P-02d

City of Troy Retiree Health Care Plan

Actuarial Valuation of Other Postemployment Benefits

December 31, 2018

Table of Contents

GRS Retirement Consulting

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August 2, 2019

Board of Trustees
City of Troy Retiree Health Care
Benefits Plan and Trust
500 West Big Beaver Road
Troy, Michigan 48084

Dear Trustees:

Submitted in this report are the results of an Actuarial Valuation of the benefit values associated with the employer financed Other Postemployment Benefits provided by the City of Troy. The date of the valuation was December 31, 2018, effective for the fiscal years beginning July 1, 2020 and July 1, 2021. This report was prepared at the request of the Board and is intended for use by the Board and those designated and approved by the Board. This report may be provided to parties only in its entirety and only with permission of the Board. GRS is not responsible for unauthorized use of this report.

The purposes of the valuation are to measure the Plan's funding progress and to determine the employer contribution rate for the fiscal years beginning July 1, 2020 and July 1, 2021. The employer contribution rate for the fiscal year beginning July 1, 2020 in this report replaces the rate established in the December 31, 2016 actuarial valuation (which was used for budgeting purposes). This report should not be relied on for any purpose other than the purposes described herein. Determinations of the financial results associated with the benefits described in this report in a manner other than the intended purpose may produce significantly different results. This report does not satisfy the disclosure requirements of GASB Statements No. 74 and No. 75. A separate report that incorporates GASB Statement Nos. 74 and 75 will be issued at a later date.

The contribution rates in this report are determined using the actuarial assumptions and methods disclosed in Section D of this report. This report includes risk metrics on pages A-6 and A-7 but does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

This valuation assumed the continuing ability of the plan sponsor to make the contributions necessary to fund this Plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

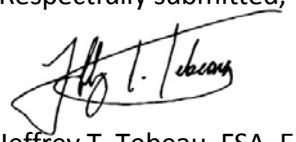
This report was prepared using assumptions adopted by the Board. All actuarial assumptions used in this report are reasonable for the purposes of this valuation. Additional information about the actuarial assumptions is included in Section D of this report.

The valuation was based upon information, furnished by the City, concerning retiree health care benefits, individual members, and financial data. Data was checked for internal consistency, but was not audited. We are not responsible for the accuracy or completeness of the information provided.

To the best of our knowledge, this report is complete and accurate and was made in accordance with generally recognized actuarial methods and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

Jeffrey T. Tebeau, Abra D. Hill and Kevin T. Noelke 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. The signing actuaries are independent of the plan sponsor.

Respectfully submitted,



Jeffrey T. Tebeau, FSA, EA, MAAA

Abra D. Hill, ASA, FCA, MAAA

Kevin T. Noelke, ASA, MAAA

JTT/ADH/KTN:sc

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EXECUTIVE SUMMARY

Executive Summary

Actuarially Determined Employer Contribution (ADEC)

Please note that beginning with the fiscal year ending June 30, 2017, GASB Statement No. 43 was replaced by GASB Statement No. 74. Also, beginning with the fiscal year ending June 30, 2018, GASB Statement No. 45 was replaced by GASB Statement No. 75. Separate GASB reports are required to comply with the actuarial requirements of GASB Statement No. 74 beginning with the fiscal year ending June 30, 2017 and GASB Statement No. 75 beginning with the fiscal year ending June 30, 2018. As such, there will no longer be an "Annual Required Contribution" calculated in the valuation reports. Therefore, we have determined the "Actuarially Determined Employer Contribution" for subsequent years.

We have calculated the Actuarially Determined Employer Contribution (ADEC) for the fiscal years beginning July 1, 2020 and beginning July 1, 2021 under the interest rate assumption of 6.50%. Below is a summary of the results.

The ADEC for the fiscal year beginning July 1, 2020 was determined to be $3,231,801 provided that the City intends to fully fund the OPEB. The ADEC for the fiscal year beginning July 1, 2021 was determined to be $3,180,761. The expected retiree health care claims and premium amounts paid are estimated to be $6,474,982 for the fiscal year beginning July 1, 2020 and $6,913,710 for the fiscal year beginning July 1, 2021. These amounts reflect the employer portion of the retiree only premium rates and the implicit subsidy for retirees and covered spouses.

For additional details, please see Section A of the report.

Liabilities and Assets

The present value of all benefits expected to be paid to current plan members as of December 31, 2018 is $123,452,184. The Actuarial Accrued Liability, which is the portion of the $123,452,184 attributable to service accrued by plan members as of December 31, 2018, is $118,455,003. The assets currently set aside for funding purposes as of December 31, 2018 are $82,669,449. The OPEB liabilities are currently 69.8% funded.

SECTION A

VALUATION RESULTS

Development of the Actuarial Determined Employer Contribution for the Other Postemployment Benefits

Contributions for	Actuarial Determined Employer Contribution
Normal Cost	
Normal Retirement	$ 645,258
Early Retirement	0
Termination Benefits	13,854
Death-in-Service	16,210
Disability	40,247
Total Normal Cost	$ 715,569
Amortization of Unfunded Actuarial Accrued Liabilities (Amortized over 23 years)	$ 2,516,232
Actuarial Determined Employer Contribution for the Fiscal Year beginning July 1, 2020	**$ 3,231,801**
Projected Payroll for the Fiscal Year Beginning July 1, 2020	$ 13,161,566
Actuarial Determined Employer Contribution as a Percentage of Projected Payroll	**24.55%**

Projected Payroll for the Fiscal Year Beginning July 1, 2021	$ 12,348,977
Actuarial Determined Employer Contribution for the Fiscal Year beginning July 1, 2021	**$ 3,180,761**
Actuarial Determined Employer Contribution as a Percentage of Projected Payroll	**25.76%**

Projected Payroll for the Fiscal Year Beginning July 1, 2022	$ 11,622,855
***Estimated* Actuarial Determined Employer Contribution* for the Fiscal Year beginning July 1, 2022**	**$ 3,141,687**
***Estimated* Actuarial Determined Employer Contribution* as a Percentage of Projected Payroll**	**27.03%**

** These amounts are for budgeting purposes only, and will be recalculated in the December 31, 2020 valuation.*

The results on this page are calculated under the assumption that a funding arrangement with contributions at least equal to the Actuarial Determined Employer Contribution (ADEC) will be followed. The Unfunded Actuarial Accrued Liabilities (UAAL) were amortized as a level dollar amount. A 23-year amortization period for the fiscal year beginning July 1, 2020 for the UAAL was used.

Determination of Unfunded Actuarial Accrued Liability as of December 31, 2018

A. Present Value of Future Benefits	
1. Retirees and Beneficiaries	$ 90,318,722
2. Vested Terminated Members	0
3. Active Members	33,133,462
Total Present Value of Future Benefits	$123,452,184
B. Present Value of Future Employer Normal Costs	4,997,181
C. Actuarial Accrued Liability (A.-B.)	118,455,003
D. Actuarial Value of Assets	82,669,449
E. Unfunded Actuarial Accrued Liability (C.-D.)	$ 35,785,554
F. Funded Ratio (D./C.)	69.8%

The Unfunded Actuarial Accrued Liability (UAAL) is not booked as an expense all in one year and does not appear in the Employer's Statement of Net Assets. Nevertheless, it is reported in the Notes to the Financial Statements and in the Required Supplementary Information. These are information sections within the employer's financial statements.

Comments

Comment A: The Actuarial Determined Employer Contribution (ADEC) calculated for the fiscal year beginning July 1, 2020 in total is lower than the prior valuation. Factors contributing to the decrease include, but are not limited to:

- Per capita health care cost experience was favorable overall, although was varied between pre-65 and post-65 retirees, as well as between the self-insured and fully-insured plans.
- Lower estimated costs due to lowering the load for excise tax on high-cost employer health plans (aka Cadillac Tax), which is effective 1/1/2022.
- Updated mortality assumptions projecting shorter future lifetimes than the tables used for the December 31, 2016 valuation, due to the level of conservatism built into the original RP-2014 Mortality Table and MP-2014 projection scale.
- Updating coverage election assumptions to reflect recent experience.

Partially offsetting these factors was an increase due to:

- Resetting the health care trend cost rates. Based on the trend assumption used for the December 31, 2016 valuation, the first year trend for this valuation would have been 7.50%. Therefore, the resetting of the trend increased the liabilities and the ADEC.
- Unfavorable investment performance. Recognized (actuarial value) returns were approximately 5.5% on average over the last two years.

The funded status of the Plan increased from 56.1% at the time of the previous valuation to 69.8% this valuation. The actual and expected Actuarial Accrued Liability (AAL), Funded Ratio, and Present Value of Future Benefits (PVFB) are shown below:

	AAL	Funded Ratio	PVFB
(1) Expected Results	$ 141,642,868	54.5%	$ 148,991,809
(2) New Premiums	120,120,525	64.3%	125,312,814
(3) New Trend applied to (2)	126,270,196	61.2%	131,800,161
(4) New Mortality applied to (3)	121,514,286	63.6%	126,658,201
(5) New Excise Tax Load applied to (4)	118,455,003	69.8%	123,452,184

Comment B: One of the key assumptions used in any valuation of the cost of postemployment benefits is the long-term rate of investment return on plan assets. Higher assumed investment returns will result in a lower ADEC. A lower assumption will result in a higher ADEC. We have calculated the liability and the resulting ADEC using an assumed investment return of 6.50%. If the City chooses to pre-fund with contributions less than the ADEC, a lower assumption may be appropriate for future valuations.

Comment C: The plan sponsor is required by GASB to perform actuarial valuations at least biennially. An annual actuarial valuation will re-compute the required contribution rate each year. This will permit fluctuations and trends in experience to be reflected in the contribution rate on a regular basis.

Comments (Concluded)

Comment D: The computed Actuarial Determined Employer Contribution reflect amortization of the Unfunded Actuarial Accrued Liability (UAAL) as a level dollar over 23 years for the fiscal year beginning July 1, 2020. A shorter amortization period would result in a higher ADEC.

Comment E: The amount of estimated claims and/or premiums paid by the employer on behalf of retirees including the effect of the implicit rate subsidy under GASB is $6,474,982 for fiscal year ending June 30, 2021, $6,913,710 for fiscal year ending June 30, 2022, and $7,269,156 for fiscal year ending June 30, 2023.

Comment F: Based on this recent experience as well as national experience, the trend assumption used to project future retiree health costs has been reset to 8.25% in year 2019 grading down to 3.50% by 2028 (see page D-6). The short-term trend of 8.25% is a reasonable expectation of current health care inflation. The long-term expectation is the assumed rate of payroll growth or wage inflation. The transition from short-term to long-term trend is supported by the Society of Actuaries' Getzen model which results in a macroeconomic estimate that health care expenditures will increase from 18.5% of gross domestic product (GDP) in 2020 to 24% of GDP in 2040 assuming 3.00% annual GDP growth.

Comment G: Excise Tax on High-Cost Employer Health Plans (aka Cadillac Tax) Effective 1/1/2022. The "Cadillac" tax is a 40% excise tax paid by the coverage provider (employer and/or insurer) on the value of health plan costs in excess of certain thresholds. The thresholds are $10,200 for single coverage or $27,500 for family coverage in 2018 (expected to be updated in 2022). Many plans are below the thresholds today, but are likely to exceed them in the next decade. The thresholds will be indexed at CPI-U, which is lower than the medical inflation rates affecting the cost of the plans. There is considerable uncertainty about how the tax would be applied, and considerable latitude in grouping of participants for tax purposes. Combining early retiree and Medicare eligible retiree costs is allowed and can keep plans under the thresholds for a longer period of time.

For this Plan it is intended that, for purposes of the test, the pre and post Medicare members will be blended. The plan sponsor will need to decide whether to reduce benefits to avoid the tax, or how the additional cost will be allocated between the employer and the members. A 6.1% load was applied to health care liabilities to approximate the cost for future excise tax.

Comment H: The following table shows necessary disclosures for Public Act 202 of 2017 under the Uniform Actuarial Assumptions. These results use healthcare inflation with an initial rate of 8.50% decreasing by 0.25% per year to a 4.50% long-term rate for Non-Medicare premiums and an initial rate of 7.00% decreasing by 0.25% per year to a 4.50% long-term rate for Medicare premiums.

Funding Value of Assets (FVA)	$ 82,669,449
Actuarial Accrued Liability (AAL)	127,435,227
Funded Status	64.90%
Total City Contribution Requirement for FY 2021	
as Percent of Payroll	32.04%
as annual dollar amount	$ 4,216,705

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 6.50% on the Actuarial Value of Assets), it is expected that:

(1) The employer normal cost will be sufficient to finance benefits accruing each year.
(2) The Unfunded Actuarial Accrued Liabilities (UAAL) will be fully amortized after 23 years (June 30, 2043).
(3) The funded status of the plan will increase gradually towards a 100% funded ratio.

The above statements assume that the full Actuarial Determined Employer Contribution (ADEC) is contributed each year.

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the Actuarial Accrued Liability (using a 6.50% discount rate) and the Actuarial 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, of transferring the obligation to an independent third party in a market based transaction.
(2) The measurement is dependent upon the actuarial cost method which, in combination with an 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 Actuarial Value of Assets, unless the market value of assets is used in the measurement.

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 System'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 computed contribution shown on page A-1 may be considered as a minimum contribution rate that complies with the Board's funding policy. 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.

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:

	2018	2016
Ratio of the market value of assets to payroll	455.4%	422.7%
Ratio of actuarial accrued liability to payroll	698.3%	786.8%
Ratio of actives to retirees and beneficiaries	55.9%	62.3%
Ratio of net cash flow to market value of assets	0.2%	0.4%

RATIO OF ACTIVE TO RETIREES AND BENEFICIARIES

A young plan with many active members and few retirees will have a high ratio of active 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 RETIREE ACTUARIAL ACCRUED LIABILITY TO TOTAL LIABILITY

The ratio of retiree liability to the total actuarial accrued liability gives an indication of the maturity of the plan. As the ratio increases, cash flow needs increase, and the liquidity needs of the portfolio change. A ratio on the order of 50% indicates a maturing system. In the case of a closed plan, this ratio will eventually reach 100%.

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 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.

ADDITIONAL RISK ASSESSMENT

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability.

SECTION B

RETIREE PREMIUM RATE DEVELOPMENT

Retiree Premium Rate Development

City of Troy retirees participate in both fully-insured and self-insured plans.

First, the per capita costs were developed for the self-insured retirees. The self-insured premium rates were developed separately for each class (pre-65 and post-65). The rates were calculated by using actual paid claims and exposure data for the period of January 2016 to December 2018, adjusted for catastrophic claims, plus the load for administration, network access fees, and stop loss premiums. The self-insured medical and prescription drug data was provided by the City. The medical and prescription drug data was split between the pre-65 and post-65 participants since Medicare is available for the post-65 participants and has a significant impact on the claim experience. Furthermore, since the prescription drug claims and the medical claims exhibit different trends and claim payment patterns, these claims are analyzed separately as well.

Next, the initial premium rates for the fully-insured retirees were developed for the two classes of retirees (pre-65 and post-65). The fully-insured rates provided by the City of Troy were utilized to determine the appropriate premium rates. The pre-65 fully insured premium rate (HAP and BCN) provided by the City are at the level that we assume they are appropriate for a retiree population and not blended with active participants. Therefore, the fully-insured premium rates were used as the basis of the initial per capita cost without adjustment. Similarly, the post-65 retirees, the fully-insured rates were used as the basis of the initial per capita cost, without adjustment, since the fully-insured rates reflects the demographics of the post-65 retiree group.

Age graded and sex distinct premiums are utilized in this valuation. The premiums developed by the preceding process are appropriate for the unique age and sex distribution currently existing. Over the future years covered by this valuation, the age and sex distribution will most likely change. Therefore, our process “distributes” the average premium over all age/sex combinations and assigns a unique premium for each specific age/sex combination. The age/sex specific premiums more accurately reflect the health care utilization and cost at that age.

The dental premium rates are not “age graded” for this valuation, since dental claims do not vary significantly by age. For the retirees that are eligible, the dental premium used for this valuation is $32.72 per person for pre-65 retirees and $30.67 per person for post-65 retirees.

Any potential impact of the Retiree Drug Subsidy (RDS) that is part of the Medicare Prescription Drug Improvement and Modernization Act of 2003 is not reflected in this report.

Retiree Premium Rate Development (Concluded)

The tables below show the combined medical and prescription drug one-person monthly premiums at select ages. The premium (or per capita costs) rates shown below reflect the use of age grading.

Current Self-Insured Retirees

For Those Not Eligible for Medicare

Age	Male	Female
45	$ 457.66	$ 631.63
50	595.93	734.12
55	784.17	856.20
60	1,012.80	997.26

For Those Eligible for Medicare

Age	Male	Female
65	$ 745.65	$ 703.30
70	812.29	786.01
75	872.41	851.28

Future Retirees (Blended)

For Those Not Eligible for Medicare

Age	Male	Female
45	$ 348.40	$ 480.83
50	453.65	558.85
55	596.95	651.78
60	771.00	759.17

For Those Eligible for Medicare

Age	Male	Female
65	$ 506.92	$ 478.12
70	552.21	534.35
75	593.09	578.72

Current Fully Insured Retirees

For Those Not Eligible for Medicare

Age	Male	Female
45	$ 582.86	$ 804.42
50	758.95	934.95
55	998.69	1,090.42
60	1,289.86	1,270.07

For Those Eligible for Medicare

Age	Male	Female
65	$ 649.10	$ 612.23
70	707.11	684.24
75	759.45	741.05

James Pranschke is a Member of the American Academy of Actuaries (MAAA) and meets the Qualification Standards of the American Academy of Actuaries to certify the per capita retiree health care rates shown above.

James E. Pranschke

James Pranschke, FSA, FCA, MAAA

SECTION C

SUMMARY OF BENEFIT PROVISIONS AND VALUATION DATA

Summary of Benefits as of December 31, 2018

Plan Participants

Employees, retirees, and spouses of the City of Troy who satisfy the following requirements are eligible to receive retiree health care coverage.

Health Insurance Premium Subsidy

Post-retirement health insurance premiums are subsidized by the City as follows:

T.C.O.A. – Retired after 7/1/1994 receive 4% per completed year up to 100% max. Eligible active members prior to 2/15/2015 receive 4% per completed year up to 100% max. New eligible active members after 2/15/2015 receive 3% per completed year up to 90% max.

T.P.O.A. – Retired after 2/20/1996 receive 4% per completed year. Eligible active members receive 4% per completed year up to 100% max.

M.A.P. – Eligible active members up to 6/30/2013 receive the greater of $400/month or 4% per completed year up to 100% max. After 6/30/2013 the percent for active members change to 3% for future completed years up to 90% max.

T.C.S.A. – Eligible active members up to 6/30/2013 receive 4% per completed year up to 100% max. Eligible active members after 6/30/2013 receive 3% per completed year up to 90% max.

T.F.S.O.A. – Retired after 1/1/1999 receive 4% per completed year up to 100% max. Eligible active members up to 6/30/2014 receive 4% per completed year up to 100% max. After 6/30/2014 eligible active members receive 3% per completed year up to 90% max.

A.F.S.C.M.E. – Eligible active members up to 6/30/2013 receive the greater of $400/month or 4% per completed year up to 100% max. Eligible active members after 6/30/2013 receive the greater of $400/month or 3% per completed year up to 90% max.

Classified/Exempt – Eligible active members up to 6/30/2015 receive 4% per completed year up to 100% max. Eligible active members after 6/30/2015 receive the greater of $400/month or 3% per completed year up to 90% max.

Regular Retirement Eligibility

T.P.O.A., T.F.S.O.A., and T.C.O.A. members – 25 years of service; or age 60 with 10 years of service.

AFSCME, Classified/Exempt, Clerical – Age 50 with 27 years of service; or age 55 with 25 years of service; or age 60 with 10 years of service.

There is no mandatory retirement age.

Summary of Benefits as of December 31, 2018 (Continued)

Health insurance from the City is not available for the following employees when they retire:

T.C.O.A. – Hired after 7/1/2011 with the exception of T.P.O.A. member transfers who carry over same benefit level.
T.P.O.A. – Hired after 7/1/2011
M.A.P. – Hired after 2/18/2008
T.C.S.A. – Hired after 2/18/2008
T.F.S.O.A. – Hired after 7/1/2006
A.F.S.C.M.E. – Hired after 7/1/2006
Classified/Exempt – Hired after 1/2/2006

Early Retirement Eligibility

Age 55 with 10 years of service. Benefit commences immediately.

Deferred Retirement

Members retiring under deferred retirement conditions are not eligible for retiree health care through the City.

Duty Disability Retirement Eligibility

No age or service requirement. Benefit commences immediately. Worker's compensation must be payable.

Non-Duty Disability Retirement Eligibility

5 years of service (10 years for Classified/Exempt employees hired after February 1996, and MAP employees hired after February 2005). Benefit commences immediately.

Duty Death Before Retirement Eligibility

No age or service requirement. Benefit commences immediately.

Non-Duty Death Before Retirement Eligibility

10 years of service. Benefit commences immediately.

Non-Medicare and Medicare–Eligible Provisions

Members and spouse have the option to enroll in Medicare Part B, unless required by their insurance carrier. Premium for Medicare Part B, if elected, is the responsibility of the retiree or spouse.

Summary of Benefits as of December 31, 2018 (Concluded)

Benefits for Spouses of Retired Employees

Spouses of living retirees are eligible for retiree health care coverage through the City. Only the spouse named at time of retirement is eligible. For retirees receiving a percentage (i.e., 3% or 4%) of their premium paid, the spouse receives an equal percentage of their premium paid. For retirees receiving a $400 benefit, the spouse may use any amount that is above and beyond the cost of the retiree's premium, but is not eligible for an additional $400.

Surviving spouses of deceased retirees are eligible for retiree health care coverage through the City if the surviving spouse is receiving a survivor's DB pension or is the spouse of a DC member. The surviving spouse's benefit amount is equal to a retiree's one person coverage.

Vision Coverage

BCN Members Only – Retirees/spouses enrolled in a Blue Care Network plan that provides vision coverage are eligible for such coverage.

Dental Coverage

Certain T.C.O.A. members and their spouses are eligible for retiree dental coverage.

Retiree dental coverage is paid by the City for these certain T.C.O.A. retirees and their spouses at the rate of 4% per completed year of service.

Life Insurance Coverage

City paid life insurance coverage is not offered to retirees of the City of Troy.

Retiree Opt-Out

Retirees who opt not to participate in the City's plan are not eligible for any payment in lieu of coverage. Retirees that opt-out of coverage are eligible to elect coverage at a later time.

Retiree Health Savings Account

Participating employees in the Retiree Health Savings Account contribute 2% of salary while working to their RHS account, the City contributes 4% of the employee's salary to the account which is used for health insurance premiums, reimbursement, etc. when they retire. These members are not included in this actuarial valuation.

This is a brief summary of the City of Troy Retiree Health Care Plan provisions. In the event that any description contained herein differs from the actual eligibility or benefit, the appropriate employee contract or governing document will prevail.

Market Value of Assets as of December 31, 2018

Cash	$	2,035,069
Accrued Interest		130,072
Short-Term		-
U.S. Bonds		-
Corporate Bonds		14,846,157
Bond Mutual Fund		4,649,447
ETF - Fixed		1,190,045
Common Stock		17,171,326
PFD Stock		-
Stock Mutual Fund		24,034,443
Exchange-Traded Funds		13,191,623
Total System Assets	$	77,248,182
Less: Accounts Payable		-
Net System Assets	$	77,248,182

Revenues and Expenditures

	2017	2018
Balance - January 1	$72,292,899	$82,099,565
Revenues		
Employees' contributions	0	0
Employer contributions	4,476,649	5,398,338
Investment income	11,465,421	(4,701,280)
Other Income (RDS Part D)	33,309	149,655
Expenses		
Benefit payments	5,898,415	5,409,482
Refunds of member contributions	0	0
Administrative expenses	0	0
Investment expenses	235,511	272,077
Actuary Fees	29,750	10,500
Miscellaneous	5,037	6,037
Balance - December 31	$82,099,565	$77,248,182

Development of the Actuarial Value of Assets

	2017	2018	2019	2020	2021	2022
A. Funding Value Beginning of Year	$75,442,935	$79,161,043				
B. Market Value End of Year	82,099,565	77,248,182				
C. Market Value Beginning of Year	72,292,899	82,099,565				
D. Non-Investment Net Cash Flow	(1,388,457)	138,511				
E. Investment Income:						
E1. Market Total: B-C-D	11,195,123	(4,989,894)				
E2. Assumed Rate	6.50%	6.50%				
E3. Amount for Immediate Recognition: E2 * (A+D/2)	4,858,666	5,149,969				
E4. Amount for Phased-In Recognition: E1-E3	6,336,457	(10,139,863)				
F. Phased-In Recognition of Investment Income:						
F1. Current Year: 0.20*E4	1,267,291	(2,027,973)				
F2. First Prior Year	(91,860)	1,267,291	$ (2,027,973)			
F3. Second Prior Year	(927,532)	(91,860)	1,267,291	$ (2,027,973)		
F4. Third Prior Year		(927,532)	(91,860)	1,267,291	$ (2,027,973)	
F5. Fourth Prior Year			(927,531)	(91,861)	1,267,293	$ (2,027,971)
F6. Total Recognized Investment Gain	247,899	(1,780,074)	(1,780,073)	(852,543)	(760,680)	(2,027,971)
G. Funding Value End of Year: A+D+E3+F6	**79,161,043**	**82,669,449**				
H. Difference between Market & Funding Value	2,938,522	(5,421,267)				
I. Recognized Rate of Return	6.83%	4.25%				
J. Market Rate of Return	15.64%	-6.07%				
K. Ratio of Funding Value to Market Value	96%	107%				

The Actuarial Value of Assets recognizes assumed investment income (line E3) fully each year. Differences between actual and assumed investment income (line E4) are phased-in over a closed five-year period. During periods when investment performance exceeds the assumed rate, Actuarial Value of Assets will tend to be less than Market Value. During periods when investment performance is less than the assumed rate, Actuarial Value of Assets will tend to be greater than Market Value. The Actuarial Value of Assets is unbiased with respect to Market Value. At any time it may be either greater or less than Market Value. If assumed rates are exactly realized for five consecutive years, it will become equal to Market Value.

General Employees
Active Member Demographic Data as of December 31, 2018

Attained Age	Years of Service to Valuation Date							Total No.
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	
30-34			1					1
35-39				2				2
40-44			2	9	1	1		13
45-49			2	10	1	3		16
50-54			3	9	6	2		20
55-59			2	11	12	5	4	34
60-64			3	4	3	10	2	22
65 & Over			1	5	2		1	9
Totals			**14**	**50**	**25**	**21**	**7**	**117**

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age:	54.6	years
Service:	21.0	years

Public Safety Employees
Active Member Demographic Data as of December 31, 2018

Attained Age	Years of Service to Valuation Date							Total No.
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	
30-34		1						1
35-39			7	1				8
40-44			9	11	3			23
45-49				7	13			20
50-54			2	2	10	1		15
55-59						2	1	3
60-64			1	2		1	2	6
Totals		**1**	**19**	**23**	**26**	**4**	**3**	**76**

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age:	46.6	years
Service:	19.6	years

Retired Member Demographic Data as of December 31, 2018

General Retirees

Attained Age	Number of Retirees		
	Male	Female	Total
Under 55	0	4	4
55-59	5	9	14
60-64	34	13	47
65 & Over	88	77	165
Totals	**127**	**103**	**230**

Public Safety Retirees

Attained Age	Number of Retirees		
	Male	Female	Total
Under 55	3	1	4
55-59	10	8	18
60-64	28	2	30
65 & Over	56	7	63
Totals	**97**	**18**	**115**

Only retirees indicated as receiving health care are valued in this report and shown in the exhibits above.

Retirees Listed by Medical Plan Coverage

Medical Plan	1 Person	2 Person/Family	Total
Blue Care Network	9	11	20
HAP	15	34	49
BCBS Medicare Advantage	21	20	41
BCBS PPO	43	84	127
BCBS Traditional	52	56	108
Total	**140**	**205**	**345**

SECTION D

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

Valuation Methods

Actuarial Cost Method. Normal cost and the allocation of benefit values between service rendered before and after the valuation date was determined using an **Individual Entry-Age Normal Actuarial Cost Method** having the following characteristics:

(i) the annual normal cost for each individual active member, payable from the date of employment to the date of retirement, is sufficient to accumulate the value of the member's benefit at the time of retirement; and

(ii) each annual normal cost is a constant percentage of the member's year by year projected covered pay.

Actuarial gains (losses), as they occur, reduce (increase) the Unfunded Actuarial Accrued Liability.

Financing of Unfunded Actuarial Accrued Liabilities. Unfunded Actuarial Accrued Liabilities (UAAL) were amortized on a level dollar basis. The UAAL were determined using the Actuarial Value of Assets and Actuarial Accrued Liability calculated as of the valuation date. The UAAL amortization payment is the amount required to fully amortize the UAAL over a 23-year period beginning fiscal year July 1, 2020. This UAAL payment does not reflect any payments expected to be made between the valuation date and the fiscal year for which the contributions in this report have been calculated.

***Rates of Investment Return under a fully funded arrangement*. 6.50% per year,** compounded annually, net of expenses. This rate consists of a real rate of return of 3.00% a year (over wages) plus a long-term rate of wage growth of 3.50% a year. This assumption is used to equate the value of payments due at different points in time. Although not explicitly used in the valuation, the economic assumptions are consistent with a price inflation assumption of 2.60% per year.

The actuary calculates contribution requirements and actuarial present values of a retirement system by applying actuarial assumptions to the benefit provisions and people information of the system, using the actuarial cost methods described on this page. All actuarial assumptions are adopted by the Board after consulting with the actuary. All actuarial assumptions are based on future expectations, not market measures.

All actuarial assumptions are estimates of future experience. Assumptions were reviewed and updated based on the 2001-2006 Employees Retirement System Experience Study which includes a rational for those assumptions. In addition, the mortality tables (which reflect national trends) were reviewed and updated for the December 31, 2018 valuation. The reasonableness of the economic assumptions was based on capital market expectations provided by various investment consultants and other sources such as the Social Security Trustees report.

Actuarial Assumptions

Rates of Salary Increase. Employee salaries are estimated to increase between the date of hire and date of retirement. Salary increases occur in recognition of (i) individual merit and seniority, (ii) inflation-related depreciation of the purchasing power of salaries, and (iii) competition from other employers for personnel. A schedule of long-term rates of increase in individual salaries used for the valuation follows for sample ages:

	% Increase in Salary at Sample Ages		
Sample Ages	Merit & Seniority	Base (Economic)	Increase Next Year
35	2.5%	3.5%	6.0%
40	2.2%	3.5%	5.7%
45	1.7%	3.5%	5.2%
50	1.2%	3.5%	4.7%
55	0.7%	3.5%	4.2%
60	0.2%	3.5%	3.7%
65	0.0%	3.5%	3.5%

Pay Projections. Active member covered payroll was projected to increase 3.50% a year, for the purpose of determining the level percent of payroll contributions. The rate of increase is consistent with the base rate of increase in salaries used to calculate actuarial present values.

Actuarial Assumptions

***Mortality*.** This assumption is used to measure the probabilities of members dying before retirement and the probabilities of each benefit payment being made after retirement. The tables used are as follows:

- Healthy Pre-Retirement: The RPH-2014 Employee Generational Mortality Tables (Total Data Set), extended via cubic spline. This table is adjusted backwards to 2006 with the MP-2014 scale. A base year of 2006 with future mortality improvements assumed each year using scale MP-2018. 20% of deaths-in-service are assumed to be duty related.
- Healthy Post-Retirement: The RPH-2014 Healthy Annuitant Generational Mortality Tables (Total Data Set), extended via cubic spline. This table is adjusted backwards to 2006 with the MP-2014 scale. A base year of 2006 with future mortality improvements assumed each year using scale MP-2018.
- Disability Retirement: The RPH-2014 Disabled Mortality Table (Total Data Set), extended via cubic spline. This table is adjusted backwards to 2006 with the MP-2014 scale. A base year of 2006 with future mortality improvements assumed each year using scale MP-2018.

Sample Attained Ages in 2018	Healthy Post-Retirement Future Life Expectancy (Years)*		Disabled Retirement Future Life Expectancy (Years)*	
	Men	Women	Men	Women
55	28.40	31.48	20.34	24.93
60	24.03	26.83	17.39	21.30
65	19.90	22.45	14.68	17.98
70	16.02	18.27	12.08	14.76
75	12.41	14.35	9.58	11.67
80	9.21	10.79	7.30	8.90

* *Based on retirements in 2018. Retirements in future years will reflect improvements in life expectancy.*

The provision for future mortality improvement is the fully generational projection table MP-2018, beginning in 2006.

Actuarial Assumptions

The rates of retirement used to measure the probability of eligible members retiring during the next year, were as follows:

	Percent of Eligible Active Members Retiring within Next Year			
Retirement Ages	Non-Exempt, General AFSCME, Clerical, and MAP	T.F.S.O.A. & Exempt	T.C.O.A.	T.P.O.A.
43			35 %	40 %
44			25	40
45			20	40
46			15	40
47			15	40
48			15	40
49			15	35
50	15 %	35 %	15	20
51	10	25	25	15
52	5	20	30	15
53	5	15	100	15
54	5	15		15
55	5	15		15
56	5	15		15
57	5	15		25
58	5	25		100
59	5	30		
60	5	100		
61	5			
62	30			
63	10			
64	10			
65	100			

T.P.O.A, T.F.S.O.A. and T.C.O.A. members were assumed to be eligible for retirement after 25 years of service, or after attaining age 60 with 10 or more years of service. General AFSCME, General Clerical, and Classified or Exempt members were assumed to be eligible for retirement after attaining age 50 with 27 years of service, or age 55 with 25 years of service; or age 60 with 10 years of service.

No active members were assumed to elect early retirement.

Actuarial Assumptions

Rates of separation from active membership are used to estimate the number of employees at each age that are expected to terminate employment before qualifying for retirement benefits. The withdrawal rates do not apply to members eligible to retire, and do not include separation on account of death or disability.

Sample rates of separation from active employment are shown below:

Sample Ages	Years of Service	% of Active Members Separating Within Next Year	
		General	Public Safety
ALL	0	30.00 %	15.00 %
	1	20.00	10.00
	2	15.00	8.00
	3	10.00	7.00
	4	7.00	6.00
25	5 & Over	6.00	5.00
30		6.00	4.50
35		6.00	3.55
40		6.00	1.45
45		3.50	0.75
50		1.50	0.75
55		1.50	0.75
60		1.50	0.75

Actuarial Assumptions

Rates of disability among active members are used to estimate the incidence of member disability in future years. Eighty percent (80%) of disabilities were assumed to be non-duty related.

Sample Ages	Percent Becoming Disabled Within Next Year	
	Male	Female
20	0.08 %	0.10 %
25	0.08	0.10
30	0.08	0.10
35	0.08	0.10
40	0.20	0.36
45	0.27	0.41
50	0.49	0.57
55	0.89	0.77
60	1.41	1.02
65	1.66	1.23

Health care trend rates used in the valuation were as shown below:

Year	Medical and Prescription Drugs	Dental
2019	8.25%	3.50%
2020	7.50%	3.50%
2021	7.00%	3.50%
2022	6.50%	3.50%
2023	6.00%	3.50%
2024	5.50%	3.50%
2025	5.00%	3.50%
2026	4.50%	3.50%
2027	4.00%	3.50%
2028 & Later	3.50%	3.50%

Miscellaneous and Technical Assumptions

Decrement Operation:	Disability and mortality decrements do not operate during the first five years of service. Disability and withdrawal also 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 exact fractional service on the date the decrement is assumed to occur.
Marriage Assumption:	90% of males and 90% 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.
Medicare Coverage:	Assumed to be available for all covered employees on attainment of age 65.
Children:	Children of active employees were assumed to not receive coverage upon retirement of the employee.
Election Percentage:	(General) It was assumed that 80% of retirees would choose to receive retiree health care benefits through the City. Of those assumed to elect coverage, 63% of retirees assumed to elect two-person coverage, if eligible. For those that elect two-person coverage, it was assumed that coverage would continue to the spouse upon death of the retiree 75% of the time, if eligible. (Public Safety) It was assumed that 80% of retirees would choose to receive retiree health care benefits through the City. Of those assumed to elect coverage, 75% of retirees assumed to elect two-person coverage, if eligible. For those that elect two-person coverage, it was assumed that coverage would continue to the spouse upon death of the retiree 75% of the time, if eligible. All T.C.O.A. members are assumed to be eligible for dental coverage.
Retiree Opt-Outs:	Retirees and spouses who have opted-out of coverage are assumed to not re-enroll.
Excise Tax:	In order to reflect the projected excise tax from the Affordable Care Act, all liabilities were increased by 6.1%.
Census Data:	Data was received from the City. Retiree records that were indicated to have two-person coverage but were missing information for the second person were assumed to follow the age difference as indicated by the marriage assumption above.

SECTION E

SUPPLEMENTARY INFORMATION

Supplementary Information

Valuation Date	December 31, 2018
Actuarial Cost Method	Individual Entry Age Normal Cost
Amortization Method	Level Dollar Closed
Remaining Amortization Period	23 Years (fiscal year beginning July 1, 2020)
Asset Valuation Method	Actuarial Value – 5-Year Smoothing
Actuarial Assumptions:	
Discount Rate	6.50% Per Year
Projected Salary Increases	3.50% - 8.00%
Valuation Health Care Cost Trend Rate	
Medical, Prescription Drug, and Vision	8.25% in 2019, grading to 3.50% in 2028
Dental	3.50% for all years

Supplementary Information (Concluded)

Rounded to the Nearest $1,000

Actuarial Valuation Date December 31	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (b)-(a)	Funded Ratio (a)/(b)	Active Member Covered Payroll (c)	Unfunded AAL as a Percentage of Active Member Covered Payroll ((b-a)/c)
2003	$ 32,815	$ 37,000	$ 4,186	88.7 %	$31,790	13.2 %
2004	36,484	40,419	3,935	90.3	30,046	13.1
2005	37,190	43,554	6,364	85.4	29,937	21.3
2006*	43,983	78,901	34,918	55.7	31,038	112.5
2008	38,094	91,966	53,872	41.4	31,168	172.8
2010	60,360	89,952	29,592	67.1	25,951	114.0
2012	59,131	100,064	40,932	59.1	19,194	213.2
2014	68,440	114,427	45,987	59.8	19,614	234.5
2016	75,443	134,544	59,101	56.1	17,101	345.6
2018	**82,669**	**118,455**	**35,786**	**69.8**	**16,962**	**211.0**

* *After adoption of OPEB compliant methods and assumptions.*

APPENDIX

GLOSSARY

Glossary

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

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 Determined Employer Contribution (ADEC) - The ADEC is the normal cost plus the portion of the Unfunded Actuarial Accrued Liability to be amortized in the current period. The ADEC is an amount that is actuarially determined in accordance with the requirements so that, if paid on an ongoing basis, it would be expected to provide sufficient resources to fund both the normal cost for each year and the amortized unfunded liability.

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.

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.

Governmental Accounting Standards Board (GASB) - GASB is the private, nonpartisan, nonprofit organization that works to create and improve the rules U.S. state and local governments follow when accounting for their finances and reporting them to the public.

Medical Trend Rate (Health Care Inflation) - The increase in the cost of providing health care benefits over time. Trend includes such elements as pure price inflation, changes in utilization, advances in medical technology, and cost shifting.

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.

Glossary (Concluded)

Other Postemployment Employee Benefits (OPEB) - OPEB are postemployment benefits other than pensions. OPEB generally takes the form of health insurance and dental, vision, prescription drugs or other health care benefits.

Reserve Account - An account used to indicate that funds have been set aside for a specific purpose and is 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."

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