

The General Retirement System of the City of Detroit

Annual Actuarial Valuation of Component II
June 30, 2021





March 11, 2022

Board of Trustees
The General Retirement System of the City of Detroit

Dear Board Members:

This report provides key results from the **Annual Actuarial Valuation** of the annuity and pension liabilities of the General Retirement System of the City of Detroit – Component II benefits. The date of the valuation was **June 30, 2021**.

The City of Detroit filed for bankruptcy on July 18, 2013. A final Plan of Adjustment (“POA”) was confirmed on November 7, 2014 and the official exit from bankruptcy was on December 10, 2014. In connection with the POA, very significant changes were made to the benefits that the General Retirement System provides and to the contributions that it will receive. In particular, the benefits provided by the Retirement System were divided into two separate plans, referred to as “Component I” and “Component II.” The benefits provided in each component are effective July 1, 2014 and are described in detail in Emergency Manager Order No. 44, dated December 8, 2014. In very general terms, Component I provides benefits for service rendered on and after July 1, 2014 and Component II provides benefits for services rendered prior to July 1, 2014.

The results provided herein relate solely to the Component II benefits. Component I benefits will be the subject of a separate report. The purposes of the valuation are:

- 1) To measure the funding progress of Component II in accordance with the terms of the POA;
- 2) To provide illustrative actuarially determined contribution amounts for FY 2023;
- 3) To compare the illustrative actuarially determined contributions to the POA mandated contributions;
and
- 4) To estimate the FY 2024 actuarially determined contributions (the first year the employer will be required to make actuarially determined contributions adopted by the Board and Investment Committee) under possible funding policies amounts.

The results of the valuation are not applicable for other purposes. In particular, the information provided in this report is not suitable for financial reporting in connection with GASB Statement No. 67. Such information is provided in a separate report. Information regarding potential benefit restoration as allowed for in the POA will also be provided in a separate report, at the Board’s request.

The contribution amounts on page 7 include POA mandated contributions plus two illustrative contribution amounts from potential alternate funding policies. Users of this report should be aware that contributions made at these amounts do not guarantee benefit security.

This report 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 Retirement System only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as: plan experience differing from that anticipated by the economic and demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements.

This valuation was based upon records maintained and furnished by the Retirement System staff concerning active members, retirees and beneficiaries, and financial accounts as of the valuation date. Data was checked for year-to-year consistency, but was not audited by the actuary. We are not responsible for the completeness or accuracy of the data. Certain necessary data was not available in time to be considered in this report and, therefore, it was necessary for us to use approximations. Please see related discussion in the Comments section as well as the Data section of this report.

The assumptions used in the valuations concerning future experience are summarized in Section D of this report. Except for the assumed rate of investment return, the actuarial assumptions used for the valuation are set by the Board based upon advice of the actuary and other parties. **Other than the prescribed assumed rate of return, this report reflects the new actuarial assumptions as adopted by the Board and the Investment Committee based on the July 1, 2015 to June 30, 2020 experience study.** The assumed rate of investment return was set to 6.75% in the POA and is, therefore, a "prescribed assumption set by another party" as discussed in Actuarial Standard of Practice No. 4. In our judgement, all of the actuarial assumptions used for this valuation are reasonable for purposes of the measurement being made.

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 sector retirement systems. To the best of our knowledge, this report is complete and accurate and was made in accordance with Actuarial Standards of Practice promulgated by the Actuarial Standards Board.

The signing actuaries are independent of the plan sponsor.

David T. Kausch, Judith A. Kermans and Jamal Adora 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.

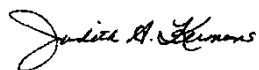


This report does not evaluate the plan sponsor's ability or willingness to make contributions to the Retirement System.

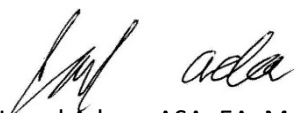
Respectfully submitted,
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SECTION A

VALUATION RESULTS

Executive Summary

(\$ in Millions)

Valuation Date	June 30, 2021	June 30, 2020
Contributions For Fiscal Year Ending	June 30, 2023	June 30, 2022
POA Mandated Employer Contributions	\$ 48.3	\$ 48.3
Membership		
Number of:		
Active Members	2,185	2,403
Retirees and Beneficiaries	11,173	11,220
Inactive, Nonretired Members	2,645	2,728
Total	16,003	16,351
Valuation Payroll	\$ 102.7	\$ 111.1
Assets		
Market Value (1)	\$ 1,818.6	\$ 1,596.1
Return on Market Value (net of all expenses)	27.84 %	(0.60)%
Actuarial Information		
Actuarial Accrued Liability (2)	\$ 2,542.6	\$ 2,716.5
Unfunded Actuarial Accrued Liability: (2) - (1)	724.0	1,120.4
Funded Ratio: (1) / (2)	71.53 %	58.76 %
Risk Metrics		
Actuarial Accrued Liability Divided by Payroll	24.8	24.4
Market Value of Assets Divided by Payroll	17.7	14.4

Valuation Results

Required contributions to the Plan through FY 2023 are provided in the POA. The schedule below details our understanding of the remaining contributions required by the POA.

Contribution Source (\$ Millions)

Fiscal Year	For DWSD Liabilities		For Other Liabilities					Total
	DWSD Transfers		UTGO	State	DIA	Other	Transfers from DWSD	
2022	\$ 45.4	\$ (2.5)	\$ -	\$ -	\$ 0.4	\$ 2.5	\$ 2.5	\$ 48.3
2023	45.4	(2.5)	-	-	0.4	2.5	2.5	48.3

We have assumed the contributions outlined above as called for in the POA (with adjustments) will not change. An estimate of the probability of those payments being made was outside the scope of this project, not required by Actuarial Standards, and was not made.

In order to develop divisional valuation results in accordance with POA provisions, we allocated the above contributions to the various divisions as instructed by the Retirement System staff. This was done by allocating DWSD transfer amounts to the General City division and remaining DWSD contributions to the DWSD division; allocating \$2.5 million per year to the Library; and allocating remaining contributions to DOT and General in proportion to their unfunded liabilities as of June 30, 2021.

The chart below shows this allocation.

	General	D.O.T.	Subtotal	Library	DWSD	Totals
	\$ Thousands					
Unfunded Liabilities (6/30/2021)	\$ 416,356	\$ 257,229	\$ 673,585	\$ (5,905)	\$ 56,301	\$ 723,980
% of Subtotal	61.8%	38.2%	100.0%	N/A	N/A	
FY 2022 Contributions	\$ 232	\$ 143	\$ 375	\$ 2,500	\$ 45,400	\$ 48,275
Transfers	\$ 2,500	\$ -	\$ 2,500	\$ -	\$ (2,500)	\$ -
FY 2022 UAAL Contributions	\$ 2,732	\$ 143	\$ 2,875	\$ 2,500	\$ 42,900	\$ 48,275

A different allocation procedure would produce different results. If a different allocation procedure should be used, please let us know and we will revise this report.

Valuation Results (Continued)

Unfunded Actuarial Accrued Liability (UAAL)

	(\$ Millions)				
	General City	D.O.T.	DWSD	Library	System Total
UAAL as of June 30, 2021	\$ 416.4	\$ 257.2	\$ 56.3	\$ (5.9)	\$ 724.0
Anticipated POA Contribution (EOY)	(2.7)	(0.1)	(42.9)	(2.5)	(48.3)
Anticipated Expenses ¹	1.9	0.3	-	0.1	2.3
Interest at 6.75%	28.2	17.4	3.8	(0.4)	48.9
Projected UAAL as of June 30, 2022	\$ 443.7	\$ 274.8	\$ 17.2	\$ (8.7)	\$ 727.0
Anticipated POA Contributions for FY 2023	2.7	0.1	42.9	2.5	48.3
Estimated Employer Contributions for FY 2024^{2, 3}					
Alternate 1: 30-Year Level Principal					
UAAL Contribution	\$ 47.7	\$ 29.6	\$ (2.5)	\$ (1.2)	\$ 73.6
\$0 Minimum UAAL Contribution	47.7	29.6	-	-	77.3
Administrative Expense Contribution⁴	1.3	0.3	0.6	0.1	2.3
Total Contribution	\$ 49.0	\$ 29.9	\$ 0.6	\$ 0.1	\$ 79.6
Alternate 2: 30-Year Level Dollar⁵					
UAAL Contribution	\$ 37.2	\$ 23.1	\$ (1.9)	\$ (0.9)	\$ 57.4
\$0 Minimum UAAL Contribution	37.2	23.1	-	-	60.2
Administrative Expense Contribution⁴	1.3	0.3	0.6	0.1	2.3
Total Contribution	\$ 38.5	\$ 23.4	\$ 0.6	\$ 0.1	\$ 62.5

Totals may not add due to rounding.

¹ Administrative expenses for DWSD are paid by General City through 2023.

² Assuming the POA contributions through 2023 and a 30-year closed amortization thereafter. When determining the contributions through 2023, only the total contributions and the DWSD contributions are stipulated in the POA. The remaining amounts were allocated to the other groups as described on page 2. A different allocation would result in different results by group.

³ Total employer contributions, including amounts paid by the employer but funded from other sources as required by POA.

⁴ We recommend that the proposed administrative expense contribution for DWSD be reviewed in the context of the 2015 agreement between the City, the Retirement System, and the Great Lakes Water Authority.

⁵ Contributions at this level may not be sufficient to prevent fund depletion prior to satisfaction of all benefit payments. This scenario is included at Retirement System's request (see page 4).

The POA contributions are well below actuarially determined amounts and, as such, result in a defunding of the plan between now and June 30, 2023, which was contemplated by the POA. In fact, the anticipated POA contributions are not expected to result in benefit restoration even if all assumptions are met (including the POA mandated assumed rate of return of 6.75%).

Also, the total FY 2022 to 2023 contributions are less than the amount of nominal interest that accrues on the UAAL.



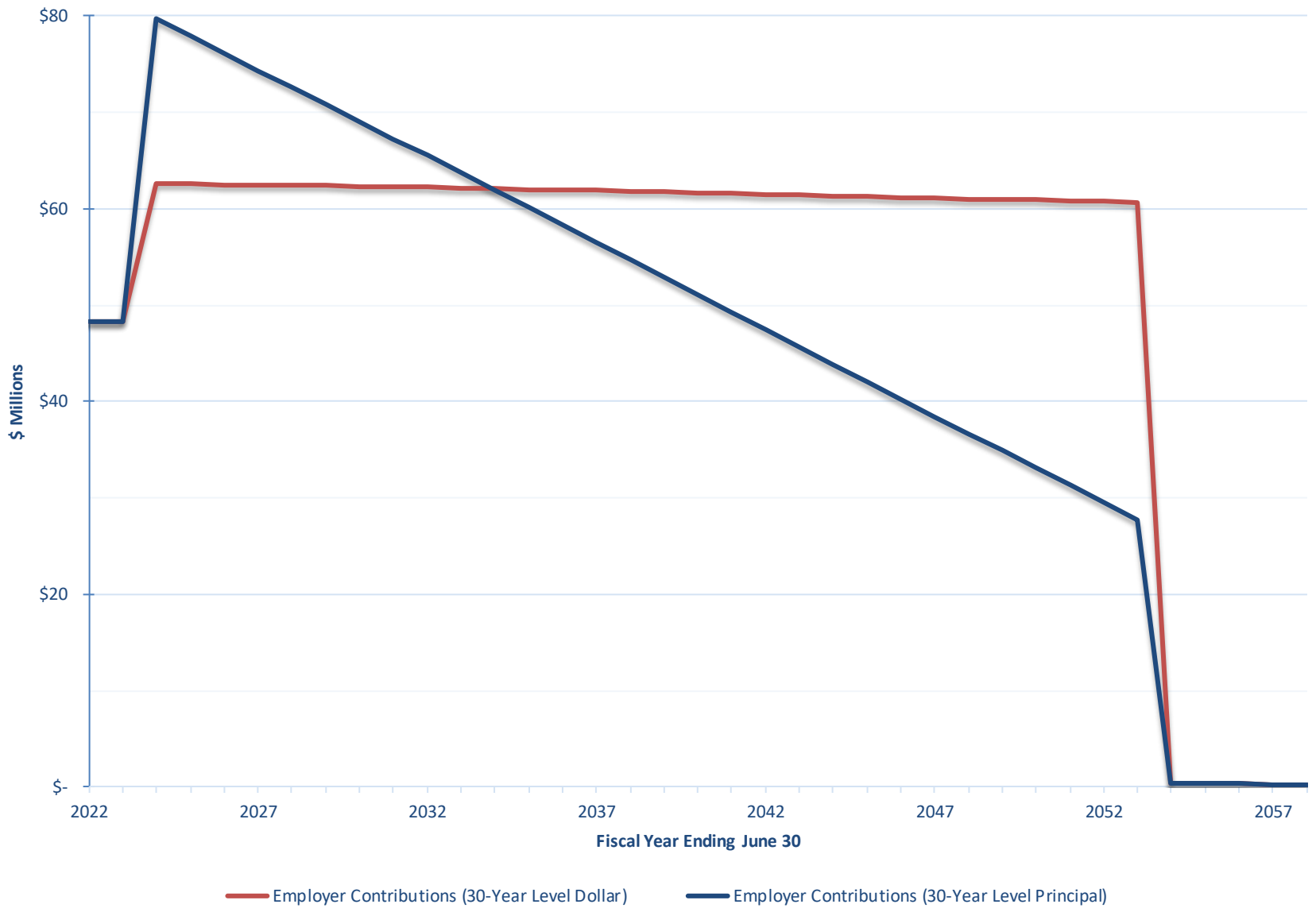
The Estimated Employer Contribution for FY 2024 is based on a projection of results assuming only the POA contributions are made and all future experience between the actuarial valuation date and FY 2024 is as assumed. Actual experience will result in changes to this estimate and the final result (from the June 30, 2022 actuarial valuation) could be materially different than shown on the previous page.

We understand that the City has set aside additional money in a side fund to be contributed to the pension plans in the future. This potential additional contribution has not been considered in this valuation.

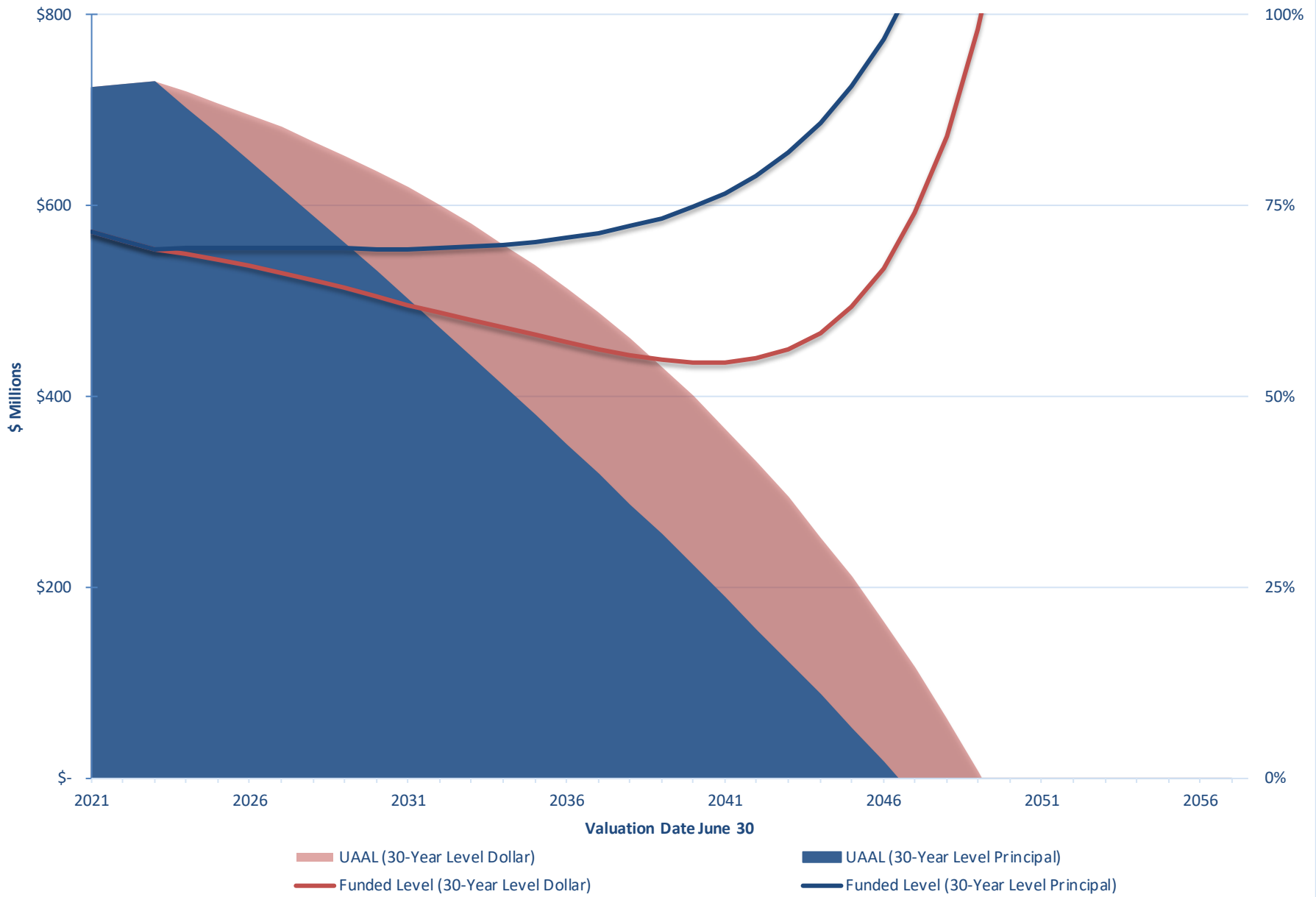
The charts that follow show a 37-year projection of the funded status and employer contributions under a 30-year level principal and 30-year level dollar policy starting in FY 2024. For purposes of these projections, we have assumed the objective would be for each group (General City, DOT, DWSD, and Library) to separately fund their UAAL. These projections assume that if any division's assets deplete, no extra contributions will be assessed. Separately assessing extra contributions by divisions may result in a different projected total employer contribution than those shown here. We have also assumed that each group would have a \$0 minimum UAL contribution. We will continue to work with the Board and Investment Committee to develop a funding policy. For the projections in this report, we note the following:

- The DWSD and Library groups are projected to be more than 100% funded on June 30, 2023. As a result, starting in FY 2024 the only contributions for those groups is for administrative expenses and the funded ratio is projected to continue growing which means that the total funded ratio is expected to exceed 100% once the other divisions achieve full funding.
- The funded ratio for DOT is projected to be 21% funded on June 30, 2023. We note the following implication of the low DOT funded status.
 - Under the 30-Year Level Principal method, the funded status for DOT is projected to fall below 15% on June 30, 2040.
 - Under the 30-Year Level Dollar method, the assets allocated for DOT are projected to be depleted by June 30, 2032. At that point, we have assumed that DOT would not be responsible for making additional contributions equal to the benefit payments.
- The projected UAL contributions for DWSD decrease to \$0 beginning in FY 2024 in this valuation (there is a small contribution requirement for administrative expenses). Note that in prior post-POA valuations, the projected DWSD contribution was greater than zero. At any point in the future, plan experience may result in an unfunded actuarial accrued liability for DWSD. In addition, under a different assumption set (such as a lower assumed rate of return), the DWSD may have an unfunded actuarial accrued liability. We understand that the City, System and GLWA have a Memorandum of Understanding dated December 1, 2015 for assessing contributions, if any, to GLWA. This report does not reflect that agreement.

DGRS - Employer Contributions (Total of All Divisions)



DGRS - Funding Projection (Total of All Divisions)



Valuation Results (Continued)

We have recommended that the Board establish a funding policy for the contribution determinations on and after Fiscal Year 2024. The Board has begun the process. Once that process has been completed, we will incorporate the adopted policy into future valuation reports. Until that process is completed, we will continue to show the following two possible policies.

In the chart below, the first policy funds the UAAL over the expected remaining active service life of this group. The second policy is similar to the Board’s pre-bankruptcy policy, but with accelerated principle payments of the UAAL to prevent insolvency prior to the end of the funding period. The illustrations are intended to show that there are a broad range of possible funding policies, but are not intended to provide a specific recommendation or a minimum or maximum level of contributions.

Funding Policy 1 is based on amortizing the UAAL over the average remaining service life of active members (8 years for General; 7 years for DOT; 8 years for DWSD; and 8 years for Library) using level dollar amortization.

Funding Policy 2 is based on amortizing the UAAL with level principal payments over a closed 30-year period plus interest. This method is also known as level principal declining interest amortization.

Illustrative Contribution Shortfall

	(\$ Millions)				
	General City	D.O.T.	DWSD	Library	System Total
(1) Illustrative Contribution for FY 2023 (Funding Policy 1)					
UAAL Contribution	\$ 73.6	\$ 50.5	\$ 2.9	\$ (1.4)	\$ 125.5
\$0 Minimum UAAL Contribution	73.6	50.5	2.9	-	127.0
Administrative Expense Contribution	1.3	0.3	0.6	0.1	2.4
Total Contribution	74.9	50.9	3.5	0.1	129.4
(2) Illustrative Contribution for FY 2023 (Funding Policy 2)					
UAAL Contribution	44.7	27.7	1.7	(0.9)	73.3
\$0 Minimum UAAL Contribution	44.7	27.7	1.7	-	74.2
Administrative Expense Contribution	1.3	0.3	0.6	0.1	2.4
Total Contribution	46.1	28.0	2.4	0.1	76.6
(3) Actual Contributions for FY 2023 (POA)	2.7	0.1	42.9	2.5	48.3
Fiscal Year 2023 Shortfall - Funding Policy 1: (1) - (3)	\$ 72.2	\$ 50.7	\$ (39.4)	\$ (2.4)	\$ 81.1
Fiscal Year 2023 Shortfall - Funding Policy 2: (2) - (3)	\$ 43.3	\$ 27.9	\$ (40.5)	\$ (2.4)	\$ 28.3

We understand the Employer continues to set aside money in a separate side fund account to contribute to the Pension Plans in the future. Since the account is outside of the trust fund and the portion of the fund this Plan will receive (vs. the Police and Fire Plan) has not been determined, we have not taken those assets into account in our calculations. We commend the Employer for taking proactive steps to manage the estimated increase in funding requirements beginning in FY 2024 from a budgeting perspective. In the meantime, we recommend continued consideration of increasing contributions actually deposited into the trust.



Valuation Results (Concluded)

In addition, as the Board works through the funding policy, we would suggest considering a funding period less than 30 years. Given the fact that not all of the retiree liabilities are funded, a period of 15 years or less should be considered.

Present Value	June 30, 2021	June 30, 2020
Accrued Pension Liabilities (Employer Financed)		
Retirees and beneficiaries	\$1,915,878,072	\$2,022,510,702
Inactive members future deferred pensions	214,790,496	223,061,249
Active members	209,090,483	256,033,419
Total accrued pensions	2,339,759,051	2,501,605,370
Pension fund balances	1,741,300,968	1,500,667,694
Unfunded accrued pension liabilities	\$ 598,458,083	\$1,000,937,676
Accrued Annuity Liabilities (Member Financed)		
Retirees and beneficiaries		
Future annuities	\$ 98,087,136	\$ 100,671,026
Member annuities & future refunds	104,783,035	114,225,043
Total accrued annuity liabilities	202,870,171	214,896,069
Annuity fund balances	77,348,330	95,434,295
Unfunded accrued annuity liabilities*	\$ 125,521,841	\$ 119,461,774
Totals		
Actuarial Accrued Liabilities (AAL)	\$2,542,629,222	\$2,716,501,439
Market Value of Assets (MVA)	1,818,649,298	1,596,101,989
Unfunded Actuarial Accrued Liabilities (UAAL)	\$ 723,979,924	\$1,120,399,450
POA Funded Status	71.5%	58.8%

* Liabilities are gross before accounting for ASF claw-back. Assets currently include a receivable of approximately \$98.0 million related to the ASF claw-back. We believe the receivable is included in the pension fund balances.

	Historical Results (\$ Millions)					
	2019	2018	2017	2016	2015	2014
Total AAL	\$2,866.1	\$2,929.1	\$2,995.8	\$3,032.3	\$3,139.1	\$3,222.4
MVA	1,798.9	1,940.6	1,966.7	1,933.5	2,131.3	2,015.2
UAAL	1,067.2	988.4	1,029.1	1,098.8	1,007.8	1,207.1
POA Funded Status	62.8%	66.3%	65.6%	63.8%	67.9%	62.5%



Funded Ratio - POA

	Defined Benefit	ASF	Total
A Actuarial Accrued Liability (AAL)	\$2,437,846,187	\$104,783,035	\$2,542,629,222
B Market Value of Assets	\$1,713,866,263	\$104,783,035	\$1,818,649,298
C Unfunded Actuarial Accrued Liability (A-B)	\$ 723,979,924	\$ 0	\$ 723,979,924
D Funded Ratio (B/A)	70.3%	100.0%	71.5%

The **POA Funded Ratio** measurement above is an expected return-based measurement of the pension obligation. It is based upon the mandated 6.75% interest rate assumption (assumption prescribed by the POA). It determines an amount (AAL) that will be sufficient to provide benefits if the portfolio earns the expected 6.75% return on assets and all other assumptions are met. This measure is appropriate for assessing the need for or amount of future contributions (if all assumptions are met). This measure is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligation, in other words, of transferring the obligation to a third party in a market value type transaction.

Funded Ratio - Solvency

	Defined Benefit	ASF	Total
A Market-Based Liability (MBL)	\$3,923,406,427	\$104,783,035	\$4,028,189,462
B Market Value of Assets	\$1,713,866,263	\$104,783,035	\$1,818,649,298
C Unfunded Market-Based Liability (A-B)	\$2,209,540,164	\$ 0	\$2,209,540,164
D Funded Ratio (B/A)	43.7%	100.0%	45.1%

The Solvency Funded Ratio is a market-based measurement of the pension obligation. It estimates the amount (MBL) the plan would need to invest in low risk securities to provide the benefits with greater certainty. For this purpose, the MBL is computed at 1.92% interest as of June 30, 2021, based on the long-term municipal bond rate ("20-Year Municipal GO AA Index" rate from the Fidelity Index as of June 30, 2021). We are not able to assess the credit quality of the plan sponsor and, as such, no adjustment has been made for the credit quality of the plan sponsor. This measure may not be appropriate for assessing the need for or amount of future contributions. This measure may not be appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligation.

The difference between the two measures (POA and Solvency) is one illustration of the savings the sponsor anticipates by taking on the risk in a diversified portfolio.

Comments

Experience

Experience was more favorable than assumed during the year ending June 30, 2021. The chart below shows the estimated gain by division.

Development of Actuarial Gain or Loss

	(\$ Millions)				
	General City	D.O.T.	DWSD	Library	System Total
(1) UAAL as of June 30, 2020 (BOY)	\$ 608.6	\$ 282.4	\$ 212.6	\$ 16.7	\$ 1,120.4
(2) Actual POA Contribution (EOY)	2.8	0.1	42.9	2.5	48.3
(3) Interest at 6.75%	41.1	19.1	14.4	1.1	75.6
(4) Benefit Changes	-	-	-	-	-
(5) Assumption Changes	(71.4)	(18.7)	(24.6)	(6.2)	(120.8)
(6) Projected UAAL* as of June 30, 2021	\$ 575.5	\$ 282.7	\$ 159.5	\$ 9.2	\$ 1,027.0
(7) Actual UAAL* as of June 30, 2021	416.4	257.2	56.3	(5.9)	724.0
Gain or Loss: (6) - (7)	\$ 159.2	\$ 25.5	\$ 103.2	\$ 15.1	\$ 303.0
Gain or Loss from Investments	\$ 168.1	\$ 24.2	\$ 105.6	\$ 13.8	\$ 311.7
Gain or Loss from Excess Interest Transfers (Inc. FY 2021)	\$ (11.1)	\$ (4.4)	\$ (3.4)	\$ (1.5)	\$ (20.4)
Gain or Loss from Liabilities	\$ 2.2	\$ 5.8	\$ 1.0	\$ 2.9	\$ 11.8

* *Unfunded actuarial accrued liability.*

Source of Actuarial Gain or Loss

Type of Risk Area	Gain (Loss) in Period	
	Totals (\$ in Millions)	Percent of Liabilities
Data Improvements	\$ 5.6	0.2 %
ASF Transfers	0.0	0.0 %
Excess Interest Transfers (Inc. FY 2021)	(20.4)	(0.8)%
Risks Related to Experience		
Economic Risk Areas:		
Investment Return	311.7	11.5 %
Demographic Risk Areas:		
Full and Reduced Service Retirements	7.6	0.3 %
Death Benefits	0.1	0.0 %
Disability Benefits	(0.1)	0.0 %
Other Terminations	2.0	0.1 %
Post-Retirement Mortality	(3.5)	(0.1)%
Total Gain or Loss Related to Experience	317.8	11.7 %
Total Gain or Loss During Period	303.0	11.2 %
Beginning of Year Accrued Liabilities	2,716.5	100.0 %

Comments (Continued)

Experience (Continued)

The estimated FY 2024 contributions are very sensitive to changes in year-to-year experience. The chart below reconciles our estimate from the June 30, 2020 valuation to our estimate from this valuation (June 30, 2021).

The June 30, 2021 gain, primarily due to investments, improved the funded status of the plan.

Reconciliation of Projected June 30, 2024 UAAL Contributions – Level Principal

	(\$ Millions)				
	General City	D.O.T.	DWSD	Library	System Total*
Estimated FY 2024 UAAL Contribution from 2020 Valuation	\$ 73.8	\$ 34.6	\$ 12.2	\$ 1.2	\$ 121.8
Gain or Loss from Investments	(19.3)	(2.8)	(12.1)	(1.6)	(35.8)
Gain or Loss from Excess Interest Transfers (Inc. FY 2021)	1.3	0.5	0.4	0.2	2.3
Gain or Loss from Liabilities	(0.2)	(0.7)	(0.1)	(0.3)	(1.4)
Modified Contributions (see below)	-	-	-	-	-
Actual FY 2021 Contribution above/(below) Expected	-	-	-	-	-
Benefit Changes	-	-	-	-	-
Assumption Changes	(7.8)	(2.1)	(2.8)	(0.7)	(13.4)
Adjustment for \$0 minimum	-	-	2.5	1.2	3.7
Estimated FY 2024 UAAL Contribution from 2021 Valuation	\$ 47.7	\$ 29.6	\$ -	\$ -	\$ 77.3

* Totals may not add due to rounding.

Reconciliation of Projected June 30, 2024 UAAL Contributions – Level Dollar

	(\$ Millions)				
	General City	D.O.T.	DWSD	Library	System Total*
Estimated FY 2024 UAAL Contribution from 2020 Valuation	\$ 57.5	\$ 27.0	\$ 9.5	\$ 1.0	\$ 94.9
Gain or Loss from Investments	(15.1)	(2.2)	(9.5)	(1.2)	(27.9)
Gain or Loss from Excess Interest Transfers (Inc. FY 2021)	1.0	0.4	0.3	0.1	1.8
Gain or Loss from Liabilities	(0.2)	(0.5)	(0.1)	(0.3)	(1.1)
Modified Contributions (see below)	-	-	-	-	-
Actual FY 2021 Contribution above/(below) Expected	-	-	-	-	-
Benefit Changes	-	-	-	-	-
Assumption Changes	(6.1)	(1.6)	(2.2)	(0.5)	(10.4)
Adjustment for \$0 minimum	-	-	1.9	0.9	2.9
Estimated FY 2024 UAAL Contribution from 2021 Valuation	\$ 37.2	\$ 23.1	\$ -	\$ -	\$ 60.2

* Totals may not add due to rounding.



Comments (Continued)

Experience (Continued)

Demographic Experience

	Number Count		
	Actual	Expected	A/E%
	A	E	
Retirement (including early)	126	261	48%
Disability	0	15	0%
Vested Terminations	112	40	277%
Other Terminations (including pre-retirement death)	58	24	237%
Post-Retirement Death	397	414	96%

Expected counts are based on the assumptions used in the prior valuation.

Member Experience Additional Comments

Retirements were less than one-half the number expected.

Vested Terminations were nearly three times the number expected.

Other Termination were over double expected.

Active member experience this year was very different from expectations. We believe this is partly due to the pandemic and resulting economic uncertainties as well as the City's response, which was to implement furloughs and a workshare program. Based on some number counts that the System's Staff provided, we suspect that a lot of the terminations are actually temporary. The System provided information on members participating in the work share program and we have confirmed that the vast majority of those members are included as active members on June 30, 2020. If the furloughed members return to full time active status in the future, this could result in a liability loss in that future year. We have considered setting up a liability reserve for this potential future loss and decided not to include such a reserve for the following reasons:

- 1) It is unknown how many of the furloughed members will return to active service; and
- 2) The liability loss in this plan related to those members returning to active status would likely be small, since it would only affect future eligibility service and not the frozen accrued benefit.

New Members

We continue to see active members added to the Legacy data. We have assumed these were either data corrections or re-hires. We have observed this every year since 2014. The change this year is included in the "Data Improvements" source of gains/losses on page 10. This year 78 members were added as active to this plan. This resulted in an increase in accrued liabilities of approximately \$1.6 million, after accounting for those members that were known to come from the deferred and retiree rolls.



Actuarial Assumptions

As a result of the recent experience study there were many assumption changes related to administrative expenses, mortality rates, withdrawal rates, disability rates, normal and early retirement rates, and merit and longevity pay increases. A full description of current assumptions can be in Section D of this report, and justification for these assumptions can be found in our Experience Study dated February 4, 2022. These changes decreased the AAL by approximately \$121 million.

In the Experience Study, we noted the continuing decrease in capital market expectations which suggests that the assumed rate of return may need to be lowered in the near future. We understand that the Board may continue to explore changes in the assumed rate of return. However, per legal counsel, we also understand that for the annual actuarial valuation the 6.75% assumed rate of return cannot be changed until the June 30, 2024 report, including for purposes of calculating the actuarially determined contribution.

We anticipate the next comprehensive review of experience to cover the period from July 1, 2020 to June 30, 2025.

Annuity Savings Fund (ASF) Claw-Back Data

For the June 30, 2015 valuation, the System's auditors determined a receivable in accordance with GAAP accounting that was included in the reported June 30, 2015 assets. The reported assets for the June 30, 2021 status valuation also included a receivable for the remaining claw-back payments. We have assumed this information, received by the System's auditors, was reasonable. This assumption is in compliance with the Actuarial Standards of Practice.

Annuity Reserve Fund (ARF)

Typically, we would compare the Annuity Reserve Fund (ARF) to the ARF liabilities and recommend a transfer if liabilities exceed assets. However, the annuity claw-back receivable created by the Bankruptcy (which relates to the ARF and the ASF) makes this analysis much more complicated. If the System would like us to perform this calculation, we will need additional information not routinely provided for the valuation. Please let us know if this is needed.

In general, assets were reviewed for reasonableness. During that review, we discovered that the ARF does not appear to have been credited any interest. As a result, we recommend that all the reserve amounts be reviewed.

Plan Provisions

Section B-1 (b) of the plan provides that members who terminate employment and are subsequently rehired before incurring a six-year break in service are eligible to earn additional vesting and eligibility service under the plan. For purposes of this valuation, we have assumed no terminated members will be rehired in the future. Rehires will, therefore, cause a loss when they occur.

Based on our discussions with System staff, we understand that current EMT members may elect to enter the Police and Fire Retirement System and that future EMT will go into in the Police and Fire Retirement System. Our understanding is that it is unlikely that a current EMT member would elect to transfer to the Police and Fire Retirement System and have assumed that no current EMT members would elect to do so.



Comments (Continued)

Allocation of Contributions Between General and DOT

Our understanding of the allocation of contributions between General and DOT is discussed on page 2 of this report. Based on the reported assets, a different allocation method appears to have been used in FY 2020 and FY 2021. If the System supplies us with this asset allocation method actually used, we can incorporate that method in future valuations.

Annuity Savings Fund (ASF) Interest Credits

The ASF fund is credited with the lesser of 5.25% interest and the total fund earnings. We understand that any earnings in excess of 5.25% (that otherwise would have been credited to the ASF fund if not for the 5.25% cap) will be transferred to Component I assets, to the extent needed, for funding of transition liability. Since ASF liabilities are equal to ASF balances, we did not model any such future excess earnings as part of this valuation. However, since the fund earned 28% during FY 2021, we expect that there will be a transfer of excess ASF interest in FY 2023 related to this year's performance. Approximately \$20.4 million was added to the liabilities in this report to account for anticipated excess earnings expected to occur as a result of return on assts in the 2021 fiscal year. No additional liabilities were included in this report to account for anticipated excess earnings expected to occur as a result of return on assets. We have discussed the potential for additional liability with the Plan's accountants and have been instructed that the excess earnings should not be included as a liability in the GASB Statement Nos. 67 and 68 reports.

We understand that the System has adopted a procedure for computing the ASF interest credits lagging the actual experience of the assets. We have not reviewed or audited this procedure. If the Retirement System can provide the methodology for determining the transfer, we may be able to more accurately reflect it in advance.

As of June 30, 2021, it appears that Component I may be fully funded under a 0.0% assumed VPIF. There does not currently exist a policy that allocates that unfunded amount between Transition Costs and non-Transition Costs. Since future excess interest transfers are affected by whether or not the Transition Costs are fully funded, we recommend that the Board adopt a method of allocating any unfunded amounts (after exclusion of the RSF) between Transition Costs and other liabilities. If the Board wishes, we can work with legal counsel and suggest a few methods for consideration and discuss the advantages and disadvantages with the Board.

For purposes of this valuation we have assumed the Component I Transition Cost is fully funded as of June 30, 2021. For Component II, this assumption only affects ASF Return Excess transfers calculated starting with the June 30, 2022 valuation.

Comments (Continued)

Estimated Excess Interest Transfers

Fiscal Year Transfer is Expected	ASF Balance BOY	Assumed ASF Payment	ASF Balance EOY	FY 2 Years Prior to Transfer		Investment Return Excess Percent	ASF Return Excess	Estimated Component I Funded Transition Cost Status	Resulting Percent Transfer	Assets to be Transferred Out (BOY)
				Year	Estimated Return					
(A)	(B)	(C)	(D)	(E)	(F)	(G) = (F) - 5.25%	(H) = (G) x (B)	(I)	(J)	(K) = (H) x (J)
2022	\$ 104,783,035	\$ 13,388,175	\$ 96,549,025	2020	-0.60%	0.00%	\$ -	<100%	100%	\$ -
2023	96,549,025	13,388,175	87,882,729	2021	27.84%	22.59%	21,810,425	<100%	100%	21,810,425
2024	87,882,729	13,388,175	78,761,453					>=100%		

We understand this calculation will be performed by staff and may be different than shown above. The estimates above are used to approximate the effect on UAAL.

Section E-16(c) of the Combined General Plan is shown below:

In any Plan Year during the period beginning on or after July 1, 2014 and ending June 30, 2023 in which the annual rate of return credited to the accounts of members investing in the Annuity Savings Fund as provided in paragraph (b) is less than the actual rate of return net of expenses of the Retirement System's invested assets for the second Plan Year immediately preceding the Plan Year in which the annual rate of return is credited ("ASF Return Excess"), an amount equal to the value of the ASF Return Excess shall be transferred to the Pension Accumulation Fund maintained under Component I of the Combined Plan and shall be used to fund the Transition Cost relating to Component I. The Transition Cost is a measure of the liability that Component I of the Retirement System has at its inception; due to the fact that at its inception, members in Component I of the Retirement System receive vesting and eligibility credit under Component I for service that was earned prior to July 1, 2014 and is otherwise credited to members under Component II of the Retirement System. Transition Cost is calculated by the Plan Actuary. In the event there is an ASF return excess for a Plan Year following the Plan Year in which such transfers have fully funded the Transition Costs relating to Component I, fifty percent (50%) of such ASF Return Excess shall be transferred to the Pension Accumulation Fund maintained under Component II and the remaining fifty percent (50%) of such ASF Return Excess shall be transferred to Component I and credited to the Rate Stabilization Fund maintained under Component I. "Transition Cost" shall be determined by the Plan Actuary.

Comments (Continued)

Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution

The determination of the accrued liability and the actuarially determined contribution 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 the accrued liability and the actuarially determined contribution that result 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** – actual investment returns may differ from the expected returns;
2. **Asset/Liability Mismatch** – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. **Contribution Risk** – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. **Salary and Payroll Risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. **Longevity Risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
6. **Other Demographic Risks** – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

Comments (Continued)

Plan Maturity Measures

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

	2021	2020
Ratio of the market value of assets to total payroll*	6.8	5.9
Ratio of actuarial accrued liability to payroll*	9.5	10.0
Ratio of actives to retirees and beneficiaries	0.2	0.2
Ratio of net cash flow to market value of assets	-10.4%	-12.1%
Duration of the actuarial accrued liability	8.2	8.6

* Payroll for this purpose is Component I payroll of \$267.0 million for 2021 and \$271.4 million for 2020.

Ratio of Market Value of Assets to Payroll

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

Ratio of Actuarial Accrued Liability to Payroll

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 2.5 times the payroll, a change in liability 2% other than assumed would equal 5% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

Comments (Continued)

Ratio of Actives to Retirees and Beneficiaries

A young plan with many active members and few retirees will have a high ratio of actives to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

Ratio of Net Cash Flow to Market Value of Assets

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make benefits payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

Duration of Actuarial Accrued Liability

The duration of the actuarial accrued liability may be used to approximate the sensitivity to a 1% change in the assumed rate of return. For example, a duration of 10 indicates that the liability would increase approximately 10% if the assumed rate of return were lowered 1%.

Additional Risk Assessment

The Solvency Liability shown on page 9 may be considered as a risk assessment. Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, and stress tests. We included additional risk assessments in the funding policy discussions based on the 2017 actuarial valuation. We can update those at the Board's request.

Census Data and Approximations

Data was reported separately for Component I and Component II. Additional time was needed to reconcile these two data sets as they came from different source data. Processing time for the valuation could be shortened if data for future valuations is reconciled before being provided to GRS. We would be happy to work with the Retirement System staff to help them provide the information that is needed for the valuation. Additional information about the data approximations and assumptions may be found on page 27.

Option Factors

The Board adopted new option factors for the Plan based on the mortality study completed in 2015. We have not been provided with a specific effective date for the new factors. However, we understand the intent is to implement the new factors with the new data system. For the sake of simplicity, we have assumed the new factors apply to all retirements after the valuation date. We will continue to work with the System in the calculation of optional forms of payment. In particular, the Board may want to consider updating the assumptions used in optional forms of payment in order to recognize recent changes to the assumptions used in the annual actuarial valuations.

Comments (Continued)

Restoration

This valuation assumes no future restoration of Component II benefits (consistent with the expectation of the POA). Any future restoration will be reflected beginning in the next valuation after being granted.

DWSD (Water/Sewer) Projections

As a result of gains in this valuation year, the DWSD (Water/Sewer) division is now expected to be fully funded by 2024. As a result, no additional contributions are expected to be needed in FY 2024 to fund DWSD liabilities.

The DWSD contributions and liabilities determined in this report do not consider the separation of DWSD-R and GLWA from the DWSD. For the illustrative employer contributions in this report, we have assumed that contributions would be assessed to the City based on the total unfunded liability for DWSD and without regard to any contribution agreement with GLWA. Our understanding is that the split of DWSD liabilities between DWSD-R and GLWA will be determined by the System's staff under previously established procedures.

DWSD Members

For the June 30, 2017 valuation we received a separate file indicating the June 30, 2014 DWSD status of members. Any members that were indicated as being DWSD division members on that file were valued under the DWSD for this valuation, regardless of the division reported on the main valuation data (which we understand to be the division as of June 30, 2021 in the Component I plan).

New Data System

We understand that the Retirement System is in the process of moving to a new data system and that future valuation data will be provided from that system beginning with the 2022 or 2023 valuation. We also understand that data may have gone through additional cleaning/auditing as it has been entered into the new system. We anticipate that data will be more precise for valuation purposes once the new system is providing that data. Please note that changes in data may impact future valuation results and generate gains or losses.

Recommendation

We recommend the Board consider updating the assumptions used in optional forms of payment in order to recognize recent changes to the assumptions used in the annual actuarial valuations.

We recommend that every potential action be taken to increase contributions to the Retirement System. Benefit payments to retirees in the Plan were almost \$236 million compared to the FY 2021 contribution of \$48.3 million. See benefit projections on page 32.

We strongly recommend that the Board and Investment Committee adopt a funding policy in the next few months so that the funding policy can be incorporated in the June 30, 2022 valuation.



Comments (Concluded)

Divisional Results

Divisional results are shown on page 21. One result that stands out is the funded status of the DOT division at 35%. This is much lower than the other divisions. We expect that all of the assets back all of the liabilities. Therefore, if this division runs out of money before all of its benefits are paid, the plan will pay DOT benefits from other divisional assets. In that case, the total plan funded status is a better measure than individual division funded ratios. However, the manner in which divisional contributions have historically been determined treats each division as a standalone plan for the purpose of determining the actuarially determined contribution. Assuming the Board continues this method for Fiscal Year 2024 (the first year actuarially determined contributions are assessed to the employer), this low funded status for the DOT (relative to the other divisions) could result in a higher DOT employer contribution (relative to the other divisions). The Board may also want to consider a more aggressive funding policy for the DOT division if they want to avoid using other divisional assets to pay DOT benefits. Please let us know if the Board would like us to do any special projects related to this situation, such as divisional cash flow projections or divisional funding policy suggestions.

Conclusion

It is likely that the funded status will decline and the unfunded actuarial accrued liability will increase between now and June 30, 2023. On a market value basis, the funded status is projected to decline to approximately 69% as of June 30, 2023 if the market rate of return equals 6.75% and all other assumptions are met.

Liability by Division - POA

(\$ Thousands)

	General	D.O.T.	DWSD	Library	Totals
Accrued Pension Liabilities					
Retirees and beneficiaries	\$1,031,632	\$285,129	\$549,107	\$ 50,010	\$1,915,878
Inactive members future deferred pensions	111,145	31,013	67,979	4,653	214,790
Active members	119,774	44,402	26,921	17,994	209,091
Total accrued pension liabilities	1,262,551	360,544	644,007	72,657	2,339,759
Pension fund balance#	916,566	114,498	626,926	83,312	1,741,302
Unfunded accrued pension liabilities	345,985	246,046	17,081	(10,655)	598,457
Accrued Annuity Liabilities					
Retirees and beneficiaries#	53,896	10,282	30,800	3,109	98,087
Members annuities & future refunds	56,834	22,783	17,265	7,900	104,782
Total accrued annuity liabilities	110,730	33,065	48,065	11,009	202,869
Annuity fund balances	40,359	21,883	8,846	6,260	77,348
Unfunded accrued annuity liabilities#	70,371	11,182	39,219	4,749	125,521
Totals					
Actuarial Accrued Liabilities	1,373,281	393,609	692,072	83,666	2,542,628
Accrued Assets	956,925	136,381	635,772	89,572	1,818,650
Funded Ratio	69.7%	34.6%	91.9%	107.1%	71.5%
Unfunded Actuarial Accrued Liabilities	\$ 416,356	\$257,228	\$56,300	\$ (5,906)	\$723,978

Totals may be off slightly due to rounding.

The pension fund balance includes a receivable of approximately \$98.0 million for future claw-back payments. Liabilities are shown gross, before the annuity savings claw-back.

SECTION B

FUND ASSETS

Statement of Plan Assets (Reported Assets at Market Value)

Market Value - June 30, 2021	
Cash and Cash Equivalents	\$ 81,684,767
Investments at Fair Value	1,631,592,944
Receivables	108,348,712
Cash and Investments held as collateral for securities lending	77,656,896
Capital Assets - Net	2,647,165
Accounts Payable	(83,281,186)
Total Current Assets	\$ 1,818,649,298

Market Value of Assets

Reserve Accounts

Funds	Fund Balances	
	June 30, 2021	June 30, 2020
Annuity Savings	\$ 104,783,035	\$ 114,225,043
Annuity Reserve	(27,434,705)	(18,790,748)
Pension Accumulation	(65,451,896)	(370,423,727)
Pension Reserve	1,806,752,864	1,871,091,421
Total Fund Balances	\$ 1,818,649,298	\$1,596,101,989

Revenues and Expenditures

	Pension Funds	Annuity Funds	Total Funds
Balance, July 1, 2020	\$1,500,667,694	\$95,434,295	\$1,596,101,989
Prior valuation audit adjustment	0	0	0
Market Value July 1, 2020	\$1,500,667,694	\$95,434,295	\$1,596,101,989
Revenues			
Employer Contributions	47,900,000	0	47,900,000
Employee Contributions	0	0	0
Foundation Contributions	375,000	0	375,000
ASF Recoupment Interest	6,739,857	0	6,739,857
Investment Income (Net of Investment Expenses)	403,573,894	3,404,023	406,977,917
Other Income	961,366	(124,348)	837,018
Total	\$ 459,550,117	\$ 3,279,675	\$ 462,829,792
Expenditures			
Benefit Payments	215,758,136	10,032,037	225,790,173
Refund of Member Contributions	0	11,333,604	11,333,604
ASF Recoupment Write Off	1,171,513	0	1,171,513
Transfer to Component I (Transition Cost)	0	0	0
Administrative Expenses	1,987,193	0	1,987,193
Total	\$ 218,916,842	\$ 21,365,641	\$ 240,282,483
Market Value June 30, 2021	\$1,741,300,969	\$ 77,348,329	\$1,818,649,298
Market Value Rate of Return (Net of all expenses)	29.3%	3.9%	27.8%
Net Cash Flow as Percent of Assets	(11.2)%	(22.4)%	(11.8)%

Rates of return are dollar-weighted estimates assuming contributions occur at the end of the year and remaining items are mid-year cash flows. "ASF Recoupment Interest" and "Other" items are treated as investment cash flows.

Note that interest credits to the ASF (and other reserves) are determined by Plan provisions and Board policy (including any timing issues) as calculated by the Retirement System's staff.

Allocation of Assets Used for Valuation by Reserve Account and Division

	June 30, 2020	Adjustments	Contributions	Benefit Payments	Other	Investment Return (Net of All Expenses)	June 30, 2021
Annuity Savings Fund							
General	\$ 60,036,933	\$ 0	\$ 0	\$ (4,066,345)	\$ (853,307)	\$ 1,716,897	\$ 56,834,178
D.O.T.	27,232,918	0	0	(4,875,528)	(432,865)	858,849	22,783,374
DWSD	18,397,307	0	0	(1,480,677)	(216,400)	564,813	17,265,043
Library	8,557,885	0	0	(911,054)	(9,856)	263,465	7,900,440
Totals	114,225,043	0	0	(11,333,604)	(1,512,428)	3,404,024	104,783,035
Annuity Reserve Fund							
General	(11,671,540)	0	0	(5,591,350)	788,048	0	(16,474,842)
D.O.T.	(399,737)	0	0	(906,471)	405,450	0	(900,758)
DWSD	(5,504,800)	0	0	(3,107,999)	193,814	0	(8,418,985)
Library	(1,214,671)	0	0	(426,217)	768	0	(1,640,120)
Totals	(18,790,748)	0	0	(10,032,037)	1,388,080	0	(27,434,705)
Pension Accumulation Fund							
General	(199,690,877)	(84,956,115)	2,765,012	0	3,528,222	216,732,663	(61,621,095)
D.O.T.	(155,570,180)	(23,189,737)	109,988	0	957,022	30,608,828	(147,084,079)
DWSD	(34,893,810)	(37,598,517)	42,900,000	0	1,897,507	135,971,815	108,276,995
Library	19,731,140	(5,675,210)	2,500,000	0	146,959	18,273,394	34,976,283
Totals	(370,423,727)	(151,419,579)	48,275,000	0	6,529,710	401,586,700	(65,451,896)
Pension Reserve Fund							
General	1,013,487,885	84,956,115	0	(120,257,345)	0	0	978,186,655
D.O.T.	269,003,263	23,189,737	0	(30,611,304)	0	0	261,581,696
DWSD	539,671,483	37,598,517	0	(58,621,191)	0	0	518,648,809
Library	48,928,790	5,675,210	0	(6,268,296)	0	0	48,335,704
Totals	1,871,091,421	151,419,579	0	(215,758,136)	0	0	1,806,752,864
Retirement System Totals	\$1,596,101,989	\$ 0	\$48,275,000	\$ (237,123,777)	\$ 6,405,362	\$ 404,990,724	\$1,818,649,298



SECTION C

PARTICIPANT DATA

Reconciliation of Raw Data

Active Members

A) Count reported in Legacy file	2,518
B) In Legacy file but not in Hybrid file	(41)
C) Hired after plan closed	(101)
D) Non-active Status	(166)
E) Agency "88"	(17)
F) Non-eligible class code & bargaining unit	(2)
G) No hire date in Hybrid file	-
H) Zero salary in Hybrid file	(6)
I) Number of records to value	<u>2,185</u>

Inactive Vested Members

A) Number of records reported on data file	2,669
B) In Legacy active file but not otherwise in database and not in Hybrid active file	1
C) Valued as inactive in prior year and would not have otherwise been valued in Legacy this year	49
D) Valued as a vested active member in prior year but not in this year's active file and would not have otherwise been valued in Legacy this year	100
E) Deceased	-
F) Less than 8 years of vesting service	(174)
G) Number of records to value	<u>2,645</u>

Retired Members and Beneficiaries

A) Number of records reported on data file	45,058
B) Number of records in P/F plan	(16,857)
C) Records not currently in receipt of benefits based on reported status codes	(16,549)
D) Component I (Hybrid) Records	(479)
E) Number of records valued	<u>11,173</u>

Notes:

Active Row B: There were 41 records that appeared in the Legacy active file but did not appear in the Hybrid active file. It was assumed that these members were no longer active in the General plan.

Active Row D: The Active data file contains a field titled "Stat." Active members were only valued if the record for this field had a value of "1." In 2021, members were also valued if this field had a status of "71" (LOA).

Active Row E: Agency "88" is the 36th District Court. We understand that members in that agency are not eligible to receive benefits.

Active Row F: We have received a separate list of Class Codes and Bargaining Units that are not eligible to receive benefits.

Inactive Vested Row B: See the note for Row B of the active member reconciliation (of the 41 members removed from the active file, only 1 appeared to be vested and added to the deferred file).

Inactive Vested Row C: Only includes records that appear in the raw database last year.

Retired Row C: The Retired Life file has a field named "STATUS." We understand that if this field is populated with a number that is one or greater, the member is no longer receiving a benefit and should not be valued.



Reconciliation of Year-to-Year Data as of June 30, 2021

	Active		Term. Vested	Retirees		Totals
	Count	Pay#	Count	Count	Monthly Benefits	Count
2020	2,403	\$111,124,304	2,728	11,220	\$17,863,859	16,351
Change in Pay/Pensions	N/A	1,359,046	N/A	N/A	(84,737)	
Rehired (Not Vested)	47	1,601,690				47
Rehired (Vested)	31	1,079,240	(31)	-	-	-
New Beneficiary				99	109,859	99
Retired	(126)	(5,375,835)	(113)	243	334,012	4
Non-Duty Disabled				-	-	-
Duty Disabled				-	-	-
Assumed Death/Removals			(59)	(397)	(510,683)	(456)
Vested Term	(112)	(4,478,728)	112			-
Non-Vested Terminated	(58)	(2,656,081)				(58)
Data Adjustment	-	-	8	8	13,847	16
2021	2,185	\$102,653,636	2,645	11,173	\$17,726,157	16,003

This represents current pay and is not used for the Component II (Legacy) valuation.

Notable Data Changes:

4 new Retirees came from nowhere. We believe most of these are a result of EDRO's.

59 Terminated Vested members were valued last year but will not be valued this year. We have assumed these members refunded and forfeited their defined benefit.

The data adjustments relate to records where we could not specifically identify the activity during the year. This could be the result of duplicate Social Security numbers or corrected Social Security numbers.

Data Approximations and Assumptions

As part of our review of the data received from the System, we discussed questionable or missing data with System staff and developed approximations and assumptions in order to perform the valuation. We provided System staff with a letter dated December 17, 2021 with additional information regarding data reconciliation, processing instructions, and assumptions regarding unresolved issues. Note, that letter disclosed our remaining data processing procedures and assumptions and details our reconciliation and final valuation data. System staff has approved the detail and final data disclosed in that letter.

The purpose of this section in this report is to summarize any unresolved concerns about questionable data that are relevant and could have a significant effect on the valuation as disclosed in that letter. This summary also discusses any significant steps we have taken to improve the data due to identifying questionable data values or relationships, significant judgments, or assumptions we have applied to the data.

Active

For active members, frozen AFC amounts and frozen service as of June 30, 2014 was reported. For purposes of this valuation, we matched the June 30, 2021 actives to the active data reported for the June 30, 2014 valuation to check against AFC as of June 30, 2014. In cases where the frozen AFC as reported in the 2021 data file was less than 75% of the AFC as reported on the 2014 data file, the AFC as reported on the 2014 data file was used. This boundary was determined after an analysis of the raw AFC data showed that the AFC for several members was unreasonably low. In cases where AFC was reported in to be \$0 in both the current data file and the 2014 data file, the current salary was used in place of the AFC.

Deferred Vested

Data provided for deferred vested members was incomplete. As part of the processing of deferred member data, in cases where AFC was incomplete, we used \$30,000 to estimate the AFC. Component II benefit service is not directly provided on the file. The Component II (Legacy) file includes total vesting service and the Component I (Hybrid) file includes Component I benefit service. Since Component II benefit service was frozen as of June 30, 2014 for members that terminated after June 30, 2014, Component II (Legacy) benefit service was determined by subtracting service in the Component I (Hybrid) inactive file from total vesting service in the corresponding Component II (Legacy) inactive file. Members with vesting service of less than 8 years were assumed to be non-vested and were not valued. We estimated the commencement date with the following rules:

- Age 55 if 30 or more years of service and hired before July 1986;
- Age 60 if less than 30 years of service, but more than 10 years of service and hired before 1986;
and
- Age 62 for all others.

The entire amount of the deferred benefit was assumed to commence at the same time regardless of the date of hire.



Retired and Beneficiary

It is our understanding that the current pension amount provided in the retiree data includes the 4.5% reduction as mandated in the POA. However, for members that retired prior to July 1, 2015, the other pension amounts provided in the data (original pension amount, equated pension amount, and prior year's pension amount) did not reflect the 4.5% reduction and, as such, were reduced by 4.5% when valuing any related liability. Other adjustments/assumptions include:

- In cases where the benefit is identified to be a joint and survivor benefit and a beneficiary is not listed in the data, it was assumed that male spouses were 3 years older than females;
- Benefits for dependent children are assumed to cease at age 21; and
- For non-converted disabled members, converted benefits are:
 - assumed to commence at age 60; and
 - estimated, based on reported service and projected service from the date of disability to age 60.

Summary of Member Data June 30, 2021 Active Members

	General	D.O.T.	DWSD	Library	Totals [^]
Number	1,327	368	293	197	2,185
% Change in active members	(7.0)%	(14.4)%	(12.8)%	(6.2)%	(9.1)%
Annual payroll (\$ millions)	\$ 68.0	\$ 13.5	\$ 12.8	\$ 8.3	\$ 102.7
Average pay	\$51,265	\$36,814	\$43,610	\$42,128	\$46,981
% Change in average pay	1.5 %	0.3 %	1.2 %	0.6 %	1.6 %

[^] May not add due to rounding.

Retired Members and Survivor Beneficiaries

	General	D.O.T.	DWSD	Library	Totals
Number	6,541	1,609	2,707	316	11,173
Annual benefits (\$ millions) #	\$ 123.9	\$ 31.2	\$ 61.1	\$ 6.5	\$ 222.8
Average benefits #	\$18,949	\$19,378	\$22,588	\$20,558	\$19,938
% Change in reported average benefit	(0.1)%	0.3 %	(0.7)%	(2.0)%	(0.3)%

Includes annuities. Does not include reductions resulting from the annuity claw-backs.

Inactive Vested Members

	General	D.O.T.	DWSD	Library	Totals
Number	1,429	354	779	83	2,645
Average AFC	\$39,902	\$45,252	\$49,269	\$33,245	\$43,168
Average years of service	15.2	15.1	15.1	13.6	15.1
Annual benefits (\$ millions)	\$ 14.2	\$ 4.0	\$ 9.5	\$ 0.6	\$ 28.3
Average benefits	\$9,918	\$11,169	\$12,227	\$ 7,524	\$10,690
% Change in average years of service	(1.1)%	(0.5)%	(0.8)%	(1.6)%	(0.9)%
% Change in average AFC	(0.4)%	(0.4)%	(0.5)%	(2.2)%	(0.4)%

Active Members as of June 30, 2021 by Attained Age and Years of Service Retirement System Totals

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
Under 20	0							0	\$ 0
20-24	0	0						0	0
25-29	0	1	0					1	39,398
30-34	4	32	9	0				45	1,652,774
35-39	3	20	27	10	4			64	2,488,489
40-44	6	28	43	51	37	2		167	7,152,916
45-49	4	54	38	63	93	24	0	276	12,649,367
50-54	6	30	50	106	162	81	36	471	22,562,792
55-59	4	39	41	72	176	96	115	543	25,725,762
60-64	2	29	36	58	89	77	147	438	20,878,415
65-69	0	20	17	9	30	12	41	129	6,893,194
70-74	0	4	5	8	11	3	6	37	1,886,883
75-79	0	2	2	2	3	1	4	14	723,646
Totals	29	259	268	379	605	296	349	2,185	\$102,653,636

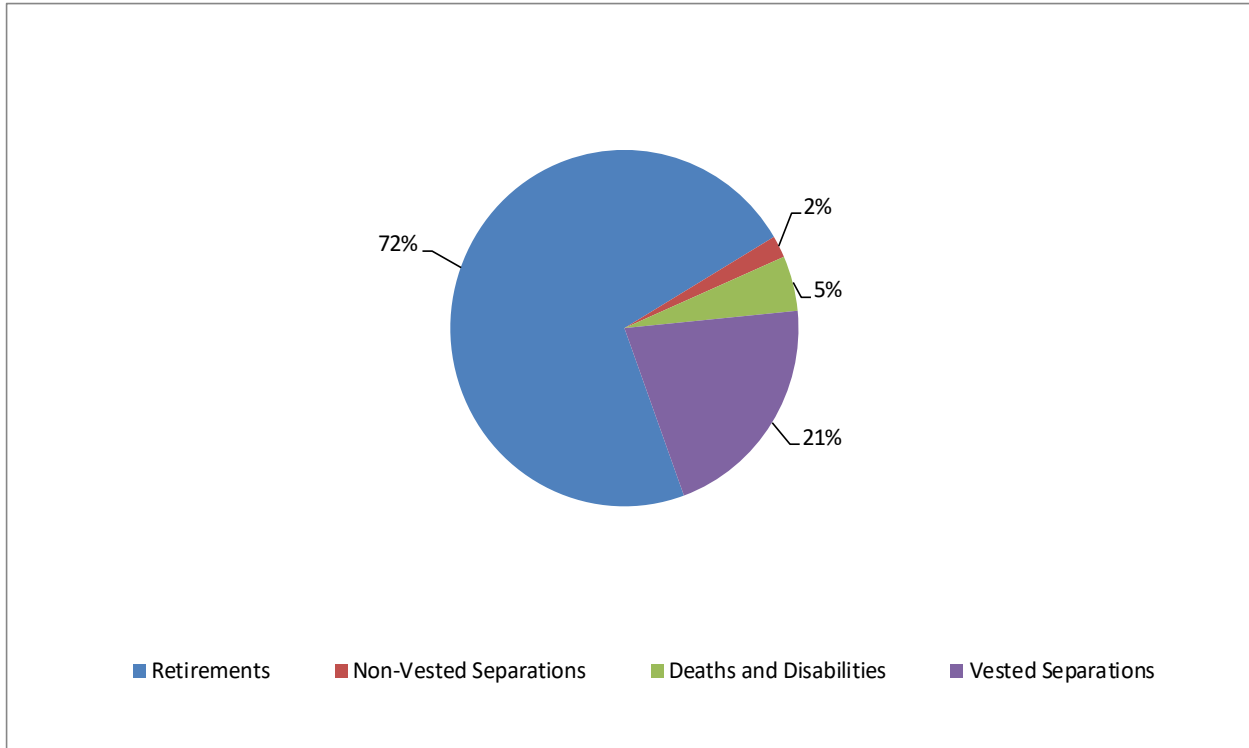
Group Averages:

Age: 54.4 years
Benefit Service: 14.9 years
Eligibility Service: 20.9 years
Annual Pay: \$46,981

Service shown in this schedule is Legacy Benefit service plus Hybrid Benefit service.



Expected Terminations from Active Employment for Current Active Members



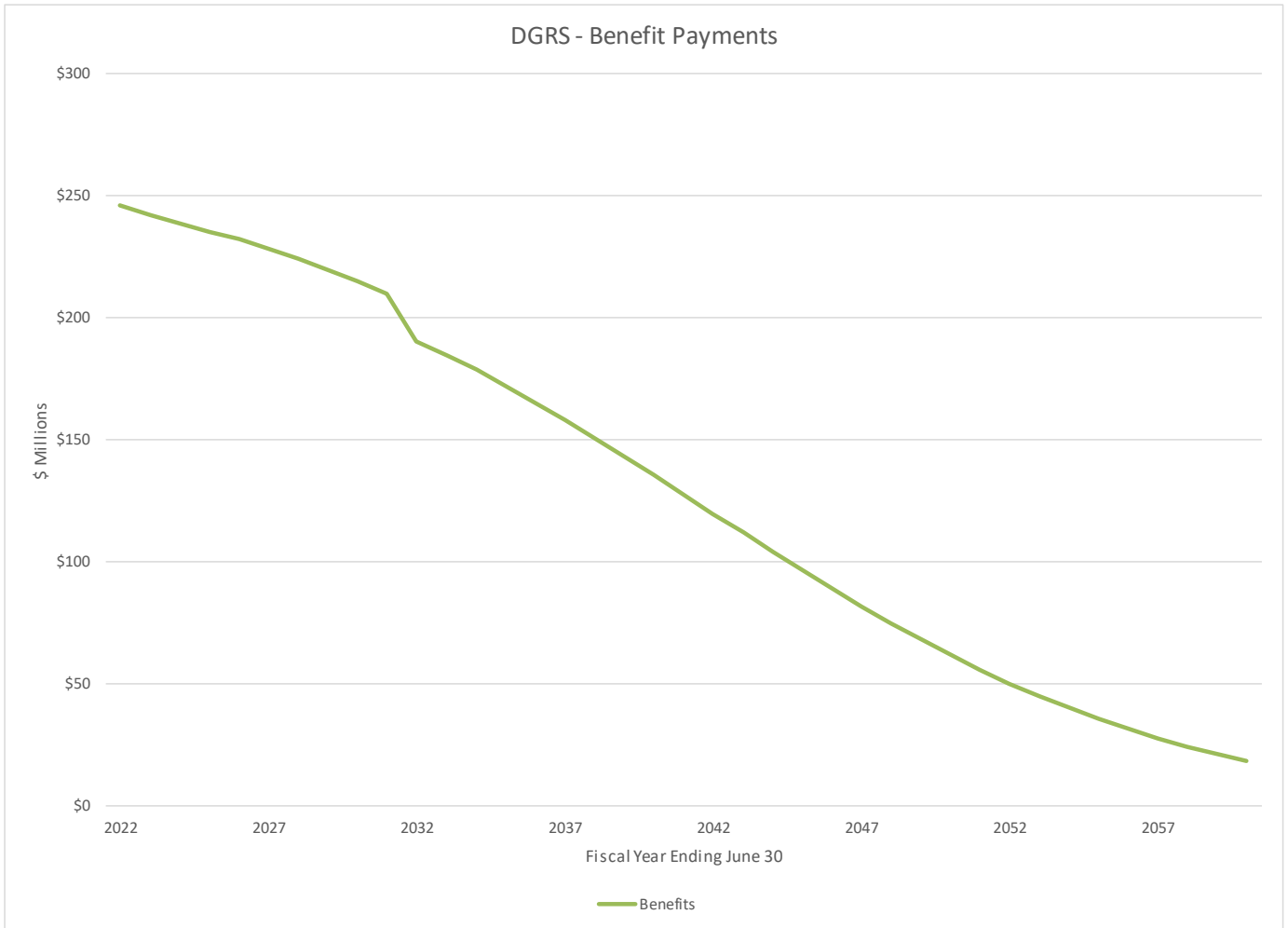
The chart shows the expected future development of the present population in simplified terms. The Retirement System presently covers 2,185 active members. Eventually, 43 people are expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. 2,029 people are expected to receive monthly retirement benefits either by retiring directly from active service, or by retiring from vested deferred status. 113 people are expected to become eligible for benefits as a result of death-in-service or disability. Vested Separations may include members eligible to retire in this Component II (Legacy) plan but not yet eligible to retire in the Component I (Hybrid) plan. A detailed discussion on how members eligible to retire in Component II (Legacy) but not eligible to retire in Component I (Hybrid) are treated is included in Section D of this report.

Actual versus expected retirements for the 2021 fiscal year is shown below:

Year Ended June 30,	Expected	Actual
2021	261	126

Expected Benefit Payments

Shown below is a graph of projected benefit payments remaining in the Retirement System.



The graph above shows the projection of future expected benefit payments (solid green line) derived from the June 30, 2021 actuarial valuation data.

Retirees and Beneficiaries as of June 30, 2021

Tabulated by Attained Ages

Retirement System Totals

Attained Ages	Age & Years of Service#		Disability		Death-in-Service		Totals	
	No.	Monthly Allowances	No.	Monthly Allowances	No.	Monthly Allowances	No.	Monthly Allowances
Under 20*	31	\$ 36,589	0	\$ 0	1	\$ 478	32	\$ 37,067
20-24	7	8,401					7	8,401
25-29	4	4,671					4	4,671
30-34	17	11,973	0	0			17	11,973
35-39	14	7,330	0	0	1	2,311	15	9,641
40-44	18	11,884	4	1,681	1	500	23	14,065
45-49	41	34,813	17	11,637	4	2,205	62	48,655
50-54	130	183,264	37	25,695	8	7,360	175	216,319
55-59	483	861,923	89	81,027	14	17,097	586	960,047
60-64	1,349	2,404,877	188	249,060	40	48,172	1,577	2,702,109
65-69	2,046	3,493,434	208	243,698	32	37,296	2,286	3,774,428
70-74	2,150	3,900,796	160	176,872	44	77,026	2,354	4,154,694
75-79	1,452	2,512,890	91	98,277	34	45,899	1,577	2,657,066
80-84	919	1,359,772	48	45,620	24	26,654	991	1,432,046
85-89	657	835,852	19	14,990	21	21,258	697	872,100
90-94	453	530,712	13	8,241	27	20,590	493	559,543
95 and Over	242	235,321	11	9,245	24	18,766	277	263,332
Totals	10,013	\$16,434,502	885	\$966,043	275	\$325,612	11,173	\$17,726,157

* May include records with defective birth dates.

Includes survivor beneficiaries of deceased retirees.

Retirees and Beneficiaries as of June 30, 2021 Tabulated by Year of Retirement

Year of Retirement	No.	Monthly Allowances	
		Total	Average
1950 & before	3	\$ 5,931	\$1,977
1951-1955	3	5,323	1,774
1956-1960	0	0	0
1961-1965	6	2,314	386
1966-1970	16	7,053	441
1971-1975	57	35,080	615
1976-1980	173	125,533	726
1981-1985	359	351,736	980
1986-1990	547	570,932	1,044
1991-1995	1,049	1,285,104	1,225
1996-2000	1,306	1,953,004	1,495
2001-2005	1,813	3,405,188	1,878
2006-2010	2,011	3,745,914	1,863
2011-2015	2,405	4,145,307	1,724
2016	398	684,389	1,720
2017	248	336,603	1,357
2018	234	308,558	1,319
2019	232	306,624	1,322
2020	212	310,897	1,466
2021	101	140,667	1,393
Totals	11,173	\$17,726,157	\$1,587

SECTION D

METHODS AND ASSUMPTIONS

Summary of Assumptions and Methods Used for Actuarial Valuations Adopted by the Board of Trustees

All assumptions are estimates of future experience except as noted. The rationale for the assumptions is based on experience studies where noted.

Economic Assumptions

The investment return rate used in making the valuation was 6.75% per year, compounded annually (net after investment expenses). This assumption is prescribed by the Eighth Amended Plan for the Adjustment of Debts of the City of Detroit (POA).

Price inflation is not directly used in the valuation. For purposes of assessing the reasonability of the investment return assumptions, we assumed price inflation of 2.50% per year.

Future **administrative expenses** are assumed to be 1.01% of benefit payments and refunds.

Non-Economic Assumptions

For healthy post-retirement mortality, the PubG-2010(B) Below-Median General Retiree table was used for mortality assumptions going forward, decreased by 3% for males and increased by 26% for females.

For disabled post-retirement mortality, PubNS-2010 Non-Safety Disabled Retiree mortality table was used, increased 4% for males and decreased 2% for females.

For pre-retirement mortality rates, the PubG-2010(B) Below-Median General Employee mortality table was used for both males and females.

The tables are projected to be fully generational, based on the 2-dimensional, sex distinct mortality improvement scale MP-2021 (which was intended to be used with the Pub-2010). 75% of all deaths-in-service are assumed to be non-duty related. This table was first used as of June 30, 2021. The rationale for the mortality assumption is based on the 2015-2020 Mortality Experience Study issued February 4, 2022.

The probabilities of retirement for members eligible to retire are shown on pages 38 and 39. These probabilities were revised for the June 30, 2021 valuation. The rationale is based on the 2015-2020 Experience Study.

The probabilities of separation from service (including *death-in-service* and *disability*) are shown for sample ages on page 40. These probabilities were revised for the June 30, 2021 valuation. The rationale is based on the 2015-2020 Experience Study.

Summary of Assumptions and Methods Used for Actuarial Valuations Adopted by the Board of Trustees (Concluded)

Funding Methods

The unit credit cost method was used in determining age & service pension liabilities, vesting liabilities, and casualty pension liabilities. Under this method, there is no normal cost since benefits are frozen and there are no future accruals and actuarial accrued liability is the present value of each individual's accrued benefit.

Unfunded Actuarial Accrued Liabilities. Actual employer contributions through June 30, 2023 are set by the POA. The amortization period and method after 2023 has not yet been established by the Board.

Employer contribution dollars were assumed to be paid at the end of the employer fiscal year.

Present assets are set equal to the Market Value.

The data about persons now covered and about present assets was furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the Actuary.

Single Life Retirement Values

Based on PubG-2010(B)
97% of Male Rates/126% of Female Rates
Using Projection Scale MP-2021

Sample Attained Ages in 2021	Future Life Expectancy (Years)	
	Men	Women
45	37.47	39.95
50	32.54	34.89
55	28.16	30.31
60	23.94	25.80
65	19.86	21.37
70	15.90	17.05
75	12.26	13.04
80	9.07	9.51

Probabilities of Age/Service Retirement for Members Eligible to Retire

Retirement Ages	Percent of Eligible Active Members Retiring within Next Year with Unreduced Benefits		
	EMS	D.O.T.	Others
62	40%	20%	20%
63	40%	20%	20%
64	40%	20%	20%
65	40%	20%	20%
66	40%	20%	20%
67	40%	30%	20%
68	40%	30%	20%
69	40%	30%	20%
70	100%	100%	20%
71			20%
72			20%
73			20%
74			20%
75			20%
76			20%
77			20%
78			20%
79			20%
80			100%
Ref	851	3304	3305

All members are assumed to retire while eligible for Component I (Hybrid) retirement only. The rationale is based on the 2015-2020 Experience Study.

Probabilities of Early Retirement for Members Eligible for Early Retirement

Retirement Ages	Percent of Eligible Active Members Retiring within Next Year with Reduced Benefits
55	6.5%
56	6.5%
57	6.5%
58	7.5%
59	8.5%
60	9.5%
61	9.5%
62	9.5%
Ref	3303

All members are assumed to retire while eligible for Component I (Hybrid) retirement only. The rationale is based on the 2015-2020 Experience Study.

Sample Rates of Separation from Active Employment Before Retirement

Sample Ages	Years of Service	% of Active Members Separating within Next Year	
		Withdrawal	
		EMS	Other
ALL	0	16.00%	28.00%
	1	15.00%	19.00%
	2	15.00%	15.00%
	3	11.00%	14.00%
	4	11.00%	14.00%
25	5 & Over	10.05%	13.00%
30		8.85%	11.91%
35		7.80%	9.25%
40		6.60%	7.19%
45		5.10%	5.91%
50		3.60%	5.00%
55		3.00%	5.00%
60		3.00%	5.00%
Ref		1405	1406
		1608	1609

Sample Ages	% of Active Members Becoming Disabled within Next Year			
	D.O.T.		Others	
	Ordinary	Duty	Ordinary	Duty
25	0.16%	0.24%	0.03%	0.03%
30	0.19%	0.28%	0.04%	0.04%
35	0.26%	0.39%	0.05%	0.05%
40	0.37%	0.56%	0.08%	0.08%
45	0.56%	0.84%	0.12%	0.12%
50	0.70%	1.05%	0.15%	0.15%
55	0.82%	1.23%	0.17%	0.17%
60	0.94%	1.41%	0.20%	0.20%
Ref	1238 x 1.20	1238 x 1.80	1238 x 0.25	1238 x 0.25

The rationale is based on the 2015-2020 Experience Study.

Miscellaneous and Technical Assumptions

Benefit Service	Exact Fractional service is used to determine the amount of benefit payable.
Decrement Operation	Disability and mortality decrements do not operate during the first five years of service. Disability and withdrawal do not operate during retirement eligibility.
Decrement Timing	Decrements of all types are assumed to occur mid-year.
Eligibility Testing	Eligibility for benefits is determined based upon the age nearest birthday and rounded service on the date the decrement is assumed to occur.
Forfeitures	None.
Incidence of Contributions	Contributions are assumed to be received at the end of the year.
Marriage Assumption	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses for active member valuation purposes.
Normal Form of Benefit	Straight life is the normal form of benefit. The Board adopted assumptions for Actuarial Equivalence to be an 80%/20% unisex blend of RP-2014 mortality (Male/Female) with Blue Collar Adjustment, set ahead one year for males and females, projected 11 years with MP-2014, an interest rate of 6.75%, and no COLA for optional forms of payment and early retirement reduction. Assumptions for annuitizing member contributions are the same except for using a 60%/40% unisex blend and a 5.25% assumed rate of interest. Prior to the use of these factors, actuarial equivalent factors were based on 7.5% interest and the 1984 Group Annuity Mortality table.
Service Credit Accruals	Service accruals stop as of June 30, 2014 for measurement of Component II liabilities. However, future service in Component I may be used to satisfy benefit eligibility requirement in Component II. Members who became duty disabled prior to June 30, 2014 are assumed to get projected service from date of disability to conversion date. Member who become disabled after June 30, 2014 are assumed to get their frozen accrued benefit as of June 30, 2014 at date of conversion.
Administrative Expenses	Administrative expenses are assumed to be 1.01% of benefit payments and are to be included in the employer contribution.
Sick Leave	Sick leave banks as of June 30, 2014 were included in the 2014 data file provided by the System.
Member Contributions	Member contributions to this Component II plan are assumed to have ceased with the bankruptcy.
Pop-Up Benefits	For current retirees with a pop-up benefit, the value of the pop-up was estimated by valuing a non-pop-up option and increasing the associated liabilities by 2%.

The rationale is based on the 2015-2020 Experience Study, modified as necessary for changes in data or administration.



SECTION E

PLAN PROVISIONS

Summary of Benefit Provisions Evaluated

Component II Frozen Benefits

All Component II benefits are frozen as of June 30, 2014 based on service and average final compensation accrued as of that date and the provisions of the Detroit General Retirement System as it existed on June 30, 2014. Frozen benefits are further reduced by 4.5% and all future cost-of-living adjustments (“COLAs”) were eliminated. Benefits resulting from the Annuity Savings Fund and benefits paid from the Annuity Reserve Fund were subject to a separate reduction described as a “Claw-back.” Details of the claw-back provision are complicated and can be found in the Eighth Amended Plan of Adjustment. The benefits evaluated in this report are the frozen reduced benefits after adjusting the assets for the claw-back. Component II benefits are payable after separation from service, upon meeting the eligibility conditions of the plan as it existed on June 30, 2014, regardless of whether the individual is eligible to receive a Component I benefit at that time.

Our understanding of the June 30, 2014 plan provisions is provided below for completeness. The material below does not have legal standing and is not intended to cover all potential situations that could occur. If there are discrepancies between the description below and appropriate legal documents, the latter necessarily govern.

Age and Service Pension

Eligibility - Any age (minimum age 55 for non-EMS members hired after 1995) with 30 years of service (25 for EMS members), or age 60 with 10 years of service, or age 65 with 8 years of service.

Annual Amount - EMS Members: Sum of a) a basic pension of \$12 for each of the first 10 years of service, plus b) a pension equal to 2.0% of AFC multiplied by years of service. Maximum benefit is 90% of AFC.

Other Members: Sum of a) a basic pension of \$12 for each of the first 10 years of service, plus b) a pension equal to the first 10 years of service multiplied by 1.6% of AFC, plus 1.8% of AFC for each year of service greater than 10 years up to 20 years, plus 2.0% of AFC for each year of service greater than 20 years up to 25 years, plus 2.2% of AFC for each year of service greater than 25 years. Future benefit accruals for certain active members (depending on bargaining unit) were reduced to 1.5% of final average compensation per year of service.

Type of Average Final Compensation (AFC) - Highest 3 consecutive years out of the last 10. Pension benefits will not be diminished if compensation is reduced because of a fiscal emergency. Effective July 1, 1999, in computing the AFC, a member shall have the option of adding the value of 25% of unused accrued sick leave to the earnings used in computing the AFC. Longevity is added to AFC in accordance with the following schedule: \$150 after 5 years, \$300 after 10 years, \$450 after 15 years, \$600 after 20 years, and \$750 after 25 years.

Early Retirement

Eligibility - Any age with 25 or more years of service (min. age 55 for members hired after 1995).

Annual Amount - Same as regular retirement but actuarially reduced.



Summary of Benefit Provisions Evaluated (Continued)

Deferred Retirement (Vested Benefit)

Eligibility - Hired prior to 7-1-80: Age 40 with 8 years of service. Hired on or after 7-1-80: Any age with 10 years of service.

Benefit Commencement - APTE hired prior to July 1, 1988: Benefit begins at the age the member would have become eligible for regular retirement if service had continued. **SAAA, Non-Union and lawyers hired prior to June 30, 1986:** Benefit begins at the age the member would have become eligible for regular retirement. **Others:** Benefits based on service rendered by June 30, 1986 begin at the age the member would have become eligible for regular retirement. Benefits based on service rendered after July 1, 1986 begin at age 62.

Annual Amount - Same as regular retirement but based on average final compensation and service at the time of termination.

Duty Disability Retirement

Eligibility - Service related disability before eligibility for service retirement prior to and July 1, 2014. No service requirement.

Annual Amount - An annuity which is the actuarial equivalent of the accumulated contributions at date of disability plus a pension of two-thirds of average final compensation at time of disability. The maximum annual pension is \$5,700 (\$9,000 for EMS). At the earliest of when the member would have accrued 30 years of service credit (25 for EMS) or age 60, the annuity is recomputed assuming contributions would have continued at a salary level equal to final compensation. The pension is recomputed with additional service credit granted from the date of disability to age 60 (or 30 years of service credit) or June 30, 2014, whichever is earlier. **Benefits payable prior to conversion/re-computation, if any, were assumed to be paid outside the trust.**

Non-Duty Disability Retirement

Eligibility - Disability from any cause before age 60 with 10 or more years of service prior to July 1, 2014.

Annual Amount - Computed in the same manner as a regular retirement benefit. Maximum annual pension to age 60 is \$6,000. Benefit is recomputed at age 60 with no maximum. **Benefits payable prior to age 60, if any, were assumed to be paid from outside the trust.**

Duty Death Before Retirement

Eligibility - Death from service related causes. No age or service requirements.

Annual Amount - One-third of final compensation as of June 30, 2014 to the surviving spouse for life or until remarriage, plus an equal share of 1/4 of final compensation to each unmarried child under age 18. If there is no eligible spouse, eligible children each receive 1/4 of final compensation; if there are more than 2 such children, each child shares an equal part of 1/2 of final compensation. Maximum total amount for spouse and children is \$9,000 annually. If there is no eligible spouse or children, dependent parents each receive 1/6 of deceased's final compensation, to a total maximum of \$600 annually.



Summary of Benefit Provisions Evaluated (Concluded)

Non-Duty Death Before Retirement

Eligibility - Death-in-service at any age with 15 years of service; or after age 60 with 10 years of service; or after age 65 with 8 years of service.

Annual Amount - To Surviving Spouse: Computed as a regular retirement benefit but reduced in accordance with a 100% joint and survivor election for members with 20 or more years of service. For members with 15 years of service but less than 20, benefit is reduced in accordance with a 50% joint and survivor election. To Dependent Children if no Surviving Spouse: \$9,000 payable to age 19 of the youngest child or for life if child is physically or mentally impaired for members with 20 or more years of service (\$6,000 if less than 20 years of service).

Post-Retirement Cost-of-Living Adjustments

Benefit is increased annually by 2.25% of the **original** pension amount at retirement. Post-retirement cost-of-living increases were eliminated on future accruals for certain active members (depending on bargaining unit).

Member Contributions

Members have the option of choosing one of four contribution amounts: (1) 0%; (2) 3.0% of compensation up to the Social Security wage base, plus 5.0% of compensation in excess of the Social Security wage base; (3) 5.0% of total compensation; or (4) 7.0% of total compensation. Member contributions can be paid as a lump sum or annuitized at retirement to provide an annuity in addition to the pension (which is not affected by the level of member contributions).

SECTION F

GLOSSARY

Glossary

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.”

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

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.

AFC. Average Final Compensation.

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.

APTE. Association of Professional and Technical Employees.

ASF. Annuity Savings Fund.

Contribution Budgeting Liability. An expected return-based measure of pension obligation.

DIA. Detroit Institute of Art.

D.O.T. Department of Transportation.

DWSD. Detroit Water and Sewerage Department.

EMS. Emergency Medical Service.



Glossary

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.

GASB. The Governmental Accounting Standards Board.

GLWA. Great Lakes Water Authority.

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.

PAF. Pension Accumulation Fund.

Plan of Adjustment or POA. The 8th Amended Plan for the Adjustment of the Debt of the City of Detroit.

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.

SAAA. Senior Accountants, Analysts, and Appraisers Association.

Solvency Liability. A market-based measure of the present value of accrued benefits at a municipal bond discount rate unadjusted for the credit quality of the plan sponsor.

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

UTGO. Unlimited Tax General Obligation.

Valuation Assets. The value of current plan assets recognized for valuation purposes.