	751.77	148.08 %	646.03	140.08 %
3. Unfunded Actuarial Accrued Liabilities	\$(244.09)	(48.08)%	\$(184.84)	(40.08)%
<b>Experience Gains (Losses)</b>				
4. Gains (losses) in economic risk areas				
a. Pay increases	\$(3.00)	(0.59)%	\$7.95	1.72 %
b. Investment return	26.15	5.15 %	17.45	3.78 %
c. Total	\$23.15	4.56 %	\$25.40	5.50 %
5. Gains (losses) from active member decrement experience				
a. Service retirement	\$(0.08)	(0.02)%	\$(0.58)	(0.13)%
b. Disability retirement	3.59	0.71 %	5.93	1.29 %
c. Death-in-service	1.04	0.20 %	0.46	0.10 %
d. Other separations	4.16	0.82 %	(0.14)	(0.03)%
e. Total	\$8.71	1.71 %	\$5.67	1.23 %
6. Gains (losses) from retiree COLA experience	\$(0.37)	(0.07)%	\$0.44	0.10 %
7. Gains (losses) from retiree mortality	\$0.06	0.01 %	\$(0.23)	(0.05)%
<b>8. Total experience gains (losses): (4c) + (5e) + (6) + (7)</b>	<b>\$31.55</b>	<b>6.21 %</b>	<b>\$31.28</b>	<b>6.78 %</b>
<b>End of Year</b>				
9. Total Actuarial Accrued Liabilities	\$567.46	100.00 %	\$501.88	100.00 %
10. Valuation Assets	874.91	154.18 %	751.77	149.79 %
11. Unfunded Actuarial Accrued Liabilities	\$(307.45)	(54.18)%	\$(249.89)	(49.79)%

\* 2021 based upon new assumptions adopted by the Board in conjunction with the 2016-2020 Experience Study.

## Summary of Pension Experience DB Portion of Member Directed Plan (\$ in Millions)

	2021		2020	
	Total \$	% of Accrued Liabilities	Total \$	% of Accrued Liabilities
<b>Beginning of Year</b>				
1. Total Actuarial Accrued Liabilities*	\$37.15	100.00 %	\$22.82	100.00 %
2. Valuation Assets	37.15	100.00 %	22.82	100.00 %
3. Unfunded Actuarial Accrued Liabilities	\$0.00	0.00 %	\$0.00	0.00 %
<b>Experience Gains (Losses)</b>				
4. Gains (losses) in economic risk areas				
a. Pay increases				
b. Investment return	\$1.34	3.61 %	\$0.81	3.55 %
c. Total	\$1.34	3.61 %	\$0.81	3.55 %
5. Gains (losses) from active member decrement experience				
a. Service retirement				
b. Disability retirement				
c. Death-in-service				
d. Other separations				
e. Total	N/A	N/A	N/A	N/A
6. Gains (losses) from retiree COLA experience	\$(0.15)	(0.40)%	\$0.20	0.88 %
7. Gains (losses) from retiree mortality	\$(0.11)	(0.30)%	\$0.30	1.31 %
<b>8. Total experience gains (losses): (4c) + (5e) + (6) + (7)</b>	<b>\$1.08</b>	<b>2.91 %</b>	<b>\$1.31</b>	<b>5.74 %</b>
<b>End of Year</b>				
9. Total Actuarial Accrued Liabilities	\$39.43	100.00 %	\$37.15	100.00 %
10. Valuation Assets	39.43	100.00 %	37.15	100.00 %
11. Unfunded Actuarial Accrued Liabilities	\$0.00	0.00 %	\$0.00	0.00 %

\* 2021 based upon new assumptions adopted by the Board in conjunction with the 2016-2020 Experience Study.



## Risk Commentary

Determination of the actuarial accrued liability, the computed amortization period, and the funded ratio requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in actuarial measurements that results from the differences between actual experience and the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions due to changing conditions; 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. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

- (1) **Investment Risk** – The risk that actual investment returns may differ from the expected investment returns. Plans such as OPERS whose members are not in Social Security typically provide higher benefits than other plans, resulting in a larger asset base and, hence, increased investment risk.
- (2) **Contribution Risk** – OPERS is a plan that has fixed maximum employer and employee contribution rates in the Revised Code of Ohio. The Board may establish employer and employee contribution rates up to the maximums. Currently, OPERS is at the maximum employer and employee contributions rates. In addition, the Board makes the determination of how much of the contributions are allocated to the pension and retiree health portions of OPERS. Currently, all of the contributions are allocated to the pension program. Contribution risk is the risk that the current level of contributions may be insufficient to fund the current pension benefit structure of OPERS while maintaining the Revised Code of Ohio requirement of an amortization period of no greater than 30 years.
- (3) **Participation Risk** – The risk that a significant portion of the active population participates in the Member Directed Plan as opposed to the Traditional Plan. This would reduce contribution income to the Traditional Plan and increase the risk that scheduled contributions would be insufficient to provide scheduled benefits.

Plan maturity measures are presented on pages I-11 and I-21 of this section.

# Summary of Risk/Maturity Measures

## Traditional Plan

Valuation Year	Funded Ratio		UAAL	UAAL / Total Payroll	Funding Value	Total AAL / Total Payroll	Standard Deviation of
	Based on FVA	Based on MVA	Amortization Period		of Assets / Total Payroll		Investment Return / Total Payroll
2012	81 %	81 %	26	1.3	5.7	7.0	74 %
2013	82	86	25	1.3	5.9	7.2	80
2014	84	86	21	1.2	6.1	7.2	83
2015*	80	77	20	1.5	6.2	7.7	83
2016	80	77	20	1.5	6.1	7.7	72
2017	81	85	19	1.5	6.2	7.7	78
2018	77	75	28	1.9	6.4	8.2	75
2019	79	82	23	1.7	6.5	8.2	82
2020*	81	85	22	1.6	6.9	8.5	92
2021	84	93	17	1.4	7.1	8.5	100

## Combined Plan

Valuation Year	Funded Ratio		UAAL	UAAL / Total Payroll	Funding Value	Total AAL / Total Payroll	Standard Deviation of
	Based on FVA	Based on MVA	Amortization Period		of Assets / Total Payroll		Investment Return / Total Payroll
2012	86 %	87 %	1	0.1	0.6	0.7	8 %
2013	100	105	0	0.0	0.7	0.7	9
2014	111	115	0	-0.1	0.8	0.7	11
2015*	116	111	0	-0.1	0.9	0.8	13
2016	120	117	0	-0.2	1.0	0.8	12
2017	131	137	0	-0.3	1.1	0.9	14
2018	131	127	0	-0.3	1.3	1.0	15
2019	140	145	0	-0.4	1.5	1.1	19
2020*	148	155	0	-0.6	1.7	1.2	23
2021	154	169	0	-0.7	1.9	1.3	27

## DB Portion of Member Directed Plan

Valuation Year	Funded Ratio		UAAL	UAAL / Total Payroll	Funding Value	Total AAL / Total Payroll	Standard Deviation of
	Based on FVA	Based on MVA	Amortization Period		of Assets / Total Payroll		Investment Return / Total Payroll
2012	95 %	97 %	N/A	0.0	0.0	0.0	N/A
2013	99	103	N/A	0.0	0.0	0.0	N/A
2014	106	107	N/A	0.0	0.0	0.0	N/A
2015*	103	99	N/A	0.0	0.0	0.0	N/A
2016	100	98	N/A	0.0	0.0	0.0	N/A
2017	100	106	N/A	0.0	0.0	0.0	N/A
2018	100	97	N/A	0.0	0.0	0.0	N/A
2019	100	104	N/A	0.0	0.0	0.0	N/A
2020*	100	105	N/A	0.0	0.1	0.1	N/A
2021	100	110	N/A	0.0	0.1	0.1	N/A

\* Based upon revised actuarial assumptions.

## Summary of Risk/Maturity Measures (Concluded)

An explanation of the significance of the risk metrics presented on the preceding page follows:

- (1) **Funded Ratio (Funding Value of Assets basis)** – This is the most widely known measure of a plan's financial strength. The trend in the funded ratio is much more important than the absolute ratio. A trend approaching 100% is desirable.
- (2) **Funded Ratio (Market Value of Assets basis)** – This is similar to the above, except that the asset value used is the market value.
- (3) **UAAL Amortization Period** – Periods above 17 to 20 years indicate that the UAAL payment is less than the interest on the UAAL. This situation is referred to as “negative amortization.” Negative amortization is increasingly viewed as undesirable.
- (4) **UAAL / Total Payroll** – The ratio of UAAL to payroll gives an indication of the plan sponsor's ability to pay off the UAAL. A declining ratio is desirable. A ratio above approximately 3.0 or 4.0 may indicate difficulty in discharging the unfunded liability in some circumstances.
- (5) **Funding Value of Assets / Total Payroll** – The ratio of assets to payroll gives an indication of both maturity and volatility. Many systems have ratios between 5.0 and 7.0. Social Security Replacement Plans may fall above that range. A high ratio can indicate volatility of contribution rates or amortization period.
- (6) **Total AAL / Total Payroll** – This is similar to above. It illustrates the expected ratio of assets to payroll when the plan has a funded ratio of 100%.
- (7) **Standard Deviation of Investment Return / Total Payroll** – The portfolio standard deviation measures the volatility of investment return. When divided by payroll it gives the effect of a one standard deviation asset gain or loss as a percent of payroll. This theoretically may happen once every 6 years.

## **SECTION II**

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### **FINANCIAL INFORMATION**

# Financial Data for Calendar Year 2021

## Consolidated Asset Reconciliation

### All Plans, All Divisions

	Traditional Pension Plan	DB Portion of Combined Pension Plan	DB Portion of Member-Directed Plan	2021 Total Defined Pension Benefit	Total Health Care	DC Portion of Combined Pension Plan	DC Portion of Member Directed	2021 Total Defined Contribution	Total 2021
Beginning Market Value @ 12/31/20									
Assets Held in Trust for Benefits	\$ 97,902,982,961	\$ 789,152,917	\$ 38,894,422	\$ 98,731,030,300	\$ 13,227,406,414	\$ 753,643,831	\$ 1,435,306,084	\$ 2,188,949,915	\$ 114,147,386,629
Gain/Loss on Security Lending (PY only In G/L for 2021)	(32,661)	19,108	861	(12,692)	12,692	-	-	-	-
Rounding (Prior Year File)	172	(232)	1	(59)	(6)	227	(3)	224	159
Assets Held for Upcoming Year Budget	121,768,141	-	-	121,768,141	-	-	-	-	121,768,141
<b>Total Beginning Market Value @ 1/1/2021</b>	<b>98,024,718,613</b>	<b>789,171,793</b>	<b>38,895,284</b>	<b>98,852,785,690</b>	<b>13,227,419,100</b>	<b>753,644,058</b>	<b>1,435,306,081</b>	<b>2,188,950,139</b>	<b>114,269,154,929</b>
External Cash Flows:									
Revenues:									
Member Contributions / Deposits	1,454,613,138	-	-	1,454,613,138	-	45,846,077	64,174,118	110,020,195	1,564,633,333
Employer Contributions	2,035,845,218	64,192,623	-	2,100,037,841	25,631,727	-	63,790,209	63,790,209	2,189,459,777
Employer Contributions - Administrative Expenses	-	-	384,018	-	-	-	-	-	384,018
Contract and Other Receipts	90,051,810	391,269	-	90,443,079	235,362	107,347	463,575	570,922	91,249,363
Refund from HC Vendors (Guarantees)	-	-	-	-	30,000	-	-	-	30,000
Other Income / Cancelled Warrants	535,621	-	(80,689)	454,932	5,954	-	-	-	460,886
<b>Total Revenues</b>	<b>3,581,045,787</b>	<b>64,583,892</b>	<b>303,329</b>	<b>3,645,933,008</b>	<b>25,903,043</b>	<b>45,953,424</b>	<b>128,427,902</b>	<b>174,381,326</b>	<b>3,846,217,377</b>
Disbursements:									
Refunds of Member Accounts	(494,540,626)	(4,935,390)	(2,778,113)	(502,254,129)	-	(18,833,305)	(70,004,549)	(88,837,854)	(591,091,983)
Retirement Benefits	(6,757,308,526)	(4,962,243)	(2,231,115)	(6,764,501,884)	-	(5,321,106)	(3,173,291)	(8,494,397)	(6,772,996,281)
Health Care Expenses	-	-	-	-	(553,009,832)	-	-	-	(553,009,832)
Retiree-Paid Health Care & Formulary Rebates	-	-	-	-	218,458,328	-	-	-	218,458,328
Federal Subsidies	-	-	-	-	2,621,709	-	-	-	2,621,709
ER Paid PCORI	-	-	-	-	(446,356)	-	-	-	(446,356)
ER Paid Medicare	-	-	-	-	(30,238,970)	-	-	-	(30,238,970)
Wellness RMA Claims	-	-	-	-	(108,026)	-	-	-	(108,026)
MD-RMA Claims	-	-	-	-	(4,315,676)	-	-	-	(4,315,676)
HRA Claims	-	-	-	-	(486,074,596)	-	-	-	(486,074,596)
Non-Investment Related Admin Expenses	(52,425,051)	-	-	(52,425,051)	(15,460,472)	(2,724,018)	(2,335,927)	(5,059,945)	(72,945,468)
Investment Administrative Expense	(42,087,776)	-	-	(42,087,776)	(5,935,091)	(620,513)	(651,293)	(1,271,806)	(49,294,673)
<b>Total Disbursements</b>	<b>(7,346,361,979)</b>	<b>(9,897,633)</b>	<b>(5,009,228)</b>	<b>(7,361,268,840)</b>	<b>(874,508,982)</b>	<b>(27,498,942)</b>	<b>(76,165,060)</b>	<b>(103,664,002)</b>	<b>(8,339,441,824)</b>
<b>Net External Cash Flow</b>	<b>(3,765,316,192)</b>	<b>54,686,259</b>	<b>(4,705,899)</b>	<b>(3,715,335,832)</b>	<b>(848,605,939)</b>	<b>18,454,482</b>	<b>52,262,842</b>	<b>70,717,324</b>	<b>(4,493,224,447)</b>
Inter-Plan Activity									
Member Balance Transfers & Plan Switches	3,159,097	(2,723,223)	-	435,874	-	(156,869)	(279,005)	(435,874)	-
Mitigation Rate	37,087,035	(15,665,566)	(6,281,366)	15,140,103	-	-	(15,140,103)	(15,140,103)	-
Intraplan Transfer (DC to DB)	-	7,312,377	9,415,876	16,728,253	-	(7,312,377)	(9,415,876)	(16,728,253)	-
<b>Total Inter-Plan Activity</b>	<b>40,246,132</b>	<b>(11,076,412)</b>	<b>3,134,510</b>	<b>32,304,230</b>	<b>-</b>	<b>(7,469,246)</b>	<b>(24,834,984)</b>	<b>(32,304,230)</b>	<b>-</b>
Investment (Income) Loss:									
Gross Investment (Income) Loss	15,059,877,881	126,334,990	6,166,150	15,192,379,021	1,858,088,012	97,319,476	196,410,316	293,729,792	17,344,196,825
Unrealized (Income) Loss on Security Lending	(3,923,644)	(31,182)	(1,450)	(3,956,276)	(328,074)	-	-	-	(4,284,350)
External Asset Management Fees	(145,942,922)	(1,232,095)	(60,136)	(147,235,153)	(11,233,795)	(196,211)	(374,987)	(571,198)	(159,040,146)
<b>Net Investment Income</b>	<b>14,910,011,315</b>	<b>125,071,713</b>	<b>6,104,564</b>	<b>15,041,187,592</b>	<b>1,846,526,143</b>	<b>97,123,265</b>	<b>196,035,329</b>	<b>293,158,594</b>	<b>17,180,872,329</b>
<b>Ending Market Value @ 12/31/21</b>	<b>109,209,659,868</b>	<b>957,853,353</b>	<b>43,428,459</b>	<b>110,210,941,680</b>	<b>14,225,339,304</b>	<b>861,752,559</b>	<b>1,658,769,268</b>	<b>2,520,521,827</b>	<b>126,956,802,811</b>



## Development of Funding Value of Pension Defined Benefit Assets Traditional, Combined, and Member Directed Plans

Year Ended December 31	2020	2021	2022	2023	2024
A. Funding Value Beginning of Year	\$ 88,571,717,117	\$ 93,969,087,876			
B. Market Value End of Year	98,852,785,690	110,210,941,680			
C. Market Value Beginning of Year	91,814,535,680	98,852,785,690			
D. Non-Investment Net Cash Flow					
D1. Member Contributions	1,411,917,040	1,454,613,138			
D2. Employer and other Non-Member Contributions	2,132,944,999	2,206,459,973			
D3. Refund of Member Accounts	(424,832,805)	(502,254,129)			
D4. Retirement Benefits	(6,512,835,896)	(6,764,501,884)			
D5. Member Balance Transfers / Intraplan Transfers / Other	27,293,543	17,164,127			
D6. Admin Expenses	(51,327,751)	(52,425,051)			
D7. Total Net Cash Flow: D1+D2+D3+D4+D5+D6	(3,416,840,870)	(3,640,943,826)			
E. Investment Return					
E1. Market Total: B-C-D7	10,455,090,880	14,999,099,816			
E2. Assumed Rate of Return	7.20%	6.90%			
E3. Assumed Amount of Return	6,254,157,361	6,358,254,501			
E4. Amount Subject to Phase-In: E1-E3	4,200,933,519	8,640,845,315			
F. Phased-In Recognition of Investment Return					
F1. Current Year: 0.25 x E4	1,050,233,380	2,160,211,329			
F2. First Prior Year	1,919,652,162	1,050,233,380	\$ 2,160,211,329		
F3. Second Prior Year	(2,106,306,648)	1,919,652,162	1,050,233,380	\$ 2,160,211,329	
F4. Third Prior Year	1,696,475,374	(2,106,306,649)	1,919,652,162	1,050,233,379	\$ 2,160,211,328
F5. Total Phase-Ins	2,560,054,268	3,023,790,222	5,130,096,871	3,210,444,708	2,160,211,328
G. Funding Value End of Year					
G1. Preliminary Funding Value End of Year: A+D7+E3+F5	\$ 93,969,087,876	\$ 99,710,188,773			
G2. Upper Corridor Limit: 112% x B	110,715,119,973	123,436,254,681			
G3. Lower Corridor Limit: 88% x B	86,990,451,407	96,985,628,679			
G4. Funding Value End of Year	\$ 93,969,087,876	\$ 99,710,188,773			
H. Difference Between Market and Funding Value	4,883,697,814	10,500,752,907	5,370,656,036	2,160,211,328	-
I. Recognized Rate of Return	10.15 %	10.18 %			
J. Market Rate of Return	11.60 %	15.46 %			
K. Ratio of Funding Value to Market Value	95 %	90 %			

The Funding Value of Assets recognizes assumed investment return (line E3) fully each year. Differences between actual and assumed investment return (line E4) are phased in over a closed 4-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than market value. If assumed rates are exactly realized for 3 consecutive years, funding value will become equal to market value.



## Development of Funding Value of Pension Defined Benefit Assets Traditional Plan

Year Ended December 31	2020	2021	2022	2023	2024
A. Funding Value Beginning of Year	\$ 87,902,862,816	\$ 93,180,162,731			
B. Market Value End of Year	98,024,718,613	109,209,659,868			
C. Market Value Beginning of Year	91,121,609,718	98,024,718,613			
D. Non-Investment Net Cash Flow					
D1. Member Contributions	1,411,917,040	1,454,613,138			
D2. Employer and other Non-Member Contributions	2,092,424,202	2,163,519,684			
D3. Refund of Member Accounts	(420,286,261)	(494,540,626)			
D4. Retirement Benefits	(6,507,132,869)	(6,757,308,526)			
D5. Member Balance Transfers / Intraplan Transfers / Other	5,785,115	3,159,097			
D6. Admin Expenses	(51,327,751)	(52,425,051)			
D7. Total Net Cash Flow: D1+D2+D3+D4+D5+D6	(3,468,620,524)	(3,682,982,284)			
E. Investment Return					
E1. Market Total: B-C-D7	10,371,729,419	14,867,923,539			
E2. Assumed Rate of Return	7.20%	6.90%			
E3. Assumed Amount of Return	6,204,135,783	6,302,368,339			
E4. Amount Subject to Phase-In: E1-E3	4,167,593,636	8,565,555,200			
F. Phased-In Recognition of Investment Return					
F1. Current Year: 0.25 x E4	1,041,898,409	2,141,388,800			
F2. First Prior Year	1,905,844,885	1,041,898,409	\$ 2,141,388,800		
F3. Second Prior Year	(2,092,829,115)	1,905,844,885	1,041,898,409	\$ 2,141,388,800	
F4. Third Prior Year	1,686,870,477	(2,092,829,116)	1,905,844,886	1,041,898,409	\$ 2,141,388,800
F5. Total Phase-Ins	2,541,784,656	2,996,302,978	5,089,132,095	3,183,287,209	2,141,388,800
G. Funding Value End of Year					
G1. Preliminary Funding Value End of Year: A+D7+E3+F5	\$ 93,180,162,731	\$ 98,795,851,764			
G2. Upper Corridor Limit: 112% x B	109,787,684,847	122,314,819,052			
G3. Lower Corridor Limit: 88% x B	86,261,752,379	96,104,500,684			
G4. Funding Value End of Year	\$ 93,180,162,731	\$ 98,795,851,764			
H. Difference Between Market and Funding Value	4,844,555,882	10,413,808,104	5,324,676,009	2,141,388,800	-
I. Recognized Rate of Return	10.15 %	10.18 %			
J. Market Rate of Return	11.60 %	15.46 %			
K. Ratio of Funding Value to Market Value	95 %	90 %			

The Funding Value of Assets recognizes assumed investment return (line E3) fully each year. Differences between actual and assumed investment return (line E4) are phased in over a closed 4-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than market value. If assumed rates are exactly realized for 3 consecutive years, funding value will become equal to market value.



## Development of Funding Value of Pension Defined Benefit Assets Combined Plan

Year Ended December 31	2020	2021	2022	2023	2024
A. Funding Value Beginning of Year	\$ 646,033,034	\$ 751,774,426			
B. Market Value End of Year	789,171,793	957,853,353			
C. Market Value Beginning of Year	669,083,950	789,171,793			
D. Non-Investment Net Cash Flow					
D1. Member Contributions	-	-			
D2. Employer and other Non-Member Contributions	46,652,470	48,918,326			
D3. Refund of Member Accounts	(3,755,507)	(4,935,390)			
D4. Retirement Benefits	(3,915,351)	(4,962,243)			
D5. Member Balance Transfers / Intraplan Transfers / Other	1,339,030	4,589,154			
D6. Admin Expenses	-	-			
D7. Total Net Cash Flow: D1+D2+D3+D4+D5+D6	40,320,642	43,609,847			
E. Investment Return					
E1. Market Total: B-C-D7	79,767,201	125,071,713			
E2. Assumed Rate of Return	7.20%	6.90%			
E3. Assumed Amount of Return	47,965,922	53,376,975			
E4. Amount Subject to Phase-In: E1-E3	31,801,279	71,694,738			
F. Phased-In Recognition of Investment Return					
F1. Current Year: 0.25 x E4	7,950,320	17,923,685			
F2. First Prior Year	13,275,333	7,950,320	\$ 17,923,685		
F3. Second Prior Year	(13,004,257)	13,275,333	7,950,320	\$ 17,923,685	
F4. Third Prior Year	9,233,432	(13,004,258)	13,275,333	7,950,319	\$ 17,923,683
F5. Total Phase-Ins	17,454,828	26,145,080	39,149,338	25,874,004	17,923,683
G. Funding Value End of Year					
G1. Preliminary Funding Value End of Year: A+D7+E3+F5	\$ 751,774,426	\$ 874,906,328			
G2. Upper Corridor Limit: 112% x B	883,872,408	1,072,795,755			
G3. Lower Corridor Limit: 88% x B	694,471,178	842,910,951			
G4. Funding Value End of Year	\$ 751,774,426	\$ 874,906,328			
H. Difference Between Market and Funding Value	37,397,367	82,947,025	43,797,687	17,923,683	-
I. Recognized Rate of Return	9.82 %	10.28 %			
J. Market Rate of Return	11.57 %	15.42 %			
K. Ratio of Funding Value to Market Value	95 %	91 %			

The Funding Value of Assets recognizes assumed investment return (line E3) fully each year. Differences between actual and assumed investment return (line E4) are phased in over a closed 4-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than market value. If assumed rates are exactly realized for 3 consecutive years, funding value will become equal to market value.



## Development of Funding Value of Pension Defined Benefit Assets DB Portion of Member Directed Plan

Year Ended December 31	2020	2021	2022	2023	2024
A. Funding Value Beginning of Year	\$ 22,821,267	\$ 37,150,719			
B. Market Value End of Year	38,895,284	43,428,459			
C. Market Value Beginning of Year	23,842,012	38,895,284			
D. Non-Investment Net Cash Flow					
D1. Member Contributions	-	-			
D2. Employer and other Non-Member Contributions	(6,131,673)	(5,978,037)			
D3. Refund of Member Accounts	(791,037)	(2,778,113)			
D4. Retirement Benefits	(1,787,676)	(2,231,115)			
D5. Member Balance Transfers / Intraplan Transfers / Other	20,169,398	9,415,876			
D6. Admin Expenses	-	-			
D7. Total Net Cash Flow: D1+D2+D3+D4+D5+D6	11,459,012	(1,571,389)			
E. Investment Return					
E1. Market Total: B-C-D7	3,594,260	6,104,564			
E2. Assumed Rate of Return	7.20%	6.90%			
E3. Assumed Amount of Return	2,055,656	2,509,187			
E4. Amount Subject to Phase-In: E1-E3	1,538,604	3,595,377			
F. Phased-In Recognition of Investment Return					
F1. Current Year: 0.25 x E4	384,651	898,844			
F2. First Prior Year	531,944	384,651	\$ 898,844		
F3. Second Prior Year	(473,276)	531,944	384,651	\$ 898,844	
F4. Third Prior Year	371,465	(473,275)	531,943	384,651	\$ 898,845
F5. Total Phase-Ins	814,784	1,342,164	1,815,438	1,283,495	898,845
G. Funding Value End of Year					
G1. Preliminary Funding Value End of Year: A+D7+E3+F5	\$ 37,150,719	\$ 39,430,681			
G2. Upper Corridor Limit: 112% x B	43,562,718	48,639,874			
G3. Lower Corridor Limit: 88% x B	34,227,850	38,217,044			
G4. Funding Value End of Year	\$ 37,150,719	\$ 39,430,681			
H. Difference Between Market and Funding Value	1,744,565	3,997,778	2,182,340	898,845	-
I. Recognized Rate of Return	10.05 %	10.59 %			
J. Market Rate of Return	12.15 %	16.02 %			
K. Ratio of Funding Value to Market Value	96 %	91 %			

The Funding Value of Assets recognizes assumed investment return (line E3) fully each year. Differences between actual and assumed investment return (line E4) are phased in over a closed 4-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than market value. If assumed rates are exactly realized for 3 consecutive years, funding value will become equal to market value.

# Allocation of Funding Value of Assets Among Divisions

## December 31, 2021

### Traditional, Combined and Member Directed Plans

	Total DB System				
	State	Local	Public Safety	Law Enforcement	Total
<b>(1) Employer Accumulation Fund</b>					
<b>(a) Allocated Amounts</b>	\$ 8,244,555,837	\$ 15,113,551,963	\$ (19,495,171)	\$ 1,759,528,105	\$ 25,098,140,734
<b>(b) Unallocated Amounts Allocated by (1)(a)</b>	30,130,663	55,870,533	(74,655)	6,737,979	92,664,520
<b>(c) OPERS Directed Asset Reallocation</b>	0	0	0	0	0
<b>(d) Total EAF (1)(a) + (1)(b) + (1)(c)</b>	\$ 8,274,686,500	\$ 15,169,422,496	\$ (19,569,826)	\$ 1,766,266,084	\$ 25,190,805,254
<b>(2) Employee Savings Fund (ESF)</b>					
<b>(a) Total Member Deposits</b>	\$ 6,288,502,901	\$ 9,466,693,531	\$ 3,753,655	\$ 845,975,877	\$ 16,604,925,964
<b>(b) ESF Allocated by (2)(a)</b>	\$ 5,987,307,827	\$ 9,014,412,090	\$ 3,572,847	\$ 805,226,511	\$ 15,810,519,275
<b>(3) Retired Assets</b>					
<b>(a) Allocated Amounts</b>	\$ 27,500,863,003	\$ 38,632,700,582	\$ 52,751,033	\$ 2,840,969,283	\$ 69,027,283,901
<b>(b) Additional Annuities and No Division</b>	295,466	58,251,783	0	0	58,547,249
<b>(c) Total Retiree Assets</b>	\$ 27,501,158,469	\$ 38,690,952,365	\$ 52,751,033	\$ 2,840,969,283	\$ 69,085,831,150
<b>(4) Subtotal: (1)(d) + (2)(b) + (3)(c)</b>	\$ 41,763,152,796	\$ 62,874,786,951	\$ 36,754,054	\$ 5,412,461,878	\$ 110,087,155,679
<b>(5) Assets Held for Upcoming Year Budget Allocated According to (4)</b>	46,923,946	70,678,517	41,707	6,141,831	123,786,001
<b>(6) Total Employer + Employee Defined Benefit Assets: (4)+(5)</b>	\$ 41,810,076,742	\$ 62,945,465,468	\$ 36,795,761	\$ 5,418,603,709	\$ 110,210,941,680
<b>(7) Market Value Adjustment Allocated According to (6)</b>	(3,983,323,507)	(5,997,223,739)	(3,508,701)	(516,696,960)	(10,500,752,907)
<b>(8) Funding Value of Defined Benefit Assets (6)+(7)</b>	\$ 37,826,753,235	\$ 56,948,241,729	\$ 33,287,060	\$ 4,901,906,749	\$ 99,710,188,773

Amounts in rows 1b, 2b, and 5 were provided by OPERS in total and allocated to each division by the actuary.

# Allocation of Funding Value of Assets Among Divisions

## December 31, 2021

### Traditional Plan

	Traditional Plan				
	State	Local	Public Safety	Law Enforcement	Total
<b>(1) Employer Accumulation Fund (EAF)</b>					
<b>(a) Allocated Amounts</b>	\$ 7,862,978,818	\$ 14,579,716,567	\$ (19,495,171)	\$ 1,759,528,105	\$ 24,182,728,319
<b>(b) Unallocated Amounts Allocated by (1)(a)</b>	30,110,677	55,831,912	(74,655)	6,737,979	92,605,913
<b>(c) OPERS Directed Asset Reallocation</b>	0	0	0	0	0
<b>(d) Total EAF (1)(a) + (1)(b) + (1)(c)</b>	\$ 7,893,089,495	\$ 14,635,548,479	\$ (19,569,826)	\$ 1,766,266,084	\$ 24,275,334,232
<b>(2) Employee Savings Fund (ESF)</b>					
<b>(a) Total Member Deposits</b>	\$ 6,287,671,369	\$ 9,468,414,251	\$ 3,753,655	\$ 845,975,877	\$ 16,605,815,152
<b>(b) ESF Allocated by (2)(a)</b>	\$ 5,984,803,839	\$ 9,012,335,192	\$ 3,572,847	\$ 805,226,511	\$ 15,805,938,389
<b>(3) Retired Assets</b>					
<b>(a) Allocated Amounts</b>	\$ 27,473,334,353	\$ 38,578,999,328	\$ 52,751,033	\$ 2,840,969,283	\$ 68,946,053,997
<b>(b) Additional Annuities</b>	295,466	58,251,783	0	0	58,547,249
<b>(c) Total Retiree Assets</b>	\$ 27,473,629,819	\$ 38,637,251,111	\$ 52,751,033	\$ 2,840,969,283	\$ 69,004,601,246
<b>(4) Subtotal: (1)(d) + (2)(b) + (3)(c)</b>	\$ 41,351,523,153	\$ 62,285,134,782	\$ 36,754,054	\$ 5,412,461,878	\$ 109,085,873,867
<b>(5) Assets Held for Upcoming Year Budget Allocated According to (4)</b>	46,923,946	70,678,517	41,707	6,141,831	123,786,000
<b>(6) Total Employer + Employee Defined Benefit Assets: (4)+(5)</b>	\$ 41,398,447,099	\$ 62,355,813,299	\$ 36,795,761	\$ 5,418,603,709	\$ 109,209,659,868
<b>(7) Market Value Adjustment Allocated According to (6)</b>	(3,947,594,786)	(5,946,007,657)	(3,508,701)	(516,696,960)	(10,413,808,104)
<b>(8) Funding Value of Defined Benefit Assets (6)+(7)</b>	\$ 37,450,852,313	\$ 56,409,805,642	\$ 33,287,060	\$ 4,901,906,749	\$ 98,795,851,764

Amounts in rows 1b, 2b, and 5 were provided by OPERS in total and allocated to each division by the actuary.



# Allocation of Funding Value of Assets Among Divisions

## December 31, 2021

### Combined Plan

	Combined Plan				
	State	Local	Public Safety	Law Enforcement	Total
<b>(1) Employer Accumulation Fund</b>					
<b>(a) Allocated Amounts</b>	\$ 373,631,623	\$ 524,820,331	\$0	\$0	\$ 898,451,954
<b>(b) Unallocated Amounts Allocated by (1)(a)</b>	59,044	82,937	0	0	141,981
<b>(c) OPERS Directed Asset Reallocation</b>	0	0	0	0	0
<b>(d) Total EAF (1)(a) + (1)(b) + (1)(c)</b>	<u>\$ 373,690,667</u>	<u>\$ 524,903,268</u>	<u>\$0</u>	<u>\$0</u>	<u>\$ 898,593,935</u>
<b>(2) Employee Savings Fund</b>					
<b>(a) Total Member Deposits</b>	\$ 1,126,050	\$ 889,801	\$0	\$0	\$ 2,015,851
<b>(b) ESF Allocated by (2)(a)</b>	\$ 2,491,818	\$ 1,969,026	\$0	\$0	\$ 4,460,844
<b>(3) Retired Assets</b>					
<b>(a) Allocated Amounts</b>	\$ 20,254,257	\$ 34,544,317	\$0	\$0	\$ 54,798,574
<b>(b) No Division</b>	0	0	0	0	0
<b>(c) Total Retiree Assets</b>	<u>\$ 20,254,257</u>	<u>\$ 34,544,317</u>	<u>\$0</u>	<u>\$0</u>	<u>\$ 54,798,574</u>
<b>(4) Subtotal: (1)(d) + (2)(b) + (3)(c)</b>	\$ 396,436,742	\$ 561,416,611	\$0	\$0	\$ 957,853,353
<b>(5) Assets Held for Upcoming Year Budget Allocated According to (4)</b>	0	0	0	0	0
<b>(6) Total Employer + Employee Defined Benefit Assets: (4)+(5)</b>	<u>\$ 396,436,742</u>	<u>\$ 561,416,611</u>	<u>\$0</u>	<u>\$0</u>	<u>\$ 957,853,353</u>
<b>(7) Market Value Adjustment Allocated According to (6)</b>	(34,330,149)	(48,616,876)	0	0	(82,947,025)
<b>(8) Funding Value of Defined Benefit Assets (6)+(7)</b>	<u>\$ 362,106,593</u>	<u>\$ 512,799,735</u>	<u>\$0</u>	<u>\$0</u>	<u>\$ 874,906,328</u>

Amounts in rows 1b, 2b, and 5 were provided by OPERS in total and allocated to each division by the actuary.

# Allocation of Funding Value of Assets Among Divisions

## December 31, 2021

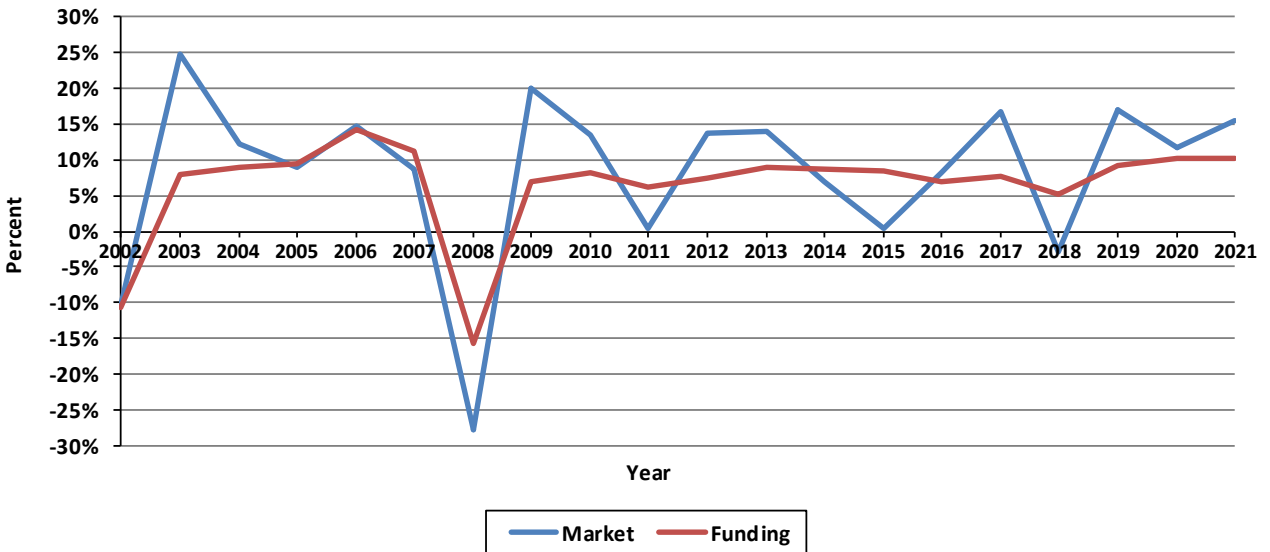
### DB Portion of Member Directed Plan

	Member-Directed Plan				Total
	State	Local	Public Safety	Law Enforcement	
<b>(1) Employer Accumulation Fund</b>					
<b>(a) Allocated Amounts</b>	\$ 7,945,396	\$ 9,015,065	\$0	\$0	\$ 16,960,461
<b>(b) Unallocated Amounts Allocated by 1(a)</b>	(39,058)	(44,316)	0	0	(83,374)
<b>(c) OPERS Directed Asset Reallocation</b>	0	0	0	0	0
<b>(d) Total EAF (1)(a) + (1)(b) + (1)(c)</b>	\$ 7,906,338	\$ 8,970,749	\$0	\$0	\$ 16,877,087
<b>(2) Employee Savings Fund</b>					
<b>(a) Total Member Deposits</b>	\$ (294,518)	\$ (2,610,521)	\$0	\$0	\$ (2,905,039)
<b>(b) ESF Allocated by (2)(a)</b>	\$ 12,170	\$ 107,872	\$0	\$0	\$ 120,042
<b>(3) Retired Assets</b>					
<b>(a) Allocated Amounts</b>	\$ 7,274,393	\$ 19,156,937	\$0	\$0	\$ 26,431,330
<b>(b) No Division</b>	0	0	0	0	0
<b>(c) Total Retiree Assets</b>	\$ 7,274,393	\$ 19,156,937	\$0	\$0	\$ 26,431,330
<b>(4) Subtotal: (1)(d) + (2)(b) + (3)(c)</b>	\$ 15,192,901	\$ 28,235,558	\$0	\$0	\$ 43,428,459
<b>(5) Assets Held for Upcoming Year Budget Allocated According to (4)</b>	0	0	0	0	0
<b>(6) Total Employer + Employee Defined Benefit Assets: (4)+(5)</b>	\$ 15,192,901	\$ 28,235,558	\$0	\$0	\$ 43,428,459
<b>(7) Market Value Adjustment Allocated According to (6)</b>	(1,398,572)	(2,599,206)	0	0	(3,997,778)
<b>(8) Funding Value of Defined Benefit Assets (6)+(7)</b>	\$ 13,794,329	\$ 25,636,352	\$0	\$0	\$ 39,430,681

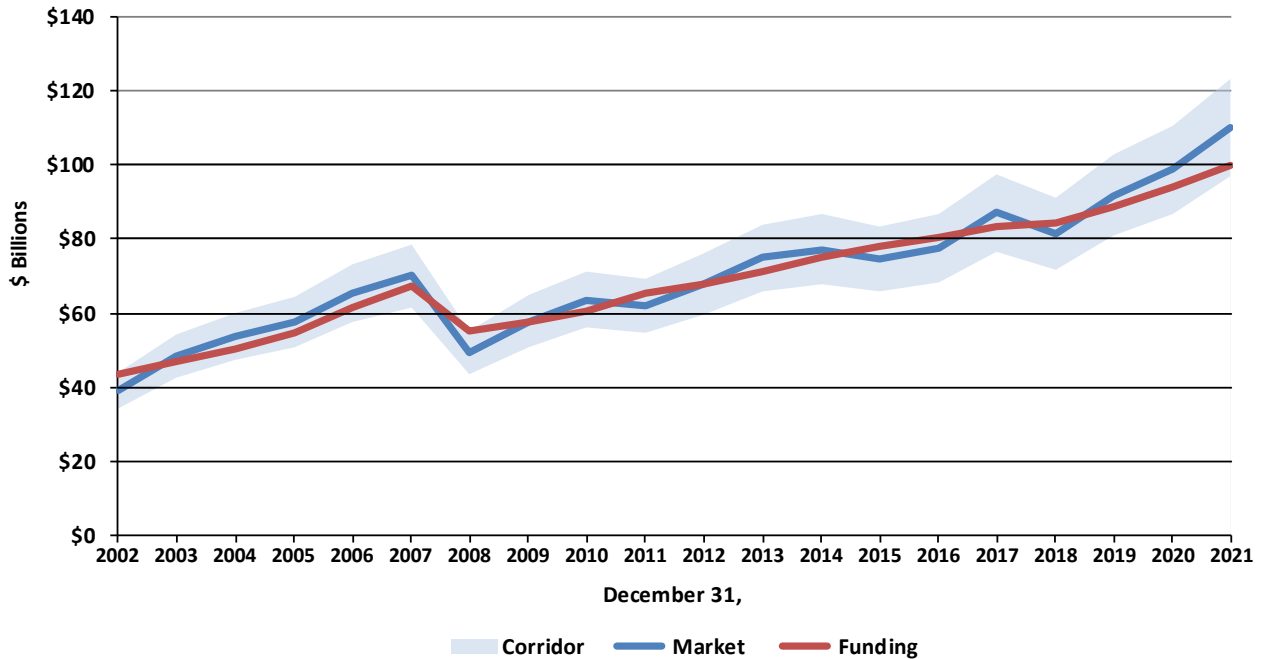
Amounts in rows 1b, 2b, and 5 were provided by OPERS in total and allocated to each division by the actuary.

# Defined Benefit Pension Assets

## Comparison of Rates of Return



## Comparison of Asset Values



## **SECTION III**

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### **BENEFITS AND CONDITIONS EVALUATED**

## Benefits and Conditions Evaluated

### Retirement Plans

**Traditional Pension Plan.** The Traditional Pension Plan is a defined benefit plan under which a member's retirement benefit is based on a formula. The formula is determined by years of contributing service and the average of the three (or five if a member of Transition Group C) highest years of earnable salary (or final average salary). OPERS investment professionals manage the investment of employee and employer contributions to ensure that funds are available to pay the formula benefit.

**Combined Plan.** The Combined Plan is a retirement plan with both a defined benefit and a defined contribution component. Under the defined benefit portion of the Combined Plan, the member's benefit is determined by a reduced formula. OPERS investment professionals manage the investment of employer contributions to ensure that funds are available to pay the reduced formula benefit. Under the defined contribution portion of the Combined Plan, employee contributions are deposited into the member's individual defined contribution account and invested as directed by the member. The member's retirement benefit under this portion of the Combined Plan is based on employee contributions and the gains and losses on those contributions. The member directs the investment by selecting from among the nine professionally-managed OPERS Investment Options.

**Member-Directed Plan.** The Member-Directed Plan is a defined contribution plan under which employee and employer contributions are deposited into a member's individual defined contribution account and invested as directed by the member. The member's retirement benefit is based on employee and employer contributions and the gains and losses on those contributions. Under the Member-Directed Plan, the member directs the investment by selecting from several professionally-managed OPERS Investment Options.



# Benefits and Conditions Evaluated

## Senate Bill 343

**Senate Bill 343.** Senate Bill (SB) 343 became effective January 7, 2013. The benefit changes enacted by SB 343 do not apply to members who retired with an effective date of January 1, 2013 or earlier.

**Transition Groups.** A transition plan was developed as part of the SB 343 benefit changes. The transition group to which a member belongs is dependent upon the date at which that member is first eligible to retire with a reduced or unreduced benefit.

A member is in Group A if the member is eligible to retire under the retirement eligibility conditions in place prior to the passage of SB 343 on or before January 7, 2018.

A member is in Group B if the member is not in Group A and satisfies either of the following conditions:

- (1) The member has 20 years of service credit as of January 7, 2013, or
- (2) The member is eligible to retire under the retirement eligibility conditions in place prior to the passage of SB 343 on or before January 7, 2023.

A member is in Group C if the member satisfies either of the following conditions:

- (1) The member was hired prior to January 7, 2013 but was not in Group A or Group B, or
- (2) The member was hired on or after January 7, 2013.

**Key Benefit Changes.** There are five key components that were affected by SB 343:

- (1) Age and service retirement eligibility conditions,
- (2) Benefit formula,
- (3) Cost-of-living Allowance (COLA),
- (4) Final Average Salary (FAS) period, and
- (5) Early retirement reduction factors

# Benefits and Conditions Evaluated

## Key Terms

**Final Average Salary** (“FAS”) means the average of the annual earnings for the 3 highest calendar years of compensation (or the last 36 months of earnable salary) for Transition Group A and B members. The highest 5 calendar years (or the last 60 months of earnable salary) is used for Transition Group C members.

**Participant Contribution Account** is the account for each Participant in the Combined or Member-Directed Plan to which shall be credited the employee contributions.

**Miscellaneous Contribution Account** is the account to which shall be credited any voluntary after-tax contributions for members in the Combined and Member-Directed Plans.

**Rollover Account** is the account to which shall be credited any rollover amounts for members in the Combined or Member-Directed Plans.

**Employers’ Accumulation Fund** is the fund to which shall be credited employer contributions for members in the Traditional or Combined Plan. There are separate accounts in the Employers’ Accumulation Fund for the Combined Plan and the Traditional Pension Plan.

**Employer Contribution Account** is the fund to which shall be credited a portion of the employer contributions for members in the Member-Directed Plan.

# Traditional Pension Plan Contributions

**Employer Contributions.** Employer contributions are expressed as a percent of member-covered payroll. The maximum statutory rate for state and local government employers is 14.0%. The maximum statutory rate for law enforcement employers is 18.1% (H.B. 416, effective 1/1/2001). Retiree Health funding portion of the contribution rates are determined by Board adoption.

**Member Contributions.** Traditional Plan members contribute rates as a percent of earnable salary presented below.

**Scheduled Contributions.** The following table shows total scheduled employer contribution rates (including the allocation of the employer contribution rate between the pension and retiree health programs) and scheduled member contribution rates. Employer contribution rates for the State division have been adopted through July 1, 2023. Employer contribution rates for the Local Government, Law Enforcement and Public Safety divisions have been adopted through December 31, 2023.

For valuation purposes, it is assumed that the contribution rates as a percent of earnable salary presented below are applicable in calendar years 2022 and thereafter.

	State	Local Government	Law Enforcement	Public Safety
<b>Employer Contributions</b>				
-Pension	14.00%	14.00%	18.10%	18.10%
-Retiree Health	0.00%	0.00%	0.00%	0.00%
-Total	14.00%	14.00%	18.10%	18.10%
<b>Member Contributions</b>				
<b>Total Contributions</b>	24.00%	24.00%	31.10%	30.10%

## Traditional Pension Plan Age & Service Benefits

**Unreduced Age and service eligibility.** The table below shows retirement eligibility conditions by division and transition group for unreduced age and service retirement.

Division	Group A		Group B		Group C	
	Age	Service	Age	Service	Age	Service
State and Local Government	Any	30	52	31	55	32
			Any	32		
	65	5	66	5	67	5
Law Enforcement	48	25	50	25	52	25
	62	15	64	15	64	15
Public Safety	52	25	54	25	56	25
	62	15	64	15	64	15
Law and Public Safety	52	25	54	25	56	25

**Reduced Age and service eligibility.** The table below shows retirement eligibility conditions by division and transition group for reduced age and service retirement.

Division	Group A		Group B		Group C	
	Age	Service	Age	Service	Age	Service
State and Local Government	55	25	55	25	57	25
	60	5	60	5	62	5
Law Enforcement	52	15	52	15	56	15
			48	25	48	25
Public Safety	52	15	52	15	56	15
	48	25	48	25	52	25
Law and Public Safety	48	25	48	25	52	25

**Unreduced Age and service allowance – State and Local Government.** A retiring member's age and service allowance is equal to Ohio service credit times 2.2% of FAS for the first 30 years of service (35 years for Transition Group C) plus 2.5% for years of service over 30 years (35 years for Transition Group C). Maximum allowance is 100% of FAS or the limits under IRC Section 415(b).

## Traditional Pension Plan Age & Service Benefits (Continued)

**Reduced Age and service allowance – State and Local Government.** If a member retires before reaching age and service eligibility for an unreduced benefit, an early retirement reduction will be applied to the computed unreduced benefit. Below is a summary of the early retirement reduction factors:

Transition Group A			
Attained Age	OR*	Years of Service Credit	Percentage of Base Amount
58		25	75%
59		26	80
60		27	85
61		N/A	88
N/A		28	90
62		N/A	91
63		N/A	94
N/A		29	95
64		N/A	97
65		30 or more	100

\* Whichever yields the higher percentage.

Transition Group B											
Service	Age										
	55	56	57	58	59	60	61	62	63	64	65
30	75%	76%	78%	79%	80%	82%	83%	85%	86%	88%	89%
29	69	70	72	73	74	75	76	78	79	80	89
28	64	65	66	67	68	69	70	71	72	80	89
27	59	60	61	62	62	63	64	65	72	80	89
26	55	55	56	57	57	58	59	65	72	80	89
25	50	51	51	52	52	53	59	65	72	80	89
24 & Under						53	59	65	72	80	89

Transition Group C										
Service	Ages									
	57	58	59	60	61	62	63	64	65	66
31	80%	80%	81%	82%	83%	85%	86%	87%	88%	89%
30	73	74	75	75	76	77	78	79	80	89
29	67	68	68	69	70	70	71	72	80	89
28	61	62	62	63	63	64	64	72	80	89
27	56	57	57	57	58	58	64	72	80	89
26	51	52	52	52	52	58	64	72	80	89
25	47	47	47	47	52	58	64	72	80	89
24 & Under						58	64	72	80	89

## Traditional Pension Plan Age & Service Benefits (Continued)

**Unreduced Age and service allowance – Law Members (Law Enforcement and Public Safety).** A retiring member’s age and service allowance (if attained 25 years of service) is equal to 2.5% of FAS times the first 25 years of service plus 2.1% of FAS times service credit in excess of 25 years. A retiring member’s age and service allowance (if attained 15 years of service, but less than 25 years of service) is equal to 1.5% of FAS times years of service credit. Maximum allowance is 90% of FAS or the limits under IRC Section 415(b).

**Reduced Age and service allowance – Law Members (Law Enforcement and Public Safety).** If a member retires before reaching age and service eligibility for an unreduced benefit, an early retirement reduction will be applied to the computed unreduced benefit. Below is a summary of the early retirement reduction factors:

Transition Group A	
Public Safety	
Attained Age	Percentage of Base Amount
48	75%
49	80
50	86
51	93
52	100

Transition Group B			
Public Safety		Law Enforcement	
Attained Age	Percentage of Base Amount	Attained Age	Percentage of Base Amount
48	58%	48	84%
49	64	49	92
50	70	50	100
51	76		
52	83		
53	91		
54	100		

Transition Group C			
Public Safety		Law Enforcement	
Attained Age	Percentage of Base Amount	Attained Age	Percentage of Base Amount
52	69%	48	70%
53	76	49	76
54	83	50	84
55	91	51	91
56	100	52	100

# Traditional Pension Plan Disability Retirement

The disability program was revised in 1992, in order to comply with the Older Workers Benefit Protection Act. Employees becoming members after July 29, 1992 are covered by the post July 29, 1992 program. Other members were able to elect coverage under the pre July 29, 1992 program (original plan) or elect to be covered by the post July 29, 1992 program (revised plan).

Features of the original plan are:

- a) Upon becoming permanently disabled after completion of at least 5 years or 60 contributing months of service but before attaining age 60, a member is eligible for a disability allowance. The service requirement is waived for Law Enforcement members with an on-duty illness or injury.
- b) The amount of the allowance is the service the member would have had if employment had continued to age 60 times 2.2% of FAS.
- c) Maximum allowance is 75% of FAS, minimum allowance is 30% of FAS.

Features of the revised plan are:

- a) A member may apply at any age after completion of 5 years or 60 contributing months of service. The service requirement is waived for Law Enforcement members with an on-duty illness or injury.
- b) A disability benefit equal to the greater of 45% of FAS or the actual service credit times 2.2% of FAS with no early retirement reduction (maximum 60% of FAS). The disability benefit period is to age 65 if the member is disabled prior to age 60. The benefit period declines gradually from 60 months for members disabled at ages 60 and 61, to 12 months for members disabled at age 69 or older.
- c) After the disability benefit ends, a service retirement benefit equal to the greater of (i) the accrued benefit based on actual service, or (ii) 2.2% of FAS times service credit including the period of disability (maximum 45% of FAS). In addition, an amount equal to the cost-of-living increases the member would have received had the member retired on the basis of age and service is paid.

# Traditional Pension Plan

## Survivor Benefits

**Death while eligible to retire.** If a member dies in service after becoming eligible to retire with an age and service allowance and leaves a surviving spouse or other sole dependent beneficiary, the survivor receives the same amount that would have been paid had the member retired the last day of the month of death and elected the 100% joint and survivor form of payment.

**Survivor (death-in-service) allowances.** If a deceased member had at least 1-1/2 years of contributing service credit, with at least 1/4 year of such service occurring within the 2-1/2 years prior to death, or was receiving a disability benefit, qualified survivors may receive the following monthly benefits. The benefit paid will be the greater of the applicable benefits paid under the following two schedules:

### Schedule 1

Number of Qualified Survivors Affecting the Benefit	Annual Benefit as a % of Deceased Member's FAS	Minimum Monthly Benefit
1	25%	\$250
2	40%	\$400
3	50%	\$500
4	55%	\$500
5 or more	60%	\$500

### Schedule 2

Years of Service	Annual Benefit as a % of Deceased Member's FAS
20	29%
21	33%
22	37%
23	41%
24	45%
25	48%
26	51%
27	54%
28	57%
29 or more	60%

Qualifying survivors who are paid benefits under Schedule 2 share equally in the benefits, except that if there is a surviving spouse, the spouse receives the greater of 25% of FAS or \$250.



## Traditional Pension Plan Survivor Benefits (Continued)

A **qualified spouse** is the surviving spouse of a deceased member who is age 62 or at any age if the deceased member had 10 or more years of Ohio service credit or if the surviving spouse is caring for a qualified child or is adjudged physically or mentally incompetent.

A **qualified child** is a child who has never been married and under the age of 18 (or 22 if attending an approved school), or regardless of age is adjudged physically or mentally incompetent at the time of the member's death.

A **qualified parent** is a dependent parent aged 65 or older (earlier if mentally or physically incompetent) who received at least one-half support from the member during the 12-month period immediately preceding the member's death.

Qualified **survivors of disability benefit recipients** have the FAS used in calculating their benefits adjusted for each year between the effective date of the disability benefit and the recipient's date of death. The FAS is adjusted by the lesser of (1) 3% or (2) the actual average percentage change in the CPI.

## Traditional Pension Plan Benefits at Retirement

**Optional Benefit Forms.** Retiring members may elect to have benefits paid in straight life form, in a form that guarantees a minimum number of monthly payments, or in a form that provides a continuation of all or a portion of the monthly benefit to a beneficiary after the death of the retiree. If a retiring member elects benefits in other than straight life form, the monthly amount is adjusted. The adjustment is based upon interest, COLA, and mortality assumptions (with a blend of male and female mortality rates to produce unisex election factors consistent with the gender distribution of members electing optional forms of payment).

**PLOP.** Effective 01/01/2004, retiring members may also elect to receive a Partial Lump Sum Option Payment (PLOP) (S.B.247). The PLOP is an option that allows a retiree to initially receive a partial lump sum benefit payment along with a reduced monthly retirement allowance. The lump sum payment cannot be less than 6 times or more than 36 times the monthly amount that would be payable to the member under the plan of payment selected and shall not result in a monthly allowance that is less than 50% of the monthly benefit. The total amount paid as a lump sum and monthly benefit shall be the actuarial equivalent of the amount that would have been paid had the lump sum not been selected.

**QEBA.** Qualified Excess Benefit Arrangement was established 01/01/2004 (H.B.190). The QEBA is operated in accordance with Internal Revenue Code Section 415(m). Under this arrangement the recipient may be paid the portion of his/her retirement benefit that was previously limited due to IRC Section 415(b).

**Cost-of-Living Adjustment.** A retiree who has received benefits for 12 months will receive an annual cost-of-living adjustment (COLA). The COLA is determined by the recipient's retirement effective date. Members with effective retirement dates prior to January 7, 2013 receive a simple 3 percent COLA corresponding to their base allowance. Members with effective retirement dates after January 7, 2013 receive a simple percent COLA corresponding to their base allowance equal to the percentage increase of the Consumer Price Index for the prior year (June to June CPI-W), not to exceed to 3 percent. Members who retired within the first five calendar years after January 7, 2013 received a simple 3 percent COLA until December 31, 2018. Reemployed Retiree annuitized balances do not receive a COLA.

**Post-retirement Death Benefit.** Upon the death of an age and service or disability retiree, a death benefit in the following amount is payable:

Service Credit at Retirement	Amount of Death Benefit
5 to 9 years	\$ 500
10 to 14 years	1,000
15 to 19 years	1,500
20 to 24 years	2,000
25 or more years	2,500

**Deferred Benefits.** A member with at least 5 years of service credit who leaves service before being eligible for an immediate allowance and who does not withdraw accumulated contributions will be entitled to a deferred allowance at age 60. For law members, the age at which benefits commence depends on the amount of service credit. The amount of the allowance will be based on credited service and final average salary at time of leaving service.



## Traditional Pension Plan Other Benefit Provisions

**Refund of Member Accumulated Contributions.** In the event a member leaves service prior to retirement, the member may elect to receive a refund of contributions with interest and may be eligible to receive an additional amount as described below. These refund provisions are available to all members. If a member dies prior to retirement and survivor benefits are not payable, the member's contributions with interest are paid to a designated beneficiary or other survivor. Interest is credited annually to member contribution balances. The rate of interest credited is determined by the OPERS Board and will not be greater than 6%. At the present time, 1% interest is credited to member contribution balances.

If the member has, or had at the time of death, at least 5 years but less than 10 years of qualified service, an additional 33% of the member's eligible contributions will be paid to the member or survivor. If the member has, or had at the time of death, at least 10 years of qualified service credit, an additional 67% of the member's eligible contributions will be paid to the member or survivor. The additional amount is not paid if the member is a re-employed retiree, or in the case of a deceased member, was receiving disability benefits at the time of death.

**Health Care Benefits.** Health care benefits are available to persons meeting retiree health care eligibility requirements. Members retiring with a normal or early service retirement allowance after January 1, 2015 must have 20 or more years of qualified service credit to be eligible for this benefit.

**Additional Annuity Program.** The additional annuity program provides Traditional Plan and re-employed retiree members the opportunity of supplementing their retirement income. Members make additional contributions (independent of the required contributions) to an account that earns investment income based upon the return of the OPERS Stable Value Fund. At termination, the member may take the additional annuity account balance either as a lump sum or annuitized in monthly payments.

**Re-Employed Retirees.** Re-employed age and service retirees contribute to the "Money Purchase Plan". In most instances, re-employed retirees will continue to receive their retirement allowance during re-employment. Upon termination of re-employment, members are eligible to apply for either a refund of contributions prior to age 65 or a Money Purchase Plan benefit as a lump sum or annuity after age 65. The Money Purchase Plan benefit is equal to member contributions and allowable interest plus an additional 67% matching amount. If monthly benefits are elected, joint and survivor options are also available.

## Combined Plan

**Age and Service Eligibility.** State and Local Government Members\* who elected the Combined Plan may retire with an age and service retirement allowance under the same eligibility conditions as the Traditional Plan.

*\*Law Enforcement and Public Safety members must elect the Traditional Pension Plan only.*

**Age and Service Retirement Allowance (Defined Benefit portion of the Plan).** A retiring member's age and service retirement allowance is equal to Ohio service credit in the Plan times 1.0% of FAS for the first 30 years of service (35 years for Transition Group C) plus 1.25% for years of service over 30 years (35 years for Transition Group C). Maximum allowance is 100% of FAS or the limits under IRC Section 415(b). Early retirement reduction factors for reduced benefits in the Combined Plan are the same as the Traditional Plan.

**Age and Service Retirement Benefit (Defined Contribution portion of the Plan).** The member's retirement benefit under this portion of the Combined Plan is based on the amounts credited to the Participant Contribution Account, Rollover Account, and Miscellaneous Account and the gains and losses on the amounts in those Accounts.

**Disability Retirement.** A Combined Plan member may apply after completion of 5 years in the Plan or 60 contributing months of service in the Plan. Combined Plan members may be covered under the original or revised disability plan. Combined Plan members who apply for disability may:

- 1) Take a lump sum distribution of the Participant Contribution Account, Rollover Account, and Miscellaneous Account and any additional amount they are entitled to from the Employers' Accumulation Fund, or
- 2) Transfer all service credit and the Participant's Accounts (as listed above) in the Combined Plan to the Traditional Pension Plan to be paid a disability benefit under the Traditional Pension Plan guidelines.

**Survivor Benefits.** Combined Plan members are eligible for the same survivor benefits as those listed under the Traditional Pension Plan and must qualify for survivor benefits under the same guidelines as those members in the Traditional Pension Plan.

**Optional Benefit Forms under the Defined Benefit portion of the Plan.** Retiring members may elect to have their age and service retirement allowance in straight life form, in a form that guarantees a minimum number of monthly payments, or in a form that provides a continuation of all or a portion of the monthly benefit to a beneficiary after the death of the retiree. If a retiring member elects benefits in other than straight life form, the monthly amount is adjusted. The adjustment is based upon interest, COLA, and mortality assumptions (with a blend of male and female mortality rates to produce unisex election factors consistent with the gender distribution of members electing optional forms of payment).

**Optional Benefit Forms under the Defined Contribution portion of the Plan.** Retiring members may elect to have retirement benefits paid in a partial lump sum, subject to any rules adopted by the Board; monthly annuity payments (with joint and survivor options) similar to those offered under the defined benefit portion of the Plan; periodic payments over a period certain; periodic payments of a specific monthly amount; payments with a deferred start date; or a combination of these options.



## Combined Plan (Continued)

**QEBA.** Qualified Excess Benefit Arrangement was established 01/01/2004 (H.B.190). The QEBA is operated in accordance with Internal Revenue Code Section 415(m). Under this arrangement the recipient may be paid the portion of his/her retirement benefit that was previously limited due to IRC Section 415(b). The QEBA is available to Combined Plan members for the age and service retirement allowance under the defined benefit portion of the Plan.

**Cost-of-Living Adjustment.** A retiree who has received benefits for 12 months will receive an annual cost-of-living adjustment (COLA). The COLA is determined by the recipient's retirement effective date. Members with effective retirement dates prior to January 7, 2013 receive a simple 3 percent COLA corresponding to their base allowance. Members with effective retirement dates after January 7, 2013 receive a simple percent COLA corresponding to their base allowance equal to the percentage increase of the Consumer Price Index for the prior year (June to June CPI-W), not to exceed to 3 percent. Members who retired within the first five calendar years after January 7, 2013 received a simple 3 percent COLA until December 31, 2018. Reemployed Retiree annuitized balances do not receive a COLA.

**Post-retirement death benefit.** Upon the death of an age and service retiree, a death benefit in the following amount is payable:

Service Credit at Retirement	Amount of Death Benefit
5 to 9 years	\$ 500
10 to 14 years	1,000
15 to 19 years	1,500
20 to 24 years	2,000
25 or more years	2,500

**Refunds and Vesting.** A participant in the Combined Plan shall at all times be 100% vested in the Participant Contribution Account, Miscellaneous Contribution Account, and the Rollover Account.

If the member has at least 5 years but less than 10 years of qualified service credit in the Plan, an additional 33% of the member's eligible contributions will be paid from the Employers' Accumulation Fund. If the member has at least 10 years of qualified service credit in the Plan, an additional 67% of the member's eligible contributions will be paid to the member. Amounts paid to purchase service credit earn interest at the same rates as the Traditional Pension Plan and are payable as a refund.

In the event a member leaves service prior to retirement, the member may elect to receive a refund of their Participant Contribution Account, the Rollover Account, the Miscellaneous Account, and any additional amounts they are entitled to from the Employers' Accumulation Fund (as described above).

**Health Care Benefits.** Health care benefits are available to persons meeting retiree health care eligibility requirements. Members retiring with a normal or early service retirement allowance after January 1, 2015 must have 20 or more years of qualified service credit to be eligible for this benefit.

# Member-Directed Plan

**Age and Service Eligibility.** State and Local Government Members\* who elected the Member Directed Plan and attained age fifty-five (55) may retire under the Member-Directed Plan.

*\*Law Enforcement and Public Safety members must elect the Traditional Pension Plan only.*

**Age and Service Retirement Benefits.** The member's retirement benefit is based on the value of the Participant Contribution Account, the Rollover Account, the Miscellaneous Account, and any vested portion of the Employer Contribution Account.

**Disability Retirement.** Not available under the Member-Directed Plan. Members may:

- 1) If age fifty-five (55), terminate employment and begin receiving retirement benefits, or
- 2) Take a lump sum distribution of their Participant Contribution Account, Rollover Account, Miscellaneous Account and any vested portion of the Employer Contribution Account.

**Survivor Benefits.** Not available under the Member-Directed Plan. Survivors must take a lump sum distribution of the member's Participant Contribution Account, Rollover Account, Miscellaneous Account and any vested portion of the Employer Contribution Account.

**Optional Benefit Forms.** Retiring members may elect to have retirement benefits paid in a partial lump sum, subject to any rules adopted by the Board; monthly annuity payments (with joint and survivor options) similar to those offered under the defined benefit portion of the Combined Plan; periodic payments over a period certain; periodic payments of a specific monthly amount; payments with a deferred start date; or a combination of these options.

**Refunds and Vesting.** A participant shall at all times be 100% vested in the Participant Contribution Account, Miscellaneous Contribution Account, and the Rollover Account. A participant shall vest in the Employer Contribution Account according to the Participant's attained years of participation in the Plan as follows:

One year of participation	20%
Two years of participation	40%
Three years of participation	60%
Four years of participation	80%
Five years of participation	100%

In the event a member leaves service prior to retirement, the member may elect to receive a refund of their Participant Contribution Account, Rollover Account, and Miscellaneous Account and any vested amounts in the Employer Contribution Account (as described above).

## Member-Directed Plan (Continued)

**Health Care Benefits.** A portion of the employer contribution for Member-Directed participants is credited to a Retiree Medical Account (RMA). Amounts contributed to the RMA may be used after separation from service and a refund or retirement distribution is made to pay qualified health, dental and vision care expenses. Beginning January 1, 2009, members vest in their RMA based on their attained years of participation in the Plan as follows:

Less than 1 year	0%
1 year	20%
2 years	40%
3 years	60%
4 years	80%
5 years	100%

# Sample Benefit Computation – Traditional Plan State or Local Member (Transition Group A) - Normal Retirement Retiring December 31, 2021 Under Benefit Provisions Evaluated

**Data:**

A.	\$32,000	Final Average Earnings
B.	33	Years of Credited Service
C.	59	Age of Retiree
D.	56	Age of Spouse
E.	100%	Percentage of Pension to Continue to Spouse after retiree's death (Retiree makes the choice of 100% Joint and Survivor with Pop-Up)

**Computations:**

F.	Formula Benefit: $(0.022 \times 30 \text{ years} + 0.025 \times 3 \text{ years}) \times \$32,000 =$	\$ 23,520
G.	Reduction for Line E Election: $\# (1 - 0.84697) \times (F) =$	3,599
H.	Benefit Payable to Retiree while Spouse is Alive: $(F) - (G) =$	19,921
I.	Benefit Payable to Spouse after Retiree's Death	19,921
J.	Benefit Payable to Retiree after Spouse's Death	23,520

**Projected Benefits:\***

Year Ended December 31,	Retiree's Benefit (Both Alive)	Spouse's Benefit (After Retiree's Death)	Retiree's Benefit (After Spouse's Death)
2022	\$ 19,921	\$ 19,921	\$ 23,520
2023	20,519	20,519	24,226
2024	21,116	21,116	24,931
2025	21,714	21,714	25,637
2026	22,312	22,312	26,342
2027	22,909	22,909	27,048
2028	23,507	23,507	27,754
2029	24,104	24,104	28,459
2030	24,702	24,702	29,165
2031	25,300	25,300	29,870

\* Assumes the annual percentage change in the Consumer Price Index (CPI) is 3% or greater in all future years.  
# Based on conversion factors for optional forms of payment in effect December 31, 2021.



# Sample Benefit Computation – Traditional Plan State or Local Member (Transition Group A) - Early Retirement Retiring December 31, 2021 Under Benefit Provisions Evaluated

**Data:**

A.	\$32,000	Final Average Earnings
B.	26	Years of Credited Service
C.	59	Age of Retiree
D.	56	Age of Spouse
E.	100%	Percentage of Pension to Continue to Spouse after retiree's death (Retiree makes the choice of 100% Joint and Survivor with Pop-Up)

**Computations:**

F.	Formula Benefit:	$0.022 \times 26 \text{ years} \times \$32,000 =$	\$ 18,304
G.	Adjustment Factor for Early Retirement (from schedule)		80%
H.	Adjusted Benefit:	$(F) \times (G) =$	14,643
I.	Reduction for Line E Election: # $(1 - 0.84697) \times (H) =$		2,241
J.	Benefit Payable to Retiree while Spouse is Alive: $(H) - (I)$		12,402
K.	Benefit Payable to Spouse after Retiree's Death		12,402
L.	Benefit Payable to Retiree after Spouse's Death		14,643

**Projected Benefits:\***

Year Ended December 31,	Retiree's Benefit (Both Alive)	Spouse's Benefit (After Retiree's Death)	Retiree's Benefit (After Spouse's Death)
2022	\$ 12,402	\$ 12,402	\$ 14,643
2023	12,774	12,774	15,082
2024	13,146	13,146	15,522
2025	13,518	13,518	15,961
2026	13,890	13,890	16,400
2027	14,263	14,263	16,840
2028	14,635	14,635	17,279
2029	15,007	15,007	17,718
2030	15,379	15,379	18,158
2031	15,751	15,751	18,597

\* Assumes the annual percentage change in the Consumer Price Index (CPI) is 3% or greater in all future years.

# Based on conversion factors for optional forms of payment in effect December 31, 2021.



**Sample Benefit Computation – Traditional Plan  
Public Safety Member  
(Transition Group A) - Normal Retirement  
Retiring December 31, 2021  
Under Benefit Provisions Evaluated**

**Data:**

A.	<u>\$38,000</u>	Final Average Earnings
B.	<u>28</u>	Years of Credited Service
C.	<u>49</u>	Age of Retiree
D.	<u>46</u>	Age of Spouse
E.	<u>100%</u>	Percentage of Pension to Continue to Spouse after retiree's death (Retiree makes the choice of 100% Joint and Survivor with Pop-Up)

**Computations:**

F.	Formula Benefit:	$(0.025 \times 25 \text{ years} + 0.021 \times 3 \text{ years}) \times \$38,000 \times 80\% =$	\$ 20,915
G.	Reduction for Line E Election: # $(1 - 0.89936) \times (F) =$		<u>2,105</u>
H.	Benefit Payable to Retiree while Spouse is Alive: $(F) - (G) =$		18,810
I.	Benefit Payable to Spouse after Retiree's Death		18,810
J.	Benefit Payable to Retiree after Spouse's Death		20,915

**Projected Benefits:\***

Year Ended December 31,	Retiree's Benefit (Both Alive)	Spouse's Benefit (After Retiree's Death)	Retiree's Benefit (After Spouse's Death)
2022	\$ 18,810	\$ 18,810	\$ 20,915
2023	19,374	19,374	21,542
2024	19,939	19,939	22,170
2025	20,503	20,503	22,797
2026	21,067	21,067	23,425
2027	21,632	21,632	24,052
2028	22,196	22,196	24,680
2029	22,760	22,760	25,307
2030	23,324	23,324	25,935
2031	23,889	23,889	26,562

\* Assumes the annual percentage change in the Consumer Price Index (CPI) is 3% or greater in all future years.

# Based on conversion factors for optional forms of payment in effect December 31, 2021.



# Sample Benefit Computation – Traditional Plan Law Enforcement Member (Transition Group A) - Normal Retirement Retiring December 31, 2021 Under Benefit Provisions Evaluated

**Data:**

A.	\$38,000	Final Average Earnings
B.	28	Years of Credited Service
C.	49	Age of Retiree
D.	46	Age of Spouse
E.	100%	Percentage of Pension to Continue to Spouse after retiree's death (Retiree makes the choice of 100% Joint and Survivor with Pop-Up)

**Computations:**

F.	Formula Benefit: $(0.025 \times 25 \text{ years} + 0.021 \times 3 \text{ years}) \times \$38,000 =$	\$ 26,144
G.	Reduction for Line E Election: $\# (1 - 0.89936) \times (F) =$	2,631
H.	Benefit Payable to Retiree while Spouse is Alive: $(F) - (G) =$	23,513
I.	Benefit Payable to Spouse after Retiree's Death	23,513
J.	Benefit Payable to Retiree after Spouse's Death	26,144

**Projected Benefits:\***

Year Ended December 31,	Retiree's Benefit (Both Alive)	Spouse's Benefit (After Retiree's Death)	Retiree's Benefit (After Spouse's Death)
2022	\$ 23,513	\$ 23,513	\$ 26,144
2023	24,218	24,218	26,928
2024	24,924	24,924	27,713
2025	25,629	25,629	28,497
2026	26,335	26,335	29,281
2027	27,040	27,040	30,066
2028	27,745	27,745	30,850
2029	28,451	28,451	31,634
2030	29,156	29,156	32,419
2031	29,862	29,862	33,203

\* Assumes the annual percentage change in the Consumer Price Index (CPI) is 3% or greater in all future years.

# Based on conversion factors for optional forms of payment in effect December 31, 2021.



# Sample Benefit Computation – Traditional Plan State or Local Member (Transition Group C) – Termination Benefit Terminating December 31, 2021 Under Benefit Provisions Evaluated

**Data:**

A.	<u>\$32,000</u>	Final Average Earnings
B.	<u>15</u>	Years of Credited Service
C.	<u>45</u>	Age of Member
D.	<u>42</u>	Age of Spouse
E.	<u>62:59</u>	Ages at Which Benefits are Payable
F.	<u>100%</u>	Percentage of Pension to Continue to Spouse after retiree's death (Retiree makes the choice of 100% Joint and Survivor with Pop-Up)
G.	<u>\$44,000</u>	Accumulated Contributions with Interest at Termination Date

**Computations:**

H.	Formula Benefit: $(0.022 \times 15 \text{ years} + 0.025 \times 0 \text{ years}) \times \$32,000 =$	\$ 10,560
I.	Adjustment Factor for Early Retirement (from schedule)	58%
J.	Adjusted Benefit: $(H) \times (I) =$	6,125
K.	Reduction for Line F Election: $\# (1 - 0.82672) \times (J) =$	<u>1,061</u>
L.	Benefit Payable to Retiree while Spouse is Alive: $(J) - (K) =$	5,064
M.	Benefit Payable to Spouse after Member's Death	5,064
N.	Benefit Payable to Retiree after Spouse's Death	6,125
O.	In lieu of a lifetime benefit, terminatee may elect to receive a refund of accumulated contributions with interest plus an additional 67% of eligible accumulated contributions because terminatee had more than 10 years of service.	73,480

**Projected Benefits:\***

Year Ended December 31,	Member's Benefit (Both Alive)	Spouse's Benefit (After Retiree's Death)	Member's Benefit (After Spouse's Death)
2039	\$ 5,064	\$ 5,064	\$ 6,125
2040	5,216	5,216	6,309
2041	5,368	5,368	6,492
2042	5,520	5,520	6,676
2043	5,671	5,671	6,860
2044	5,823	5,823	7,044
2045	5,975	5,975	7,227
2046	6,127	6,127	7,411
2047	6,279	6,279	7,595
2048	6,431	6,431	7,778

\* Assumes the annual percentage change in the Consumer Price Index (CPI) is 3% or greater in all future years.

# Based on conversion factors for optional forms of payment in effect December 31, 2021.



# Sample Benefit Computation – Traditional Plan Public Safety/Law Enforcement Member (Transition Group C) – Termination Benefit Terminating December 31, 2021 Under Benefit Provisions Evaluated

**Data:**

A.	<u>\$38,000</u>	Final Average Earnings
B.	<u>15</u>	Years of Credited Service
C.	<u>37</u>	Age of Member
D.	<u>34</u>	Age of Spouse
E.	<u>56:53</u>	Ages at Which Benefits are Payable
F.	<u>100%</u>	Percentage of Pension to Continue to Spouse after retiree's death (Retiree makes the choice of 100% Joint and Survivor with Pop-Up)
G.	<u>\$46,000</u>	Accumulated Contributions at Termination Date

**Computations:**

H.	Formula Benefit: $(0.015 \times 15 \text{ years}) \times \$38,000 =$	\$ 8,550
I.	Reduction for Line F Election: $\# (1 - 0.86503) \times (H) =$	<u>1,154</u>
J.	Benefit Payable to Retiree while Spouse is Alive: $(H) - (I) =$	7,396
K.	Benefit Payable to Spouse after Member's Death	7,396
L.	Benefit Payable to Retiree after Spouse's Death	8,550
M.	In lieu of a lifetime benefit, terminee may elect to receive a refund of accumulated contributions with interest plus an additional 67% of eligible accumulated contributions because terminee had more than 10 years of service.	76,820

**Projected Benefits:\***

Year Ended December 31,	Member's Benefit (Both Alive)	Spouse's Benefit (After Retiree's Death)	Member's Benefit (After Spouse's Death)
2041	\$ 7,396	\$ 7,396	\$ 8,550
2042	7,618	7,618	8,807
2043	7,840	7,840	9,063
2044	8,062	8,062	9,320
2045	8,284	8,284	9,576
2046	8,505	8,505	9,833
2047	8,727	8,727	10,089
2048	8,949	8,949	10,346
2049	9,171	9,171	10,602
2050	9,393	9,393	10,859

\* Assumes the annual percentage change in the Consumer Price Index (CPI) is 3% or greater in all future years.

# Based on conversion factors for optional forms of payment in effect December 31, 2021.



## **SECTION IV**

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### **RECOMMENDATIONS FOR RESERVE TRANSFERS**

## December 31, 2021 Retired Life Valuation Reserve Transfers

Reserve transfers from the Employer Accumulation Fund to the A & PR Fund and/or Survivor Benefit Funds are recommended in the following instances.

- Whenever the December 31 valuation shows unfunded accrued liabilities or assets in excess of computed liabilities in any of the retired life funds.
- To cover the cost of ad-hoc postretirement benefit increases.
- To adjust retired life reserves for any changes in computed liabilities resulting from assumption changes.

By making these annual adjustments in addition to the regular transfers when allowances are added to the rolls, the ratio of assets to liabilities for retired members and beneficiaries will stay at 100%. Year to year changes in this ratio before recommended transfers will normally be isolated to mortality experience within the retired life group.

In 1992, OPERS began making interim benefit payments for certain retirements to shorten the delay between the retirement effective date and receipt of the first monthly check. However, reserve transfers are not made until benefit amounts are final. Transfers for these cases have been accrued based upon supplemental information supplied by OPERS staff and are shown on the following page. The accruals, when added to other assets, are intended to put retired life reserves in the same position they would have been in if reserve transfers for the interim benefit cases had been coincident with benefit commencement.

It is recommended that the transfers shown on the following page be made from the Employer Accumulation Fund to the Annuity & Pension Reserve Fund and Survivor Benefit Funds as indicated. The Accrued Transfers are an estimate of pending future transfers for interim cases, and do not require a year end transfer. Any accrued transfers that have been made prior to OPERS' extract date and, hence, are not included in the "Accrued Transfers" column on pages IV-2 through IV-5 should be netted off the "Other" column on pages IV-2 through IV-5.

## Traditional Plan

### Reserve Transfers Affecting the Employer Accumulation Fund

### December 31, 2021

	Assets Before Transfers	Transfers		Assets After Transfers	Liabilities	Ratio
		Accrued	Other			
<b>State</b>						
A&PR Fund						
SR	\$ 23,845,410,827	\$ 181,394,419	\$ 1,927,633,394	\$ 25,954,438,640	\$ 25,954,438,640	
MP	53,224,014	26,661	1,203,895	54,454,570	54,454,570	
AA	295,466	0	117,198	412,664	412,664	
JR	0	0	0	0	0	
CR	215,777,333	0	23,227,212	239,004,545	239,004,545	
DR	1,994,598,869	0	231,928,019	2,226,526,888	2,226,526,888	
BD	642,782,434	3,328,872	39,314,482	685,425,788	685,425,788	
<b>Total A&amp;PR</b>	<b>\$ 26,752,088,943</b>	<b>\$ 184,749,952</b>	<b>\$ 2,223,424,200</b>	<b>\$ 29,160,263,095</b>	<b>\$ 29,160,263,095</b>	<b>100.0%</b>
SBF						
AA	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	
S-1	141,277,465	14,441,626	(3,041,118)	152,677,973	152,677,973	
S-2	580,263,411	119,740	76,289,557	656,672,708	656,672,708	
<b>Total SBF</b>	<b>\$ 721,540,876</b>	<b>\$ 14,561,366</b>	<b>\$ 73,248,439</b>	<b>\$ 809,350,681</b>	<b>\$ 809,350,681</b>	<b>100.0%</b>
<b>Total State</b>	<b>\$ 27,473,629,819</b>	<b>\$ 199,311,318</b>	<b>\$ 2,296,672,639</b>	<b>\$ 29,969,613,776</b>	<b>\$ 29,969,613,776</b>	<b>100.0%</b>
<b>Local</b>						
A&PR Fund						
SR	\$ 33,794,490,716	\$ 215,705,374	\$ 2,735,550,214	\$ 36,745,746,304	\$ 36,745,746,304	
MP	135,330,842	632,386	3,208,722	139,171,950	139,171,950	
AA	58,251,784	288,204	4,650,288	63,190,276	63,190,276	
JR	0	0	0	0	0	
CR	317,070,908	0	33,966,764	351,037,672	351,037,672	
DR	2,409,979,707	501,119	257,358,524	2,667,839,350	2,667,839,350	
BD	750,123,686	1,395,032	39,360,919	790,879,637	790,879,637	
<b>Total A&amp;PR</b>	<b>\$ 37,465,247,643</b>	<b>\$ 218,522,115</b>	<b>\$ 3,074,095,431</b>	<b>\$ 40,757,865,189</b>	<b>\$ 40,757,865,189</b>	<b>100.0%</b>
SBF						
AA	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	
S-1	212,637,419	23,896,413	(557,605)	235,976,227	235,976,227	
S-2	959,366,050	406,751	101,033,038	1,060,805,839	1,060,805,839	
<b>Total SBF</b>	<b>\$ 1,172,003,469</b>	<b>\$ 24,303,164</b>	<b>\$ 100,475,433</b>	<b>\$ 1,296,782,066</b>	<b>\$ 1,296,782,066</b>	<b>100.0%</b>
<b>Total Local</b>	<b>\$ 38,637,251,112</b>	<b>\$ 242,825,279</b>	<b>\$ 3,174,570,864</b>	<b>\$ 42,054,647,255</b>	<b>\$ 42,054,647,255</b>	<b>100.0%</b>



## Traditional Plan

### Reserve Transfers Affecting the Employer Accumulation Fund

### December 31, 2021

	Assets Before Transfers	Transfers		Assets After Transfers	Liabilities	Ratio
		Accrued	Other			
<b>Public Safety</b>						
A&PR Fund						
SR	\$ 12,301,462	\$ 0	\$ (258,875)	\$ 12,042,587	\$ 12,042,587	
MP	0	0	0	0	0	
AA	0	0	0	0	0	
JR	0	0	0	0	0	
CR	0	0	0	0	0	
DR	14,387,031	0	2,287,866	16,674,897	16,674,897	
BD	1,987,565	0	472,964	2,460,529	2,460,529	
Total A&PR	\$ 28,676,058	\$ 0	\$ 2,501,955	\$ 31,178,013	\$ 31,178,013	100.0%
SBF						
AA	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	
S-1	4,859,880	2,668,907	(1,385,172)	6,143,615	6,143,615	
S-2	19,215,095	0	1,016,769	20,231,864	20,231,864	
Total SBF	\$ 24,074,975	\$ 2,668,907	\$ (368,403)	\$ 26,375,479	\$ 26,375,479	100.0%
<b>Total Public Safety</b>	<b>\$ 52,751,033</b>	<b>\$ 2,668,907</b>	<b>\$ 2,133,552</b>	<b>\$ 57,553,492</b>	<b>\$ 57,553,492</b>	<b>100.0%</b>
<b>Law Enforcement</b>						
A&PR Fund						
SR	\$ 2,051,776,883	\$ 30,254,474	\$ 192,634,013	\$ 2,274,665,370	\$ 2,274,665,370	
MP	33,414	21,656	(20,651)	34,419	34,419	
AA	0	0	0	0	0	
JR	0	0	0	0	0	
CR	2,558,845	0	(493,372)	2,065,473	2,065,473	
DR	540,790,304	0	71,483,594	612,273,898	612,273,898	
BD	179,775,631	621,435	24,290,701	204,687,767	204,687,767	
Total A&PR	\$ 2,774,935,077	\$ 30,897,565	\$ 287,894,285	\$ 3,093,726,927	\$ 3,093,726,927	100.0%
SBF						
AA	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	
S-1	10,509,878	732,850	662,595	11,905,323	11,905,323	
S-2	55,524,328	0	8,410,025	63,934,353	63,934,353	
Total SBF	\$ 66,034,206	\$ 732,850	\$ 9,072,620	\$ 75,839,676	\$ 75,839,676	100.0%
<b>Total Law Enforcement</b>	<b>\$ 2,840,969,283</b>	<b>\$ 31,630,415</b>	<b>\$ 296,966,905</b>	<b>\$ 3,169,566,603</b>	<b>\$ 3,169,566,603</b>	<b>100.0%</b>
<b>Grand Total</b>	<b>\$ 69,004,601,247</b>	<b>\$ 476,435,919</b>	<b>\$ 5,770,343,960</b>	<b>\$ 75,251,381,126</b>	<b>\$ 75,251,381,126</b>	<b>100.0%</b>

**Combined Plan**  
**Reserve Transfers Affecting the Employer Accumulation Fund**  
**December 31, 2021**

	Assets Before Transfers	Transfers		Assets After Transfers	Liabilities	Ratio
		Accrued	Other			
<b>State</b>						
A&PR Fund						
CA	\$ 8,303,177	\$ 0	\$ (929,821)	\$ 7,373,356	\$ 7,373,356	
CA Reserve for Future Adverse Experience	0	0	929,821	929,821	929,821	
CA Total (DC)	\$ 8,303,177	\$ 0	\$ 0	\$ 8,303,177	\$ 8,303,177	
CB Total (DB)	11,951,080	212,965	2,223,401	14,387,446	14,387,446	
Total A&PR	\$ 20,254,257	\$ 212,965	\$ 2,223,401	\$ 22,690,623	\$ 22,690,623	100.0%
<b>Total State</b>	<b>\$ 20,254,257</b>	<b>\$ 212,965</b>	<b>\$ 2,223,401</b>	<b>\$ 22,690,623</b>	<b>\$ 22,690,623</b>	<b>100.0%</b>
<b>Local</b>						
A&PR Fund						
CA	\$ 15,244,323	\$ 0	\$ (2,683,401)	\$ 12,560,922	\$ 12,560,922	
CA Reserve for Future Adverse Experience	0	0	2,683,401	2,683,401	2,683,401	
CA Total (DC)	\$ 15,244,323	\$ 0	\$ 0	\$ 15,244,323	\$ 15,244,323	
CB Total (DB)	19,299,994	289,803	4,464,943	24,054,740	24,054,740	
Total A&PR	\$ 34,544,317	\$ 289,803	\$ 4,464,943	\$ 39,299,063	\$ 39,299,063	100.0%
<b>Total Local</b>	<b>\$ 34,544,317</b>	<b>\$ 289,803</b>	<b>\$ 4,464,943</b>	<b>\$ 39,299,063</b>	<b>\$ 39,299,063</b>	<b>100.0%</b>
<b>Grand Total</b>	<b>\$ 54,798,574</b>	<b>\$ 502,767</b>	<b>\$ 6,688,345</b>	<b>\$ 61,989,686</b>	<b>\$ 61,989,686</b>	<b>100.0%</b>

**Member Directed Plan**  
**Reserve Transfers Affecting the Employer Accumulation Fund**  
**December 31, 2021**

	Assets Before Transfers	Transfers		Assets After Transfers	Liabilities	Ratio
		Accrued	Other			
<b>State</b>						
A&PR Fund						
MD	\$ 7,274,393	\$ 0	\$ 687,238	\$ 7,961,631	\$ 7,961,631	
Reserve for Future Adverse Experience*	6,519,936	0	(687,238)	5,832,698	5,832,698	
<b>Total State</b>	<b>\$ 13,794,329</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 13,794,329</b>	<b>\$ 13,794,329</b>	<b>100.0%</b>
<b>Local</b>						
A&PR Fund						
MD	\$ 19,156,937	\$ 0	\$ (1,846,223)	\$ 17,310,714	\$ 17,310,714	
Reserve for Future Adverse Experience*	6,479,415	0	1,846,223	8,325,638	8,325,638	
<b>Total Local</b>	<b>\$ 25,636,352</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 25,636,352</b>	<b>\$ 25,636,352</b>	<b>100.0%</b>
<b>Grand Total</b>	<b>\$ 39,430,681</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 39,430,681</b>	<b>\$ 39,430,681</b>	<b>100.0%</b>

\* Includes funds for pending retirements.

**SECTION V**



**STATE DIVISION**

## STATE DIVISION

Data on active, inactive, retired and money purchase members that was used in the valuation is tabulated briefly below.

### *Active Members in Valuation December 31, 2021*

Groups	Number	Annual Payroll	Average		
			Pay	Age	Service
<b>Traditional Plan</b>					
Men	43,249	\$ 2,438,877,450	\$ 56,392	42.2 yrs.	10.4 yrs.
Women	55,110	2,930,601,995	53,177	41.1	9.4
Traditional Plan Total	98,359	\$ 5,369,479,445	\$ 54,591	41.6 yrs.	9.8 yrs.
<b>Combined Plan</b>					
Men	1,054	\$ 75,525,802	\$ 71,656	46.1 yrs.	10.8 yrs.
Women	1,583	112,415,906	71,014	45.7	10.2
Combined Plan Total	2,637	\$ 187,941,708	\$ 71,271	45.8 yrs.	10.4 yrs.
<b>Grand Total</b>	<b>100,996</b>	<b>\$ 5,557,421,153</b>	<b>\$ 55,026</b>	<b>41.7 yrs.</b>	<b>9.9 yrs.</b>

Also included in the valuation were 315,833 inactive members and 3,396 members active in the money purchase plan.

### *Retired Members in Valuation December 31, 2021*

Fund/Type of Allowance	Number	Current Monthly Benefits	Actuarial Liabilities
<b>Traditional Plan</b>			
A & PR Fund			
Superannuation Retirement	64,134	\$ 194,777,582	\$ 26,193,855,849
Disability Retirement	7,236	20,790,820	2,911,952,676
Money Purchase	1,099	551,503	54,454,570
Total A & PR Fund	72,469	\$ 216,119,905	\$ 29,160,263,095
Total SBF	4,463	6,484,686	809,350,681
Traditional Plan Total	76,932	\$ 222,604,591	\$ 29,969,613,776
<b>Combined Plan</b>			
A & PR Fund			
CB (DB)	180	\$ 99,233	\$ 14,387,446
CA (DC)	114	51,782	8,303,177
Total A & PR Fund	294	\$ 151,015	\$ 22,690,623
Combined Plan Total	294	\$ 151,015	\$ 22,690,623
<b>Member Directed Plan</b>			
A & PR Fund	104	\$ 56,447	\$ 7,961,631
Reserve for Future Adverse Experience			5,832,698
Member Directed Plan Total	104	\$ 56,447	\$ 13,794,329
<b>Grand Total</b>	<b>77,330</b>	<b>\$ 222,812,053</b>	<b>\$ 30,006,098,728</b>

**STATE DIVISION**  
**Employer Contributions to Support**  
**Defined Benefit Retirement Allowances**  
**Expressed as Percents of Active Member Payroll**

Valuation Date December 31	2021			2020 <sup>@</sup>
Contributions for	2024			2023
Normal Cost	<u>Traditional Plan</u>	<u>Combined Plan</u>	<u>Traditional and Combined Plans</u>	<u>Traditional and Combined Plans</u>
Age and Service Allowances*	8.79 %	4.89 %	8.64 %	8.67 %
Disability Allowances	1.25 %	1.15 %	1.25 %	1.24 %
Survivor's Benefits	0.36 %	0.30 %	0.36 %	0.36 %
Separation Benefits	3.98 %	0.99 %	3.87 %	3.87 %
<b>Total Normal Cost</b>	<b>14.38 %</b>	<b>7.33 %</b>	<b>14.12 %</b>	<b>14.14 %</b>
(Member Contributions)	10.00 %	0.00 %	9.62 %	9.62 %
<b>Employer Normal Cost</b>	<b>4.38 %</b>	<b>7.33 %</b>	<b>4.50 %</b>	<b>4.52 %</b>
<b>Unfunded Actuarial Accrued Liabilities</b>				
Total Available Contribution	9.62 %	4.67 %	9.44 %	9.48 %
Amortization Years	22	0	22	27
<b>Total Pension Employer Contribution Rate</b>	<b>14.00 %</b>	<b>12.00 %</b>	<b>13.94 %</b>	<b>14.00 %</b>

\* Includes contributions for administrative expenses.

@ Revised actuarial assumptions

The term "Amortization Years" refers to the period sufficient to produce the Total Employer Contribution Rate for retirement allowances and survivor benefits and incorporates all scheduled employer and member contribution rate increases and scheduled employer rate reallocations between the pension and retiree health programs.



## STATE DIVISION Comparative Statement

Valuation Date December 31	Contribution Rate Effective January 1	Defined Benefit Active Members in Valuation				Computed Employer Contributions as % of Payroll				
		No.	Annual Payroll			Normal Cost	Unfunded Accrued Liability	Pension Total	Retiree Health	Grand Total
			Total	Average	Increase					
2007	2010	118,466	(\$Millions) \$ 4,703	\$ 39,695	1.8 %	5.44 %	1.56 %	7.00 %	7.00 %	14.00 %
2008	2011	114,925	4,780	41,590	4.8 %	5.44 %	4.56 %	10.00 %	4.00 %	14.00 %
2009	2012	117,008	4,763	40,704	(2.1)%	5.45 %	4.55 %	10.00 %	4.00 %	14.00 %
2010@	2013	118,240	4,811	40,691	0.0 %	5.36 %	7.64 %	13.00 %	1.00 %	14.00 %
2011	2014	118,273	4,844	40,952	0.6 %	5.37 %	8.63 %	14.00 %	0.00 %	14.00 %
2012#	2015	117,430	4,690	39,938	(2.5)%	3.49 %	7.51 %	11.00 %	3.00 %	14.00 %
2013	2016	117,370	4,746	40,433	1.2 %	3.49 %	6.51 %	10.00 %	4.00 %	14.00 %
2014	2017	118,114	4,826	40,862	1.1 %	3.40 %	6.60 %	10.00 %	4.00 %	14.00 %
2015@	2018	118,372	4,961	41,911	2.6 %	4.09 %	9.91 %	14.00 %	0.00 %	14.00 %
2016	2019	119,223	5,131	43,037	2.7 %	4.03 %	9.97 %	14.00 %	0.00 %	14.00 %
2017	2020	121,199	5,285	43,610	1.3 %	4.07 %	9.93 %	14.00 %	0.00 %	14.00 %
2018^	2021	102,165	5,189	50,795	16.5 %	4.78 %	9.22 %	14.00 %	0.00 %	14.00 %
2019	2022	103,162	5,375	52,101	2.6 %	4.74 %	9.26 %	14.00 %	0.00 %	14.00 %
2020@	2023	97,744	5,416	55,410	6.4 %	4.52 %	9.48 %	14.00 %	0.00 %	14.00 %
2021	2024	100,996	5,557	55,026	(0.7)%	4.50 %	9.44 %	13.94 %	0.06 %	14.00 %

# After benefit changes.

@ Revised actuarial assumptions.

^ Reflects active members reclassified as inactive.

**STATE DIVISION**  
**Development of Unfunded Actuarial Accrued Liabilities**  
**December 31, 2021**

Actuarial Present Value	(1) Total Actuarial Present Value	Allocation by Entry Age	
		(2) Portion Covered By Future Normal Cost Contributions	(3) Actuarial Accrued Liabilities (1)-(2)
Allowances currently being paid from the Annuity & Pension Reserve Fund	\$ 29,196,748,047	\$ -	\$ 29,196,748,047
Allowances currently being paid from the Survivors Benefit Fund	809,350,681	-	809,350,681
Age and service allowances based on service rendered before and likely to be rendered after valuation date*	18,664,882,930	4,312,500,163	14,352,382,767
Disability allowances likely to be paid present active members who become permanently disabled	1,339,612,690	623,156,804	716,455,886
Survivor benefits likely to be paid to spouses and children of present active members who die before retiring	470,031,765	174,234,913	295,796,852
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active and inactive members	3,045,119,745	1,984,711,593	1,060,408,152
<b>Total</b>	<b>\$ 53,525,745,858</b>	<b>\$ 7,094,603,473</b>	<b>\$ 46,431,142,385</b>
Funding Value of Assets			37,826,753,235
Unfunded Actuarial Accrued Liability			<b>\$ 8,604,389,150</b>

\* Includes contributions for administrative expenses.



**STATE DIVISION**  
**Development of Unfunded Actuarial Accrued Liabilities**  
**Comparative Statement**  
**(\$ in Millions Except Averages)**

Dec. 31	Defined Benefit Active Payroll		Active and Inactive Member Accrued Liabilities for Retirement Allowances				Unfunded /Payroll
			Computed Total	Valuation Assets	Unfunded	Amortization Years	
	Total	Average					
2007	4,703	\$39,695	\$ 14,526	\$ 13,442	\$ 1,084	20	0.23
2008	4,780	41,590	14,872	7,488	7,384	N/A	1.54
2009	4,763	40,704	14,843	6,648	8,195	N/A	1.71
2010@	4,811	40,691	14,903	7,113	7,790	48	1.62
2011	4,844	40,952	14,754	6,616	8,138	37	1.68
2012#	4,690	39,938	13,135	5,270	7,865	37	1.68
2013	4,746	40,433	13,125	6,572	6,553	32	1.38
2014	4,826	40,862	12,951	5,631	7,320	40	1.52
2015@	4,961	41,911	13,788	5,550	8,238	24	1.66
2016	5,131	43,037	14,090	5,587	8,503	24	1.66
2017	5,285	43,610	14,300	5,899	8,401	23	1.59
2018	5,189	50,795	15,280	4,784	10,496	35	2.02
2019	5,375	52,101	15,694	5,684	10,010	29	1.86
2020@	5,416	55,410	16,234	6,651	9,583	27	1.77
2021	5,557	55,026	16,432	7,828	8,604	22	1.55

# After benefit changes.

@ Revised actuarial assumptions.

While no one or two numeric indices can fully describe the financial condition of a retirement plan, the ratio of unfunded actuarial accrued liabilities divided by active member payroll ("UNFUNDED/PAYROLL" above) is significant. Unfunded actuarial accrued liabilities represent plan debt, while active member payroll represents the plan's capacity to collect contributions to pay toward debt --- thus the ratio is a relative index of condition. The lower the ratio, the greater the financial strength, and vice-versa.

**STATE DIVISION**  
**Male Active Members in Defined Benefit Valuation**  
**December 31, 2021**  
**by Attained Age and Years of Service**

Attained Ages	Years of Service To Valuation Date							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
15-19	692							692
Tot. Pay	\$7,411,463							\$7,411,463
Avg. Pay	\$10,710							\$10,710
20-24	5,238	13						5,251
Tot. Pay	\$94,107,336	\$630,210						\$94,737,546
Avg. Pay	\$17,966	\$48,478						\$18,042
25-29	3,899	716	7					4,622
Tot. Pay	\$146,391,029	\$38,693,782	\$349,471					\$185,434,282
Avg. Pay	\$37,546	\$54,042	\$49,924					\$40,120
30-34	2,585	1,623	417	9				4,634
Tot. Pay	\$115,165,191	\$98,268,509	\$27,714,957	\$665,016				\$241,813,673
Avg. Pay	\$44,551	\$60,547	\$66,463	\$73,891				\$52,182
35-39	1,689	1,345	1,050	438	18			4,540
Tot. Pay	\$82,001,236	\$86,238,054	\$74,688,670	\$31,457,787	\$1,152,593			\$275,538,340
Avg. Pay	\$48,550	\$64,118	\$71,132	\$71,821	\$64,033			\$60,691
40-44	1,177	961	864	1,016	412	8		4,438
Tot. Pay	\$58,571,633	\$61,722,019	\$63,398,099	\$78,698,767	\$31,114,287	\$553,381		\$294,058,186
Avg. Pay	\$49,763	\$64,227	\$73,377	\$77,459	\$75,520	\$69,173		\$66,259
45-49	975	757	617	766	985	314	9	4,423
Tot. Pay	\$46,354,640	\$48,701,956	\$44,723,983	\$60,406,278	\$79,367,498	\$24,683,100	\$757,309	\$304,994,764
Avg. Pay	\$47,543	\$64,335	\$72,486	\$78,859	\$80,576	\$78,609	\$84,145	\$68,957
50-54	902	674	620	714	957	1,131	366	5,364
Tot. Pay	\$43,319,455	\$44,693,406	\$44,618,966	\$56,040,130	\$74,468,476	\$97,315,219	\$32,576,056	\$393,031,708
Avg. Pay	\$48,026	\$66,311	\$71,966	\$78,488	\$77,814	\$86,044	\$89,006	\$73,272
55-59	730	500	517	620	723	889	742	4,721
Tot. Pay	\$31,896,308	\$31,056,979	\$36,822,364	\$46,640,825	\$54,293,484	\$73,786,059	\$66,143,577	\$340,639,596
Avg. Pay	\$43,694	\$62,114	\$71,223	\$75,227	\$75,095	\$82,999	\$89,142	\$72,154
60-64	490	388	376	441	592	587	626	3,500
Tot. Pay	\$18,270,026	\$23,811,040	\$25,550,451	\$33,959,459	\$42,906,397	\$46,433,534	\$54,601,544	\$245,532,451
Avg. Pay	\$37,286	\$61,369	\$67,953	\$77,006	\$72,477	\$79,103	\$87,223	\$70,152
65-69	302	167	158	235	174	188	259	1,483
Tot. Pay	\$7,870,703	\$10,711,296	\$11,266,498	\$18,408,434	\$13,531,497	\$15,439,436	\$21,745,799	\$98,973,663
Avg. Pay	\$26,062	\$64,139	\$71,307	\$78,334	\$77,767	\$82,125	\$83,961	\$66,739
70 & Over	271	54	58	56	47	59	90	635
Tot. Pay	\$5,016,534	\$2,400,679	\$4,138,050	\$4,482,634	\$3,479,715	\$4,674,911	\$8,045,057	\$32,237,580
Avg. Pay	\$18,511	\$44,457	\$71,346	\$80,047	\$74,036	\$79,236	\$89,390	\$50,768
<b>Totals</b>	18,950	7,198	4,684	4,295	3,908	3,176	2,092	44,303
<b>Tot. Pay</b>	\$656,375,554	\$446,927,930	\$333,271,509	\$330,759,330	\$300,313,947	\$262,885,640	\$183,869,342	\$2,514,403,252
<b>Avg. Pay</b>	\$34,637	\$62,091	\$71,151	\$77,010	\$76,846	\$82,773	\$87,892	\$56,755

**STATE DIVISION**  
**Female Active Members in Defined Benefit Valuation**  
**December 31, 2021**  
**by Attained Age and Years of Service**

Attained Ages	Years of Service To Valuation Date							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
15-19	1,360							1,360
Tot. Pay	\$12,514,276							\$12,514,276
Avg. Pay	\$9,202							\$9,202
20-24	7,696	14						7,710
Tot. Pay	\$129,733,899	\$521,627						\$130,255,526
Avg. Pay	\$16,857	\$37,259						\$16,894
25-29	4,898	880	9					5,787
Tot. Pay	\$196,177,979	\$48,680,354	\$499,367					\$245,357,700
Avg. Pay	\$40,053	\$55,319	\$55,485					\$42,398
30-34	3,509	2,190	503	10				6,212
Tot. Pay	\$150,305,371	\$131,394,252	\$33,747,572	\$677,231				\$316,124,426
Avg. Pay	\$42,834	\$59,997	\$67,093	\$67,723				\$50,889
35-39	2,236	1,779	1,273	449	12			5,749
Tot. Pay	\$109,358,594	\$111,555,977	\$88,799,576	\$33,112,938	\$749,764			\$343,576,849
Avg. Pay	\$48,908	\$62,707	\$69,756	\$73,748	\$62,480			\$59,763
40-44	1,774	1,261	987	1,214	424	10		5,670
Tot. Pay	\$86,846,465	\$80,047,588	\$68,947,840	\$93,926,767	\$31,538,352	\$777,458		\$362,084,470
Avg. Pay	\$48,955	\$63,479	\$69,856	\$77,370	\$74,383	\$77,746		\$63,860
45-49	1,440	1,067	781	921	1,017	327	14	5,567
Tot. Pay	\$72,242,907	\$68,796,143	\$56,769,660	\$73,619,628	\$79,151,424	\$25,845,143	\$1,035,252	\$377,460,157
Avg. Pay	\$50,169	\$64,476	\$72,688	\$79,934	\$77,828	\$79,037	\$73,947	\$67,803
50-54	1,323	1,002	819	791	966	1,104	371	6,376
Tot. Pay	\$65,440,289	\$63,880,135	\$58,808,205	\$60,942,602	\$73,466,229	\$89,750,706	\$30,287,678	\$442,575,844
Avg. Pay	\$49,464	\$63,753	\$71,805	\$77,045	\$76,052	\$81,296	\$81,638	\$69,413
55-59	948	776	729	828	833	920	838	5,872
Tot. Pay	\$45,260,744	\$48,740,626	\$48,981,970	\$61,097,840	\$58,450,597	\$70,868,599	\$71,248,375	\$404,648,751
Avg. Pay	\$47,743	\$62,810	\$67,191	\$73,790	\$70,169	\$77,031	\$85,022	\$68,912
60-64	545	495	610	725	739	718	569	4,401
Tot. Pay	\$23,624,993	\$30,540,493	\$39,711,434	\$47,769,978	\$50,210,644	\$51,140,252	\$45,068,056	\$288,065,850
Avg. Pay	\$43,349	\$61,698	\$65,101	\$65,890	\$67,944	\$71,226	\$79,206	\$65,455
65-69	182	182	201	270	267	189	242	1,533
Tot. Pay	\$5,728,362	\$10,511,989	\$12,603,474	\$18,833,736	\$17,586,311	\$13,450,660	\$17,679,456	\$96,393,988
Avg. Pay	\$31,475	\$57,758	\$62,704	\$69,755	\$65,866	\$71,168	\$73,056	\$62,879
70 & Over	98	39	51	70	65	51	82	456
Tot. Pay	\$1,832,598	\$1,579,257	\$2,696,713	\$4,258,257	\$3,728,896	\$3,740,785	\$6,123,558	\$23,960,064
Avg. Pay	\$18,700	\$40,494	\$52,877	\$60,832	\$57,368	\$73,349	\$74,678	\$52,544
<b>Totals</b>	26,009	9,685	5,963	5,278	4,323	3,319	2,116	56,693
<b>Tot. Pay</b>	\$899,066,477	\$596,248,441	\$411,565,811	\$394,238,977	\$314,882,217	\$255,573,603	\$171,442,375	\$3,043,017,901
<b>Avg. Pay</b>	\$34,568	\$61,564	\$69,020	\$74,695	\$72,839	\$77,003	\$81,022	\$53,675

**STATE DIVISION**  
**Inactive Members in Defined Benefit Valuation**  
**December 31, 2021**  
**by Attained Age and Years of Service**

Attained Ages	Years of Service to Valuation Date							Total Number
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
Under 20	569							569
20-24	33,109	1						33,110
25-29	54,803	272	1					55,076
30-34	70,322	1,091	51					71,464
35-39	40,718	1,410	306	42				42,476
40-44	34,537	1,283	489	180	21			36,510
45-49	25,259	940	464	197	70	5		26,935
50-54	16,765	1,055	539	280	158	48	2	18,847
55-59	10,010	1,064	686	328	209	57	10	12,364
60-64	7,914	918	654	337	151	34	6	10,014
65-69	5,208	369	174	92	39	13	7	5,902
70 & Over	2,397	105	35	15	6	5	3	2,566
<b>Totals</b>	<b>301,611</b>	<b>8,508</b>	<b>3,399</b>	<b>1,471</b>	<b>654</b>	<b>162</b>	<b>28</b>	<b>315,833</b>

## **SECTION VI**

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### **LOCAL GOVERNMENT DIVISION**

## LOCAL GOVERNMENT DIVISION

Data on active, inactive, retired and money purchase members that was used in the valuation is tabulated briefly below.

### *Active Members in Valuation December 31, 2021*

Groups	Number	Annual Payroll	Average		
			Pay	Age	Service
<b>Traditional Plan</b>					
Men	77,438	\$ 3,866,782,200	\$ 49,934	47.0 yrs.	10.9 yrs.
Women	90,679	4,100,572,333	45,221	45.9	10.7
Traditional Plan Total	168,117	\$ 7,967,354,533	\$ 47,392	46.4 yrs.	10.8 yrs.
<b>Combined Plan</b>					
Men	2,035	\$ 125,708,134	\$ 61,773	48.2 yrs.	10.6 yrs.
Women	2,450	137,698,837	56,204	47.4	10.5
Combined Plan Total	4,485	\$ 263,406,971	\$ 58,731	47.7 yrs.	10.6 yrs.
<b>Grand Total</b>	<b>172,602</b>	<b>\$ 8,230,761,504</b>	<b>\$ 47,686</b>	<b>46.4 yrs.</b>	<b>10.8 yrs.</b>

Also included in the valuation were 363,305 inactive members and 14,809 members active in the money purchase plan.

### *Retired Members in Valuation December 31, 2021*

Fund/Type of Allowance	Number	Current Monthly Benefits	Actuarial Liabilities
<b>Traditional Plan</b>			
A & PR Fund			
Superannuation Retirement	120,166	\$ 277,242,082	\$ 37,159,974,252
Disability Retirement	9,653	25,100,755	3,458,718,987
Money Purchase	3,584	1,403,039	139,171,950
Total A & PR Fund	133,403	\$ 303,745,876	\$ 40,757,865,189
Total SBF	9,474	10,572,392	1,296,782,066
Traditional Plan Total	142,877	\$ 314,318,268	\$ 42,054,647,255
<b>Combined Plan</b>			
A & PR Fund			
CB (DB)	369	\$ 166,748	\$ 24,054,740
CA (DC)	251	87,873	15,244,323
Total A & PR Fund	620	\$ 254,621	\$ 39,299,063
Combined Plan Total	620	\$ 254,621	\$ 39,299,063
<b>Member Directed Plan</b>			
A & PR Fund			
Reserve for Future Adverse Experience	278	\$ 121,316	\$ 17,310,714
Member Directed Plan Total	278	\$ 121,316	\$ 25,636,352
<b>Grand Total</b>	<b>143,775</b>	<b>\$ 314,694,205</b>	<b>\$ 42,119,582,670</b>

**LOCAL GOVERNMENT DIVISION**  
**Employer Contributions to Support**  
**Defined Benefit Retirement Allowances**  
**Expressed as Percents of Active Member Payroll**

Valuation Date December 31	2021			2020 <sup>@</sup>
Contributions for	2024			2023
Normal Cost	<u>Traditional Plan</u>	<u>Combined Plan</u>	<u>Traditional and Combined Plans</u>	<u>Traditional and Combined Plans</u>
Age and Service Allowances*	9.33 %	5.16 %	9.19 %	9.21 %
Disability Allowances	0.96 %	0.87 %	0.95 %	0.95 %
Survivor's Benefits	0.41 %	0.35 %	0.41 %	0.41 %
Separation Benefits	3.64 %	1.09 %	3.56 %	3.56 %
Total Normal Cost	14.34 %	7.47 %	14.11 %	14.13 %
(Member Contributions)	10.00 %	0.00 %	9.65 %	9.64 %
Employer Normal Cost	4.34 %	7.47 %	4.46 %	4.49 %
<b>Unfunded Actuarial Accrued Liabilities</b>				
Total Available Contribution	9.66 %	4.53 %	9.48 %	9.51 %
Amortization Years	15	0	14	18
<b>Total Pension Employer Contribution Rate</b>	<b>14.00 %</b>	<b>12.00 %</b>	<b>13.94 %</b>	<b>14.00 %</b>

\* Includes contributions for administrative expenses.

@ Revised actuarial assumptions

The term "Amortization Years" refers to the period sufficient to produce the Total Employer Contribution Rate for retirement allowances and survivor benefits and incorporates all scheduled employer and member contribution rate increases and scheduled employer rate reallocations between the pension and retiree health programs.



## LOCAL GOVERNMENT DIVISION Comparative Statement

Valuation Date December 31	Contribution Rate Effective January 1	Defined Benefit Active Members in Valuation				Computed Employer Contributions as % of Payroll				
		No.	Annual Payroll			Normal Cost	Unfunded Accrued Liability	Pension Total	Retiree Health	Grand Total
			Total	Average	Increase					
			(\$Millions)							
2007	2010	237,225	\$ 7,438	\$ 31,354	3.1 %	5.12 %	1.88 %	7.00 %	7.00 %	14.00 %
2008	2011	233,163	7,566	32,451	3.5 %	5.14 %	4.86 %	10.00 %	4.00 %	14.00 %
2009	2012	223,004	7,334	32,889	1.3 %	5.14 %	4.86 %	10.00 %	4.00 %	14.00 %
2010	2013	215,144	7,196	33,447	1.7 %	5.15 %	7.85 %	13.00 %	1.00 %	14.00 %
2011	2014	209,452	7,115	33,968	1.6 %	5.14 %	8.86 %	14.00 %	0.00 %	14.00 %
2012#	2015	208,188	7,061	33,918	(0.1)%	3.13 %	7.87 %	11.00 %	3.00 %	14.00 %
2013	2016	207,416	7,134	34,396	1.4 %	3.16 %	6.84 %	10.00 %	4.00 %	14.00 %
2014	2017	203,955	7,360	36,087	4.9 %	3.06 %	6.94 %	10.00 %	4.00 %	14.00 %
2015@	2018	202,779	7,505	37,008	2.6 %	3.91 %	10.09 %	14.00 %	0.00 %	14.00 %
2016	2019	203,767	7,800	38,279	3.4 %	3.85 %	10.15 %	14.00 %	0.00 %	14.00 %
2017	2020	201,953	7,929	39,263	2.6 %	3.89 %	10.11 %	14.00 %	0.00 %	14.00 %
2018^	2021	182,306	7,836	42,984	9.5 %	4.64 %	9.36 %	14.00 %	0.00 %	14.00 %
2019	2022	182,109	8,025	44,067	2.5 %	4.58 %	9.42 %	14.00 %	0.00 %	14.00 %
2020@	2023	172,805	7,941	45,954	4.3 %	4.49 %	9.51 %	14.00 %	0.00 %	14.00 %
2021	2024	172,602	8,231	47,686	3.8 %	4.46 %	9.48 %	13.94 %	0.06 %	14.00 %

# After benefit changes.

@ Revised actuarial assumptions.

^ Reflects active members reclassified as inactive.



**LOCAL GOVERNMENT DIVISION**  
**Development of Unfunded Actuarial Accrued Liabilities**  
**December 31, 2021**

Actuarial Present Value	(1) Total Actuarial Present Value	Allocation by Entry Age	
		(2) Portion Covered By Future Normal Cost Contributions	(3) Actuarial Accrued Liabilities (1)-(2)
Allowances currently being paid from the Annuity & Pension Reserve Fund	\$ 40,822,800,604	\$ -	\$ 40,822,800,604
Allowances currently being paid from the Survivors Benefit Fund	1,296,782,066	-	1,296,782,066
Age and service allowances based on service rendered before and likely to be rendered after valuation date*	28,204,830,825	6,647,773,172	21,557,057,653
Disability allowances likely to be paid present active members who become permanently disabled	1,403,817,047	691,739,674	712,077,373
Survivor benefits likely to be paid to spouses and children of present active members who die before retiring	744,937,308	290,435,539	454,501,769
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active and inactive members	4,494,566,468	2,682,998,674	1,811,567,794
<b>Total</b>	<b>\$ 76,967,734,318</b>	<b>\$ 10,312,947,059</b>	<b>\$ 66,654,787,259</b>
Funding Value of Assets			56,948,241,729
Unfunded Actuarial Accrued Liability			<b>\$ 9,706,545,530</b>

\* Includes contributions for administrative expenses.

**LOCAL GOVERNMENT DIVISION**  
**Development of Unfunded Actuarial Accrued Liabilities**  
**Comparative Statement**  
**(\$ in Millions Except Averages)**

Dec. 31	Defined Benefit Active Payroll		Active and Inactive Member Accrued Liabilities for Retirement Allowances				Unfunded /Payroll
			Computed	Valuation	Unfunded	Amortization Years	
	Total	Average	Total	Assets			
2007	\$ 7,438	\$ 31,354	\$ 20,838	\$ 19,656	\$ 1,182	9	0.16
2008	7,566	32,451	21,590	11,561	10,029	N/A	1.33
2009	7,334	32,889	21,620	11,599	10,021	N/A	1.37
2010@	7,196	33,447	21,668	13,212	8,456	22	1.18
2011	7,115	33,968	21,631	11,418	10,213	25	1.44
2012#	7,061	33,918	19,583	11,981	7,602	15	1.08
2013	7,134	34,396	19,586	11,440	8,146	20	1.14
2014	7,360	36,087	19,656	13,066	6,590	13	0.90
2015@	7,505	37,008	20,867	10,620	10,247	16	1.37
2016	7,800	38,279	21,422	10,699	10,723	17	1.37
2017	7,929	39,263	21,605	11,273	10,332	16	1.30
2018	7,836	42,984	22,942	9,874	13,068	24	1.67
2019	8,025	44,067	23,366	11,334	12,032	20	1.50
2020@	7,941	45,954	24,008	12,955	11,053	18	1.39
2021	8,231	47,686	24,547	14,840	9,707	14	1.18

# After benefit changes.

@ Revised actuarial assumptions.

While no one or two numeric indices can fully describe the financial condition of a retirement plan, the ratio of unfunded actuarial accrued liabilities divided by active member payroll (“UNFUNDED/PAYROLL” above) is significant. Unfunded accrued liabilities represent plan debt, while active member payroll represents the plan’s capacity to collect contributions to pay toward debt --- thus the ratio is a relative index of condition. The lower the ratio, the greater the financial strength, and vice-versa.

**LOCAL GOVERNMENT DIVISION**  
**Male Active Members in Defined Benefit Valuation**  
**December 31, 2021**  
**by Attained Age and Years of Service**

Attained Ages	Years of Service To Valuation Date							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
15-19	1,415							1,415
Tot. Pay	\$17,607,254							\$17,607,254
Avg. Pay	\$12,443							\$12,443
20-24	3,828	86						3,914
Tot. Pay	\$107,792,748	\$4,016,905						\$111,809,653
Avg. Pay	\$28,159	\$46,708						\$28,567
25-29	4,486	1,169	29					5,684
Tot. Pay	\$171,276,592	\$58,072,565	\$1,473,184					\$230,822,341
Avg. Pay	\$38,180	\$49,677	\$50,799					\$40,609
30-34	3,854	2,449	671	37				7,011
Tot. Pay	\$159,621,085	\$133,623,761	\$38,973,226	\$2,054,766				\$334,272,838
Avg. Pay	\$41,417	\$54,563	\$58,082	\$55,534				\$47,678
35-39	3,112	2,138	1,430	804	66			7,550
Tot. Pay	\$132,007,680	\$121,231,801	\$89,319,959	\$51,665,007	\$4,352,438			\$398,576,885
Avg. Pay	\$42,419	\$56,703	\$62,462	\$64,260	\$65,946			\$52,792
40-44	2,659	1,769	1,238	1,510	878	46		8,100
Tot. Pay	\$108,730,446	\$98,959,452	\$75,257,000	\$102,905,340	\$58,710,727	\$3,003,223		\$447,566,188
Avg. Pay	\$40,891	\$55,941	\$60,789	\$68,149	\$66,869	\$65,287		\$55,255
45-49	2,293	1,523	1,111	1,332	1,630	650	26	8,565
Tot. Pay	\$90,504,645	\$82,030,895	\$68,671,319	\$89,745,054	\$119,938,371	\$47,855,864	\$1,785,451	\$500,531,599
Avg. Pay	\$39,470	\$53,861	\$61,810	\$67,376	\$73,582	\$73,624	\$68,671	\$58,439
50-54	2,384	1,544	1,137	1,328	1,757	1,634	593	10,377
Tot. Pay	\$90,888,108	\$81,988,524	\$65,262,282	\$85,723,297	\$127,251,273	\$123,794,439	\$45,166,013	\$620,073,936
Avg. Pay	\$38,124	\$53,101	\$57,399	\$64,551	\$72,425	\$75,762	\$76,165	\$59,755
55-59	2,011	1,256	1,079	1,227	1,652	1,499	1,121	9,845
Tot. Pay	\$71,972,529	\$64,736,457	\$60,034,725	\$74,002,910	\$112,530,696	\$107,353,469	\$87,438,730	\$578,069,516
Avg. Pay	\$35,789	\$51,542	\$55,639	\$60,312	\$68,118	\$71,617	\$78,001	\$58,717
60-64	1,809	1,114	994	1,139	1,314	1,149	1,023	8,542
Tot. Pay	\$53,451,535	\$52,731,031	\$51,544,951	\$64,426,266	\$84,771,317	\$79,551,999	\$77,453,811	\$463,930,910
Avg. Pay	\$29,548	\$47,335	\$51,856	\$56,564	\$64,514	\$69,236	\$75,712	\$54,312
65-69	1,473	738	522	511	568	433	511	4,756
Tot. Pay	\$28,261,468	\$28,304,590	\$23,683,515	\$25,545,941	\$33,529,072	\$26,415,249	\$35,722,338	\$201,462,173
Avg. Pay	\$19,186	\$38,353	\$45,371	\$49,992	\$59,030	\$61,005	\$69,907	\$42,360
70 & Over	1,637	713	409	320	240	157	238	3,714
Tot. Pay	\$23,058,311	\$13,951,588	\$10,035,114	\$10,661,419	\$8,782,493	\$7,145,194	\$14,132,922	\$87,767,041
Avg. Pay	\$14,086	\$19,567	\$24,536	\$33,317	\$36,594	\$45,511	\$59,382	\$23,631
<b>Totals</b>	30,961	14,499	8,620	8,208	8,105	5,568	3,512	79,473
<b>Tot. Pay</b>	\$1,055,172,401	\$739,647,569	\$484,255,275	\$506,730,000	\$549,866,387	\$395,119,437	\$261,699,265	\$3,992,490,334
<b>Avg. Pay</b>	\$34,081	\$51,014	\$56,178	\$61,736	\$67,843	\$70,963	\$74,516	\$50,237



**LOCAL GOVERNMENT DIVISION**  
**Female Active Members in Defined Benefit Valuation**  
**December 31, 2021**  
**by Attained Age and Years of Service**

Attained Ages	Years of Service To Valuation Date							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
15-19	1,550							1,550
Tot. Pay	\$16,381,869							\$16,381,869
Avg. Pay	\$10,569							\$10,569
20-24	4,114	49						4,163
Tot. Pay	\$101,419,261	\$1,418,805						\$102,838,066
Avg. Pay	\$24,652	\$28,955						\$24,703
25-29	6,085	1,200	32					7,317
Tot. Pay	\$222,961,909	\$52,684,672	\$1,324,609					\$276,971,190
Avg. Pay	\$36,641	\$43,904	\$41,394					\$37,853
30-34	5,157	3,194	601	58				9,010
Tot. Pay	\$197,886,423	\$158,261,616	\$29,954,454	\$2,789,267				\$388,891,760
Avg. Pay	\$38,372	\$49,550	\$49,841	\$48,091				\$43,162
35-39	3,957	2,703	1,647	714	65			9,086
Tot. Pay	\$156,116,321	\$135,198,897	\$92,796,718	\$39,573,032	\$3,488,446			\$427,173,414
Avg. Pay	\$39,453	\$50,018	\$56,343	\$55,424	\$53,668			\$47,014
40-44	3,601	2,270	1,429	1,899	922	53		10,174
Tot. Pay	\$135,711,660	\$112,880,731	\$81,584,448	\$115,703,644	\$55,086,068	\$2,975,381		\$503,941,932
Avg. Pay	\$37,687	\$49,727	\$57,092	\$60,929	\$59,746	\$56,139		\$49,532
45-49	3,099	1,887	1,278	1,522	2,170	739	52	10,747
Tot. Pay	\$113,559,621	\$93,259,020	\$71,053,951	\$92,356,776	\$137,027,058	\$47,281,202	\$2,995,109	\$557,532,737
Avg. Pay	\$36,644	\$49,422	\$55,598	\$60,681	\$63,146	\$63,980	\$57,598	\$51,878
50-54	3,117	2,014	1,358	1,567	2,111	1,885	691	12,743
Tot. Pay	\$109,365,605	\$93,227,307	\$70,828,476	\$88,723,499	\$128,283,079	\$126,308,042	\$43,532,359	\$660,268,367
Avg. Pay	\$35,087	\$46,290	\$52,156	\$56,620	\$60,769	\$67,007	\$62,999	\$51,814
55-59	2,503	1,743	1,264	1,559	1,952	1,581	1,251	11,853
Tot. Pay	\$83,077,729	\$76,097,649	\$60,698,039	\$82,739,080	\$114,522,918	\$98,513,758	\$83,291,026	\$598,940,199
Avg. Pay	\$33,191	\$43,659	\$48,021	\$53,072	\$58,670	\$62,311	\$66,580	\$50,531
60-64	1,824	1,499	1,133	1,496	1,807	1,426	964	10,149
Tot. Pay	\$51,556,740	\$61,628,807	\$50,379,620	\$72,654,293	\$97,098,421	\$82,224,916	\$62,638,589	\$478,181,386
Avg. Pay	\$28,266	\$41,113	\$44,466	\$48,566	\$53,735	\$57,661	\$64,978	\$47,116
65-69	990	574	466	618	669	488	434	4,239
Tot. Pay	\$19,065,015	\$19,853,858	\$18,111,510	\$28,202,165	\$32,950,214	\$26,161,296	\$26,303,752	\$170,647,810
Avg. Pay	\$19,258	\$34,589	\$38,866	\$45,635	\$49,253	\$53,609	\$60,608	\$40,257
70 & Over	800	315	190	219	211	169	194	2,098
Tot. Pay	\$10,369,341	\$6,174,568	\$4,870,887	\$8,175,572	\$8,396,005	\$7,780,282	\$10,735,785	\$56,502,440
Avg. Pay	\$12,962	\$19,602	\$25,636	\$37,331	\$39,791	\$46,037	\$55,339	\$26,932
<b>Totals</b>	36,797	17,448	9,398	9,652	9,907	6,341	3,586	93,129
<b>Tot. Pay</b>	\$1,217,471,494	\$810,685,930	\$481,602,712	\$530,917,328	\$576,852,209	\$391,244,877	\$229,496,620	\$4,238,271,170
<b>Avg. Pay</b>	\$33,086	\$46,463	\$51,245	\$55,006	\$58,227	\$61,701	\$63,998	\$45,510

**LOCAL GOVERNMENT DIVISION**  
**Inactive Members in Defined Benefit Valuation**  
**December 31, 2021**  
**by Attained Age and Years of Service**

Attained Ages	Years of Service to Valuation Date							Total Number
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
Under 20	4,759							4,759
20-24	36,859	4						36,863
25-29	41,443	377	1					41,821
30-34	47,111	1,347	117	1				48,576
35-39	42,596	1,821	439	58	1			44,915
40-44	40,012	1,728	750	308	53			42,851
45-49	33,382	1,756	820	473	189	24		36,644
50-54	27,592	2,047	1,109	613	371	115	11	31,858
55-59	21,543	2,160	1,348	749	434	119	11	26,364
60-64	19,928	1,992	1,326	738	408	96	20	24,508
65-69	14,615	965	473	208	99	35	14	16,409
70 & Over	7,178	337	117	60	23	14	8	7,737
<b>Totals</b>	<b>337,018</b>	<b>14,534</b>	<b>6,500</b>	<b>3,208</b>	<b>1,578</b>	<b>403</b>	<b>64</b>	<b>363,305</b>

## **SECTION VII**

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### **PUBLIC SAFETY DIVISION**

## PUBLIC SAFETY DIVISION

Data on active, inactive, retired and money purchase members that was used in the valuation is tabulated briefly below.

### *Active Members in Valuation December 31, 2021*

Groups	Number	Annual Payroll	Average		
			Pay	Age	Service
Men	33	\$ 1,775,740	\$ 53,810	43.9 yrs.	12.8 yrs.
Women	9	435,402	48,378	44.2	12.1
<b>Totals</b>	<b>42</b>	<b>\$ 2,211,142</b>	<b>\$ 52,646</b>	<b>44.0 yrs.</b>	<b>12.7 yrs.</b>

Also included in the valuation were 62 inactive members and 0 members active in the money purchase plan.

### *Retired Members in Valuation December 31, 2021*

Fund/Type of Allowance	Number	Current Monthly Benefits	Actuarial Liabilities
A & PR Fund			
Superannuation Retirement	33	\$ 77,282	\$ 12,042,587
Disability Retirement	35	129,146	19,135,426
Money Purchase	0	0	0
Total A & PR Fund	68	\$ 206,428	\$ 31,178,013
Total SBF	117	192,636	26,375,479
<b>Grand Total</b>	<b>185</b>	<b>\$ 399,064</b>	<b>\$ 57,553,492</b>

**PUBLIC SAFETY DIVISION**  
**Employer Contributions to Support**  
**Retirement Allowances**  
**Expressed as Percents of Active Member Payroll**

Valuation Date December 31	2021	2020 <sup>@</sup>
Contributions for	2024	2023
<b>Normal Cost</b>		
Age and Service Allowances*	9.86 %	9.64 %
Disability Allowances	2.87 %	2.61 %
Survivor's Benefits	0.63 %	0.58 %
Separation Benefits	4.71 %	4.87 %
Total Normal Cost	18.07 %	17.70 %
(Member Contributions)	12.00 %	12.00 %
Employer Normal Cost	6.07 %	5.70 %
<b>Unfunded Actuarial Accrued Liabilities</b>		
Total Available Contribution	12.03 %	12.40 %
Amortization Years	N/A	N/A
<b>Total Pension Employer Contribution Rate</b>	<b>18.10 %</b>	<b>18.10 %</b>

\* Includes contributions for administrative expenses.

@ Revised actuarial assumptions

N/A The total pension contribution rate is not sufficient to amortize the unfunded actuarial accrued liabilities.

The term "Amortization Years" refers to the period sufficient to produce the Total Employer Contribution Rate for retirement allowances and survivor benefits and incorporates all scheduled employer and member contribution rate increases and scheduled employer rate reallocations between the pension and retiree health programs.



## PUBLIC SAFETY DIVISION Comparative Statement

Valuation Date December 31	Contribution Rate Effective January 1	Active Members in Valuation				Computed Employer Contributions as % of Payroll				
		No.	Annual Payroll			Normal Cost	Unfunded Accrued Liability	Pension Total	Retiree Health	Grand Total
			Total	Average	Increase					
			(\$Thousands)							
2007	2010	120	\$ 5,638	\$ 46,985	2.0 %	8.95 %	1.92 %	10.87 %	7.00 %	17.87 %
2008	2011	127	6,219	48,969	4.2 %	8.32 %	5.78 %	14.10 %	4.00 %	18.10 %
2009	2012	94	4,061	43,205	(11.8)%	7.77 %	6.33 %	14.10 %	4.00 %	18.10 %
2010@	2013	88	3,650	41,480	(4.0)%	6.22 %	10.88 %	17.10 %	1.00 %	18.10 %
2011	2014	84	3,629	43,202	4.2 %	6.12 %	11.98 %	18.10 %	0.00 %	18.10 %
2012#	2015	87	3,751	43,119	(0.2)%	3.96 %	11.14 %	15.10 %	3.00 %	18.10 %
2013	2016	85	3,684	43,338	0.5 %	4.11 %	9.99 %	14.10 %	4.00 %	18.10 %
2014	2017	86	3,823	44,452	2.6 %	4.16 %	9.94 %	14.10 %	4.00 %	18.10 %
2015@	2018	79	3,620	45,817	3.1 %	5.24 %	12.86 %	18.10 %	0.00 %	18.10 %
2016	2019	76	3,401	44,752	(2.3)%	5.45 %	12.65 %	18.10 %	0.00 %	18.10 %
2017	2020	75	3,640	48,539	8.5 %	5.42 %	12.68 %	18.10 %	0.00 %	18.10 %
2018^	2021	61	3,004	49,253	1.5 %	6.51 %	11.59 %	18.10 %	0.00 %	18.10 %
2019	2022	59	3,058	51,826	5.2 %	6.58 %	11.52 %	18.10 %	0.00 %	18.10 %
2020@	2023	55	2,849	51,801	(0.1)%	5.70 %	12.40 %	18.10 %	0.00 %	18.10 %
2021	2024	42	2,211	52,646	1.6 %	6.07 %	12.03 %	18.10 %	0.00 %	18.10 %

# After benefit changes.

@ Revised actuarial assumptions.

^ Reflects active members reclassified as inactive.

**PUBLIC SAFETY DIVISION**  
**Development of Unfunded Actuarial Accrued Liabilities**  
**December 31, 2021**

Actuarial Present Value	(1) Total Actuarial Present Value	Allocation by Entry Age	
		(2) Portion Covered By Future Normal Cost Contributions	(3) Actuarial Accrued Liabilities (1)-(2)
Allowances currently being paid from the Annuity & Pension Reserve Fund	\$ 31,178,013	\$ -	\$ 31,178,013
Allowances currently being paid from the Survivors Benefit Fund	26,375,479	-	26,375,479
Age and service allowances based on service rendered before and likely to be rendered after valuation date*	8,202,272	1,707,773	6,494,499
Disability allowances likely to be paid present active members who become permanently disabled	1,196,363	493,399	702,964
Survivor benefits likely to be paid to spouses and children of present active members who die before retiring	271,751	105,315	166,436
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active and inactive members	1,960,521	842,237	1,118,284
<b>Total</b>	<b>\$ 69,184,399</b>	<b>\$ 3,148,724</b>	<b>\$ 66,035,675</b>
Funding Value of Assets			33,287,060
Unfunded Actuarial Accrued Liability			<b>\$ 32,748,615</b>

\* Includes contributions for administrative expenses.

**PUBLIC SAFETY DIVISION**  
**Development of Unfunded Actuarial Accrued Liabilities**  
**Comparative Statement**  
**(\$ in Millions Except Averages)**

Dec. 31	Defined Benefit Active Payroll		Active and Inactive Member Accrued Liabilities for Retirement Allowances				Unfunded /Payroll
			Computed	Valuation	Unfunded	Amortization	
	Total	Average	Total	Assets		Years	
2007	\$ 6	\$46,985	\$18	\$(82)	\$ 100	N/A	16.67
2008	6	48,969	18	9	9	79	1.50
2009	4	43,205	12	0	12	N/A	3.00
2010@	4	41,480	7	(7)	14	N/A	3.50
2011	4	43,202	8	(1)	9	45	2.25
2012#	4	43,119	7	(14)	21	N/A	5.25
2013	4	43,338	7	1	6	19	1.50
2014	4	44,452	8	(15)	23	N/A	5.75
2015@	4	45,817	8	(4)	12	82	3.00
2016	3	44,752	8	(7)	15	N/A	5.00
2017	4	48,539	9	(9)	18	N/A	4.50
2018	3	49,253	9	(15)	24	N/A	8.00
2019	3	51,826	10	(16)	26	N/A	8.67
2020@	3	51,801	8	(23)	31	N/A	10.33
2021	2	52,646	8	(25)	33	N/A	16.50

# After benefit changes.

N/A The total pension contribution rate is not sufficient to amortize the unfunded actuarial accrued liabilities.

@ Revised actuarial assumptions.

While no one or two numeric indices can fully describe the financial condition of a retirement plan, the ratio of unfunded actuarial accrued liabilities divided by active member payroll ("UNFUNDED/PAYROLL" above) is significant. Unfunded accrued liabilities represent plan debt, while active member payroll represents the plan's capacity to collect contributions to pay toward debt --- thus the ratio is a relative index of condition. The lower the ratio, the greater the financial strength, and vice-versa.

**PUBLIC SAFETY DIVISION**  
**Male Active Members in Valuation December 31, 2021**  
**by Attained Age and Years of Service**

Attained Ages	Years of Service To Valuation Date							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
15-19								
Tot. Pay								
Avg. Pay								
20-24	3							3
Tot. Pay	\$119,461							\$119,461
Avg. Pay	\$39,820							\$39,820
25-29	2							2
Tot. Pay	\$98,683							\$98,683
Avg. Pay	\$49,342							\$49,342
30-34	3	3	1					7
Tot. Pay	\$128,020	\$186,048	\$63,140					\$377,208
Avg. Pay	\$42,673	\$62,016	\$63,140					\$53,887
35-39			1					1
Tot. Pay			\$44,297					\$44,297
Avg. Pay			\$44,297					\$44,297
40-44		1		1				2
Tot. Pay		\$43,583		\$70,877				\$114,460
Avg. Pay		\$43,583		\$70,877				\$57,230
45-49			1		4			5
Tot. Pay			\$46,199		\$234,944			\$281,143
Avg. Pay			\$46,199		\$58,736			\$56,229
50-54			1	1	1	2		5
Tot. Pay			\$43,609	\$51,122	\$47,453	\$114,302		\$256,486
Avg. Pay			\$43,609	\$51,122	\$47,453	\$57,151		\$51,297
55-59				2	1		1	4
Tot. Pay				\$128,580	\$70,123		\$73,219	\$271,922
Avg. Pay				\$64,290	\$70,123		\$73,219	\$67,981
60-64	1	1		1				3
Tot. Pay	\$17,330	\$43,552		\$76,867				\$137,749
Avg. Pay	\$17,330	\$43,552		\$76,867				\$45,916
65-69								
Tot. Pay								
Avg. Pay								
70 & Over				1				1
Tot. Pay				\$74,331				\$74,331
Avg. Pay				\$74,331				\$74,331
<b>Totals</b>	9	5	4	6	6	2	1	33
<b>Tot. Pay</b>	\$363,494	\$273,183	\$197,245	\$401,777	\$352,520	\$114,302	\$73,219	\$1,775,740
<b>Avg. Pay</b>	\$40,388	\$54,637	\$49,311	\$66,963	\$58,753	\$57,151	\$73,219	\$53,810

**PUBLIC SAFETY DIVISION**  
**Female Active Members in Valuation December 31, 2021**  
**by Attained Age and Years of Service**

Attained Ages	Years of Service To Valuation Date						Total	
	0-4	5-9	10-14	15-19	20-24	25-29		30+
15-19								
Tot. Pay								
Avg. Pay								
20-24								
Tot. Pay								
Avg. Pay								
25-29	1							1
Tot. Pay	\$40,234							\$40,234
Avg. Pay	\$40,234							\$40,234
30-34								
Tot. Pay								
Avg. Pay								
35-39	1			1				2
Tot. Pay	\$35,524			\$43,886				\$79,410
Avg. Pay	\$35,524			\$43,886				\$39,705
40-44		2						2
Tot. Pay		\$84,062						\$84,062
Avg. Pay		\$42,031						\$42,031
45-49		1						1
Tot. Pay		\$45,921						\$45,921
Avg. Pay		\$45,921						\$45,921
50-54						1	1	2
Tot. Pay						\$39,607	\$102,635	\$142,242
Avg. Pay						\$39,607	\$102,635	\$71,121
55-59								
Tot. Pay								
Avg. Pay								
60-64		1						1
Tot. Pay		\$43,533						\$43,533
Avg. Pay		\$43,533						\$43,533
65-69								
Tot. Pay								
Avg. Pay								
70 & Over								
Tot. Pay								
Avg. Pay								
<b>Totals</b>	2	4		1		1	1	9
<b>Tot. Pay</b>	\$75,758	\$173,516		\$43,886		\$39,607	\$102,635	\$435,402
<b>Avg. Pay</b>	\$37,879	\$43,379		\$43,886		\$39,607	\$102,635	\$48,378



**PUBLIC SAFETY DIVISION**  
**Inactive Members in Valuation December 31, 2021**  
**by Attained Age and Years of Service**

Attained Ages	Years of Service to Valuation Date							Total Number
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
Under 20								
20-24	1							1
25-29	18							18
30-34	10							10
35-39	9	1						10
40-44	7							7
45-49	6	1			1			8
50-54	4				1			5
55-59			1					1
60-64	1							1
65-69			1					1
70 & Over								
<b>Totals</b>	<b>56</b>	<b>2</b>	<b>2</b>		<b>2</b>			<b>62</b>

## **SECTION VIII**

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### **LAW ENFORCEMENT DIVISION**

## LAW ENFORCEMENT DIVISION

Data on active, inactive, retired and money purchase members that was used in the valuation is tabulated briefly below.

### *Active Members in Valuation December 31, 2021*

Groups	Number	Annual Payroll	Average		
			Pay	Age	Service
Men	6,939	\$ 522,905,247	\$ 75,357	41.4 yrs.	14.4 yrs.
Women	992	69,608,837	70,170	39.9	13.0
<b>Totals</b>	<b>7,931</b>	<b>\$ 592,514,084</b>	<b>\$ 74,709</b>	<b>41.2 yrs.</b>	<b>14.3 yrs.</b>

Also included in the valuation were 1,503 inactive members and 23 members active in the money purchase plan.

### *Retired Members in Valuation December 31, 2021*

Fund/Type of Allowance	Number	Current Monthly Benefits	Actuarial Liabilities
A & PR Fund			
Superannuation Retirement	3,761	\$ 14,666,562	\$ 2,276,730,843
Disability Retirement	1,550	5,574,390	816,961,665
Money Purchase	3	233	34,419
Total A & PR Fund	5,314	\$ 20,241,185	\$ 3,093,726,927
Total SBF	432	581,210	75,839,676
<b>Grand Total</b>	<b>5,746</b>	<b>\$ 20,822,395</b>	<b>\$ 3,169,566,603</b>



**LAW ENFORCEMENT DIVISION**  
**Employer Contributions to Support**  
**Retirement Allowances**  
**Expressed as Percents of Active Member Payroll**

Valuation Date December 31	2021	2020 <sup>@</sup>
Contributions for	2024	2023
<b>Normal Cost</b>		
Age and Service Allowances*	14.37 %	14.41 %
Disability Allowances	2.92 %	2.89 %
Survivor's Benefits	0.69 %	0.68 %
Separation Benefits	2.45 %	2.45 %
Total Normal Cost	20.43 %	20.43 %
(Member Contributions)	13.00 %	13.00 %
Employer Normal Cost	7.43 %	7.43 %
<b>Unfunded Actuarial Accrued Liabilities</b>		
Total Available Contribution	10.67 %	10.67 %
Amortization Years	7	11
<b>Total Pension Employer Contribution Rate</b>	<b>18.10 %</b>	<b>18.10 %</b>

\* Includes contributions for administrative expenses.

@ Revised actuarial assumptions

The term "Amortization Years" refers to the period sufficient to produce the Total Employer Contribution Rate for retirement allowances and survivor benefits and incorporates all scheduled employer and member contribution rate increases and scheduled employer rate reallocations between the pension and retiree health programs.

## LAW ENFORCEMENT DIVISION Comparative Statement

Valuation Date December 31	Contribution Rate Effective January 1	Active Members in Valuation				Computed Employer Contributions as % of Payroll				
		No.	Annual Payroll			Normal Cost	Unfunded Accrued Liability	Pension Total	Retiree Health	Grand Total
			Total	Average	Increase					
			(\$Thousands)							
2007	2010	8,265	\$ 437,223	\$ 52,901	3.6 %	9.95 %	0.92 %	10.87 %	7.00 %	17.87 %
2008	2011	8,173	448,694	54,900	3.8 %	8.43 %	5.67 %	14.10 %	4.00 %	18.10 %
2009	2012	8,006	447,232	55,862	1.8 %	8.16 %	5.94 %	14.10 %	4.00 %	18.10 %
2010@	2013	7,702	438,830	56,976	2.0 %	7.56 %	9.54 %	17.10 %	1.00 %	18.10 %
2011	2014	7,545	437,605	57,999	1.8 %	7.18 %	10.92 %	18.10 %	0.00 %	18.10 %
2012#	2015	7,470	438,500	58,702	1.2 %	5.43 %	9.67 %	15.10 %	3.00 %	18.10 %
2013	2016	7,549	447,612	59,294	1.0 %	5.44 %	8.66 %	14.10 %	4.00 %	18.10 %
2014	2017	7,618	463,653	60,863	2.6 %	5.34 %	8.76 %	14.10 %	4.00 %	18.10 %
2015@	2018	7,779	481,296	61,871	1.7 %	6.70 %	11.40 %	18.10 %	0.00 %	18.10 %
2016	2019	7,916	511,457	64,610	4.4 %	6.75 %	11.35 %	18.10 %	0.00 %	18.10 %
2017	2020	8,039	528,004	65,680	1.7 %	6.79 %	11.31 %	18.10 %	0.00 %	18.10 %
2018^	2021	8,015	543,649	67,829	3.3 %	8.09 %	10.01 %	18.10 %	0.00 %	18.10 %
2019	2022	8,062	564,250	69,989	3.2 %	8.05 %	10.05 %	18.10 %	0.00 %	18.10 %
2020@	2023	8,005	577,952	72,199	3.2 %	7.43 %	10.67 %	18.10 %	0.00 %	18.10 %
2021	2024	7,931	592,514	74,709	3.5 %	7.43 %	10.67 %	18.10 %	0.00 %	18.10 %

# After benefit changes.

@ Revised actuarial assumptions.

^ Reflects active members reclassified as inactive.

**LAW ENFORCEMENT DIVISION**  
**Development of Unfunded Actuarial Accrued Liabilities**  
**December 31, 2021**

Actuarial Present Value	(1) Total Actuarial Present Value	Allocation by Entry Age	
		(2) Portion Covered By Future Normal Cost Contributions	(3) Actuarial Accrued Liabilities (1)-(2)
Allowances currently being paid from the Annuity & Pension Reserve Fund	\$ 3,093,726,927	\$ -	\$ 3,093,726,927
Allowances currently being paid from the Survivors Benefit Fund	75,839,676	-	75,839,676
Age and service allowances based on service rendered before and likely to be rendered after valuation date*	2,824,491,278	869,503,830	1,954,987,448
Disability allowances likely to be paid present active members who become permanently disabled	331,511,540	174,662,478	156,849,062
Survivor benefits likely to be paid to spouses and children of present active members who die before retiring	86,291,307	41,314,229	44,977,078
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active and inactive members	186,937,857	148,326,663	38,611,194
<b>Total</b>	<b>\$ 6,598,798,585</b>	<b>\$ 1,233,807,200</b>	<b>\$ 5,364,991,385</b>
Funding Value of Assets			4,901,906,749
Unfunded Actuarial Accrued Liability			<b>\$ 463,084,636</b>

\* Includes contributions for administrative expenses.

**LAW ENFORCEMENT DIVISION**  
**Development of Unfunded Actuarial Accrued Liabilities**  
**Comparative Statement**  
**(\$ in Millions Except Averages)**

Dec. 31	Defined Benefit Active Payroll		Active and Inactive Member Accrued Liabilities for Retirement Allowances				Unfunded /Payroll
			Computed	Valuation	Unfunded	Amortization	
	Total	Average	Total	Assets		Years	
2007	\$437	\$52,901	\$ 1,430	\$ 1,214	\$ 216	N/A	0.49
2008	449	54,900	1,500	771	729	N/A	1.62
2009	447	55,862	1,534	807	727	N/A	1.63
2010@	439	56,976	1,542	966	576	19	1.31
2011	438	57,999	1,546	813	733	23	1.67
2012#	439	58,702	1,480	945	535	14	1.22
2013	448	59,294	1,510	981	529	15	1.18
2014	464	60,863	1,550	1,062	488	13	1.05
2015@	481	61,871	1,706	1,087	619	13	1.29
2016	511	64,610	1,818	1,172	646	13	1.26
2017	528	65,680	1,871	1,258	613	12	1.16
2018	544	67,829	2,048	1,219	829	20	1.52
2019	564	69,989	2,156	1,425	731	16	1.30
2020@	578	72,199	2,192	1,586	606	11	1.05
2021	593	74,709	2,195	1,732	463	7	0.78

# After benefit changes.

@ Revised actuarial assumptions.

While no one or two numeric indices can fully describe the financial condition of a retirement plan, the ratio of unfunded actuarial accrued liabilities divided by active member payroll (“UNFUNDED/PAYROLL” above) is significant. Unfunded accrued liabilities represent plan debt, while active member payroll represents the plan’s capacity to collect contributions to pay toward debt --- thus the ratio is a relative index of condition. The lower the ratio, the greater the financial strength, and vice-versa.

**LAW ENFORCEMENT DIVISION**  
**Male Active Members in Valuation December 31, 2021**  
**by Attained Age and Years of Service**

Attained Ages	Years of Service To Valuation Date							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
15-19	1							1
Tot. Pay	\$19,574							\$19,574
Avg. Pay	\$19,574							\$19,574
20-24	214	4						218
Tot. Pay	\$10,701,117	\$193,019						\$10,894,136
Avg. Pay	\$50,005	\$48,255						\$49,973
25-29	533	246	1					780
Tot. Pay	\$30,642,878	\$16,922,790	\$66,325					\$47,631,993
Avg. Pay	\$57,491	\$68,792	\$66,325					\$61,067
30-34	298	576	156	2				1,032
Tot. Pay	\$18,377,011	\$42,201,957	\$11,577,860	\$159,550				\$72,316,378
Avg. Pay	\$61,668	\$73,267	\$74,217	\$79,775				\$70,074
35-39	155	289	338	184	6			972
Tot. Pay	\$9,195,891	\$21,163,672	\$26,760,046	\$14,590,073	\$570,150			\$72,279,832
Avg. Pay	\$59,328	\$73,231	\$79,172	\$79,294	\$95,025			\$74,362
40-44	76	120	180	378	245	4		1,003
Tot. Pay	\$4,394,088	\$8,971,907	\$13,568,577	\$30,824,557	\$20,816,896	\$267,832		\$78,843,857
Avg. Pay	\$57,817	\$74,766	\$75,381	\$81,546	\$84,967	\$66,958		\$78,608
45-49	60	75	115	208	560	220	1	1,239
Tot. Pay	\$3,467,079	\$5,277,023	\$8,906,407	\$16,542,328	\$47,495,133	\$19,203,653	\$93,438	\$100,985,061
Avg. Pay	\$57,785	\$70,360	\$77,447	\$79,530	\$84,813	\$87,289	\$93,438	\$81,505
50-54	28	38	65	134	279	442	99	1,085
Tot. Pay	\$1,532,921	\$2,644,075	\$5,201,758	\$10,462,594	\$23,428,645	\$38,092,020	\$9,447,162	\$90,809,175
Avg. Pay	\$54,747	\$69,581	\$80,027	\$78,079	\$83,974	\$86,181	\$95,426	\$83,695
55-59	19	17	23	44	114	143	69	429
Tot. Pay	\$1,044,040	\$1,143,929	\$1,637,596	\$3,286,407	\$9,323,131	\$12,007,934	\$6,065,047	\$34,508,084
Avg. Pay	\$54,949	\$67,290	\$71,200	\$74,691	\$81,782	\$83,972	\$87,899	\$80,438
60-64	3	4	10	14	30	29	46	136
Tot. Pay	\$129,605	\$226,273	\$780,990	\$1,122,606	\$2,446,123	\$2,209,366	\$4,227,607	\$11,142,570
Avg. Pay	\$43,202	\$56,568	\$78,099	\$80,186	\$81,537	\$76,185	\$91,905	\$81,931
65-69	1	2		5	8	6	15	37
Tot. Pay	\$67,473	\$152,401		\$376,730	\$636,120	\$425,434	\$1,272,899	\$2,931,057
Avg. Pay	\$67,473	\$76,201		\$75,346	\$79,515	\$70,906	\$84,860	\$79,218
70 & Over		3					2	7
Tot. Pay		\$174,141			\$51,174	\$76,364	\$241,851	\$543,530
Avg. Pay		\$58,047			\$51,174	\$76,364	\$120,926	\$77,647
<b>Totals</b>	1,388	1,374	888	969	1,243	845	232	6,939
<b>Tot. Pay</b>	\$79,571,677	\$99,071,187	\$68,499,559	\$77,364,845	\$104,767,372	\$72,282,603	\$21,348,004	\$522,905,247
<b>Avg. Pay</b>	\$57,328	\$72,104	\$77,139	\$79,840	\$84,286	\$85,542	\$92,017	\$75,357



# LAW ENFORCEMENT DIVISION

## Female Active Members in Valuation December 31, 2021 by Attained Age and Years of Service

Attained Ages	Years of Service To Valuation Date							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
15-19								
Tot. Pay								
Avg. Pay								
20-24	35	2						37
Tot. Pay	\$1,848,135	\$137,034						\$1,985,169
Avg. Pay	\$52,804	\$68,517						\$53,653
25-29	125	42						167
Tot. Pay	\$6,980,857	\$2,682,078						\$9,662,935
Avg. Pay	\$55,847	\$63,859						\$57,862
30-34	47	87	20	1				155
Tot. Pay	\$2,733,132	\$6,153,618	\$1,481,048	\$56,969				\$10,424,767
Avg. Pay	\$58,152	\$70,731	\$74,052	\$56,969				\$67,257
35-39	15	33	48	25	1			122
Tot. Pay	\$881,971	\$2,305,503	\$3,985,165	\$1,927,826	\$47,491			\$9,147,956
Avg. Pay	\$58,798	\$69,864	\$83,024	\$77,113	\$47,491			\$74,983
40-44	13	26	23	48	40			150
Tot. Pay	\$759,657	\$1,800,031	\$1,845,647	\$3,776,052	\$3,010,574			\$11,191,961
Avg. Pay	\$58,435	\$69,232	\$80,246	\$78,668	\$75,264			\$74,613
45-49	11	12	17	26	67	26	1	160
Tot. Pay	\$556,527	\$696,206	\$1,233,435	\$1,926,625	\$5,262,439	\$2,240,313	\$64,415	\$11,979,960
Avg. Pay	\$50,593	\$58,017	\$72,555	\$74,101	\$78,544	\$86,166	\$64,415	\$74,875
50-54	2	5	8	20	34	53	5	127
Tot. Pay	\$184,340	\$373,428	\$528,050	\$1,601,335	\$2,627,269	\$4,255,863	\$445,592	\$10,015,877
Avg. Pay	\$92,170	\$74,686	\$66,006	\$80,067	\$77,273	\$80,299	\$89,118	\$78,865
55-59	1	2	3	6	16	15	7	50
Tot. Pay	\$72,944	\$123,259	\$188,014	\$419,351	\$1,122,700	\$1,064,711	\$548,493	\$3,539,472
Avg. Pay	\$72,944	\$61,630	\$62,671	\$69,892	\$70,169	\$70,981	\$78,356	\$70,789
60-64		1	1	4	4	5	3	18
Tot. Pay		\$73,559	\$71,943	\$226,345	\$325,243	\$392,783	\$204,322	\$1,294,195
Avg. Pay		\$73,559	\$71,943	\$56,586	\$81,311	\$78,557	\$68,107	\$71,900
65-69	1			2	1	1	1	6
Tot. Pay	\$44,678			\$110,404	\$70,075	\$69,900	\$71,488	\$366,545
Avg. Pay	\$44,678			\$55,202	\$70,075	\$69,900	\$71,488	\$61,091
70 & Over								
Tot. Pay								
Avg. Pay								
<b>Totals</b>	250	210	120	132	163	100	17	992
<b>Tot. Pay</b>	\$14,062,241	\$14,344,716	\$9,333,302	\$10,044,907	\$12,465,791	\$8,023,570	\$1,334,310	\$69,608,837
<b>Avg. Pay</b>	\$56,249	\$68,308	\$77,778	\$76,098	\$76,477	\$80,236	\$78,489	\$70,170

**LAW ENFORCEMENT DIVISION**  
**Inactive Members in Valuation December 31, 2021**  
**by Attained Age and Years of Service**

Attained Ages	Years of Service to Valuation Date							Total Number
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
Under 20								
20-24	38							38
25-29	180	14						194
30-34	173	90	5					268
35-39	129	60	27	4				220
40-44	98	28	24	23	3	1		177
45-49	100	21	22	25	25	4		197
50-54	117	28	21	16	16	7		205
55-59	71	6	14	12	4	2		109
60-64	38	4	4	4	3			53
65-69	18		3		1			22
70 & Over	18			1			1	20
<b>Totals</b>	<b>980</b>	<b>251</b>	<b>120</b>	<b>85</b>	<b>52</b>	<b>14</b>	<b>1</b>	<b>1,503</b>

## **SECTION IX**

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### **ALLOWANCES BEING PAID TO RETIREES AND BENEFICIARIES**



## Monthly Allowances of Retired Lives by Year of Retirement as of December 31, 2021

Year of Retirement	No.	Initial	Post-Ret. Increase	Total	Average
2021	9,869	\$25,466,912	\$ 99,406	\$ 25,566,318	\$ 2,591
2020	8,971	21,903,301	195,992	22,099,293	2,463
2019	7,725	18,340,925	421,550	18,762,475	2,429
2018	7,837	17,279,599	918,915	18,198,514	2,322
2017	8,840	19,938,208	1,653,741	21,591,949	2,443
2016	8,132	17,356,234	1,945,353	19,301,587	2,374
2015	7,296	14,969,362	2,110,224	17,079,586	2,341
2014	11,491	21,003,970	3,604,320	24,608,290	2,142
2013	11,369	22,404,933	5,113,368	27,518,301	2,420
2012	10,398	21,545,708	5,832,284	27,377,992	2,633
2011	11,394	25,515,400	7,699,541	33,214,941	2,915
2010	10,135	20,868,574	6,906,272	27,774,846	2,740
2009	9,878	20,874,699	7,499,957	28,374,656	2,873
2008	8,494	16,429,507	6,392,244	22,821,751	2,687
2007	8,078	15,034,642	6,304,484	21,339,126	2,642
2006	8,483	15,031,094	6,714,712	21,745,806	2,563
2005	7,793	14,253,885	6,784,804	21,038,689	2,700
2000-2004	32,328	53,974,132	30,048,115	84,022,247	2,599
1995-1999	19,536	25,943,850	17,359,309	43,303,159	2,217
1990-1994	10,193	10,677,381	8,547,922	19,225,303	1,886
1985-1989	5,808	5,325,278	5,090,023	10,415,301	1,793
1980-1984	2,004	1,200,934	1,291,509	2,492,443	1,244
1975-1979	727	302,258	371,732	673,990	927
1970-1974	187	49,774	77,434	127,208	680
Before 1970	70	16,264	37,682	53,946	771
<b>TOTAL</b>	<b>227,036</b>	<b>\$425,706,824</b>	<b>\$133,020,893</b>	<b>\$558,727,717</b>	<b>\$2,461</b>

## Monthly Allowances of Retired Lives by Years of Service as of December 31, 2021

Years of Service	No.	Initial	Post-Ret. Increase	Total	Average
<5 or n/a	9,057	\$ 3,606,956	\$ 515,581	\$ 4,122,537	\$ 455
5	3,994	1,570,546	559,674	2,130,220	533
6	3,317	1,505,430	485,013	1,990,443	600
7	3,237	1,580,291	486,138	2,066,429	638
8	3,177	1,733,774	508,095	2,241,869	706
9	2,584	1,591,692	438,184	2,029,876	786
10	8,686	4,757,108	1,705,580	6,462,688	744
11	5,519	3,635,033	1,166,905	4,801,938	870
12	5,663	4,032,981	1,253,322	5,286,303	933
13	5,427	4,356,974	1,336,028	5,693,002	1,049
14	5,195	4,441,977	1,335,083	5,777,060	1,112
15	5,674	5,263,062	1,585,246	6,848,308	1,207
16	5,371	5,272,634	1,617,279	6,889,913	1,283
17	5,025	5,401,051	1,655,010	7,056,061	1,404
18	5,050	5,725,892	1,762,847	7,488,739	1,483
19	4,610	5,393,448	1,803,115	7,196,563	1,561
20	7,279	9,945,496	2,568,472	12,513,968	1,719
21	5,760	8,111,476	2,351,448	10,462,924	1,816
22	5,440	8,310,267	2,449,227	10,759,494	1,978
23	5,266	8,571,168	2,563,971	11,135,139	2,115
24	4,961	8,486,350	2,543,119	11,029,469	2,223
25	10,739	20,007,577	6,520,830	26,528,407	2,470
26	6,507	13,008,107	4,232,849	17,240,956	2,650
27	6,377	13,637,606	4,640,686	18,278,292	2,866
28	6,933	16,198,221	5,930,509	22,128,730	3,192
29	6,530	16,500,373	5,855,718	22,356,091	3,424
30	34,465	95,061,402	30,417,809	125,479,211	3,641
31	11,742	35,929,849	9,442,682	45,372,531	3,864
32	8,003	24,840,544	7,498,328	32,338,872	4,041
33	5,951	19,188,697	5,950,423	25,139,120	4,224
34	4,586	15,182,664	4,867,754	20,050,418	4,372
35	4,089	13,846,022	4,499,190	18,345,212	4,486
36	2,892	9,897,839	3,237,461	13,135,300	4,542
37	2,219	7,634,644	2,558,683	10,193,327	4,594
38	1,613	5,679,116	1,822,515	7,501,631	4,651
39	1,209	4,202,884	1,469,437	5,672,321	4,692
40 & Over	2,889	11,597,673	3,386,682	14,984,355	5,187
<b>TOTAL</b>	<b>227,036</b>	<b>\$425,706,824</b>	<b>\$133,020,893</b>	<b>\$558,727,717</b>	<b>\$2,461</b>

# Annuity and Pension Reserve Fund

## Annual Allowance, Reported Assets and Actuarial Liabilities

### Comparative Statement

#### (\$ Millions)

Valuation Date	Annual Allowances			Reported Assets*	Actuarial Liabilities	Ratio of Assets to Liabilities	Ratio of DB Active to Retired
	No.	\$ Millions	% of DB Payroll				
12/31/1992	98,609	\$ 835	12.1 % **	\$ 8,814	\$ 8,692	101.4 %	3.4
12/31/1993	100,651	901	12.5 % **	9,390	9,356	100.4 %	3.4
12/31/1994	102,587	958	12.6 % **	9,964	9,893	100.7 %	3.3
12/31/1995	104,806	1,036	13.0 % **	10,808	10,737	100.7 %	3.3
12/31/1996@	107,617	1,141	13.7 % **	11,819	11,762	100.5 %	3.3
12/31/1997	110,470	1,233	14.3 % **	12,843	12,755	100.7 %	3.2
12/13/1998	113,000	1,327	14.7 % **	13,885	13,751	101.0 %	3.1
12/31/1999+	115,431	1,530	16.1 % **	14,978	16,139	92.8 %	3.1
12/31/2000	118,620	1,641	16.1 % **	16,980	16,980	100.0 %	3.1
12/31/2001@	121,875	1,775	16.5 % **	18,001	18,001	100.0 %	3.0
12/31/2002	126,409	1,958	17.5 % **	20,085	20,085	100.0 %	2.9
12/31/2003	130,433	2,136	19.1 % **	22,535	22,535	100.0 %	2.7
12/31/2004	134,535	2,311	20.2 % **	24,470	24,470	100.0 %	2.6
12/31/2005@	138,996	2,508	21.2 % **	27,084	27,084	100.0 %	2.6
12/31/2006	144,037	2,710	22.3 % **	29,304	29,304	100.0 %	2.5
12/31/2007	148,493	2,916	23.2 % **	31,547	31,547	100.0 %	2.5
12/31/2008	153,931	3,148	24.6 % **	34,060	34,060	100.0 %	2.3
12/31/2009	159,518	3,419	27.2 % **	37,098	37,098	100.0 %	2.2
12/31/2010@	166,247	3,705	29.8 % **	40,184	40,818	100.0 %	2.1
12/31/2011	174,679	4,065	32.8 % **	45,001	45,001	100.0 %	1.9
12/31/2012	180,759	4,352	35.7 % **	48,044	48,044	100.0 %	1.8
12/31/2013	187,198	4,629	37.5 % **	50,754	50,754	100.0 %	1.8
12/31/2014	194,096	4,908	38.8 % **	53,432	53,432	100.0 %	1.7
12/31/2015@	196,709	5,115	39.5 % **	55,117	55,117	100.0 %	1.7
12/31/2016	199,662	5,344	39.7 % **	60,949	60,949	100.0 %	1.7
12/31/2017	202,292	5,575	40.6 % **	62,931	62,931	100.0 %	1.6
12/31/2018	204,479	5,791	42.7 % **	66,395	66,395	100.0 %	1.4
12/31/2019	206,832	6,018	43.1 % **	68,058	68,058	100.0 %	1.4
12/31/2020@	209,216	6,245	44.8 % **	70,674	70,674	100.0 %	1.3
12/31/2021	212,550	6,491	45.1 % **	73,141	73,141	100.0 %	1.3

\* Including certain recommended transfers and accrued transfers.

@ Revised actuarial assumptions.

\*\* Excluding health insurance and Medicare payments.

+ Including estimated effect of legislated benefit changes.

**Annuity and Pension Reserve Fund**  
**Retirees and Beneficiaries December 31, 2021**  
**Type of Benefit, Monthly Amount and Actuarial Liabilities**

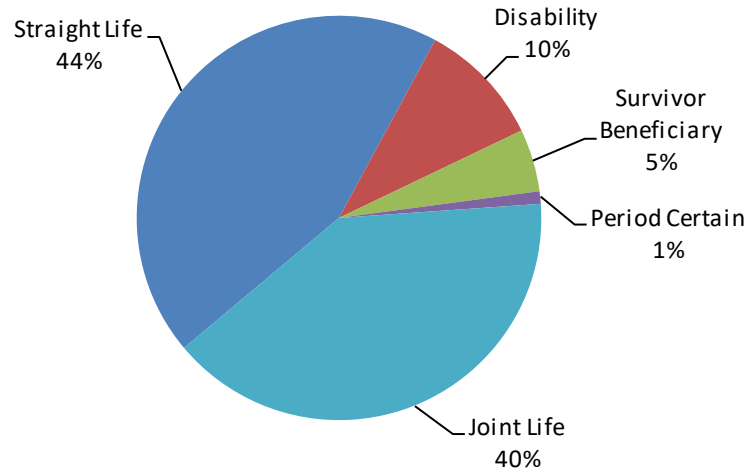
Type of Allowance	Number	Current Total	Actuarial Liabilities
Superannuation Retirement			
Multiple Life Plan/Plan A - Joint & 50%	23,554	\$ 71,565,412	\$ 10,134,658,095
Single Life Plan/Plan B - Straight Life	96,426	234,519,095	29,291,921,330
Multiple Life Plan/Plan C - Special Joint & Survivor	20,345	65,901,054	9,231,271,804
Multiple Life Plan/Plan D - Joint & 100%	28,065	79,826,205	13,005,971,505
Period Certain/Plan E - Life & 0 to 5 Years Guaranteed	280	673,441	76,672,690
- Life & 6 to 10 Years Guaranteed	414	924,196	104,265,302
- Life & 11 to 15 Years Guaranteed	566	1,137,181	131,112,941
- Life & 16 to 20 Years Guaranteed	58	163,188	23,155,377
Multiple Life Plan/Plan F - Multiple Continuing Beneficiaries	1,564	4,639,517	907,372,810
Reserve for Combined Plan Future Adverse Experience			3,613,222
Reserve for Member Directed Future Adverse Experience			14,158,336
Money Purchase	4,294	1,902,468	186,528,281
Survivor Beneficiary - Life Benefit	18,449	27,939,799	2,822,626,442
Survivor Beneficiary - Temporary Benefit	61	110,126	4,356,702
<b>Total Superannuation</b>	<b>194,076</b>	<b>\$ 489,301,682</b>	<b>\$ 65,937,684,837</b>
Disability Retirement	18,474	\$ 51,595,111	\$ 7,206,768,754
<b>Total from A &amp; PR</b>	<b>212,550</b>	<b>\$ 540,896,793</b>	<b>\$ 73,144,453,591</b>

**Annuity and Pension Reserve Fund**  
**Retirees and Beneficiaries December 31, 2021**  
**Type of Benefit and Amount by Gender of Recipient**

Type of Allowance	Men		Women		Total	
	Number	Monthly Allowances	Number	Monthly Allowances	Number	Monthly Allowances
Superannuation Retirement						
Multiple Life Plan/Plan A - Joint & 50%	14,964	\$ 48,505,398	8,590	\$ 23,060,014	23,554	\$ 71,565,412
Single Life Plan/Plan B - Straight Life	29,806	81,548,955	66,620	152,970,140	96,426	234,519,095
Multiple Life Plan/Plan C - Special Joint & Survivor	9,516	35,561,692	10,829	30,339,362	20,345	65,901,054
Multiple Life Plan/Plan D - Joint & 100%	21,735	64,990,620	6,330	14,835,585	28,065	79,826,205
Period Certain/Plan E - Life & 0 to 5 Years Guaranteed	107	296,478	173	376,963	280	673,441
- Life & 6 to 10 Years Guaranteed	198	443,989	216	480,207	414	924,196
- Life & 11 to 15 Years Guaranteed	300	589,581	266	547,600	566	1,137,181
- Life & 16 to 20 Years Guaranteed	37	97,076	21	66,112	58	163,188
Multiple Life Plan/Plan F - Multiple Continuing Beneficiaries	588	2,066,700	976	2,572,817	1,564	4,639,517
Money Purchase	2,562	1,363,295	1,732	539,173	4,294	1,902,468
Survivor Beneficiary - Life Benefit	2,743	2,623,260	15,706	25,316,539	18,449	27,939,799
Survivor Beneficiary - Temporary Benefit	18	37,851	43	72,275	61	110,126
<b>Total Superannuation</b>	<b>82,574</b>	<b>\$ 238,124,895</b>	<b>111,502</b>	<b>\$ 251,176,787</b>	<b>194,076</b>	<b>\$ 489,301,682</b>
Disability Retirement	9,406	\$ 28,695,996	9,068	\$ 22,899,115	18,474	\$ 51,595,111
<b>Total from A &amp; PR</b>	<b>91,980</b>	<b>\$ 266,820,891</b>	<b>120,570</b>	<b>\$ 274,075,902</b>	<b>212,550</b>	<b>\$ 540,896,793</b>

# Annuities Being Paid by Type December 31, 2021

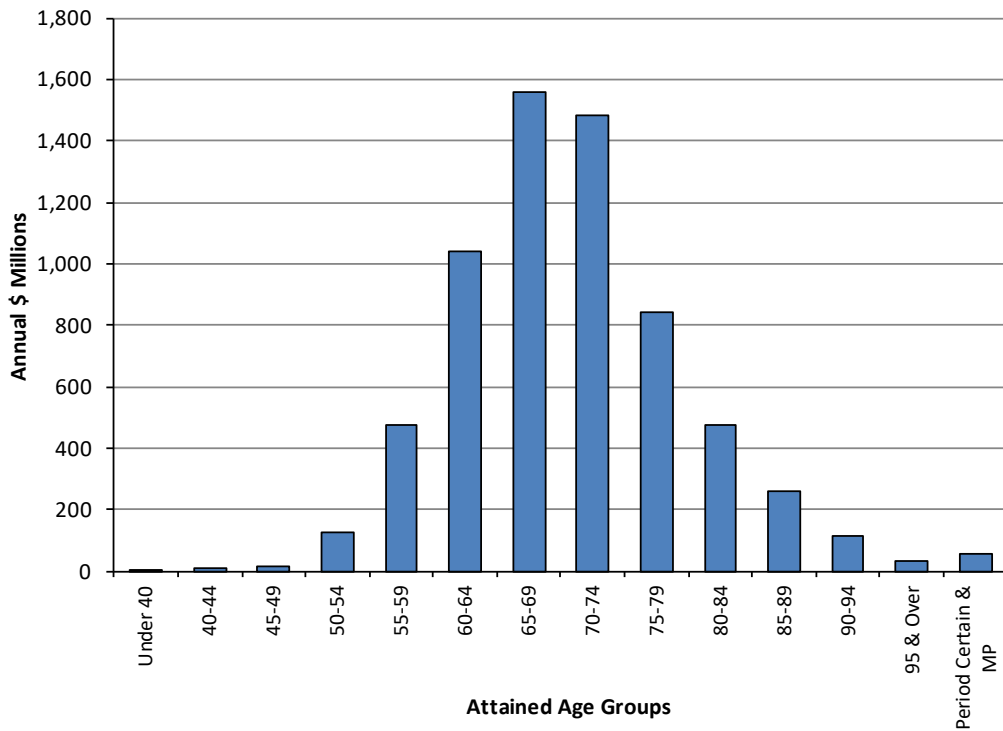
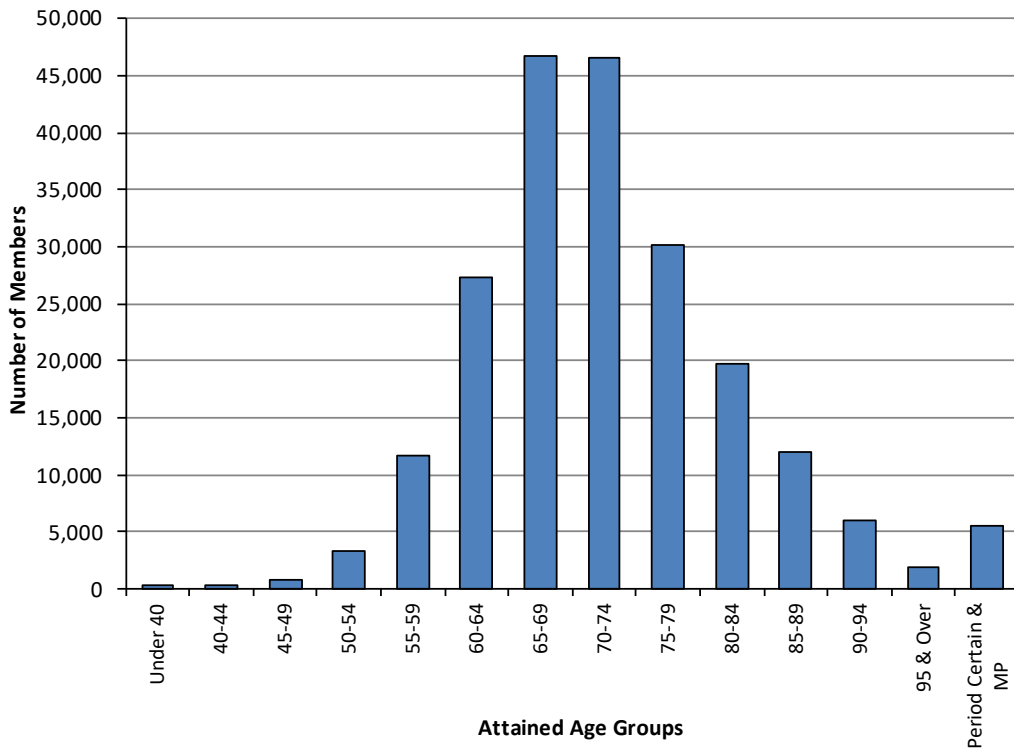
## Annuity and Pension Reserve Fund



**Annuity and Pension Reserve Fund**  
**Retirees and Beneficiaries December 31, 2021**  
**Current Monthly Total \$ by Attained Ages**

Attained Ages	Superannuation		Disability		Totals	
	No.	Monthly Total	No.	Monthly Total	No.	Monthly Total
Under 20	12	\$ 10,443			12	\$ 10,443
20-24	34	37,554			34	37,554
25-29	49	29,362	1	\$ 679	50	30,041
30-34	68	54,170	13	22,154	81	76,324
35-39	63	55,667	65	119,601	128	175,268
40-44	86	66,325	246	490,803	332	557,128
45-49	130	185,277	607	1,328,855	737	1,514,132
50-54	1,796	6,024,294	1,599	4,286,504	3,395	10,310,798
55-59	8,640	30,950,327	3,002	8,830,503	11,642	39,780,830
60-64	22,724	73,309,716	4,525	13,176,823	27,249	86,486,539
65-69	43,377	119,218,737	3,387	10,551,283	46,764	129,770,020
70-74	43,847	115,926,033	2,720	7,707,595	46,567	123,633,628
75-79	28,837	67,018,827	1,372	3,380,639	30,209	70,399,466
80-84	19,176	38,428,842	611	1,196,607	19,787	39,625,449
85-89	11,783	21,142,036	233	389,442	12,016	21,531,478
90-94	5,901	9,415,389	76	98,402	5,977	9,513,791
95 & Over	1,941	2,628,209	17	15,221	1,958	2,643,430
Period Certain & Money Purchase	5,612	4,800,474			5,612	4,800,474
<b>Totals</b>	<b>194,076</b>	<b>\$489,301,682</b>	<b>18,474</b>	<b>\$51,595,111</b>	<b>212,550</b>	<b>\$540,896,793</b>

# Annuity and Pension Reserve Fund Benefits Being Paid by Attained Ages December 31, 2021





## Annuity and Pension Reserve Fund Percent of Recipients by Age Groups and Year

Attained Age Group	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Under 30	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
30-39	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	0.4%	0.4%
40-49	0.5%	0.6%	0.7%	0.8%	0.9%	1.1%	1.1%	1.3%	1.5%	1.8%	2.0%	2.2%	2.5%	2.7%	2.9%
50-59	7.1%	7.7%	8.5%	9.5%	10.6%	11.5%	12.5%	13.7%	14.6%	15.4%	15.9%	15.9%	16.0%	15.9%	15.9%
60-69	34.8%	35.7%	36.4%	37.3%	37.9%	38.6%	38.8%	37.9%	36.5%	35.5%	34.8%	33.5%	32.6%	31.4%	30.7%
70-79	36.2%	34.8%	33.2%	31.4%	29.8%	27.9%	26.7%	26.2%	26.1%	25.8%	25.4%	25.7%	26.2%	26.7%	27.2%
80-89	15.0%	14.7%	14.6%	14.5%	14.3%	14.4%	14.4%	14.4%	14.8%	15.3%	15.8%	16.6%	16.9%	17.4%	17.7%
90 & Over	3.7%	3.8%	3.8%	3.7%	3.7%	3.7%	3.6%	3.6%	3.6%	3.6%	3.6%	3.6%	3.4%	3.4%	3.3%
Period Certain & Money Purchase	2.6%	2.6%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.3%	2.2%	2.1%	2.1%	1.9%
<b>TOTALS</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>
Average Age	71.7	71.5	71.2	70.9	70.9	70.6	70.4	70.2	70.0	69.9	69.9	70.0	70.0	70.1	70.1



**STATE DIVISION**  
**Survivor Benefit Fund Tabulated by**  
**Type of Benefit Being Paid and Monthly Amount**  
**December 31, 2021**

Group	Number	Current Total	Actuarial Liabilities
<b>S-1 - Survivor Benefit to Beneficiary of Deceased Member Joint and Survivor Computation</b>			
Men	216	\$ 303,438	\$ 33,081,927
Women	574	1,042,165	119,596,045
<b>Totals</b>	<b>790</b>	<b>\$ 1,345,603</b>	<b>\$ 152,677,972</b>
<b>S-2 - Survivor Benefit to Beneficiary of Deceased Member Fixed Rate Amount</b>			
<b>Males</b>			
Widower	761	\$ 1,078,287	\$ 137,782,603
Parent	0	0	0
Other	1	573	75,488
Child	291	249,490	16,811,962
<b>Subtotals - Male</b>	<b>1,053</b>	<b>\$ 1,328,350</b>	<b>\$ 154,670,053</b>
<b>Females</b>			
Widow	2,150	\$ 3,371,262	\$ 458,773,971
Parent	0	0	0
Other	3	3,742	503,581
Child	281	243,313	13,163,242
<b>Subtotals - Female</b>	<b>2,434</b>	<b>\$ 3,618,317</b>	<b>\$ 472,440,794</b>
<b>Totals</b>	<b>3,487</b>	<b>\$ 4,946,667</b>	<b>\$ 627,110,847</b>
<b>Total Benefits Being Paid from Survivor Benefit Fund</b>			
Men	1,269	\$ 1,631,788	\$ 187,751,980
Women	3,008	4,660,482	592,036,839
<b>Totals</b>	<b>4,277</b>	<b>\$ 6,292,270</b>	<b>\$ 779,788,819</b>

**LOCAL GOVERNMENT DIVISION**  
**Survivor Benefit Fund Tabulated by**  
**Type of Benefit Being Paid and Monthly Amount**  
**December 31, 2021**

Group	Number	Current Total	Actuarial Liabilities
<b>S-1 - Survivor Benefit to Beneficiary of Deceased Member Joint and Survivor Computation</b>			
Men	326	\$ 352,333	\$ 36,699,260
Women	1,266	1,767,157	199,276,967
<b>Totals</b>	<b>1,592</b>	<b>\$ 2,119,490</b>	<b>\$ 235,976,227</b>
<b>S-2 - Survivor Benefit to Beneficiary of Deceased Member Fixed Rate Amount</b>			
<b>Males</b>			
Widower	1,268	\$ 1,325,503	\$ 167,936,128
Parent	0	0	0
Other	0	0	0
Child	601	418,803	30,716,178
<b>Subtotals - Male</b>	<b>1,869</b>	<b>\$ 1,744,306</b>	<b>\$ 198,652,306</b>
<b>Females</b>			
Widow	5,079	\$ 6,028,792	\$ 798,676,056
Parent	2	2,272	160,610
Other	9	7,856	786,126
Child	546	393,618	24,151,327
<b>Subtotals - Female</b>	<b>5,636</b>	<b>\$ 6,432,538</b>	<b>\$ 823,774,119</b>
<b>Totals</b>	<b>7,505</b>	<b>\$ 8,176,844</b>	<b>\$ 1,022,426,425</b>
<b>Total Benefits Being Paid from Survivor Benefit Fund</b>			
Men	2,195	\$ 2,096,639	\$ 235,351,566
Women	6,902	8,199,695	1,023,051,086
<b>Totals</b>	<b>9,097</b>	<b>\$ 10,296,334</b>	<b>\$ 1,258,402,652</b>

**PUBLIC SAFETY DIVISION**  
**Survivor Benefit Fund Tabulated by**  
**Type of Benefit Being Paid and Monthly Amount**  
**December 31, 2021**

Group	Number	Current Total	Actuarial Liabilities
<b>S-1 - Survivor Benefit to Beneficiary of Deceased Member Joint and Survivor Computation</b>			
Men	2	\$ 2,687	\$ 336,001
Women	24	42,989	5,807,614
<b>Totals</b>	<b>26</b>	<b>\$ 45,676</b>	<b>\$ 6,143,615</b>
<b>S-2 - Survivor Benefit to Beneficiary of Deceased Member Fixed Rate Amount</b>			
<b>Males</b>			
Widower	2	\$ 1,804	\$ 194,736
Other	0	0	0
Child	1	1,189	227,522
<b>Subtotals - Male</b>	<b>3</b>	<b>\$ 2,993</b>	<b>\$ 422,258</b>
<b>Females</b>			
Widow	84	\$ 140,250	\$ 19,309,808
Other	0	0	0
Child	4	3,717	499,798
<b>Subtotals - Female</b>	<b>88</b>	<b>\$ 143,967</b>	<b>\$ 19,809,606</b>
<b>Totals</b>	<b>91</b>	<b>\$ 146,960</b>	<b>\$ 20,231,864</b>
<b>Total Benefits Being Paid from Survivor Benefit Fund</b>			
Men	5	\$ 5,680	\$ 758,259
Women	112	186,956	25,617,220
<b>Totals</b>	<b>117</b>	<b>\$ 192,636</b>	<b>\$ 26,375,479</b>

**LAW ENFORCEMENT DIVISION**  
**Survivor Benefit Fund Tabulated by**  
**Type of Benefit Being Paid and Monthly Amount**  
**December 31, 2021**

Group	Number	Current Total	Actuarial Liabilities
<b>S-1 - Survivor Benefit to Beneficiary of Deceased Member Joint and Survivor Computation</b>			
Men	2	\$ 2,332	\$ 239,366
Women	49	103,477	11,665,956
<b>Totals</b>	<b>51</b>	<b>\$ 105,809</b>	<b>\$ 11,905,322</b>
<b>S-2 - Survivor Benefit to Beneficiary of Deceased Member Fixed Rate Amount</b>			
<b>Males</b>			
Widower	16	\$ 16,854	\$ 2,385,645
Other	0	0	0
Child	64	54,791	2,441,506
<b>Subtotals - Male</b>	<b>80</b>	<b>\$ 71,645</b>	<b>\$ 4,827,151</b>
<b>Females</b>			
Widow	242	\$ 352,053	\$ 55,843,722
Other	0	0	0
Child	54	47,277	2,639,481
<b>Subtotals - Female</b>	<b>296</b>	<b>\$ 399,330</b>	<b>\$ 58,483,203</b>
<b>Totals</b>	<b>376</b>	<b>\$ 470,975</b>	<b>\$ 63,310,354</b>
<b>Total Benefits Being Paid from Survivor Benefit Fund</b>			
Men	82	\$ 73,977	\$ 5,066,517
Women	345	502,807	70,149,159
<b>Totals</b>	<b>427</b>	<b>\$ 576,784</b>	<b>\$ 75,215,676</b>

**STATE DIVISION**  
**Deferred Survivor Beneficiaries**  
**Tabulated by Gender and Deferred Age**  
**December 31, 2021**

<b>Group</b>	<b>Number</b>	<b>Current Total</b>	<b>Actuarial Liabilities</b>
Widowers - Male			
No Deferral Age	18	\$ 24,271	\$ 4,658,546
Deferred to age 50	0	0	0
Deferred to age 62	27	23,729	2,865,925
Deferred to age 65	0	0	0
<b>Total - Male</b>	<b>45</b>	<b>\$ 48,000</b>	<b>\$ 7,524,471</b>
Widows - Female			
No Deferral Age	42	\$ 62,450	\$ 12,029,201
Deferred to age 50	0	0	0
Deferred to age 62	99	81,966	10,008,190
Deferred to age 65	0	0	0
<b>Total - Female</b>	<b>141</b>	<b>\$ 144,416</b>	<b>\$ 22,037,391</b>
<b>Totals</b>	<b>186</b>	<b>\$ 192,416</b>	<b>\$ 29,561,862</b>

**LOCAL GOVERNMENT DIVISION**  
**Deferred Survivor Beneficiaries**  
**Tabulated by Gender and Deferred Age**  
**December 31, 2021**

Group	Number	Current Total	Actuarial Liabilities
Widowers - Males			
No Deferral Age	35	\$ 24,047	\$ 4,336,876
Deferred to age 50	0	0	0
Deferred to age 62	66	35,830	3,766,275
Deferred to age 65	0	0	0
Total - Male	101	\$ 59,877	\$ 8,103,151
Widows - Female			
No Deferral Age	81	\$ 74,308	\$ 13,473,003
Deferred to age 50	0	0	0
Deferred to age 62	195	141,873	16,803,260
Deferred to age 65	0	0	0
Total - Female	276	\$ 216,181	\$ 30,276,263
<b>Totals</b>	<b>377</b>	<b>\$ 276,058</b>	<b>\$ 38,379,414</b>

**PUBLIC SAFETY DIVISION**  
**Deferred Survivor Beneficiaries**  
**Tabulated by Gender and Deferred Age**  
**December 31, 2021**

<b>Group</b>	<b>Number</b>	<b>Current Total</b>	<b>Actuarial Liabilities</b>
Widowers - Males			
No Deferral Age	0	\$ 0	\$ 0
Deferred to age 50	0	0	0
Deferred to age 62	0	0	0
<b>Total - Male</b>	<b>0</b>	<b>\$ 0</b>	<b>\$ 0</b>
Widows - Females			
No Deferral Age	0	\$ 0	\$ 0
Deferred to age 50	0	0	0
Deferred to age 62	0	0	0
<b>Total - Female</b>	<b>0</b>	<b>\$ 0</b>	<b>\$ 0</b>
<b>Totals</b>	<b>0</b>	<b>\$ 0</b>	<b>\$ 0</b>



**LAW ENFORCEMENT DIVISION**  
**Deferred Survivor Beneficiaries**  
**Tabulated by Gender and Deferred Age**  
**December 31, 2021**

Group	Number	Current Total	Actuarial Liabilities
Widowers - Males			
No Deferral Age	0	\$ 0	\$ 0
Deferred to age 50	0	0	0
Deferred to age 62	0	0	0
Total - Male	0	\$ 0	\$ 0
Widows - Females			
No Deferral Age	2	\$ 1,580	\$ 326,912
Deferred to age 50	0	0	0
Deferred to age 62	3	2,846	297,088
Total - Female	5	\$ 4,426	\$ 624,000
<b>Totals</b>	<b>5</b>	<b>\$ 4,426</b>	<b>\$ 624,000</b>

## Survivor Benefit Fund Reported Assets and Liabilities Divisions Combined

Valuation Date	Monthly Allowances				\$ Millions		Ratio of Assets to Liabilities
	Current		Deferred		Reported Assets+	Actuarial Liabilities	
	No.	Amount	No.	Amount			
12/31/1987	12,153	\$ 3,656,420	933	\$ 279,327	\$ 626.1	\$ 472.9	132 %
12/31/1988	12,237	3,822,085	941	283,026	490.8	490.8	100 %
12/31/1989@	12,198	4,177,540	941	320,792	525.3	522.1	101 %
12/31/1990	12,182	4,330,622	907	321,218	542.5	537.1	101 %
12/31/1991	12,268	4,528,326	860	314,414	567.9	557.1	102 %
12/31/1992	12,318	4,750,848	852	329,509	589.8	583.3	101 %
12/31/1993	12,437	4,985,681	862	345,937	620.7	607.7	102 %
12/31/1994	12,569	5,207,186	845	347,178	641.5	628.5	102 %
12/31/1995	12,608	5,408,577	866	376,573	668.9	652.4	103 %
12/31/1996@	12,724	5,822,113	878	395,594	711.6	710.6	100 %
12/31/1997	12,856	6,074,566	932	433,430	743.0	740.5	100 %
12/13/1998	13,079	6,337,739	1,060	500,514	780.2	779.6	100 %
12/31/1999#	13,236	7,345,740	989	550,153	801.4	910.9	88 %
12/31/2000	13,317	9,026,315	666	348,886	1,037.4	1,037.4	100 %
12/31/2001@	13,588	9,449,543	993	490,441	1,086.4	1,086.4	100 %
12/31/2002	13,708	9,764,826	902	470,284	1,120.2	1,120.2	100 %
12/31/2003	13,988	10,246,174	842	493,329	1,193.1	1,193.1	100 %
12/31/2004	13,903	10,503,169	858	524,733	1,227.1	1,227.1	100 %
12/31/2005@	14,108	10,948,727	831	528,162	1,289.3	1,289.3	100 %
12/31/2006	14,172	11,333,735	832	508,430	1,332.6	1,332.6	100 %
12/31/2007	14,186	11,714,551	832	510,846	1,375.9	1,375.9	100 %
12/31/2008	14,238	12,122,501	847	526,623	1,425.6	1,425.6	100 %
12/31/2009	14,301	12,576,956	840	527,032	1,479.4	1,479.4	100 %
12/31/2010@	14,407	13,047,857	829	524,242	1,545.7	1,545.7	100 %
12/31/2011	14,370	13,424,237	800	505,111	1,589.7	1,589.7	100 %
12/31/2012#	14,224	13,769,795	796	519,459	1,629.3	1,629.3	100 %
12/31/2013	14,187	14,152,417	751	480,335	1,663.5	1,663.5	100 %
12/31/2014	13,974	14,406,311	739	474,837	1,688.7	1,688.7	100 %
12/31/2015@	13,842	14,728,606	750	479,666	1,838.1	1,838.1	100 %
12/31/2016	13,790	15,119,687	715	462,896	1,881.1	1,881.1	100 %
12/31/2017	13,960	15,655,980	726	553,126	1,942.9	1,942.9	100 %
12/31/2018	13,890	16,063,379	706	542,369	2,034.1	2,034.1	100 %
12/31/2019	13,936	16,606,829	656	496,472	2,091.0	2,091.0	100 %
12/31/2020@	13,811	16,924,352	625	456,657	2,141.0	2,141.0	100 %
12/31/2021	13,918	17,358,024	568	472,900	2,208.3	2,208.3	100 %

@ Revised actuarial assumptions.

# After benefit changes.

+ Includes certain recommended transfers and accrued transfers.



# Retirees and Beneficiaries December 31, 2021

## Historical Averages

All Retirees								
December 31	Number Count	Average Age at Retirement	Average Service at Retirement	Average Pension at Retirement	Average Age on Valuation Date	Average Pension on Valuation Date	Median Pension on Valuation Date	Average FAS at Retirement
2021	227,036	58.0	23.5	\$23,012	71.6	\$30,233	\$26,568	\$46,591
2020	223,652	58.0	23.4	22,422	71.4	29,505	25,884	45,397
2019	221,424	57.9	23.2	21,881	71.1	28,740	25,140	44,379
2018	219,075	57.8	23.1	21,429	70.7	27,944	24,408	43,395
2017	216,978	57.7	23.0	20,993	70.4	27,161	23,652	42,486
2016	214,167	57.6	22.9	20,526	70.2	26,370	22,848	41,524
2015	211,301	57.6	22.8	20,076	69.9	25,579	22,056	40,604
2014	208,809	57.6	22.8	19,673	69.7	24,833	21,348	39,753
2013	202,136	57.4	22.8	19,290	69.5	24,209	20,784	38,763
2012	195,779	57.4	22.7	18,827	69.3	23,461	20,088	37,743
2011	189,849	57.3	22.6	18,218	69.3	22,611	19,212	36,552
2010	181,483	57.2	22.4	17,379	69.3	21,598	18,144	35,025
2009	174,659	57.2	22.2	16,724	69.3	20,730	17,256	33,808
2008	169,016	57.2	22	15,942	69.4	19,750	16,284	32,401
2007	163,511	57.2	21.9	15,318	69.4	18,917	15,480	31,214

Traditional Plan								
December 31	Number Count	Average Age at Retirement	Average Service at Retirement	Average Pension at Retirement	Average Age on Valuation Date	Average Pension on Valuation Date	Median Pension on Valuation Date	Average FAS at Retirement
2021	225,740	58.0	23.5	\$23,056	71.7	\$30,294	\$26,640	\$46,575
2020	222,577	58.0	23.4	22,457	71.4	29,553	25,944	45,386
2019	220,448	57.9	23.3	21,912	71.1	28,784	25,188	44,368
2018	218,226	57.8	23.2	21,456	70.7	27,981	24,444	43,386
2017	216,260	57.7	23.1	21,016	70.4	27,192	23,688	42,479
2016	213,550	57.6	23.0	20,545	70.2	26,396	22,884	41,519
2015	210,792	57.6	22.9	20,092	69.9	25,600	22,080	40,600
2014	208,395	57.6	22.8	19,686	69.7	24,849	21,372	39,749
2013	201,841	57.4	22.8	19,299	69.5	24,220	20,796	38,760
2012	195,622	57.4	22.7	18,832	69.3	23,468	20,088	37,741
2011	189,753	57.3	22.6	18,221	69.3	22,614	19,224	36,549
2010	181,433	57.2	22.4	17,380	69.3	21,600	18,144	35,025
2009	174,637	57.2	22.2	16,725	69.3	20,731	17,256	33,808
2008	169,000	57.2	22	15,942	69.4	19,751	16,284	32,401
2007	163,505	57.2	21.9	15,318	69.4	18,917	15,480	31,214

Combined Plan								
December 31	Number Count	Average Age at Retirement	Average Service at Retirement	Average Pension at Retirement	Average Age on Valuation Date	Average Pension on Valuation Date	Median Pension on Valuation Date	Average FAS at Retirement
2021	914	64.9	12.4	\$5,427	69.7	\$5,814	\$5,088	\$53,230
2020	744	64.9	11.4	4,849	69.8	5,294	4,476	51,079
2019	659	64.8	11.1	4,686	69.1	5,107	4,314	50,618
2018	569	64.8	10.6	4,338	68.7	4,697	4,020	49,007
2017	476	64.7	10.3	4,000	68.2	4,304	3,816	47,455
2016	398	64.8	10.0	3,709	67.9	3,956	3,528	46,614
2015	324	64.6	9.8	3,401	67.3	3,596	3,186	45,141
2014	259	64.7	9.7	3,284	66.8	3,421	3,030	44,349
2013	164	64.9	8.7	2,839	67.0	2,962	2,682	43,403
2012	95	64.2	8.5	2,785	66.2	2,891	2,556	45,218
2011	58	64.2	7.9	2,757	66	2,828	2,202	49,751
2010	32	64.3	7.9	2,158	65.9	2,219	1,962	40,548
2009	12	65.0	7.6	1,590	66.6	1,635	1,740	35,139
2008	12	64	7.4	1,239	64.8	1,260	1,092	29,454
2007	4	61.1	4.8	1,620	62.0	1,644	1,644	43,743

DB Portion of Member-Directed Plan								
December 31	Number Count	Average Age at Retirement	Average Service at Retirement	Average Pension at Retirement	Average Age on Valuation Date	Average Pension on Valuation Date	Median Pension on Valuation Date	Average FAS at Retirement
2021	382	NA	NA	NA	NA	NA	NA	NA
2020	331	NA	NA	NA	NA	NA	NA	NA
2019	317	NA	NA	NA	NA	NA	NA	NA
2018	280	NA	NA	NA	NA	NA	NA	NA
2017	242	NA	NA	NA	NA	NA	NA	NA
2016	219	NA	NA	NA	NA	NA	NA	NA
2015	185	NA	NA	NA	NA	NA	NA	NA
2014	155	NA	NA	NA	NA	NA	NA	NA
2013	131	NA	NA	NA	NA	NA	NA	NA
2012	62	NA	NA	NA	NA	NA	NA	NA
2011	38	NA	NA	NA	NA	NA	NA	NA
2010	18	NA	NA	NA	NA	NA	NA	NA
2009	10	NA	NA	NA	NA	NA	NA	NA
2008	4	NA	NA	NA	NA	NA	NA	NA
2007	2	NA	NA	NA	NA	NA	NA	NA

## SECTION X

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### ACTUARIAL METHODS AND ASSUMPTIONS

# Summary of Actuarial Methods and Assumptions used for OPERS Actuarial Valuations Assumptions Adopted by the Retirement Board After Consulting with the Actuary

**The individual entry age actuarial cost method of valuation** was used in determining liabilities and normal cost. Differences in the past between assumed experience and actual experience (“actuarial gains and losses”) become part of actuarial accrued liabilities.

Unfunded actuarial accrued liabilities are amortized to produce payments (principal & interest) which are level percent of payroll contributions.

**The actuarial assumptions used** in the valuation are shown in this section. Assumptions were established following the December 31, 2020 actuarial valuation based upon an Experience Study covering the period January 1, 2016 through December 31, 2020. The actuarial assumptions represent estimates of future experience.

## Economic Assumptions

**The investment return rate** assumed in the valuations was 6.90% per year, compounded annually (net after investment expenses).

**The wage inflation rate** assumed in this valuation was 2.75% per year. The wage inflation rate is defined to be the portion of total pay increases for an individual that are due to macroeconomic forces including productivity, price inflation, and labor market conditions. The wage inflation rate does not include pay changes related to individual merit and seniority effects.

**The price inflation** component of the investment return rate and the wage inflation rate is assumed to be 2.35%.

**The assumed real rate of return** over wage inflation is defined to be the portion of total investment return that is more than the assumed total wage growth rate. Considering other economic assumptions, the 6.90% investment return rate translates to an assumed real rate of return over wage inflation of 4.15%. The assumed real rate of return over price inflation is 4.55%.

**The active member population** (the sum of the Traditional and Combined Plan active members) is assumed to remain constant. For purposes of financing the unfunded actuarial accrued liabilities, total payroll (the sum of the Traditional and Combined Plan active payroll) is assumed to grow at the wage inflation rate – 2.75% per year.

**Pay increase assumptions** for individual active members are shown for sample ages on pages X-8 through X-11. Part of the assumption for each age is for merit and/or seniority increase, and the other 2.75% recognizes wage inflation, including price inflation, productivity increases, and other macroeconomic forces.



## Non-Economic Assumptions

**The pre-retirement mortality tables**, for pre-retirement mortality, used in evaluating allowances to be paid were 130% of the Pub-2010 General Employee Mortality tables (males and females) for State and Local Government divisions and 170% of the Pub-2010 Safety Employee Mortality tables (males and females) for the Public Safety and Law Enforcement divisions. The base year is 2010 and mortality rates for a particular calendar year are determined by applying the MP-2020 mortality improvement scales (males and females) to the above described tables.

**The healthy retiree mortality tables**, for post-retirement mortality, used in evaluating allowances to be paid were 115% of the PubG-2010 Retiree Mortality Tables (males and females) for all divisions. The base year is 2010 and mortality rates for a particular calendar year are determined by applying the MP-2020 mortality improvement scales (males and females) to the above described tables.

**The disabled retiree mortality tables**, for post-retirement disabled mortality, used in evaluating allowances to be paid were the PubNS-2010 Disabled Retiree Mortality Tables (males and females) for all divisions. The base year is 2010 and mortality rates for a particular calendar year are determined by applying the MP-2020 mortality improvement scales (males and females) to the above described tables.

**The probabilities of unreduced and reduced age and service retirement** are shown on pages X-3 through X-7. For State and Local Government members that satisfy the 30-year (31 & 32 years for Transition Groups B & C) unreduced retirement condition prior to age 65 (66 & 67 for Transition Groups B & C), the service-based unreduced retirement probabilities are used. For State and Local Government members that satisfy the 30-year (31 & 32 years for Transition Groups B & C) unreduced retirement condition on or after age 65 (66 & 67 for Transition Groups B & C), the age-based unreduced retirement probabilities are used.

**The probabilities of withdrawal from service, disability and death-in-service** are shown for sample ages on pages X-8 through X-11. For withdrawal from service it was assumed that members terminating with less than 5 years of service and a percentage of all other members would withdraw their contributions and forfeit their entitlement to an employer financed benefit. For State and Local Government members the percentage is 35% for ages at or below 48 and is reduced for each year of age after 48, becoming 0% at age 55. For Public Safety and Law enforcement members the percentage is 50% for ages at or below 40 and is reduced for each year after age 40, becoming 0% at age 45.

**For purposes of death-in-service and disability benefits**, it is assumed that Combined Plan members will take a benefit from the Traditional Plan, unless a lump sum distribution from the Combined Plan would have a greater value. It is assumed death-in-service members have 2 qualified survivor beneficiaries.

**The funding value of defined benefit assets** recognizes assumed investment return fully each year. Differences between actual and assumed investment return are phased-in over a closed 4-year period. Funding value is not permitted to deviate from market value by more than 12%. Traditional and Combined Plan retiree health funding values of assets are developed independently beginning with the December 31, 2004 valuation.

**Present assets (cash & investments) at funding value** are shown on pages II-2 through II-9.

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The actuarial valuation computations were made by or under the supervision of a Member of the American Academy of Actuaries (MAAA). Great care was taken in the production of this report, but there may be cases where schedules do not add, or where they do not exactly balance to other related schedules due to rounding.

# Probabilities of Unreduced Age and Service Retirement

## Transition Group A

Ages	Percent of Eligible Active Members Retiring Within Next Year			
	State		Local Government	
	Men	Women	Men	Women
65	22%	25%	24%	25%
66	22%	25%	24%	25%
67	20%	25%	22%	22%
68	20%	22%	22%	22%
69	20%	22%	22%	22%
70	20%	22%	22%	22%
71	20%	22%	18%	22%
72	20%	22%	18%	22%
73	20%	22%	18%	22%
74	20%	22%	18%	22%
75	20%	25%	18%	18%
76	20%	25%	18%	18%
77	20%	25%	18%	18%
78	20%	25%	18%	18%
79	20%	25%	20%	22%
80	25%	25%	20%	22%
81	25%	25%	20%	22%
82	25%	25%	20%	22%
83	25%	25%	20%	22%
84	25%	25%	20%	22%
85 & Over	100%	100%	100%	100%
Ref	3256	3257	3258	3259

Ages	Percent of Eligible Active Members Retiring Within Next Year	
	Public Safety	Law Enforcement
	48	
49		15%
50		15%
51		15%
52	18%	18%
53	18%	18%
54	18%	18%
55	18%	18%
56	20%	20%
57	20%	20%
58	20%	20%
59	20%	20%
60	20%	20%
61	20%	20%
62	30%	30%
63	25%	25%
64	25%	25%
65	25%	25%
66	30%	30%
67	30%	30%
68	30%	30%
69	30%	30%
70 & Over	100%	100%
Ref	3261	3261

Service	Percent of Eligible Active Members Retiring Within Next Year			
	State		Local Government	
	Men	Women	Men	Women
30	33%	33%	33%	33%
31	27%	27%	27%	27%
32-49	21%	21%	21%	21%
50 & Over	100%	100%	100%	100%
Ref	3260	3260	3260	3260

# Probabilities of Unreduced Age and Service Retirement

## Transition Group B

Ages	Percent of Eligible Active Members Retiring Within Next Year			
	State		Local Government	
	Men	Women	Men	Women
66	22%	25%	24%	25%
67	22%	25%	24%	25%
68	20%	25%	22%	22%
69	20%	22%	22%	22%
70	20%	22%	22%	22%
71	20%	22%	22%	22%
72	20%	22%	18%	22%
73	20%	22%	18%	22%
74	20%	22%	18%	22%
75	20%	22%	18%	22%
76	20%	25%	18%	18%
77	20%	25%	18%	18%
78	20%	25%	18%	18%
79	20%	25%	18%	18%
80	20%	25%	20%	22%
81	25%	25%	20%	22%
82	25%	25%	20%	22%
83	25%	25%	20%	22%
84	25%	25%	20%	22%
85 & Over	100%	100%	100%	100%
Ref	3256	3257	3258	3259

Ages	Percent of Eligible Active Members Retiring Within Next Year	
	Public Safety	Law Enforcement
	50	
51		15%
52		15%
53		15%
54	18%	18%
55	18%	18%
56	20%	18%
57	20%	18%
58	20%	20%
59	20%	20%
60	20%	20%
61	20%	20%
62	30%	20%
63	25%	20%
64	25%	30%
65	25%	25%
66	30%	25%
67	30%	25%
68	30%	30%
69	30%	30%
70	100%	30%
71	100%	30%
72 & Over	100%	100%
Ref	3261	3261

Service	Percent of Eligible Active Members Retiring Within Next Year			
	State		Local Government	
	Men	Women	Men	Women
31	33%	33%	33%	33%
32	27%	27%	27%	27%
33-50	21%	21%	21%	21%
51 & Over	100%	100%	100%	100%
Ref	3260	3260	3260	3260



# Probabilities of Unreduced Age and Service Retirement

## Transition Group C

67 & 5 Condition	Percent of Eligible Active Members Retiring Within Next Year			
	State		Local Government	
	Men	Women	Men	Women
Age				
67	22%	25%	24%	25%
68	22%	25%	24%	25%
69	20%	25%	22%	22%
70	20%	22%	22%	22%
71	20%	22%	22%	22%
72	20%	22%	22%	22%
73	20%	22%	18%	22%
74	20%	22%	18%	22%
75	20%	22%	18%	22%
76	20%	22%	18%	22%
77	20%	25%	18%	18%
78	20%	25%	18%	18%
79	20%	25%	18%	18%
80	20%	25%	18%	18%
81	20%	25%	20%	22%
82	25%	25%	20%	22%
83	25%	25%	20%	22%
84	25%	25%	20%	22%
85 & Over	100%	100%	100%	100%
Ref	3256	3257	3258	3259

Ages	Percent of Eligible Active Members Retiring Within Next Year	
	Public Safety	Law Enforcement
	52	
53		15%
54		15%
55		15%
56	20%	18%
57	20%	18%
58	20%	18%
59	20%	18%
60	20%	20%
61	20%	20%
62	30%	20%
63	25%	20%
64	25%	20%
65	25%	20%
66	30%	30%
67	30%	25%
68	30%	25%
69	30%	25%
70	100%	30%
71	100%	30%
72	100%	30%
73	100%	30%
74 & Over	100%	100%
Ref	3261	3261

55 & 32 Condition	Percent of Eligible Active Members Retiring Within Next Year			
	State		Local Government	
	Men	Women	Men	Women
Year of Eligibility				
1	33%	33%	33%	33%
2	27%	27%	27%	27%
3-20	21%	21%	21%	21%
21 & over	100%	100%	100%	100%
Ref	3260	3260	3260	3260

# Probabilities of Reduced Retirement

## Transition Group A

Ages	Percent of Eligible Active Members Retiring Within Next Year				
	State		Local Government		Public Safety
	Men	Women	Men	Women	
48					4.00%
49					4.00%
50					4.00%
51					4.00%
52					
53					
54					
55	3.00%	2.50%	3.00%	3.50%	
56	3.00%	2.50%	3.00%	3.50%	
57	3.00%	3.50%	3.00%	3.50%	
58	3.00%	3.50%	3.00%	3.50%	
59	3.00%	3.50%	3.00%	3.50%	
60	5.00%	8.00%	5.00%	8.00%	
61	5.00%	8.00%	5.00%	8.00%	
62	8.75%	8.00%	8.75%	8.00%	
63	8.75%	10.00%	8.75%	10.00%	
64	8.75%	10.00%	8.75%	10.00%	
Ref	3253	3254	3253	3255	1200

## Transition Group B

Ages	Percent of Eligible Active Members Retiring Within Next Year					
	State		Local Government		Public Safety	Law Enforcement
	Men	Women	Men	Women		
48					4.00%	4.00%
49					4.00%	4.00%
50					4.00%	
51					4.00%	
52					4.00%	
53					4.00%	
54						
55	3.00%	2.50%	3.00%	3.50%		
56	3.00%	2.50%	3.00%	3.50%		
57	3.00%	3.50%	3.00%	3.50%		
58	3.00%	3.50%	3.00%	3.50%		
59	3.00%	3.50%	3.00%	3.50%		
60	5.00%	8.00%	5.00%	8.00%		
61	5.00%	8.00%	5.00%	8.00%		
62	8.75%	8.00%	8.75%	8.00%		
63	8.75%	10.00%	8.75%	10.00%		
64	8.75%	10.00%	8.75%	10.00%		
65	15.00%	15.00%	12.00%	15.00%		
Ref	3253	3254	3253	3255	1200	1200

# Probabilities of Reduced Retirement

## Transition Group C

Ages	Percent of Eligible Active Members Retiring Within Next Year					
	State		Local Government		Public Safety	Law Enforcement
	Men	Women	Men	Women		
48						4.00%
49						4.00%
50						4.00%
51						4.00%
52					4.00%	
53					4.00%	
54					4.00%	
55					4.00%	
56						
57	3.00%	2.50%	3.00%	3.50%		
58	3.00%	2.50%	3.00%	3.50%		
59	3.00%	3.50%	3.00%	3.50%		
60	3.00%	3.50%	3.00%	3.50%		
61	3.00%	3.50%	3.00%	3.50%		
62	5.00%	8.00%	5.00%	8.00%		
63	5.00%	8.00%	5.00%	8.00%		
64	8.75%	8.00%	8.75%	8.00%		
65	8.75%	10.00%	8.75%	10.00%		
66	8.75%	10.00%	8.75%	10.00%		
Ref	3253	3254	3253	3255	1200	1200

## STATE

### Separations from Active Employment Before Age & Service Retirement & Individual Pay Increase Assumptions

Sample Ages	Years of Service	Percent of Active Members Separating Within the Next Year						Pay Increase Assumptions for an Individual Employee		
		Death*		Withdrawal		Disability		Merit & Seniority	Base (Economy)	Increase Next Year
		Men	Women	Men	Women	Men	Women			
	0			50.00%	50.00%					
	1			35.00%	35.00%					
	2			20.00%	20.00%					
	3			15.00%	15.00%					
	4			12.00%	12.00%					
20	5 & Over	0.0506%	0.0187%	10.00%	10.00%	0.07%	0.06%	5.50%	2.75%	8.25%
25		0.0437%	0.0146%	8.20%	9.28%	0.07%	0.06%	5.14%	2.75%	7.89%
30		0.0660%	0.0272%	5.80%	7.30%	0.07%	0.06%	3.88%	2.75%	6.63%
35		0.0905%	0.0413%	4.28%	5.10%	0.11%	0.10%	2.90%	2.75%	5.65%
40		0.1115%	0.0550%	3.14%	3.46%	0.20%	0.17%	2.34%	2.75%	5.09%
45		0.1335%	0.0712%	2.22%	2.42%	0.33%	0.28%	1.68%	2.75%	4.43%
50		0.1821%	0.1015%	1.84%	2.10%	0.47%	0.40%	1.10%	2.75%	3.85%
55		0.2764%	0.1643%	1.80%	2.10%	0.74%	0.63%	0.72%	2.75%	3.47%
60		0.4319%	0.2560%	1.80%	2.10%	0.88%	0.75%	0.42%	2.75%	3.17%
65		0.6176%	0.3702%	1.80%	2.10%	0.88%	0.75%	0.12%	2.75%	2.87%
70		0.8551%	0.5682%	1.80%	2.10%	0.88%	0.75%	0.00%	2.75%	2.75%
Ref		#2723x1.3sb0	#2724x1.3sb0	1034 #1387x1	1034 #1389x1	#1092x0.7	#1092x0.6	573		

\*Applicable rates during the 2021 Calendar Year. Rates in future years are determined by the above rates and the MP-2020 projection scale.

The pay increase assumptions are age based only, and not service based.

## LOCAL GOVERNMENT

### Separations from Active Employment Before Age & Service Retirement & Individual Pay Increase Assumptions

Sample Ages	Years of Service	Percent of Active Members Separating Within the Next Year						Pay Increase Assumptions for an Individual Employee		
		Death*		Withdrawal		Disability		Merit & Seniority	Base (Economy)	Increase Next Year
		Men	Women	Men	Women	Men	Women			
	0			40.00%	40.00%					
	1			27.00%	27.00%					
	2			18.00%	18.00%					
	3			13.00%	13.00%					
	4			11.00%	11.00%					
20	5 & Over	0.0506%	0.0187%	10.00%	11.00%	0.05%	0.04%	5.50%	2.75%	8.25%
25		0.0437%	0.0146%	7.78%	9.32%	0.05%	0.04%	5.14%	2.75%	7.89%
30		0.0660%	0.0272%	5.34%	6.94%	0.05%	0.04%	3.88%	2.75%	6.63%
35		0.0905%	0.0413%	3.86%	5.02%	0.08%	0.06%	2.78%	2.75%	5.53%
40		0.1115%	0.0550%	2.82%	3.52%	0.15%	0.12%	2.14%	2.75%	4.89%
45		0.1335%	0.0712%	2.26%	2.70%	0.24%	0.19%	1.60%	2.75%	4.35%
50		0.1821%	0.1015%	2.04%	2.50%	0.34%	0.27%	1.10%	2.75%	3.85%
55		0.2764%	0.1643%	2.00%	2.50%	0.53%	0.42%	0.72%	2.75%	3.47%
60		0.4319%	0.2560%	2.00%	2.50%	0.63%	0.50%	0.42%	2.75%	3.17%
65		0.6176%	0.3702%	2.00%	2.50%	0.63%	0.50%	0.12%	2.75%	2.87%
70	0.8551%	0.5682%	2.00%	2.50%	0.63%	0.50%	0.00%	2.75%	2.75%	
Ref		#2723x1.3sb0	#2724x1.3sb0	1035 #1391x1	1035 #1393x1	#1092x0.5	#1092x0.4	574		

\*Applicable rates during the 2021 Calendar Year. Rates in future years are determined by the above rates and the MP-2020 projection scale.

The pay increase assumptions are age based only, and not service based.

## PUBLIC SAFETY

### Separations from Active Employment Before Age & Service Retirement & Individual Pay Increase Assumptions

Sample Ages	Years of Service	Percent of Active Members Separating Within the Next Year						Pay Increase Assumptions for an Individual Employee		
		Death*		Withdrawal		Disability		Merit & Seniority	Base (Economy)	Increase Next Year
		Men	Women	Men	Women	Men	Women			
	0			20.00%	20.00%					
	1			19.00%	19.00%					
	2			15.00%	15.00%					
	3			15.00%	15.00%					
	4			10.00%	10.00%					
20	5 & Over	0.0733%	0.0301%	10.00%	10.00%	0.20%	0.20%	8.00%	2.75%	10.75%
25		0.0756%	0.0423%	10.00%	10.00%	0.20%	0.20%	6.80%	2.75%	9.55%
30		0.0984%	0.0639%	8.80%	8.80%	0.20%	0.20%	4.20%	2.75%	6.95%
35		0.1183%	0.0847%	6.20%	6.20%	0.23%	0.44%	2.22%	2.75%	4.97%
40		0.1304%	0.0979%	3.50%	3.50%	0.43%	0.66%	1.46%	2.75%	4.21%
45		0.1460%	0.1115%	2.20%	2.20%	0.70%	0.76%	1.00%	2.75%	3.75%
50		0.1918%	0.1457%	2.00%	2.00%	1.07%	0.92%	0.74%	2.75%	3.49%
55		0.2888%	0.2149%	2.00%	2.00%	1.40%	2.05%	0.52%	2.75%	3.27%
60		0.4673%	0.3023%	2.00%	2.00%	1.80%	2.75%	0.40%	2.75%	3.15%
65		0.7075%	0.3730%	2.00%	2.00%	2.00%	2.75%	0.16%	2.75%	2.91%
70	1.2184%	0.6900%	2.00%	2.00%	2.00%	2.75%	0.00%	2.75%	2.75%	
Ref		#2721x1.7sb0	#2722x1.7sb0	1036 #1211x1	1036 #1211x1	#1221x1	#1222x1	575		

\*Applicable rates during the 2021 Calendar Year. Rates in future years are determined by the above rates and the MP-2020 projection scale.

The pay increase assumptions are age based only, and not service based.

## LAW ENFORCEMENT

### Separations from Active Employment Before Age & Service Retirement & Individual Pay Increase Assumptions

Sample Ages	Years of Service	Percent of Active Members Separating Within the Next Year						Pay Increase Assumptions for an Individual Employee		
		Death*		Withdrawal		Disability		Merit & Seniority	Base (Economy)	Increase Next Year
		Men	Women	Men	Women	Men	Women			
	0			16.00%	20.00%					
	1			10.00%	12.00%					
	2			8.00%	9.00%					
	3			6.00%	6.00%					
	4			5.00%	6.00%					
20	5 & Over	0.0733%	0.0301%	4.50%	5.00%	0.20%	0.20%	8.00%	2.75%	10.75%
25		0.0756%	0.0423%	3.54%	3.80%	0.20%	0.20%	6.80%	2.75%	9.55%
30		0.0984%	0.0639%	2.66%	2.90%	0.20%	0.20%	4.20%	2.75%	6.95%
35		0.1183%	0.0847%	2.14%	2.30%	0.23%	0.44%	2.22%	2.75%	4.97%
40		0.1304%	0.0979%	1.48%	1.50%	0.43%	0.66%	1.46%	2.75%	4.21%
45		0.1460%	0.1115%	1.20%	1.30%	0.70%	0.76%	1.00%	2.75%	3.75%
50		0.1918%	0.1457%	1.20%	1.20%	1.07%	0.92%	0.74%	2.75%	3.49%
55		0.2888%	0.2149%	1.20%	1.20%	1.40%	2.05%	0.52%	2.75%	3.27%
60		0.4673%	0.3023%	1.20%	1.20%	1.80%	2.75%	0.40%	2.75%	3.15%
65		0.7075%	0.3730%	1.20%	1.20%	2.00%	2.75%	0.16%	2.75%	2.91%
70	1.2184%	0.6900%	1.20%	1.20%	2.00%	2.75%	0.00%	2.75%	2.75%	
Ref		#2721x1.7sb0	#2722x1.7sb0	753 #876x1	1037 #575x1	#1221x1	#1222x1	575		

\*Applicable rates during the 2021 Calendar Year. Rates in future years are determined by the above rates and the MP-2020 projection scale.

The pay increase assumptions are age based only, and not service based.

## Single Life Retirement Values

Sample Attained Ages*	Present Value of \$1 Monthly for Life Increasing 3.0% Annually (First Increase After 1 Year)		Future Life Expectancy (Years)	
	Males	Females	Males	Females
50	\$202.50	\$210.90	34.00	36.95
55	188.45	198.46	29.16	32.02
60	171.92	183.32	24.51	27.23
65	152.94	165.12	20.12	22.58
70	131.31	143.78	15.98	18.13
75	107.69	119.83	12.18	13.99
80	83.67	94.84	8.85	10.31
Ref:	:#2705x1.15sb0	:#2706x1.15sb0		

\*Attained Age during the 2021 Calendar Year.



# Miscellaneous and Technical Assumptions

## December 31, 2021

<b>Marriage Assumption:</b>	70% of males and 60% of females are assumed to be married for purposes of death-in-service benefits for State and Local members. 90% of males and 90% of females are assumed to be married for purposes of death-in-service benefits for Law members. Male spouses are assumed to be three years older than female spouses for active member valuation purposes. In retired or inactive cases where spouse information is needed, but not available, the three-year age difference is also assumed.
<b>Pay Increase Timing:</b>	Beginning of year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.
<b>Final Average Salary:</b>	For present value of future benefit purposes, final average salary was calculated in accordance with pay increase assumptions, but was not permitted to fall below the final average salary reported in the data.
<b>Decrement Timing:</b>	Decrements are assumed to occur mid-year.
<b>Eligibility Testing:</b>	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
<b>Decrement Relativity:</b>	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
<b>Decrement Operation:</b>	Disability and mortality decrements do not operate during the first 5 years of service. The withdrawal decrement does not operate for members eligible to retire.
<b>Death after Disability:</b>	Death after disability benefits were approximated by assuming that the disability benefit would be paid as a joint and 35% survivor benefit for people in the original disability plan and as a joint and 20% survivor benefit for people in the post 1992 plan.
<b>Service Credit Accruals:</b>	It is assumed that members accrue one year of service credit per year. A (0.40)% factor is applied to State active member liabilities (other than for refunds) and a (0.50)% factor is applied to Local active member liabilities (other than for refunds) to recognize that a portion of the membership is part time.
<b>Minimum Earnable Salary:</b>	A (1.00)% factor is applied to State and Local active member liabilities (other than for refunds) to recognize the minimum amount that members must earn each month to qualify for full service credit. The minimum earnable salary for calendar year 2022 was \$696.84 per month.
<b>Qualified Excess Benefit Arrangement (QEBA):</b>	Benefit amounts, if any, in excess of the IRC §415(b) limits are paid through a QEBA and are included in the actuarial valuation results.

# Miscellaneous and Technical Assumptions

## December 31, 2021 (Concluded)

<b>Miscellaneous Loads:</b>	<ul style="list-style-type: none"><li>• A load of approximately 0.46% of payroll is included in the computed normal cost to recognize subsidized service purchases.</li><li>• Law active accrued liabilities for retirement are reduced by 10% to recognize that total service reported is not entirely Law service, and that non-Law service cannot be used to satisfy Law eligibility conditions.</li><li>• A load of approximately 0.40% of Traditional Plan and 1.00% of Combined Plan payroll is included in the Traditional and Combined Plan computed normal costs to recognize expected administrative expenses.</li></ul>
<b>Transition Groups Under Senate Bill #343:</b>	If the transition group data field was populated and it was A or B, the OPERS provided transition group was used. For all other records (i.e., the provided transition group was C or blank), the member's transition group was estimated based upon first eligibility of retirement (assuming future service accruals for active members).
<b>Cost-of-Living Adjustments:</b>	For individuals retiring after January 7, 2013, cost-of-living adjustments were assumed to be 3.00% for calendar year 2022 and 2.05% thereafter. Increases assumed to occur on anniversary of benefit effective date.
<b>Incidence of Contributions:</b>	Contributions are assumed to be received continuously throughout the year based upon contribution rates presented in the Summary of Benefits, and the actual payroll payable at the time contributions are made.
<b>Other Contributions:</b>	For amortization purposes, it was assumed that payroll for mitigating contributions (i.e., 3.50% from the Combined and Member Directed Plans and 2.24% from the Alternate Retirement Plan) and payroll for reemployed retirees will grow at the assumed 2.75% wage inflation assumption.
<b>Benefit Service:</b>	Exact fractional service is used to determine the amount of benefit payable.
<b>Normal Form of Benefit:</b>	The assumed normal form of benefit is a straight life benefit, except where otherwise noted.
<b>Missing Member Data and Member Data Adjustments:</b>	Active and inactive records with missing dates of birth, if any, were given dates of birth that resulted in an entry age of 30 based upon the reported service. Active and inactive records with missing gender codes, if any, were assumed to be female. For active members with less than 6 months of service credit and a reported annualized salary greater than \$200,000, the annual salary used for valuation purposes was the greater of the member's reported FAS and non-annualized gross salary.

## **SECTION XI**

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### **FINANCIAL PRINCIPLES**

# Financial Principles and Operational Techniques of OPERS

**Promises Made, and To Be Paid For.** As each year is completed, OPERS in effect hands an “IOU” to each member then acquiring a year of service credit --- the “IOU” says: “The Ohio Public Employees Retirement System owes you one year’s worth of retirement benefits, payments in cash commencing when you qualify for retirement.”

The related **key financial questions** are:

**Which generation of taxpayers contributes the money to cover the IOU?**

**The present taxpayers**, who receive the benefit of the member’s present year of service? **Or the future taxpayers**, who happen to be in Ohio at the time the IOU becomes a cash demand, years and often decades later?

**The law governing OPERS financing intends that this year’s taxpayers contribute the money to cover the IOUs being handed out this year.** With this financial objective, **the employer contribution rate is expected to remain approximately level from generation to generation of taxpayers.**

There are systems which have a design for deferring contributions to future taxpayers. Lured by a lower contribution rate now, they put aside the consequence that the contribution rate must then relentlessly grow to a level much higher than would be required if a level contribution pattern were followed.

An inevitable by-product of the level-cost design is the accumulation of reserve assets, for decades, and the income produced when the assets are invested. **Investment income** becomes **the 3<sup>rd</sup> and largest contributor** for benefits to employees, and is interlocked with the contribution amounts required from employees and employers.

Translated to actuarial terminology, this level-cost objective means that the contribution rates must total at least the following:

Normal Cost (the cost of members’ service being rendered this year)

... plus ...

Interest on Unfunded Actuarial Accrued Liabilities (unfunded actuarial accrued liabilities are the difference between: liabilities for service already rendered; and the accrued assets of OPERS).

**Computing Contributions to Support Fund Benefits.** From a given schedule of benefits and from employee and asset data, the actuary calculates the contribution rates to support the benefits by means of ***an actuarial valuation and a funding method.***

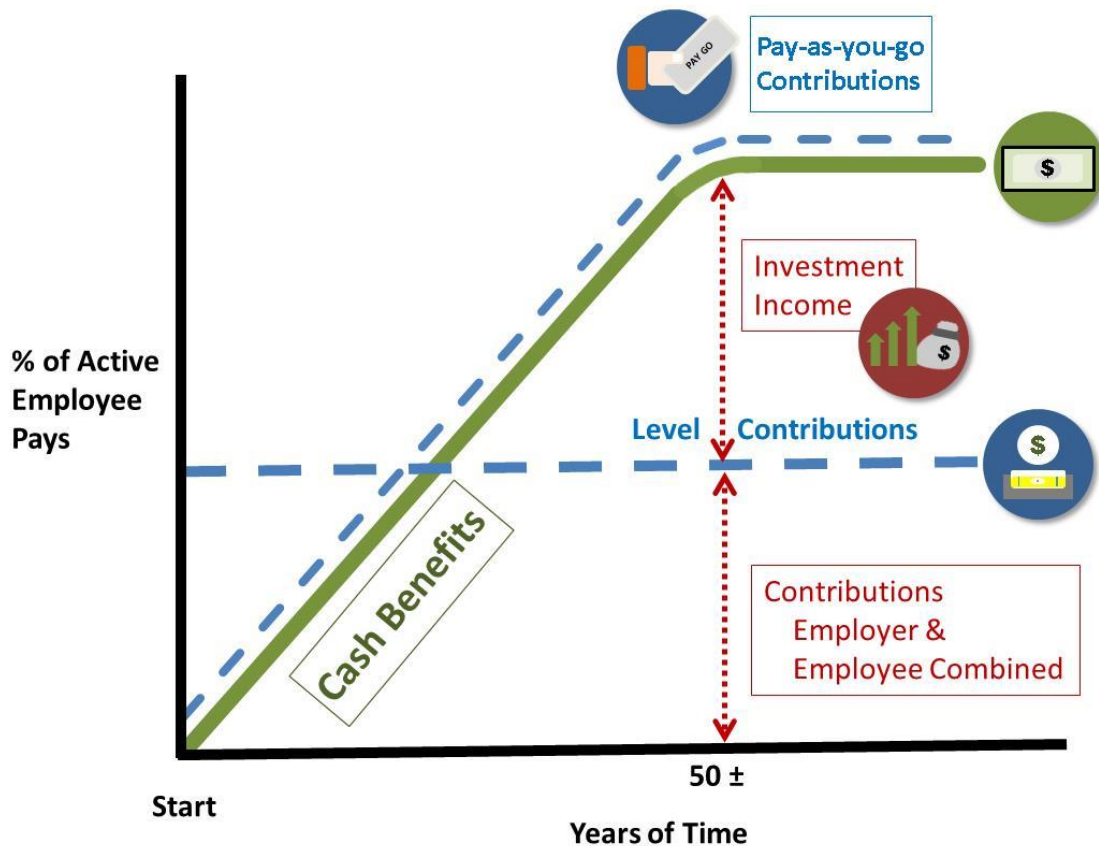
An actuarial valuation has a number of ingredients such as: the rate of investment return which plan assets will earn; the rates of withdrawal of active members who leave covered employment; the rates of mortality; the rates of disability; the rates of pay increases; and the assumed age or ages at actual retirement.

In an actuarial valuation, assumptions must be made as to what the above rates will be for the next year and for decades in the future. The assumptions are established by the Retirement Board after receiving the advice of the actuary.

**Reconciling Differences Between Assumed Experience and Actual Experience.** Once actual experience has occurred and has been observed, it will not coincide exactly with assumed experience, regardless of the skill of the actuary and the many calculations made. The future cannot be predicted with 100% precision.

OPERS copes with these continually changing differences by having annual actuarial valuations. Each actuarial valuation is a complete recalculation of assumed future experience, taking into account all past differences between assumed and actual experience. The result is ***continuing adjustments in financial position.***

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**CASH BENEFITS LINE.** This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

**LEVEL CONTRIBUTION LINE.** Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

- **Economic Risk Areas**
  - Rates of investment return
  - Rates of pay increase
  - Changes in active member group size
- **Non-Economic Risk Areas**
  - Ages at actual retirement
  - Rates of mortality
  - Rates of withdrawal of active members (turnover)
  - Rates of disability

## The Actuarial Valuation Process

*The financing diagram* on the opposite page shows the relationship between *the two fundamentally different philosophies of paying* for retirement benefits: the method where contributions match cash benefit payments (or barely exceed cash benefit payments, as in the Federal Social Security program) which is thus an *increasing contribution method*; and, the *level contribution method* which attempts to equalize contributions between the generations.

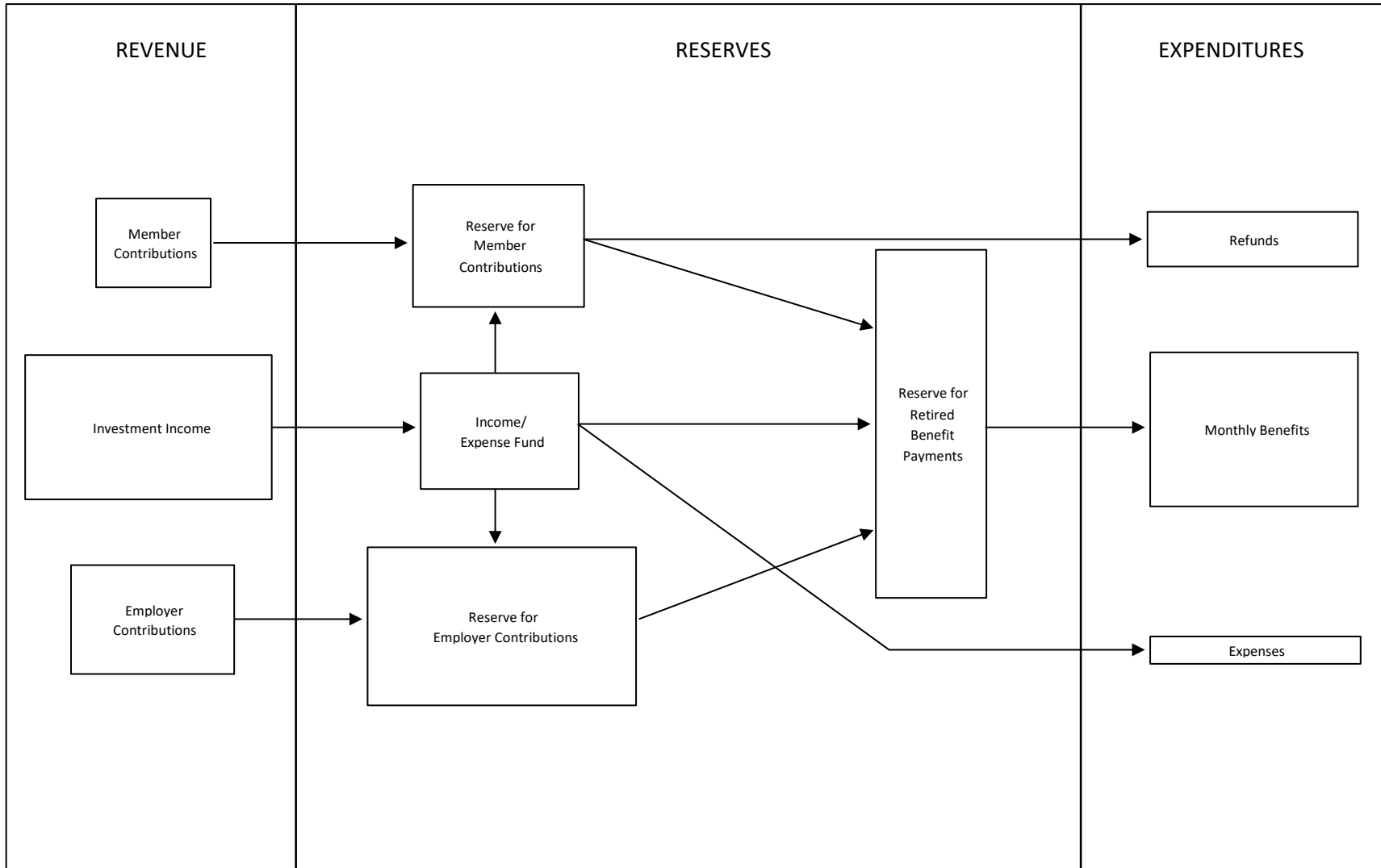
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*The actuarial valuation* is the mathematical process by which the level contribution rate is determined. The activity constituting the valuation may be summarized as follows:

- A. **Census Data**, including:
  - Retired lives now receiving benefits
  - Former employees with vested benefits not yet payable
  - Active employees
  
- B. + **Asset data** (cash & investments)
  
- C. + **Benefit provisions** that establish eligibility and amounts of payments to members
  
- D. + **Assumptions concerning future experience** in various risk areas
  
- E. + **The funding method** for employer contributions (the long-term, planned pattern for employer contributions)
  
- F. + **Mathematically combining the assumptions, the funding method, and the data**
  
- G. = Determination of:
  - Plan Financial Position; and/or
  - New Employer Contribution Rate



# Flow of Money Through the Retirement System



## Glossary

**Accrued Service.** The service credited under the plan which was rendered before the date of the actuarial valuation.

**Accumulated Benefit Obligation.** The actuarial present value of vested and non-vested benefits based on service to date and past and current salary levels.

**Actuarial Accrued Liability.** The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as “accrued liability” or “past service liability.”

**Actuarial Assumptions.** Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

**Actuarial Cost Method.** A mathematical budgeting procedure for allocating the dollar amount of the “actuarial present value of future plan benefits” between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”

**Actuarial Equivalent.** A single amount or series of amounts of equal value to another single amount or series of amounts, computed on the basis of the rate(s) of interest and mortality tables used by the plan.

**Actuarial Present Value.** The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

**Actuary.** A person who is trained in the applications of probability and compound interest to problems in business and finance that involve payment of money in the future, contingent upon the occurrence of future events. Most actuaries in the United States are Members of the American Academy of Actuaries (MAAA). The Society of Actuaries is an international research, education and membership organization for actuaries in the life and health insurance, employee benefits, and pension fields. It administers a series of examinations leading initially to Associateship and the designation ASA and ultimately to Fellowship with the designation FSA.

**Amortization.** Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

**Experience Gain (Loss).** A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

**Funding Value of Assets.** The value of current plan assets recognized for valuation purposes. Generally based on a phased-in recognition of all or a portion of market related investment return. Sometimes referred to as Actuarial Value of Assets.

**Normal Cost.** The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as “current service cost.” Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

**Plan Termination Liability.** The actuarial present value of future plan benefits based on the assumption that there will be no further accruals for future service and salary. The termination liability will generally be less than the liabilities computed on a “going concern” basis and is not normally determined in a routine actuarial valuation.

**Reserve Account.** An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

**Unfunded Actuarial Accrued Liability.** The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as “unfunded accrued liability.”

## Meaning of “Unfunded Actuarial Accrued Liabilities”

**“Actuarial accrued liabilities”** are **the present value of the portions of promised benefits that are not covered by future normal cost contributions** --- a liability has been established (“accrued”) because the service has been rendered but the resulting monthly cash benefit may not be payable until years in the future.

If “actuarial accrued liabilities” at any time exceed the plan’s accrued assets (cash & investments), the difference is **“unfunded actuarial accrued liabilities.”** This is the common condition. If the plan’s assets equaled the plan’s “actuarial accrued liabilities”, the plan would be termed “fully funded.” This is an unusual condition.

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Each time a plan adds a new benefit which applies to service already rendered, an “actuarial accrued liability” is created, which is also an “unfunded actuarial accrued liability” because the plan can’t print instant cash to cover the value of the new benefit promises. Payment for such unfunded actuarial accrued liabilities is spread over a period of years, commonly in the 15-30 year range.

Unfunded actuarial accrued liabilities can occur in another way: if actual plan experience is less favorable than assumed, the difference is added to unfunded actuarial accrued liabilities. For example, in plans where benefits are directly related to an employee’s pay near time of retirement, unfunded actuarial accrued liabilities increased rapidly during the 1970’s because unexpected rates of pay increase created additional actuarial accrued liabilities which could not be matched by reasonable investment results. Most of the unexpected pay increases were the direct result of inflation, which is a very destructive force on financial stability.

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The existence of unfunded actuarial accrued liabilities is not bad, but the changes from year to year in the amount of unfunded actuarial accrued liabilities are important, “bad” or “good” or somewhere in between.

Nor are unfunded actuarial accrued liabilities a bill payable immediately, but it is important that policy-makers prevent the amount from becoming unreasonably high and ***it is vital for plans to have a sound method for making payments toward them*** so that they are controlled.

## **SECTION XII**

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### **ADDITIONAL SCHEDULES**

**This information is presented in draft form for review by the System's auditor. Please let us know if there are any items that the auditor changes so that we may maintain consistency with the System's financial statements.**

## Schedule of Defined Benefit Funding Progress (\$ Amounts in Millions) Traditional, Combined, and Member Directed Plans

The schedule below measures the funding progress with respect to the **retirement allowance** portion of OPERS benefits. Assets and liabilities related to post-employment health care benefits are specifically excluded from the schedule. Assets do, however, include market value adjustments.

Valuation Year	Actuarial Accrued Liabilities (AAL) @	Valuation Assets	Unfunded Actuarial Accrued Liabilities (UAAL)	Ratio of Assets to AAL	Covered Payroll^	UAAL as a % of Covered Payroll
2001	\$49,095	\$48,748	\$ 347	99 %	\$ 10,782	3 %
2001*	47,492	48,748	(1,256)	103 %	10,782	0 %
2002	50,872	43,706	7,166	86 %	11,207	64 %
2003	54,774	46,746	8,028	85 %	11,165	72 %
2004	57,604	50,452	7,152	88 %	11,454	62 %
2005	61,146	54,473	6,673	89 %	11,807	57 %
2005*	62,498	54,473	8,025	87 %	11,807	68 %
2006	66,161	61,296	4,865	93 %	12,175	40 %
2007	69,734	67,151	2,583	96 %	12,583	21 %
2008	73,466	55,315	18,150	75 %	12,801	142 %
2009	76,555	57,629	18,926	75 %	12,548	151 %
2010	79,630	60,600	19,031	76 %	12,450	153 %
2010*	80,485	63,649	16,836	79 %	12,450	135 %
2011	84,530	65,436	19,094	77 %	12,399	154 %
2012	87,105	67,855	19,250	78 %	12,193	158 %
2012#	83,878	67,855	16,023	81 %	12,193	131 %
2013	86,645	71,411	15,234	82 %	12,331	124 %
2014	89,285	74,865	14,420	84 %	12,486	114 %
2015	91,832	78,061	13,771	85 %	12,688	106 %
2015*	97,177	78,061	19,116	80 %	12,688	148 %
2016	100,167	80,280	19,887	80 %	13,186	151 %
2017	102,656	83,292	19,364	81 %	13,498	143 %
2017*	106,090	83,292	22,797	79 %	13,498	169 %
2018	108,705	84,287	24,418	78 %	13,807	177 %
2019	111,371	88,572	22,800	80 %	14,380	159 %
2020	113,372	93,969	19,402	83 %	14,383	135 %
2020*	115,241	93,969	21,272	82 %	14,383	148 %
2021	118,517	99,710	18,807	84 %	14,822	127 %

@ Valuation years 2015 and prior exclude reserve for Member Directed future adverse experience (if any).

^ In 2014 and thereafter reported by the OPERS Staff to GRS. Prior to 2014, valuation payroll is presented. The payroll amounts exclude Member Directed payroll.

\* Revised actuarial assumptions.

# After benefit changes.

## Schedule of Defined Benefit Funding Progress (\$ Amounts in Millions) Traditional Plan

The schedule below measures the funding progress with respect to the **retirement allowance** portion of OPERS benefits. Assets and liabilities related to post-employment health care benefits are specifically excluded from the schedule. Assets do, however, include market value adjustments.

Valuation Year	Actuarial Accrued Liabilities (AAL)	Valuation Assets	Unfunded Actuarial Accrued Liabilities (UAAL)	Ratio of Assets to AAL	Covered Payroll <sup>^</sup>	UAAL as a % of Covered Payroll
2001	\$49,095	\$48,748	\$ 347	99 %	\$ 10,782	3 %
2001*	47,492	48,748	(1,256)	103 %	10,782	0 %
2002	50,872	43,706	7,166	86 %	11,207	64 %
2003	54,756	46,737	8,019	85 %	11,056	73 %
2004	57,573	50,430	7,143	88 %	11,313	63 %
2005	61,099	54,433	6,666	89 %	11,633	57 %
2005*	62,447	54,433	8,014	87 %	11,633	69 %
2006	66,089	61,235	4,854	93 %	11,971	41 %
2007	69,639	67,067	2,572	96 %	12,347	21 %
2008	73,346	55,230	18,116	75 %	12,546	144 %
2009	76,407	57,519	18,888	75 %	12,290	154 %
2010	79,459	60,461	18,997	76 %	12,165	156 %
2010*	80,307	63,515	16,792	79 %	12,165	138 %
2011	84,325	65,274	19,052	77 %	12,103	157 %
2012	86,876	67,670	19,206	78 %	11,884	162 %
2012#	83,664	67,670	15,994	81 %	11,884	135 %
2013	86,407	71,175	15,232	82 %	12,000	127 %
2014	89,017	74,567	14,450	84 %	12,140	117 %
2015	91,535	77,700	13,835	85 %	12,321	110 %
2015*	96,863	77,700	19,163	80 %	12,321	152 %
2016	99,818	79,865	19,953	80 %	12,794	156 %
2017	102,274	82,797	19,477	81 %	13,085	149 %
2017*	105,691	82,797	22,894	78 %	13,085	175 %
2018	108,265	83,715	24,549	77 %	13,376	184 %
2019	110,887	87,903	22,984	79 %	13,932	165 %
2020	112,833	93,180	19,652	83 %	13,940	141 %
2020*	114,696	93,180	21,516	81 %	13,940	154 %
2021	117,910	98,796	19,114	84 %	14,364	133 %

<sup>^</sup> In 2014 and thereafter reported by the OPERS Staff to GRS. Prior to 2014, valuation payroll is presented.

\* Revised actuarial assumptions.

# After benefit changes.

## Schedule of Defined Benefit Funding Progress (\$ Amounts in Millions) Combined Plan

The schedule below measures the funding progress with respect to the **retirement allowance** portion of OPERS benefits. Assets and liabilities related to post-employment health care benefits are specifically excluded from the schedule. Assets do, however, include market value adjustments.

Valuation Year	Actuarial Accrued Liabilities (AAL)	Valuation Assets	Unfunded Actuarial Accrued Liabilities (UAAL)	Ratio of Assets to AAL	Covered Payroll <sup>^</sup>	UAAL as a % of Covered Payroll
2003	\$ 18	\$ 9	\$ 9	50 %	\$109	8 %
2004	31	22	9	71 %	141	6 %
2005	47	40	7	85 %	174	4 %
2005*	51	40	11	78 %	174	6 %
2006	72	61	11	85 %	205	5 %
2007	95	84	11	88 %	236	5 %
2008	120	85	35	71 %	255	14 %
2009	148	110	38	74 %	258	15 %
2010	171	138	33	81 %	284	12 %
2010*	177	134	43	76 %	284	15 %
2011	203	161	42	79 %	296	14 %
2012	226	183	43	81 %	310	14 %
2012#	212	183	29	86 %	310	9 %
2013	230	229	1	100 %	331	0 %
2014	260	289	(29)	111 %	346	0 %
2015	288	350	(62)	122 %	367	0 %
2015*	303	350	(47)	116 %	367	0 %
2016	336	402	(66)	120 %	392	0 %
2017	365	479	(113)	131 %	413	0 %
2017*	382	479	(97)	125 %	413	0 %
2018	420	552	(132)	131 %	431	0 %
2019	461	646	(185)	140 %	448	0 %
2020	502	752	(250)	150 %	443	0 %
2020*	508	752	(244)	148 %	443	0 %
2021	567	875	(307)	154 %	458	0 %

<sup>^</sup> In 2014 and thereafter reported by the OPERS Staff to GRS. Prior to 2014, valuation payroll is presented.

\* Revised actuarial assumptions.

# After benefit changes.



## Schedule of Defined Benefit Funding Progress (\$ Amounts) Member Directed Plan

The schedule below measures the funding progress with respect to the **retirement allowance** portion of OPERS benefits. Assets and liabilities related to post-employment health care benefits are specifically excluded from the schedule. Assets do, however, include market value adjustments.

Valuation Year	Actuarial Accrued Liabilities (AAL) @	Valuation Assets	Unfunded Actuarial Accrued Liabilities (UAAL)	Ratio of Assets to AAL	Covered Payroll	UAAL as a % of Covered Payroll
2008	\$ 166,354	\$ 147,976	\$ 18,378	89 %	NA	NA
2009	252,670	205,639	47,031	81 %	NA	NA
2010	489,792	438,982	50,810	90 %	NA	NA
2010*	496,004	454,025	41,979	92 %	NA	NA
2011	1,172,900	1,156,151	16,749	99 %	NA	NA
2012	2,665,552	2,523,879	141,673	95 %	NA	NA
2013	6,884,231	6,826,536	57,695	99 %	NA	NA
2014	8,291,077	8,771,712	(480,635)	106 %	NA	NA
2015	9,767,164	10,622,057	(854,893)	109 %	NA	NA
2015*	10,290,582	10,622,057	(331,475)	103 %	NA	NA
2016	12,961,105	12,961,105	0	100 %	NA	NA
2017	16,770,041	16,770,041	0	100 %	NA	NA
2017*	16,770,041	16,770,041	0	100 %	NA	NA
2018	19,916,815	19,916,815	0	100 %	NA	NA
2019	22,821,267	22,821,267	0	100 %	NA	NA
2020	37,150,719	37,150,719	0	100 %	NA	NA
2020*	37,150,719	37,150,719	0	100 %	NA	NA
2021	39,430,681	39,430,681	0	100 %	NA	NA

@ Valuation years 2015 and prior exclude reserve for Member Directed future adverse experience (if any).

\* Revised actuarial assumptions.

## Schedule of Employer Contributions\*

Traditional Plan		
Valuation Date December 31	Year Ended December 31	Actuarial Determined Employer Contribution (Percents of Payroll)
2005	2008	7.12%
2006	2009	7.13%
2007	2010	7.14%
2008	2011	13.33%
2009	2012	13.64%
2010	2013	13.52%
2011	2014	14.15%
2012	2015	11.16%
2013	2016	10.16%
2014	2017	10.16%
2015	2018	14.16%
2016	2019	14.17%
2017	2020	14.17%
2018	2021	14.18%
2019	2022	14.18%
2020	2023	14.18%
2021	2024	14.17%

Combined Plan		
Valuation Date December 31	Year Ended December 31	Actuarial Determined Employer Contribution (Percents of Payroll)
2005	2008	7.29%
2006	2009	7.33%
2007	2010	7.22%
2008	2011	10.00%
2009	2012	10.00%
2010	2013	13.00%
2011	2014	14.00%
2012	2015	11.00%
2013	2016	10.00%
2014	2017	10.00%
2015	2018	14.00%
2016	2019	14.00%
2017	2020	14.00%
2018	2021	14.00%
2019	2022	14.00%
2020	2023	14.00%
2021	2024	14.00%

Member Directed Plan		
Valuation Date December 31	Year Ended December 31	Actuarial Determined Employer Contribution
2008	2011	\$ 1,570
2009	2012	4,019
2010	2013	4,342
2011	2014	1,669
2012	2015	14,121
2013	2016	5,751
2014	2017	0
2015	2018	0
2016	2019	0
2017	2020	0
2018	2021	0
2019	2022	0
2020	2023	0
2021	2024	0

\* The amounts reported in this schedule do not include contributions for post-employment healthcare benefits.



## Schedule of Unfunded Actuarial Accrued Liability@ Traditional, Combined and Member Directed Plans

	December 31, 2021					
	General			Public Safety	Law Enforcement	Grand Total
	State	Local	Total			
<b>Accrued Liabilities</b>						
Active and Inactive Members	\$ 16,425,043,657	\$ 24,535,204,589	\$ 40,960,248,246	\$ 8,482,183	\$ 2,195,424,782	\$ 43,164,155,211
Retirees and Beneficiaries	30,006,098,728	42,119,582,670	72,125,681,398	57,553,492	3,169,566,603	75,352,801,493
<b>Total Accrued Liabilities</b>	<b>\$ 46,431,142,385</b>	<b>\$ 66,654,787,259</b>	<b>\$ 113,085,929,644</b>	<b>\$ 66,035,675</b>	<b>\$ 5,364,991,385</b>	<b>\$ 118,516,956,704</b>
<b>Assets</b>						
Active and Inactive Members						
EAF*	\$ 5,769,746,241	\$ 11,740,792,191	\$ 17,510,538,432	\$ (24,372,285)	\$ 1,437,668,764	\$ 18,923,834,911
ESF	5,987,307,827	9,014,412,090	15,001,719,917	3,572,847	805,226,511	15,810,519,275
Unallocated	46,923,946	70,678,517	117,602,463	41,707	6,141,831	123,786,001
Funding Value of Assets Adjustment	(3,983,323,507)	(5,997,223,739)	(9,980,547,246)	(3,508,701)	(516,696,960)	(10,500,752,907)
<b>Total Active and Inactive Assets</b>	<b>\$ 7,820,654,507</b>	<b>\$ 14,828,659,059</b>	<b>\$ 22,649,313,566</b>	<b>\$ (24,266,432)</b>	<b>\$ 1,732,340,146</b>	<b>\$ 24,357,387,280</b>
Retirees and Beneficiaries						
A & PR Fund*	\$ 29,190,915,349	\$ 40,814,474,966	\$ 70,005,390,315	\$ 31,178,013	\$ 3,093,726,927	\$ 73,130,295,255
SBF Fund*	809,350,681	1,296,782,066	2,106,132,747	26,375,479	75,839,676	2,208,347,902
Reserve for Future MD Adverse Experience^	5,832,698	8,325,638	14,158,336	0	0	14,158,336
<b>Total R&amp;B Assets</b>	<b>\$ 30,006,098,728</b>	<b>\$ 42,119,582,670</b>	<b>\$ 72,125,681,398</b>	<b>\$ 57,553,492</b>	<b>\$ 3,169,566,603</b>	<b>\$ 75,352,801,493</b>
<b>Total Assets</b>	<b>\$ 37,826,753,235</b>	<b>\$ 56,948,241,729</b>	<b>\$ 94,774,994,964</b>	<b>\$ 33,287,060</b>	<b>\$ 4,901,906,749</b>	<b>\$ 99,710,188,773</b>
<b>Unfunded Actuarial Accrued Liability</b>	<b>\$ 8,604,389,150</b>	<b>\$ 9,706,545,530</b>	<b>\$ 18,310,934,680</b>	<b>\$ 32,748,615</b>	<b>\$ 463,084,636</b>	<b>\$ 18,806,767,931</b>

@ The amounts reported in this schedule do not include contributions for post-employment healthcare benefits.

\* After reserve transfers.

^ Includes funds for pending Member Directed retirements.

## Schedule of Unfunded Actuarial Accrued Liability@ Traditional Plan

	December 31, 2021					
	General			Public Safety	Law Enforcement	Grand Total
	State	Local	Total			
<b>Accrued Liabilities</b>						
Active and Inactive Members	\$ 16,206,120,000	\$ 24,248,656,428	\$ 40,454,776,428	\$ 8,482,183	\$ 2,195,424,782	\$ 42,658,683,393
Retirees and Beneficiaries	29,969,613,776	42,054,647,255	72,024,261,031	57,553,492	3,169,566,603	75,251,381,126
Total Accrued Liabilities	\$ 46,175,733,776	\$ 66,303,303,683	\$ 112,479,037,459	\$ 66,035,675	\$ 5,364,991,385	\$ 117,910,064,519
<b>Assets</b>						
Active and Inactive Members						
EAF*	\$ 5,397,105,538	\$ 11,218,152,335	\$ 16,615,257,873	\$ (24,372,285)	\$ 1,437,668,764	\$ 18,028,554,352
ESF	5,984,803,839	9,012,335,192	14,997,139,031	3,572,847	805,226,511	15,805,938,389
Unallocated	46,923,946	70,678,517	117,602,463	41,707	6,141,831	123,786,001
Funding Value of Assets Adjustment	(3,947,594,786)	(5,946,007,657)	(9,893,602,443)	(3,508,701)	(516,696,960)	(10,413,808,104)
Total Active and Inactive Assets	\$ 7,481,238,537	\$ 14,355,158,387	\$ 21,836,396,924	\$ (24,266,432)	\$ 1,732,340,146	\$ 23,544,470,638
Retirees and Beneficiaries						
A & PR Fund*	\$ 29,160,263,095	\$ 40,757,865,189	\$ 69,918,128,284	\$ 31,178,013	\$ 3,093,726,927	\$ 73,043,033,224
SBF Fund*	809,350,681	1,296,782,066	2,106,132,747	26,375,479	75,839,676	2,208,347,902
Total R&B Assets	\$ 29,969,613,776	\$ 42,054,647,255	\$ 72,024,261,031	\$ 57,553,492	\$ 3,169,566,603	\$ 75,251,381,126
Total Assets	\$ 37,450,852,313	\$ 56,409,805,642	\$ 93,860,657,955	\$ 33,287,060	\$ 4,901,906,749	\$ 98,795,851,764
Unfunded Actuarial Accrued Liability	\$ 8,724,881,463	\$ 9,893,498,041	\$ 18,618,379,504	\$ 32,748,615	\$ 463,084,636	\$ 19,114,212,755

@ The amounts reported in this schedule do not include contributions for post-employment healthcare benefits.

\* After reserve transfers.

## Schedule of Unfunded Actuarial Accrued Liability<sup>@</sup> Combined Plan

	December 31, 2021					
	General			Public Safety	Law Enforcement	Grand Total
	State	Local	Total			
<b>Accrued Liabilities</b>						
Active and Inactive Members	\$ 218,923,657	\$ 286,548,161	\$ 505,471,818			\$ 505,471,818
Retirees and Beneficiaries	22,690,623	39,299,063	61,989,686			61,989,686
Total Accrued Liabilities	\$ 241,614,280	\$ 325,847,224	\$ 567,461,504			\$ 567,461,504
<b>Assets</b>						
Active and Inactive Members						
EAF*	\$ 371,254,301	\$ 520,148,522	\$ 891,402,823			\$ 891,402,823
ESF	2,491,818	1,969,026	4,460,844			4,460,844
Unallocated	0	0	0			0
Funding Value of Assets Adjustment	(34,330,149)	(48,616,876)	(82,947,025)			(82,947,025)
Total Active and Inactive Assets	\$ 339,415,970	\$ 473,500,672	\$ 812,916,642			\$ 812,916,642
Retirees and Beneficiaries						
A & PR Fund*	\$ 22,690,623	\$ 39,299,063	\$ 61,989,686			\$ 61,989,686
SBF Fund*	0	0	0			0
Total R&B Assets	\$ 22,690,623	\$ 39,299,063	\$ 61,989,686			\$ 61,989,686
Total Assets	\$ 362,106,593	\$ 512,799,735	\$ 874,906,328			\$ 874,906,328
Unfunded Actuarial Accrued Liability	\$ (120,492,313)	\$ (186,952,511)	\$ (307,444,824)			\$ (307,444,824)

<sup>@</sup> The amounts reported in this schedule do not include contributions for post-employment healthcare benefits.

\* After reserve transfers.

## Schedule of Unfunded Actuarial Accrued Liability<sup>@</sup> DB Portion of Member Directed Plan

	December 31, 2021					
	General			Public Safety	Law Enforcement	Grand Total
	State	Local	Total			
<b>Accrued Liabilities</b>						
Active and Inactive Members	\$ 0	\$ 0	\$ 0			\$ 0
Retirees and Beneficiaries	13,794,329	25,636,352	39,430,681			39,430,681
<b>Total Accrued Liabilities</b>	<b>\$ 13,794,329</b>	<b>\$ 25,636,352</b>	<b>\$ 39,430,681</b>			<b>\$ 39,430,681</b>
<b>Assets</b>						
Active and Inactive Members						
EAF*	\$ 1,386,402	\$ 2,491,334	\$ 3,877,736			\$ 3,877,736
ESF	12,170	107,872	120,042			120,042
Unallocated	0	0	0			0
Funding Value of Assets Adjustment	(1,398,572)	(2,599,206)	(3,997,778)			(3,997,778)
<b>Total Active and Inactive Assets</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 0</b>			<b>\$ 0</b>
Retirees and Beneficiaries						
A & PR Fund*	\$ 7,961,631	\$ 17,310,714	\$ 25,272,345			\$ 25,272,345
SBF Fund*	0	0	0			0
Reserve for Future Adverse Experience^	5,832,698	8,325,638	14,158,336			14,158,336
<b>Total R&amp;B Assets</b>	<b>\$ 13,794,329</b>	<b>\$ 25,636,352</b>	<b>\$ 39,430,681</b>			<b>\$ 39,430,681</b>
<b>Total Assets</b>	<b>\$ 13,794,329</b>	<b>\$ 25,636,352</b>	<b>\$ 39,430,681</b>			<b>\$ 39,430,681</b>
<b>Unfunded Actuarial Accrued Liability</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 0</b>			<b>\$ 0</b>

<sup>@</sup> The amounts reported in this schedule do not include contributions for post-employment healthcare benefits.

\* After reserve transfers.

^ Includes funds for pending Member Directed retirements.

## Supplementary Information

The information presented in the required supplementary schedules was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest valuation date follows:

Valuation date	December 31, 2021		
Actuarial cost method	Individual entry age		
Amortization method for unfunded actuarial accrued liabilities	Level percent closed - Traditional and Combined Level dollar closed - Member-Directed		
Equivalent Single Amortization Period			
Traditional Plan	17 years	(Ending December 31, 2039)	
Combined Plan	N/A	(Plan has funded ratio of at least 100%)	
Member-Directed Plan	N/A	(Plan has funded ratio of at least 100%)	
Asset valuation method	4-year smoothed market		
Actuarial assumptions:			
Investment rate of return	6.90%		
Projected salary increases including wage inflation at 2.75%	2.75% - 10.75%		
Cost-of-living adjustments	Pre 1/7/2013 Retirees: 3.0% simple Post 1/7/2013 Retirees: 3.0% for calendar year 2022, then 2.05% simple		

	<b>Traditional</b>	<b>Member Combined</b>	<b>Directed</b>	<b>Total</b>
Retirees and beneficiaries receiving benefits	225,740	914	382	227,036
Terminated plan members entitled to but not yet receiving benefits				
Less than 5 years of service	638,269	1,547	0	639,816
5 or more years of service	39,918	969	0	40,887
Total	678,187	2,516	0	680,703
Active plan members				
Less than 5 years of service	112,586	1,780	0	114,366
5 or more years of service	161,863	5,342	0	167,205
Total	274,449	7,122	0	281,571
Total				
Less than 5 years of service	750,855	3,327	0	754,182
5 or more years of service	427,521	7,225	382	435,128
Total	1,178,376	10,552	382	1,189,310





August 24, 2022

Ms. Karen E. Carraher  
Executive Director  
Ohio Public Employees Retirement System  
277 East Town Street  
Columbus, Ohio 43215

**Re: Report of the December 31, 2021 Actuarial Valuation**

Dear Karen:

Enclosed are the 20 bound copies of the final report.

Sincerely,  
Gabriel, Roeder, Smith & Company

A handwritten signature in black ink that reads "Brian B. Murphy". The signature is written in a cursive, flowing style.

Brian B. Murphy, FSA, EA, MAAA, FCA

BBM:rmn  
Enclosures

cc: Mr. Spencer Tawa  
Plante Moran