



GASB 74/75 INTERIM ACTUARIAL VALUATION

Fiscal Year Ending December 31, 2022

SHELBY TOWNSHIP

CONTACT

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April 11, 2023

**Allan McDonald
Shelby Township
52700 Van Dyke Avenue
Shelby Township, MI 48316**

This report summarizes the interim GASB actuarial valuation for the Shelby Township 2022 fiscal year . To the best of our knowledge, the report presents a fair position of the funded status of the plan in accordance with GASB Statement No. 74 (Financial Reporting for Post-Employment Benefit Plans Other Than Pension Plans) and GASB Statement No. 75 (Accounting and Financial Reporting by Employers for Post-Employment Benefits Other Than Pensions). This report may not be appropriate for other purposes. Please contact Nyhart prior to disclosing this report to any other party or relying on its content for any purpose other than that explained above. Failure to do so may result in misrepresentation or misinterpretation of this report.

The information presented herein is based on the actuarial assumptions and substantive plan provisions summarized in this report and participant information furnished to us by the Plan Sponsor. Asset information has been provided to us by the trustee. We have reviewed the employee census provided by the Plan Sponsor for reasonableness when compared to the prior information provided but have not audited the information at the source, and therefore do not accept responsibility for the accuracy or the completeness of the data on which the information is based . When relevant data may be missing, we may have made assumptions we feel are neutral or conservative to the purpose of the measurement . We are not aware of any significant issues with and have relied on the data provided.

The discount rate, other economic assumptions, and demographic assumptions have been selected by the Plan Sponsor with the concurrence of Nyhart . In our opinion, the actuarial assumptions are individually reasonable and in combination represent our estimate of anticipated experience of the Plan . All calculations have been made in accordance with generally accepted actuarial principles and practice .

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

- plan experience differing from that anticipated by the economic or demographic assumptions;
- changes in economic or demographic assumptions;
- increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and
- changes in plan provisions or applicable law.

We did not perform an analysis of the potential range of future measurements due to the limited scope of our engagement .

To our knowledge, there have been no significant events prior to the current year's measurement date or as of the date of this report that could materially affect the results contained herein.



Neither Nyhart nor any of its employees has any relationship with the plan or its sponsor that could impair or appear to impair the objectivity of this report. Our professional work is in full compliance with the American Academy of Actuaries "Code of Professional Conduct" Precept 7 regarding conflict of interest. The undersigned are compliant with the continuing education requirements of the Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States.

Should you have any questions please do not hesitate to contact us.

A handwritten signature in black ink that reads 'Nisha Sundi'.

Nisha Sundi, FSA, MAAA
Actuary

A handwritten signature in black ink that reads 'Sandy DeKalb'.

Sandy DeKalb ASA, MAAA
Actuary

Executive Summary

Shelby Township Interim GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

Summary of Results

Presented below is the summary of GASB 75 results for the fiscal year ending December 31, 2022 compared to the prior fiscal year as shown in the Township's Notes to Financial Statement.

| | As of December 31, 2021 | As of December 31, 2022 |
|----------------------------------|-------------------------|-------------------------|
| Total OPEB Liability | \$ 85,240,938 | \$ 82,470,896 |
| Actuarial Value of Assets | \$ (75,388,992) | \$ (66,757,701) |
| Net OPEB Liability | \$ 9,851,946 | \$ 15,713,195 |
| Funded Ratio | 88.4% | 80.9% |

| | FY 2021 | FY 2022 |
|--|----------------|----------------|
| OPEB Expense | \$ (2,208,915) | \$ (1,856,647) |
| Annual Employer Contributions | \$ 4,150,660 | \$ 4,144,283 |
| Actuarially Determined Contribution | \$ 2,540,377 | \$ 1,772,934 |

| | As of December 31, 2021 | As of December 31, 2022 |
|----------------------------------|-------------------------|-------------------------|
| Discount Rate | 6.75% | 6.75% |
| Expected Return on Assets | 6.75% | 6.75% |

GASB Disclosures

Shelby Township Interim GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

Schedule of Changes in Net OPEB Liability and Related Ratios

| OPEB Liability | FY 2022 | FY 2021 | FY 2020 | FY 2019 | FY 2018 |
|--|----------------------|---------------------|----------------------|----------------------|----------------------|
| Total OPEB Liability | | | | | |
| Total OPEB Liability - beginning of year | \$ 85,240,938 | \$ 81,579,007 | \$ 82,701,240 | \$ 76,740,322 | \$ 82,753,454 |
| Service cost | 983,437 | 1,207,044 | 1,223,200 | 1,324,049 | 1,277,181 |
| Interest | 5,706,548 | 5,489,631 | 5,584,035 | 5,183,329 | 5,585,818 |
| Change of benefit terms | 0 | 0 | 0 | 0 | 0 |
| Changes in assumptions | 0 | 323,753 | 0 | 402,951 | 0 |
| Differences between expected and actual experience | (6,094,190) | (442,115) | (5,533,480) | 1,599,226 | (10,278,171) |
| Benefit payments | (3,365,837) | (2,916,382) | (2,395,988) | (2,548,637) | (2,597,960) |
| Net change in total OPEB liability | \$ (2,770,042) | \$ 3,661,931 | \$ (1,122,233) | \$ 5,960,918 | \$ (6,013,132) |
| Total OPEB Liability - end of year | \$ 82,470,896 | \$ 85,240,938 | \$ 81,579,007 | \$ 82,701,240 | \$ 76,740,322 |
| Plan Fiduciary Net Position | | | | | |
| Plan fiduciary net position - beginning of year | \$ 75,388,992 | \$ 63,949,738 | \$ 54,617,453 | \$ 43,256,019 | \$ 40,282,470 |
| Contributions - employer | 4,144,283 | 4,150,660 | 4,964,907 | 5,158,256 | 8,379,343 |
| Contributions - active employees | 0 | 0 | 0 | 0 | 0 |
| Net investment income | (8,975,614) | 10,809,283 | 7,124,021 | 9,102,619 | (2,517,121) |
| Benefit payments | (3,365,837) | (2,916,382) | (2,395,988) | (2,548,637) | (2,597,960) |
| Trust administrative expenses | (434,123) | (604,307) | (360,655) | (350,804) | (290,713) |
| Net change in plan fiduciary net position | \$ (8,631,291) | \$ 11,439,254 | \$ 9,332,285 | \$ 11,361,434 | \$ 2,973,549 |
| Plan fiduciary net position - end of year | \$ 66,757,701 | \$ 75,388,992 | \$ 63,949,738 | \$ 54,617,453 | \$ 43,256,019 |
| Net OPEB Liability - end of year | \$ 15,713,195 | \$ 9,851,946 | \$ 17,629,269 | \$ 28,083,787 | \$ 33,484,303 |
| Plan fiduciary net position as % of total OPEB liability | 80.9% | 88.4% | 78.4% | 66.0% | 56.4% |
| Covered employee payroll | \$ 13,580,477 | \$ 13,089,616 | \$ 14,271,967 | \$ 13,756,113 | \$ 14,269,367 |
| Net OPEB liability as % of covered payroll | 115.7% | 75.3% | 123.5% | 204.2% | 234.7% |

* FY 2022 covered payroll is estimated based on the FY 2021 payroll increased by the payroll inflation assumption (3.75%).

GASB Disclosures

Shelby Township Interim GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

Schedule of Employer Contributions

The Actuarially Determined Contributions (ADC) shown below are based on the Annual Required Contribution (ARC) calculated in prior GASB 45 actuarial valuations as shown in the Township's financial statements.

| | FY 2022 | FY 2021 | FY 2020 | FY 2019 | FY 2018 |
|---|----------------|----------------|----------------|----------------|----------------|
| Actuarially Determined Contribution (ADC) | \$ 1,772,934 | \$ 2,540,377 | \$ 3,239,304 | \$ 3,653,012 | \$ 4,127,952 |
| Contributions in relation to the ADC | 4,144,283 | 4,150,660 | 4,964,907 | 5,158,256 | 8,379,343 |
| Contribution deficiency/(excess) | \$ (2,371,349) | \$ (1,610,283) | \$ (1,725,603) | \$ (1,505,244) | \$ (4,251,391) |
| Covered employee payroll | \$ 13,580,477 | \$ 13,089,616 | \$ 14,271,967 | \$ 13,756,113 | \$ 14,269,367 |
| Contribution as a % of covered payroll | 30.5% | 31.7% | 34.8% | 37.5% | 58.7% |

| | FY 2017 | FY 2016 | FY 2015 | FY 2014 | FY 2013 |
|---|----------------|---------------|---------------|---------------|---------------|
| Actuarially Determined Contribution (ADC) | \$ 4,488,364 | \$ 5,815,278 | \$ 5,773,353 | \$ 5,773,353 | \$ 5,079,690 |
| Contributions in relation to the ADC | 9,927,224 | 5,142,960 | 4,599,525 | 3,527,026 | 4,416,806 |
| Contribution deficiency/(excess) | \$ (5,438,860) | \$ 672,318 | \$ 1,173,828 | \$ 2,246,327 | \$ 662,884 |
| Covered employee payroll | \$ 13,753,607 | \$ 13,897,076 | \$ 14,554,860 | \$ 14,554,860 | \$ 16,179,279 |
| Contribution as a % of covered payroll | 72.2% | 37.0% | 31.6% | 24.2% | 27.3% |

*Includes employer contribution for pay-go cost paid from the General Fund and pre-funding contributions deposited into the OPEB Trust. FY 2022 covered payroll is estimated based on the FY 2021 payroll increased by the payroll inflation assumption (3.75%).

GASB Disclosures

Shelby Township Interim GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

OPEB Expense

| OPEB Expense | FY 2022 | FY 2021 |
|---|----------------|----------------|
| Discount Rate | | |
| Beginning of year | 6.75% | 6.75% |
| End of year | 6.75% | 6.75% |
| Service cost | \$ 983,437 | \$ 1,207,044 |
| Interest | 5,706,548 | 5,489,631 |
| Change of benefit terms | 0 | 0 |
| Projected earnings on OPEB plan investments | (5,100,378) | (4,337,869) |
| Reduction for contributions from active employees | 0 | 0 |
| OPEB plan administrative expenses | 434,123 | 604,307 |
| Current period recognition of deferred outflows / (inflows) of resources | | |
| Differences between expected and actual experience | \$ (4,753,237) | \$ (3,229,688) |
| Changes in assumptions | 161,528 | 161,528 |
| Net difference between projected and actual earnings on OPEB plan investments | 711,332 | (2,103,868) |
| Total current period recognition | \$ (3,880,377) | \$ (5,172,028) |
| Total OPEB expense | \$ (1,856,647) | \$ (2,208,915) |

GASB Disclosures

Shelby Township Interim GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

Deferred Outflows / (Inflows) of Resources

Deferred Outflows / (Inflows) of Resources represents the following items that have not been recognized in the OPEB Expense :

1. Differences between expected and actual experience of the OPEB plan
2. Changes of assumptions
3. Differences between projected and actual earnings in OPEB plan investments (for funded plans only)

The initial amortization period for the first two items noted above is based on expected future service lives while the difference between the projected and actual earnings in OPEB plan investment is amortized over five years. All balances are amortized linearly on a principal only basis and new bases will be created annually for each of the items above.

| Differences between expected and actual experience for FYE | Initial Balance | Initial Amortization Period | Annual Recognition | Unamortized Balance as of December 31, 2022 |
|--|-----------------|-----------------------------|--------------------|---|
| December 31, 2018 | \$ (10,278,171) | 5 | \$ (2,055,635) | \$ 0 |
| December 31, 2019 | \$ 1,599,226 | 5 | \$ 319,845 | \$ 319,846 |
| December 31, 2020 | \$ (5,533,480) | 4 | \$ (1,383,370) | \$ (1,383,370) |
| December 31, 2021 | \$ (442,115) | 4 | \$ (110,529) | \$ (221,057) |
| December 31, 2022 | \$ (6,094,190) | 4 | \$ (1,523,548) | \$ (4,570,642) |

| Changes in assumptions for FYE | Initial Balance | Initial Amortization Period | Annual Recognition | Unamortized Balance as of December 31, 2022 |
|--------------------------------|-----------------|-----------------------------|--------------------|---|
| December 31, 2018 | \$ 0 | N/A | \$ 0 | \$ 0 |
| December 31, 2019 | \$ 402,951 | 5 | \$ 80,590 | \$ 80,591 |
| December 31, 2020 | \$ 0 | N/A | \$ 0 | \$ 0 |
| December 31, 2021 | \$ 323,753 | 4 | \$ 80,938 | \$ 161,877 |
| December 31, 2022 | \$ 0 | N/A | \$ 0 | \$ 0 |

GASB Disclosures

Shelby Township Interim GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

Deferred Outflows / (Inflows) of Resources (Continued)

| Net Difference between projected and actual earnings in OPEB plan investments for FYE | Initial Balance | Initial Amortization Period | Annual Recognition | Unamortized Balance as of December 31, 2022 |
|---|-----------------|-----------------------------|--------------------|---|
| December 31, 2018 | \$ 5,421,497 | 5 | \$ 1,084,301 | \$ 0 |
| December 31, 2019 | \$ (6,106,603) | 5 | \$ (1,221,321) | \$ (1,221,319) |
| December 31, 2020 | \$ (3,362,814) | 5 | \$ (672,563) | \$ (1,345,125) |
| December 31, 2021 | \$ (6,471,414) | 5 | \$ (1,294,283) | \$ (3,882,848) |
| December 31, 2022 | \$ 14,075,992 | 5 | \$ 2,815,198 | \$ 11,260,794 |

| As of fiscal year ending December 31, 2022 | Deferred Outflows | Deferred Inflows |
|---|---------------------|-----------------------|
| Differences between expected and actual experience | \$ 319,846 | \$ (6,175,069) |
| Changes in assumptions | 242,468 | 0 |
| Net difference between projected and actual earnings in OPEB plan investments | 4,811,502 | 0 |
| Total | \$ 5,373,816 | \$ (6,175,069) |

Annual Amortization of Deferred Outflows / (Inflows)

The balances as of December 31, 2022 of the deferred outflows / (inflows) of resources will be recognized in OPEB expense in the future fiscal years as noted below.

| FYE | Balance |
|------------|----------------|
| 2023 | \$ (2,909,039) |
| 2024 | \$ (704,784) |
| 2025 | \$ (2,630) |
| 2026 | \$ 2,815,200 |
| 2027 | \$ 0 |
| Thereafter | \$ 0 |

GASB Disclosures

Shelby Township Interim GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

Sensitivity Results

The following presents the Net OPEB Liability as of December 31, 2022, calculated using the discount rate assumed and what it would be using a 1% higher and 1% lower discount rate.

- The current discount rate is 6.75%.
- The 1% decrease in discount rate would be 5.75%.
- The 1% increase in discount rate would be 7.75%.

| As of December 31, 2022 | Net OPEB Liability |
|-------------------------|--------------------|
| 1% Decrease | \$ 27,501,318 |
| Current Discount Rate | \$ 15,713,195 |
| 1% Increase | \$ 6,139,528 |

The following presents the Net OPEB Liability as of December 31, 2022, using the health care trend rates assumed and what it would be using 1% higher and 1% lower health care trend rates.

- The current health care trend rate starts at an initial rate of 7.00%, decreasing to an ultimate rate of 4.50%.
- The 1% decrease in health care trend rates would assume an initial rate of 6.00%, decreasing to an ultimate rate of 3.50%.
- The 1% increase in health care trend rates would assume an initial rate of 8.00%, decreasing to an ultimate rate of 5.50%.

| As of December 31, 2022 | Net OPEB Liability |
|-------------------------|--------------------|
| 1% Decrease | \$ 5,748,278 |
| Current Trend Rates | \$ 15,713,195 |
| 1% Increase | \$ 28,069,781 |

* Health care trend rate sensitivity results also include the impact of increases or decreases to the dental and vision trend rates. The current trend rates for dental/vision are 4.00%/3.00% annually, so a 1% decrease would be 3.00%/2.00%, and a 1% increase would be 5.00%/4.00%.

GASB Disclosures

Shelby Township Interim GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

Asset Information

| Asset Breakdown | FY 2021 | FY 2022 |
|--|----------------------|----------------------|
| Assets | | |
| Cash and deposits | \$ (1,136,975) | \$ (1,494,425) |
| Securities lending cash collateral | 0 | 0 |
| Total cash | \$ (1,136,975) | \$ (1,494,425) |
| Receivables | | |
| Contributions | \$ 0 | \$ 0 |
| Accrued interest | 67,533 | 36,749 |
| Total receivables | \$ 67,533 | \$ 36,749 |
| Investments | | |
| Fixed income | \$ 1,055,906 | \$ 1,217,946 |
| Equities | 61,649,852 | 54,452,238 |
| Mutual Funds | 13,841,955 | 12,663,939 |
| Total investments | \$ 76,547,713 | \$ 68,334,123 |
| Total Assets | \$ 75,478,271 | \$ 66,876,447 |
| Liabilities | | |
| Payables | | |
| Investment management fees | \$ 73,516 | \$ 102,119 |
| Securities lending expense | 15,763 | 16,627 |
| Total liabilities | \$ 89,279 | \$ 118,746 |
| Net Position Restricted to OPEB | \$ 75,388,992 | \$ 66,757,701 |

GASB Disclosures

Shelby Township Interim GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

Asset Information (Continued)

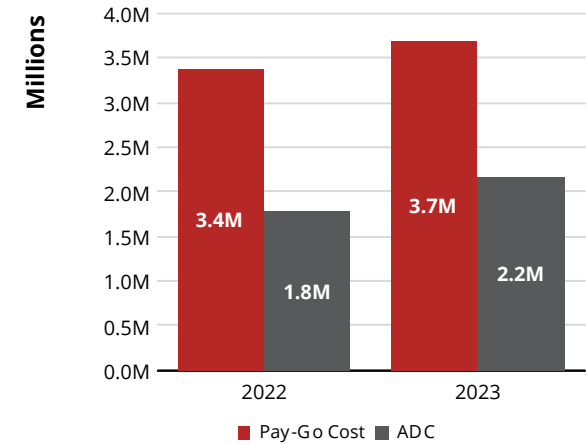
| Asset Reconciliation | FY 2021 | FY 2022 |
|--|---------------|-----------------|
| Additions | | |
| Contributions Received | | |
| Employer | \$ 4,150,660 | \$ 4,144,283 |
| Active employees | 0 | 0 |
| Total contributions | \$ 4,150,660 | \$ 4,144,283 |
| Investment Income | | |
| Net increase in fair value of investments | \$ 9,225,246 | \$ (10,376,587) |
| Interest and dividends | 1,584,037 | 1,400,973 |
| Investment expense, other than from securities lending | 0 | 0 |
| Securities lending income | 0 | 0 |
| Securities lending expense | 0 | 0 |
| Net investment income | \$ 10,809,283 | \$ (8,975,614) |
| Total additions | \$ 14,959,943 | \$ (4,831,331) |
| Deductions | | |
| Benefit payments | \$ 2,916,382 | \$ 3,365,837 |
| Administrative expenses | 604,307 | 434,123 |
| Other | 0 | 0 |
| Total deductions | \$ 3,520,689 | \$ 3,799,960 |
| Net increase in net position | \$ 11,439,254 | \$ (8,631,291) |
| Net position restricted to OPEB | | |
| Beginning of year | \$ 63,949,738 | \$ 75,388,992 |
| End of year | \$ 75,388,992 | \$ 66,757,701 |

Actuarially Determined Contributions

Shelby Township Interim GASB 74/75 Valuation For Fiscal Year Ending December 31, 2022

| | FY 2022 | | FY 2023 | |
|---|-----------|---------------------------------------|-----------|---------------------------------------|
| Discount rate (Funding) | | 6.75% | | 6.75% |
| Payroll growth factor used for amortization | | 3.00% | | 3.00% |
| Actuarial cost method | | Entry Age Normal Level % of Salary | | Entry Age Normal Level % of Salary |
| Amortization type | | Level % of Salary | | Level % of Salary |
| Amortization period (years) | | 20 | | 19 |
| Actuarial Accrued Liability (AAL) - beginning of year | \$ | 85,240,938 | \$ | 82,470,896 |
| Actuarial Value of Assets (AVA) - beginning of year | | (75,388,992) | | (66,757,701) |
| Unfunded AAL - beginning of year | \$ | 9,851,946 | \$ | 15,713,195 |
| Normal Cost | \$ | 983,437 | \$ | 910,799 |
| Amortization of Unfunded AAL | | 677,391 | | 1,119,407 |
| Total normal cost plus amortization | \$ | 1,660,828 | \$ | 2,030,206 |
| Interest to end of year | | 112,106 | | 137,039 |
| Actuarially Determined Contribution - Preliminary | \$ | 1,772,934 | \$ | 2,167,245 |
| Expected Benefit Payments | | 3,365,837 | | 3,686,804 |
| Actuarially Determined Contribution - Final | \$ | 1,772,934 | \$ | 2,167,245 |

Cash Vs Accrual Accounting



Actuarially Determined Contribution (ADC) is the target or recommended contribution to a defined benefit OPEB plan, which if paid on an ongoing basis, will provide sufficient resources to fund future costs for services to be earned and liabilities attributed to past services. This is typically higher than the pay-as-you-go cost because it includes recognition of employer costs expected to be paid in future accounting periods.

Discussion of Discount Rates

Shelby Township GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

Under GASB 74, the discount rate used in valuing OPEB liabilities for funded plans as of the Measurement Date must be based on the long-term expected rate of return on OPEB plan investments that are expected to be used to finance future benefit payments to the extent that (a) they are sufficient to pay for the projected benefit payments and (b) the OPEB plan assets are invested using a strategy that will achieve that return. When the OPEB plan investments are insufficient to cover future benefit payments, a yield for 20-year tax-exempt general obligation municipal bonds with an average rating of AA /Aa or higher (or equivalent quality on another rating scale) must be used.

For the current valuation:

1. The long-term expected rate of return on OPEB plan investment is assumed to be 6.75%. This was determined using a building block method in which expected future real rates of return (expected returns, net of OPEB plan investment expense and inflation) are developed for each major asset class. These expected future real rates of return are then combined to produce the long-term expected rate of return by weighting them based on the target asset allocation percentage and adding in expected inflation (2.44%). The best estimates of arithmetic real rates of return for each major asset class included in the OPEB Plan's target asset allocation as of December 31, 2022 are summarized in the following table.
2. The discount rate used when the OPEB plan investments are insufficient to pay for future benefit payments are selected from the range of indices as shown in the table below, where the range is given as the spread between the lowest and highest rate shown.

| Asset Class | Target Allocation | L/T Expected Real ROR |
|-------------------------------|-------------------|-----------------------|
| Domestic Large Cap Equity | 26.00% | 4.07% |
| Domestic Small/Mid Cap Equity | 16.00% | 4.52% |
| International Equity | 15.00% | 4.61% |
| Emerging Markets Equity | 5.00% | 5.42% |
| Domestic Bonds | 20.00% | 1.02% |
| Private Debt | 9.00% | 7.37% |
| Real Estate | 9.00% | 7.37% |
| Total | 100.00% | 4.27% |

| Yield as of | January 1, 2022 | December 31, 2022 |
|--|-----------------|-------------------|
| Bond Buyer Go 20-Bond Municipal Bond Index | 2.05% | 3.72% |
| S&P Municipal Bond 20-Year High Grade Rate Index | 2.25% | 4.31% |
| Fidelity 20-Year Go Municipal Bond Index | 1.84% | 4.05% |
| Bond Index Range | 1.84% - 2.25% | 3.72% - 4.31% |

3. The final equivalent single discount rate used for this year's valuation is 6.75% for accounting disclosure purposes based on the following assumptions:
 - a. The Township will continue making \$2.15 million pre-funding contributions annually to the Trust.
 Based on the above assumptions, the OPEB Trust is expected to have sufficient assets to cover all future benefit payments.

The same discount rate is also used for funding disclosure purposes (in calculating the Actuarially Determined Contribution).

Actuarial Methods and Assumptions

Shelby Township GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

For a complete summary of actuarial methods and assumptions, refer to the GASB 74/75 actuarial valuation report for the fiscal year ending December 31, 2021.

Measurement Date

For fiscal year ending December 31, 2022, a December 31, 2022 measurement date was used.

Actuarial Valuation Date

January 1, 2022 with results actuarially projected on a “no gain / no loss” basis to get to the December 31, 2022 measurement date. Liabilities as of January 1, 2022 are based on an actuarial valuation date of January 1, 2022 with no adjustments.

Discount Rate

6.75% as of December 31, 2022 and January 1, 2022 for accounting disclosure purposes.
6.75% for funding disclosure purposes (in calculating the Actuarially Determined Contribution)
Refer to the Discussion of Discount Rates section for more information on selection of the discount rate

Payroll Growth

Merit/productivity increases as shown below, which are based on the Michigan Employees Retirement System (MERS) actuarial valuation as of December 31, 2020. The assumptions from the state-wide valuations provide reasonable estimates of experience for municipal employers such as Shelby Township. Sample merit/productivity increases are shown in the table below.

| Service | Rates | Service | Rates |
|---------|-------|---------|-------|
| 0 | 6.70% | 25 | 0.40% |
| 5 | 1.90% | 30 | 0.20% |
| 10 | 1.10% | 35 | 0.10% |
| 15 | 0.70% | 40+ | 0.00% |
| 20 | 0.60% | | |

Inflation Rate

General wage inflation is 3.75%, with implicit inflation of 3.00% annually.

The inflation rate is based on the current economic environment and future expectations.

Cost Method

Allocation of Actuarial Present Value of Future Benefits for services prior and after the Measurement Date was determined using Entry Age Normal Level % of Salary method where:

- Service Cost for each individual participant, payable from date of employment to date of retirement, is sufficient to pay for the participant’s benefit at retirement; and
- Annual Service Cost is a constant percentage of the participant’s salary that is assumed to increase according to the Payroll Growth.

Actuarial Methods and Assumptions

Shelby Township GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

| Health Care Trend Rates | FYE | Pre-65 | Post-65 |
|-------------------------|-------|--------|---------|
| | 2023 | 7.00% | 6.00% |
| | 2024 | 6.50% | 5.75% |
| | 2025 | 6.00% | 5.50% |
| | 2026 | 5.50% | 5.25% |
| | 2027 | 5.00% | 5.00% |
| | 2028 | 4.50% | 4.75% |
| | 2029+ | 4.50% | 4.50% |

The initial trend rate was based on a combination of employer history, national trend surveys, and professional judgment.

The ultimate trend rate was selected based on historical medical CPI information.

Dental Trend Rates 4.00% per year

Vision Trend Rates 3.00% per year

Retiree Contributions Retiree contributions are assumed to increase according to health care trend rates.

Models

ProVal Valuation software developed by Winklevoss Technologies, LLC. This software is widely used for the purpose of performing postretirement medical valuations. We coded the plan provisions, assumptions, methods, and participant data summarized in this report, and reviewed the liability and cost outputs for reasonableness. We are not aware of any weakness or limitations in the software and have determined it is appropriate for performing this valuation.

HealthMAPS Manual Rating manual developed by WTW. Aging factors are used to develop per capita costs by age for plans with limited credible exposure to develop plan-specific factors. We are not aware of any weakness or limitations in the factors and have determined they are appropriate for performing this valuation.

Actuary's Notes

Shelby Township GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

Interim year valuation results have been projected from the prior year's valuation with adjustments for actual premium increases from 2022 to 2023. Making this change resulted in a decrease in liabilities.

Medical Plans

A comparison of monthly premiums for medical and prescription drug benefits effective on January 1, 2022 and January 1, 2023 by retiree's Division are as shown below.

| Division | Eff. 1/1/2022 | | | | Eff. 1/1/2023 | | | |
|----------|---------------|-------------|---------------|-------------|---------------|-------------|---------------|-------------|
| | Pre-Medicare | | Post-Medicare | | Pre-Medicare | | Post-Medicare | |
| | Single | 2 Person | Single | 2 Person | Single | 2 Person | Single | 2 Person |
| 0000 | \$ 442.66 | \$ 1,062.38 | \$ 633.53 | \$ 1,267.06 | \$ 476.09 | \$ 1,142.62 | \$ 689.78 | \$ 1,379.56 |
| 0001* | \$ 717.09 | \$ 1,721.01 | \$ 766.64 | \$ 1,533.28 | \$ 726.46 | \$ 1,743.48 | \$ 706.96 | \$ 1,413.92 |
| 0032 | \$ 303.84 | \$ 729.21 | \$ 633.53 | \$ 1,267.06 | \$ 326.74 | \$ 784.16 | \$ 689.78 | \$ 1,379.56 |
| 0015 | \$ 651.66 | \$ 1,563.98 | \$ 687.74 | \$ 1,375.48 | \$ 701.88 | \$ 1,684.52 | \$ 749.99 | \$ 1,499.98 |
| 0018 | \$ 645.77 | \$ 1,549.83 | \$ 687.74 | \$ 1,375.48 | \$ 695.73 | \$ 1,669.74 | \$ 749.99 | \$ 1,499.98 |
| 0020* | \$ 720.80 | \$ 1,729.90 | \$ 766.64 | \$ 1,533.28 | \$ 730.66 | \$ 1,753.58 | \$ 706.96 | \$ 1,413.92 |
| 0023* | \$ 741.89 | \$ 1,780.18 | \$ 834.11 | \$ 1,668.25 | \$ 749.32 | \$ 1,798.09 | \$ 769.41 | \$ 1,538.85 |
| 0024* | \$ 719.82 | \$ 1,727.54 | \$ 746.66 | \$ 1,493.30 | \$ 731.37 | \$ 1,755.28 | \$ 690.71 | \$ 1,381.41 |
| 0025 | \$ 650.29 | \$ 1,560.70 | \$ 707.97 | \$ 1,415.94 | \$ 700.37 | \$ 1,680.89 | \$ 771.74 | \$ 1,543.48 |
| 0027 | \$ 442.66 | \$ 1,062.38 | \$ 633.53 | \$ 1,267.06 | \$ 476.09 | \$ 1,142.62 | \$ 689.78 | \$ 1,379.56 |
| 0029 | \$ 648.74 | \$ 1,556.99 | \$ 674.92 | \$ 1,349.84 | \$ 698.65 | \$ 1,676.76 | \$ 735.74 | \$ 1,471.48 |
| 0031* | \$ 616.31 | \$ 1,479.13 | \$ 710.70 | \$ 1,421.38 | \$ 620.74 | \$ 1,489.75 | \$ 652.98 | \$ 1,305.95 |
| 0021 | \$ 644.29 | \$ 1,546.29 | \$ 680.74 | \$ 1,361.48 | \$ 694.09 | \$ 1,665.83 | \$ 742.21 | \$ 1,484.42 |
| 0022* | \$ 676.43 | \$ 1,623.65 | \$ 649.99 | \$ 1,299.99 | \$ 694.31 | \$ 1,666.51 | \$ 612.09 | \$ 1,224.20 |
| 0011 | \$ 661.01 | \$ 1,586.43 | \$ 750.71 | \$ 1,501.42 | \$ 712.27 | \$ 1,709.46 | \$ 819.23 | \$ 1,638.46 |
| 0012 | \$ 609.00 | \$ 1,461.58 | \$ 708.93 | \$ 1,417.86 | \$ 656.21 | \$ 1,574.91 | \$ 773.52 | \$ 1,547.04 |
| 0013 | \$ 657.36 | \$ 1,577.65 | \$ 708.93 | \$ 1,417.86 | \$ 708.21 | \$ 1,699.72 | \$ 773.52 | \$ 1,547.04 |
| 0014 | \$ 657.36 | \$ 1,577.65 | \$ 736.15 | \$ 1,472.30 | \$ 708.21 | \$ 1,699.72 | \$ 803.05 | \$ 1,606.10 |
| 0016 | \$ 651.66 | \$ 1,563.98 | \$ 687.74 | \$ 1,375.48 | \$ 701.88 | \$ 1,684.52 | \$ 749.99 | \$ 1,499.98 |
| 0017 | \$ 645.77 | \$ 1,549.83 | \$ 687.74 | \$ 1,375.48 | \$ 695.73 | \$ 1,669.74 | \$ 749.99 | \$ 1,499.98 |
| 0009 | \$ 661.01 | \$ 1,586.43 | \$ 723.36 | \$ 1,446.72 | \$ 712.27 | \$ 1,709.46 | \$ 789.56 | \$ 1,579.12 |

* These divisions have separate prescription drug provisions. The rates above are for medical and prescription drug benefits.

Actuary's Notes

Shelby Township GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

Prescription Drug Plans

A comparison of monthly premiums effective on January 1, 2022 and January 1, 2023 by copayments are as shown below.

| Copayments | Eff. 1/1/2022 | | | | Eff. 1/1/2023 | | | |
|------------|---------------|-----------|---------------|-----------|---------------|-----------|---------------|-----------|
| | Pre-Medicare | | Post-Medicare | | Pre-Medicare | | Post-Medicare | |
| | Single | 2 Person | Single | 2 Person | Single | 2 Person | Single | 2 Person |
| 7/20/35 | \$ 162.69 | \$ 390.44 | \$ 439.21 | \$ 878.42 | \$ 132.31 | \$ 317.53 | \$ 357.19 | \$ 714.38 |
| 10/20/40 | \$ 155.28 | \$ 372.65 | \$ 419.23 | \$ 838.44 | \$ 126.28 | \$ 303.06 | \$ 340.94 | \$ 681.87 |
| 0/15/20 | \$ 166.99 | \$ 400.78 | \$ 450.84 | \$ 901.70 | \$ 135.81 | \$ 325.94 | \$ 366.65 | \$ 733.31 |
| 0/10/20 | \$ 177.35 | \$ 425.29 | \$ 478.76 | \$ 957.55 | \$ 144.23 | \$ 345.87 | \$ 389.35 | \$ 778.73 |
| 10/40 | \$ 119.40 | \$ 286.75 | \$ 322.56 | \$ 645.13 | \$ 97.10 | \$ 233.20 | \$ 262.32 | \$ 524.66 |

Dental Plans

A comparison of monthly premium rates effective on January 1, 2022 and January 1, 2023 for the two dental plans are as shown below:

| | Eff. 1/1/2022 | | | | Eff. 1/1/2023 | | | |
|----------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|
| | Pre-Medicare | | Post-Medicare | | Pre-Medicare | | Post-Medicare | |
| | Single | 2 Person | Single | 2 Person | Single | 2 Person | Single | 2 Person |
| Dental 1 | \$ 35.33 | \$ 70.67 | \$ 34.38 | \$ 68.76 | \$ 36.87 | \$ 73.74 | \$ 35.87 | \$ 71.74 |
| Dental 2 | \$ 33.03 | \$ 66.06 | \$ 32.26 | \$ 64.52 | \$ 34.47 | \$ 68.93 | \$ 33.66 | \$ 67.32 |

Vision Plans

A comparison of monthly premium rates effective on January 1, 2022 and January 1, 2023 for the vision plan are as shown below:

| | Eff. 1/1/2022 | | Eff. 1/1/2023 | |
|---------------|---------------|----------|---------------|----------|
| | Single | 2 Person | Single | 2 Person |
| Pre-Medicare | \$ 5.03 | \$ 10.05 | \$ 4.65 | \$ 9.29 |
| Post-Medicare | \$ 4.07 | \$ 8.14 | \$ 3.76 | \$ 7.52 |

Appendix

Shelby Township GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

GASB Results by Group

Below is the summary of the GASB results for fiscal year ending December 31, 2022 based on the Entry Age Normal Level % of Pay cost method with a discount rate of 6.75%.

| <i>Bargaining Unit</i> | <i>Total OPEB Liability (TOL) As of December 31, 2022</i> | <i>Fiduciary Net Position (FNP) As of December 31, 2022</i> | <i>Net OPEB Liability (NOL) As of December 31, 2022</i> | <i>Funded Ratio As of December 31, 2022</i> | <i>Actuarially Determined Contribution (ADC) For 2022</i> |
|---------------------------------|---|---|---|---|---|
| 911 | \$ 1,452,522 | \$ (2,546,144) | \$ (1,093,622) | 175.3% | \$ (28,465) |
| Command | \$ 19,560,626 | \$ (12,897,104) | \$ 6,663,522 | 65.9% | \$ 660,934 |
| Court | \$ 4,778,529 | \$ (2,774,721) | \$ 2,003,808 | 58.1% | \$ 231,262 |
| Department Head | \$ 2,700,780 | \$ (3,129,911) | \$ (429,131) | 115.9% | \$ (36,375) |
| Fire | \$ 24,807,698 | \$ (18,348,877) | \$ 6,458,821 | 74.0% | \$ 717,301 |
| General | \$ 12,304,885 | \$ (13,142,721) | \$ (837,836) | 106.8% | \$ (104,616) |
| Patrol | \$ 9,289,451 | \$ (5,092,287) | \$ 4,197,164 | 54.8% | \$ 425,380 |
| Supervisory (including Special) | \$ 7,336,340 | \$ (8,631,337) | \$ (1,294,997) | 117.7% | \$ (93,721) |
| Elected Official | \$ 240,065 | \$ (194,599) | \$ 45,466 | 81.1% | \$ 1,234 |
| Total | \$ 82,470,896 | \$ (66,757,701) | \$ 15,713,195 | 80.9% | \$ 1,772,934 |

| <i>Fund</i> | <i>Total OPEB Liability (TOL) As of December 31, 2022</i> | <i>Fiduciary Net Position (FNP) As of December 31, 2022</i> | <i>Net OPEB Liability (NOL) As of December 31, 2022</i> | <i>Funded Ratio As of December 31, 2022</i> | <i>Actuarially Determined Contribution (ADC) For 2022</i> |
|--------------|---|---|---|---|---|
| 101 | \$ 13,520,048 | \$ (15,322,775) | \$ (1,802,727) | 113.3% | \$ (149,786) |
| 206 | \$ 25,375,531 | \$ (19,008,472) | \$ 6,367,059 | 74.9% | \$ 714,571 |
| 207 | \$ 31,737,762 | \$ (21,892,893) | \$ 9,844,869 | 69.0% | \$ 1,070,853 |
| 290 | \$ 4,778,529 | \$ (3,504,763) | \$ 1,273,766 | 73.3% | \$ 173,445 |
| 591 | \$ 6,327,039 | \$ (6,378,635) | \$ (51,596) | 100.8% | \$ (43,395) |
| 598 | \$ 731,987 | \$ (650,163) | \$ 81,824 | 88.8% | \$ 7,246 |
| Total | \$ 82,470,896 | \$ (66,757,701) | \$ 15,713,195 | 80.9% | \$ 1,772,934 |

Appendix

Shelby Township GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

GASB Results by Group

Below is the summary of the GASB results for fiscal year ending December 31, 2022 based on the Entry Age Normal Level % of Pay cost method with a discount rate of 6.75%.

| <i>Bargaining Unit</i> | <i>Total OPEB Liability (TOL) As of January 1, 2022</i> | <i>Fiduciary Net Position (FNP) As of January 1, 2022</i> | <i>Net OPEB Liability (NOL) As of January 1, 2022</i> | <i>Service Cost For FY 2022</i> | <i>Experience Gain /Loss¹ For FY 2022</i> |
|---------------------------------|---|---|---|-------------------------------------|--|
| 911 | \$ 1,703,567 | \$ (2,785,979) | \$ (1,082,412) | \$ 47,758 | \$ (347,480) |
| Command | \$ 20,487,576 | \$ (13,556,196) | \$ 6,931,380 | \$ 142,562 | \$ (1,625,766) |
| Court | \$ 5,047,655 | \$ (2,993,940) | \$ 2,053,715 | \$ 75,432 | \$ (484,328) |
| Department Head | \$ 2,765,808 | \$ (3,769,232) | \$ (1,003,424) | \$ 34,917 | \$ (176,097) |
| Fire | \$ 24,445,826 | \$ (20,068,153) | \$ 4,377,673 | \$ 370,949 | \$ (686,359) |
| General | \$ 13,146,946 | \$ (15,683,141) | \$ (2,536,195) | \$ 76,380 | \$ (1,274,373) |
| Patrol | \$ 9,544,774 | \$ (6,127,717) | \$ 3,417,057 | \$ 163,535 | \$ (684,563) |
| Supervisory (including Special) | \$ 7,851,974 | \$ (10,174,634) | \$ (2,322,660) | \$ 71,904 | \$ (801,892) |
| Elected Official | \$ 246,812 | \$ (230,000) | \$ 16,812 | \$ 0 | \$ (13,332) |
| Total | \$ 85,240,938 | \$ (75,388,992) | \$ 9,851,946 | \$ 983,437 | \$ (6,094,190) |

| <i>Fund</i> | <i>Total OPEB Liability (TOL) As of January 1, 2022</i> | <i>Fiduciary Net Position (FNP) As of January 1, 2022</i> | <i>Net OPEB Liability (NOL) As of January 1, 2022</i> | <i>Service Cost For FY 2022</i> | <i>Experience Gain /Loss¹ For FY 2022</i> |
|--------------|---|---|---|-------------------------------------|--|
| 101 | \$ 14,559,086 | \$ (18,399,999) | \$ (3,840,913) | \$ 123,775 | \$ (1,346,946) |
| 206 | \$ 25,048,323 | \$ (20,852,196) | \$ 4,196,127 | \$ 380,874 | \$ (862,975) |
| 207 | \$ 33,282,732 | \$ (23,955,108) | \$ 9,327,624 | \$ 361,801 | \$ (2,976,150) |
| 290 | \$ 5,047,655 | \$ (3,781,660) | \$ 1,265,995 | \$ 75,432 | \$ (506,650) |
| 591 | \$ 6,596,209 | \$ (7,682,778) | \$ (1,086,569) | \$ 34,058 | \$ (393,909) |
| 598 | \$ 706,933 | \$ (717,251) | \$ (10,318) | \$ 7,497 | \$ (7,560) |
| Total | \$ 85,240,938 | \$ (75,388,992) | \$ 9,851,946 | \$ 983,437 | \$ (6,094,190) |

¹ To calculate the experience gain/loss by Bargaining Unit, actual benefit payments by unit in 2022 were estimated based on each unit's TOL as a percent of total as of January 1, 2022. To calculate the experience gain/loss by Fund, 2022 actual benefit payments by Fund were utilized.

Appendix

Shelby Township GASB 74/75 Valuation for Fiscal Year Ending December 31, 2022

PA 202 Uniform Assumption Disclosures

The information presented below is for the purposes of filing Form No. 5572 under PA 202 uniform assumption requirements. Per regulation, Form No. 5572 must be filed no later than six months after the end of the fiscal year. Governmental fund revenues are not shown below and should be determined by the Township. Refer to the Michigan Department of Treasury website for additional information.

| Form 5572 Line | Description | Township |
|----------------|---|---------------|
| Line 28 | Actuarial Value of Assets | \$ 66,757,701 |
| Line 29 | Actuarial Accrued Liability | \$ 86,389,274 |
| Line 31 | Actuarially Determined Contribution for FY 2022 | \$ 1,757,529 |

Line 31 (Actuarially Determined Contribution) was calculated using level % of pay amortization with a 6.75% discount rate. The amortization period is a closed, 30-year period with 20 years remaining in FY 2022.

Under PA 202 requirements, uniform assumption setting is mandated in reporting of liabilities, assets, and ADC. The following is a description of the PA 202 uniform assumption guidance and final assumption used for the Township for purposes of calculating the figures above.

| Assumption | Uniform Assumption Guidance | Township Assumption |
|---------------------------|---|--|
| Investment Rate of Return | Maximum of 6.85% | 6.75% as of January 1, 2022 and 6.75% as of December 31, 2022 (for funding/ADC purposes) |
| Discount Rate | Blended discount rate calculated per GASB 74/75: <ul style="list-style-type: none"> Maximum of 6.85% where plan assets are sufficient to make projected benefit payments 2.16% for periods where assets are insufficient to make projected benefit payments | 6.75% (for calculation of the OPEB liability) |
| Salary Increase | Minimum of 3.00% or based on actuarial experience study within the past 5 years | Same as the GASB 74/75 valuation |
| Mortality Table | A version of PUB-2010 with Scale MP-2020 generational mortality improvement or based on actuarial experience study within the past 5 years | Same PUB-2010 tables as GASB 74/75 valuation with Scale MP-2020 generational mortality improvement |
| Amortization Period | Maximum closed period of 27 years for Retiree Health Systems | For FY 2022, 20 years on a closed period basis |
| Asset Valuation | Market Value as reported on Financial Statements | Same as the GASB 74/75 valuation |
| Healthcare Inflation | Non-Medicare: 7.25% decreasing 0.25% per year to a 4.50% long-term rate Medicare: 5.50% decreasing 0.25% per year to a 4.50% long-term rate | Same as PA 202 uniform assumption |