NORTH TEXAS MUNICIPAL WATER DISTRICT

ACTUARIAL EXPERIENCE STUDY OF THE RETIREMENT PLAN FOR EMPLOYEES OF NORTH TEXAS MUNICIPAL WATER DISTRICT AND THE RETIREE HEALTH INSURANCE PROGRAM FOR THE PERIOD FROM JANUARY 1, 2018 THROUGH DECEMBER 31, 2022

R&W | Rudd and Wisdom, Inc.

www.ruddwisdom.com

9500 Arboretum Blvd., Suite 200
Austin, Texas 78759
Phone: 512-346-1590
Fax: 512-345-7437

Mitchell L. Bilbe, F.S.A.
Evan L. Dial, F.S.A.
Philip S. Dial, F.S.A.
Charles V. Faerber, F.S.A., A.C.A.S.
Mark R. Fenlaw, F.S.A.
Brandon L. Fuller, F.S.A.
Christopher S. Johnson, F.S.A.
Oliver B. Kiel, F.S.A.
Dustin J. Kim, F.S.A.
Edward A. Mire, F.S.A.

Rudd and Wisdom, Inc.
Consulting Actuaries

Rebecca B. Morris, A.S.A.
Amanda L. Murphy, F.S.A.
Michael J. Muth, F.S.A.
Khiem Ngo, F.S.A., A.C.A.S.
Timothy B. Seifert, F.S.A.
Chelsea E. Stewart, F.S.A.
Raymond W. Tilotta
Ronald W. Tobleman, F.S.A.
David G. Wilkes, F.S.A.

June 28, 2023

Ms. Jeanne Chipperfield
Deputy Director – Administrative Services
North Texas Municipal Water District
501 E. Brown Street
Wylie, Texas 75098

Re: Five-Year Actuarial Experience Study

Dear Jeanne:

Pursuant to the request of the North Texas Municipal Water District (NTMWD), we have completed an actuarial experience study of the Retirement Plan for Employees of NTMWD (Pension Plan) and the Retiree Health Insurance Program [the Other Post-Employment Benefits (OPEB) Plan].

We have reviewed the experience of the participants in the plan during the five-year period from January 1, 2018 through December 31, 2022 in order to review the appropriateness of the current actuarial assumptions for future actuarial valuations and to recommend modified assumptions where appropriate. Because the covered populations in the Pension Plan and the OPEB Plan are substantially similar, many of the assumptions recommended herein are recommended for use in future valuations of both plans.

Actuarial valuations are used to determine appropriate levels of funding and to model the costs of retirement plans, but actuarial valuations do not determine the ultimate cost of retirement plans. Instead, the ultimate cost of such a plan is equal to the total benefits and expenses paid by the plan in excess of the investment returns of the plan. Thus, the ultimate cost is independent of the actuarial assumptions used to value the plan. While the underlying actuarial assumptions that are used in an actuarial valuation cannot be relied upon as a measure of a plan's ultimate cost, the valuation and its assumptions are used to determine whether an existing funding policy can reasonably be expected to adequately finance plan benefits over a long period of time. A new funding policy should be recommended for consideration whenever a valuation would indicate that the current policy may be inadequate. The accuracy and usefulness of actuarial valuations are dependent upon the use of actuarial assumptions that will reasonably reflect the plan's future experience as it unfolds over a long period of time.

This report documents our analysis and presents our recommendations for new actuarial assumptions. In addition, this report illustrates the effects of the proposed assumption changes on the January 1, 2023 plan liabilities and employer contribution amounts for the Pension Plan and the September 30, 2022 plan liabilities and employer contribution amounts for the OPEB Plan.

We look forward to discussing this report with you.

Sincerely,

Christopher S. Johnson, F.S.A.

Brandon L. Fuller, F.S.A.

CSJ/BLF:ph

Enclosures

cc: Holly Matthews
Kristie Mixon

Rpt-Final_NTMWD_DB_2023_EXPSTUDY.docx

ACTUARIAL EXPERIENCE STUDY OF THE RETIREMENT PLAN FOR EMPLOYEES OF NORTH TEXAS MUNICIPAL WATER DISTRICT AND THE RETIREE HEALTH INSURANCE PROGRAM FOR THE PERIOD FROM JANUARY 1, 2018 THROUGH DECEMBER 31, 2022

RUDD AND WISDOM, INC.
AUSTIN, TEXAS

JUNE 2023

TABLE OF CONTENTS

Section I – Certification of Actuarial Experience Study

At the request of the North Texas Municipal Water District (NTMWD), we have performed an actuarial experience study of the Retirement Plan for Employees of NTMWD and the Retiree Health Insurance Program for the five-year period ending December 31, 2022. The purpose of this report is to evaluate the appropriateness of the current actuarial assumptions and to recommend new assumptions, if appropriate.

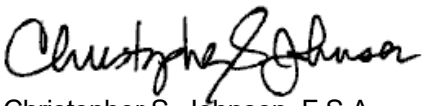
We have based the actuarial experience study on current employee, former employee and retiree data as of January 1, 2023 provided by NTMWD and prior valuation information provided by the prior actuary for the five annual valuation dates commencing January 1, 2018 and ending January 1, 2022. We have evaluated the actuarial assumptions described in Section III of this report.

To the best of our knowledge, all employees eligible to participate in the plans and all other individuals who had a remaining vested benefit under the plans as of each of the annual valuation dates have been included in the experience study.

The plan sponsor remains solely responsible for the accuracy and comprehensiveness of the data provided. However, to the best of our knowledge, no material biases exist with respect to any imperfections in the data provided by the above sources. To the extent any imperfections exist in service or compensation records, we have relied on best estimates provided by the employer. We have not audited the data provided, but have reviewed it for reasonableness and consistency relative to previously provided information.

To the best of our knowledge, the actuarial information supplied in this report is complete and accurate. In our opinion the recommended assumptions are reasonably related to the experience of the plan and to reasonable expectations. The assumptions represent a reasonable estimate of anticipated experience of the plans over the long-term future, and their selection complies with the applicable actuarial standards of practice.

We hereby certify that we are members of the American Academy of Actuaries who meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.



Christopher S. Johnson, F.S.A.
Enrolled Actuary Number 23-7100
Member of American Academy of Actuaries

Brandon L. Fuller, F.S.A.
Enrolled Actuary Number 23-8409
Member of American Academy of Actuaries

Section II – Executive Summary

A. Scope and Purpose

This actuarial experience study has been conducted in order to review the continued appropriateness of assumptions to be used in future actuarial valuations of the Retirement Plan for Employees of the North Texas Municipal Water District (the Pension Plan) and the Retiree Health Insurance Program [the Other Post-Employment Benefits (OPEB) Plan]. Because the covered populations in the Pension Plan and the OPEB Plan are substantially similar, many of the assumptions recommended herein are recommended for use in the future valuations of both plans.

Actual plan experience over the five-year period from January 1, 2018 to December 31, 2022 has been reviewed in order to evaluate the following assumptions:

Assumption	Purpose
1. Retirement Rates	Estimate incidence of retirement at various retirement age and service eligibilities
2. Termination Rates	Estimate timing of employment termination prior to retirement eligibility for both voluntary and involuntary terminations
3. Disability Rates	Estimate incidence of disability at various ages
4. Mortality Rates	Estimate survival rates for purposes of death benefits and for purposes of projecting lifetime(s) over which benefits are paid
5. Other Demographic Assumptions	Estimate the assumed spousal age difference, the retiree coverage election percentage and the spouse coverage election percentage (OPEB Plan)
6. Inflation	Estimate price inflation which is a component of the Compensation Increase assumption, the Investment Return assumption, OPEB trend assumptions and the annual Cost of Living Adjustment assumption
7. Compensation Increases	Estimate future compensation increases for projecting benefit accruals at future decrement dates
8. Investment Return	Estimate long-term rate of return on Pension Plan and OPEB Plan assets which is used to discount the plans' expected benefit payments

The above assumptions form the basis for actuarial valuations which are used to determine appropriate levels of funding and to model the costs of retirement plans, but it is important to remember that actuarial valuations do not determine the ultimate cost of retirement plans. The ultimate cost of a retirement plan is equal to the total benefits and expenses paid by the plan in excess of the investment returns of the plan. Thus, the ultimate cost is independent of the actuarial assumptions used to value the plan.

While the underlying actuarial assumptions that are used in an actuarial valuation cannot be relied upon to measure a plan's ultimate cost, the valuation and its assumptions are used to determine whether an existing funding policy can reasonably be expected to adequately finance plan benefits over a long period of time. A new funding policy should be recommended for consideration whenever a valuation would indicate that the current policy may be inadequate. The accuracy and usefulness of actuarial valuations are dependent upon the use of actuarial assumptions that will reasonably reflect the plan's future experience as it unfolds over a long period of time.

Based on the results of this experience study, we recommend updating several assumptions.

B. Recommendations

The table below provides a general description of our recommended changes. Details for each assumption can be found in Section III of this report. We consider the recommended changes to be reasonable and appropriate for the Pension Plan and OPEB Plan, where applicable, for the long-term future and each recommendation complies with applicable actuarial standards of practice.

Assumption	Recommendation	Additional Details
1. Retirement Rates	Assume gradual rates of retirement based on age. Relative to current assumption, recommended rates are earlier on average for ages under 65 and later on average for ages over 65.	See Section III.A.
2. Termination Rates	Assume service-based select and ultimate rates of termination. Relative to current assumption, recommended rates are higher in first two years of service and lower for most service amounts over two years	See Section III.B.
3. Disability Rates	No change recommended	See Section III.C.
4. Mortality Rates	No change recommended	See Section III.D.
5. Other Demographic Assumptions	Increase spouse coverage election percentage from 60% to 65%	See Section III.E.
6. Inflation	Increase assumed inflation from 2.20% (OPEB) and 2.00% (Pension) to 2.50%	See Section III.F.
7. Compensation Increases	Assume age-graded compensation increases instead of a flat assumption at all ages	See Section III.G.
8. Investment Return	Reduce the investment return assumption to 7.25%	See Section III.H.

The above assumptions are recommended to the NTMWD. However, the decision to adopt any of these recommended changes rests with the NTMWD.

C. Effect on Actuarial Valuations

If adopted by the NTMWD, we propose that the recommended assumptions would initially be used for the January 1, 2023 actuarial valuation for the Pension Plan and the September 30, 2023 actuarial valuation for the OPEB Plan. The effect of the recommended changes is summarized in the tables below based on the most recent Pension Plan valuation (i.e., the January 1, 2023 valuation) and the most recent OPEB Plan valuation (i.e., the September 30, 2022 valuation).

Pension Plan

Assumption	Pension Plan Valuation Results as of January 1, 2023[1]		
	Increase/(Decrease) in Actuarially Determined Contribution	Increase/(Decrease) in Entry Age Normal Actuarial Accrued Liability	
	$ Millions	$ Millions	Funded Ratio
1. Retirement Rates	$ 0.6	$ 4.4	(1.3)%
2. Termination Rates	0.6	4.1	(1.1)%
3. Inflation	0.3	0.9	(0.2)%
4. COLA	(0.3)	(2.7)	0.7%
5. Compensation Increases	(0.4)	(1.8)	0.5%
6. Total excluding Investment Return	**$ 0.8**	**$ 4.9**	**(1.4%)**
7. Investment Return	1.7	13.6	(3.6)%
8. Total including Investment Return	**$ 2.5**	**$ 18.5**	**(5.0%)**

January 1, 2023 Valuation Results	Pension Plan Funding Valuation Results as of January 1, 2023[1]		
	Actuarially Determined Contribution	Entry Age Normal Actuarial Accrued Liability	
	$ Millions	$ Millions	Funded Ratio
1. Results Prior to Recommended Changes	$ 12.9	$ 195.6	57.5%
2. Effect of Recommended Changes excluding Investment Return [Row 6. in table above]	0.8	4.9	(1.4%)
3. Results After Recommended Changes excluding Investment Return [1. + 2.]	**$ 13.7**	**$ 200.5**	**56.1%**
4. Effect of Recommended Change to Investment Return [Row 7. in table above]	1.7	13.6	(3.6%)
5. Results After Recommended Changes including Investment Return [3. + 4.]	**$ 15.4**	**$ 214.1**	**52.5%**

[1] If adopted in advance of the January 1, 2023 valuation, the new assumptions and methods would first apply to the January 1, 2023 valuation. These results are presented as an estimate of the effects on the January 1, 2023 valuation.

OPEB Plan

Assumption	OPEB Plan Valuation Results as of September 30, 2022[1]		
	Increase/(Decrease) in Actuarially Determined Contribution	Increase/(Decrease) in Total OPEB Liability	
	$ Millions	$ Millions	Funded Ratio
1. Retirement Rates	$ 0.3	$ 1.7	(3.0)%
2. Termination Rates	0.4	1.6	(2.4)%
3. Inflation	0.1	0.3	(0.5)%
4. Compensation Increases	(0.1)	(0.5)	0.7%
5. Spouse Coverage %	0.1	0.6	(0.8)%
6. Subtotal excluding Investment Return	**$ 0.8**	**$ 3.7**	**(6.0%)**
7. Investment Return	0.1	0.5	(0.7)%
8. Total including Investment Return	**$ 0.9**	**$ 4.2**	**(6.7%)**

September 30, 2022 Valuation Results	OPEB Plan Valuation Results as of September 30, 2022[1]		
	Actuarially Determined Contribution	Total OPEB Liability	
	$ Millions	$ Millions	Funded Ratio
1. Results Prior to Recommended Changes	$ 2.4	$ 21.4	40.6%
2. Effect of Recommended Changes except Investment Return [Row 6. in table above]	0.8	3.7	(6.0%)
3. Results After Recommended Changes excluding Investment Return [1. + 2.]	**$ 3.2**	**$ 25.1**	**34.6%**
4. Effect of Recommended Change to Investment Return [Row 7. in table above]	0.1	0.5	(0.7%)
5. Results After Recommended Changes including Investment Return [3. + 4.]	**$ 3.3**	**$ 25.6**	**33.9%**

[1] If adopted in advance of the September 30, 2023 valuation, the new assumptions and methods would first apply to the September 30, 2023 valuation. These results are presented as an estimate of the effects on the September 30, 2022 valuation. The effects on the September 30, 2023 valuation are expected to be similar in magnitude.

Section III – Actuarial Assumptions for Actuarial Valuations

A. Retirement

Under the current provisions of the Pension and OPEB Plans, participants may elect to terminate employment and begin receiving retirement and OPEB benefits provided they meet one of the following three eligibility criteria:

Eligibility for Retirement Benefits			
Eligibility Criteria Description	**Age**	**Service**	**Age + Service**
a) Normal Retirement	65	5 years	n/a
b) Early Retirement	55	20 years	n/a
c) Rule of 80 Retirement	n/a	n/a	80 years

For the Pension Plan, Unreduced Early Retirement benefits equal to the full amount of the Accrued Retirement Benefit under the Pension Plan are available if the participant meets the Rule of 80.

For those who meet the eligibility criteria for retirement but are not eligible for Unreduced Early Retirement, Reduced Early Retirement benefits are equal to the Vested Accrued Retirement Benefit determined at the Early Retirement Date reduced 5% for each year the participant's Early Retirement Date precedes their Normal Retirement Date.

In 2021, NTMWD offered a Retirement Incentive Program (RIP), whereby certain eligible active participants were offered five additional years of retirement eligibility service to retire immediately. There were 47 participants that participated in the RIP. Since these retirements are not representative of typical retirement behavior, they have been excluded from this experience study.

The current Retirement Rates were used by the prior actuary and, to our knowledge, were not based on a formal experience study. The schedule of Retirement Rates currently assumed for the Pension Plan actuarial valuations varies by age beginning with 4% at age 55 with 100% of eligible participants assumed to retire at age 70 (see Table 1 below).

Table 1: ***Current Retirement Rates Assumption (Pension Plan)***

Age	Annual Rate
55	0.04
56	0.03
57	0.10
58	0.07
59	0.02
60	0.05
61-62	0.10
63	0.03
64	0.11
65	0.42
66	0.38
67	0.27
68	0.12
69	0.33
70	1.00

The schedule of Retirement Rates currently assumed for the OPEB Plan actuarial valuations varies by age beginning with 10% at age 55 with 100% of eligible participants assumed to retire at age 65 (see Table 2 below).

Table 2: ***Current Retirement Rates Assumption (OPEB Plan)***

Age	Annual Rate
55	0.10
56-59	0.03
60	0.20
61	0.05
62	0.25
63-64	0.10
65	1.00

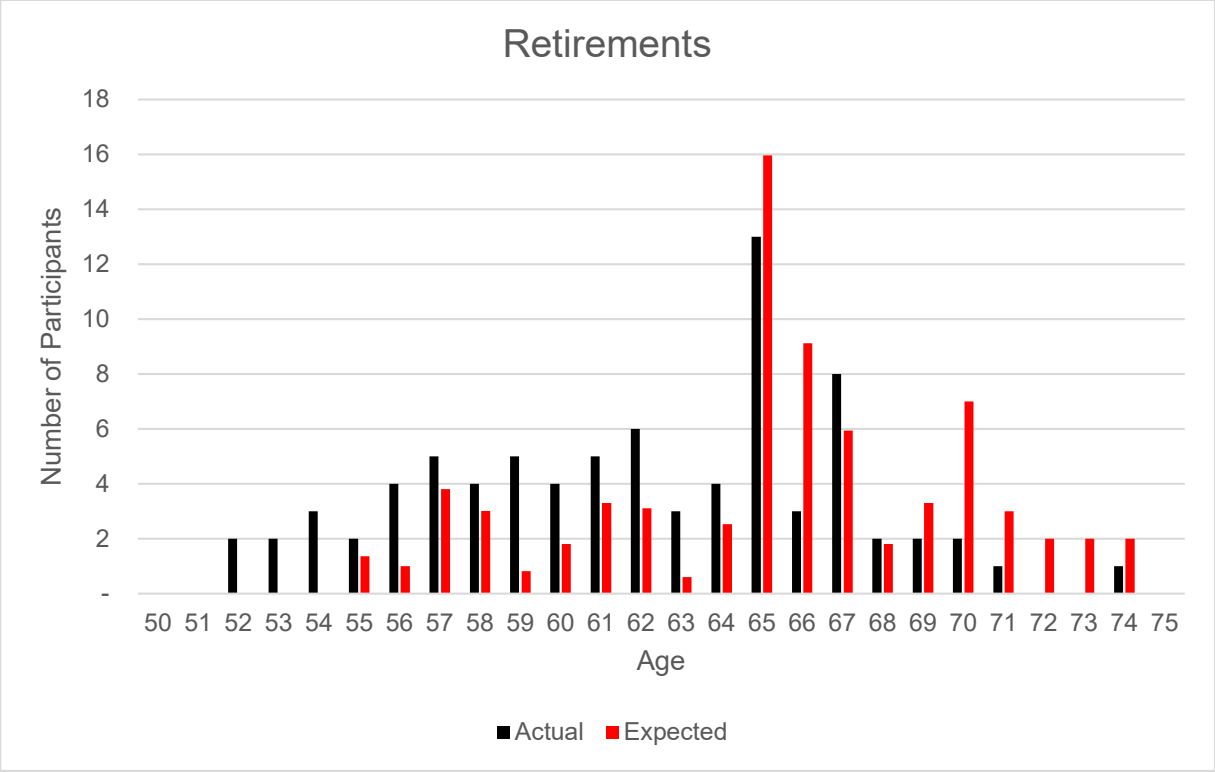
The appropriateness of the current assumed retirement rates is tested by calculating the ratios of the number of actual retirements to the number of expected retirements (A/E ratio) based on the currently assumed rates. The A/E ratios in Table 3 below indicate how different the actual retirement experience was compared to the expected experience. An A/E ratio greater than 100% indicates that there were more retirements than expected, while a ratio under 100% means there were fewer retirements than expected according to the current assumption.

Table 3: Retirement Rate Study (January 2018 – December 2022)

Age Group	Actual Retirements	Expected Retirements - Current Rates (Pension)	Expected Retirements - Current Rates (OPEB)	A/E (Actual to Expected Ratio) Pension	A/E (Actual to Expected Ratio) OPEB
50-54	7	0	0	N/A	N/A
55-59	20	10	8	200%	250%
60-64	22	11	21	200%	105%
65-69	28	36	109	78%	26%
70	2	7	7	29%	29%
71	1	3	3	33%	33%
72+	1	6	6	17%	17%
Total	81	73	154	111%	53%

This same information is shown for each age in Chart 1 on the following page.

Chart 1: Actual versus Expected Retirements by Age (Pension Plan)



Observations from Table 3 and Chart 1:

- While there are no assumed retirement rates at ages below 55 under the current assumptions, there were actual retirements between ages 50 and 54.
- Prior to age 65, there were more actual retirements than were expected during the exposure period.
- After age 65, participants retired later than expected during the exposure period.

Based on the above observations, the assumed retirement rates should be adjusted to increase the number of expected retirements at earlier ages and extend out the expected age at which all eligible participants are assumed to retire to better fit the actual recent experience of the plan. Further, since the Pension Plan and OPEB Plan cover the same participant population, the Retirement Rate assumption should be the same for both plans.

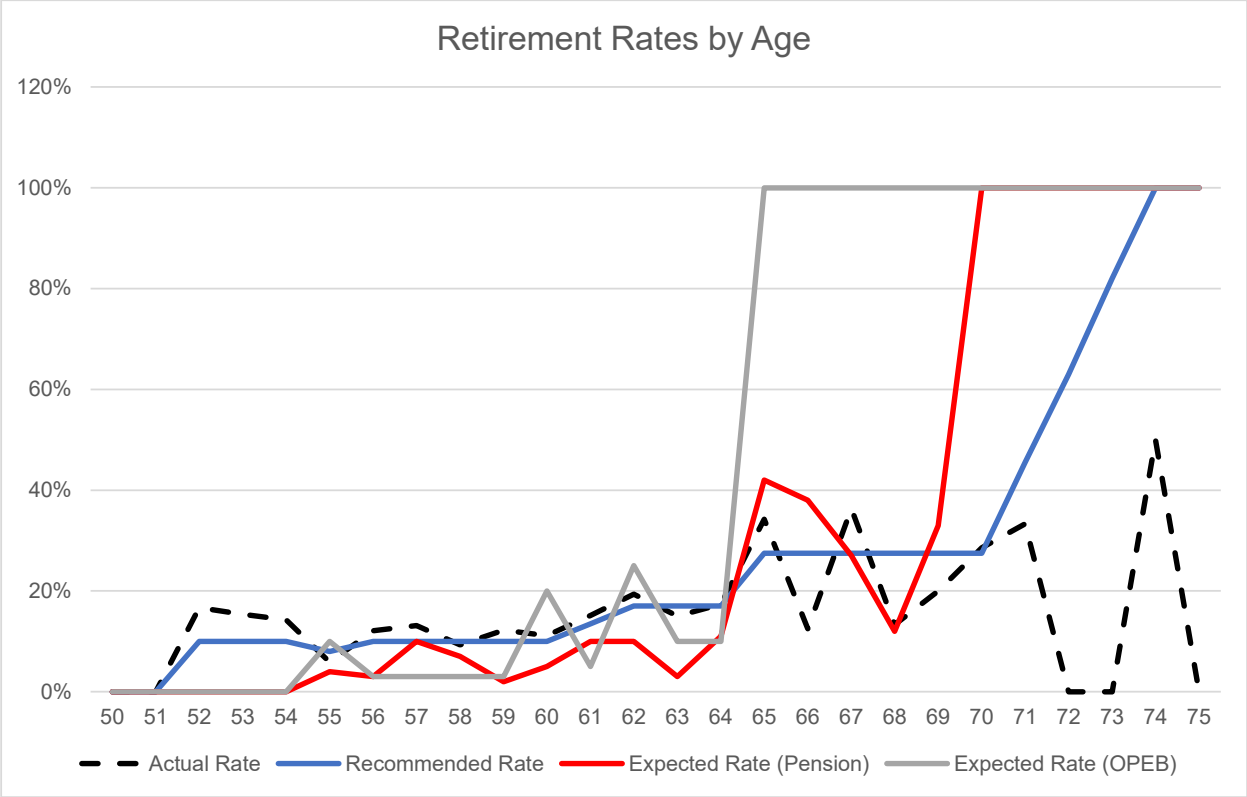
We recommend the rates shown in Table 4 below as the actuarial assumption for retirement rates for future Pension Plan and OPEB Plan actuarial valuations. These rates continue to reflect an age-based assumption. In general, higher rates are used at most ages prior to age 65 and rates after age 65 are extended to age 74. This is consistent with recent plan experience.

Table 4: ***Recommended Retirement Rates Assumption (Pension and OPEB Plans)***

Age	Annual Rate
52-54	0.100
55	0.080
56-60	0.100
61	0.135
62-64	0.170
65-70	0.275
71	0.455
72	0.630
73	0.820
74	1.000

Chart 2 below graphs the recommended retirement rates relative to the actual and expected rates during the study period.

Chart 2: **Recommended Retirement Rates Relative to Actual and Expected Rates**



We tested the fit of the recommended rates using ratios of actual to expected retirements based on these new retirement rates. The new rates produce 82 expected retirements (as compared to the 81 actual retirements shown in Table 1 above and Table 5 below) and bring the A/E ratios closer to 100% overall. These rates also better reflect the overall pattern of rates based on age, as illustrated in Chart 2 above.

Table 5: Number of Retirements – Actual versus Expected based on Current and Recommended Rates

	Number of Retirements		
	Current Rates (Pension)	Current Rates (OPEB)	Recommended Rates
Actual Number	81	81	81
Expected Number	73	154	82
Actual/Expected Ratio	111%	53%	99%

B. Termination

Another important actuarial assumption for the Pension and OPEB Plans is the assumption of termination of employment with NTMWD for reasons other than death, disability or retirement.

Pension Plan Members must become vested in order to be eligible for employer-provided benefits upon their retirement. The Pension Plan vesting schedule is as follows:

Years of Service	Vesting Percent
Less than 5	0%
5 or more	100%

Participants who terminate prior to becoming 100% vested receive a distribution of their accumulated contributions from the Pension Plan.

The termination assumption uses a schedule of assumed termination rates to recognize that some of the employees will terminate before they are eligible to receive retirement benefits.

Application of the termination rates to the employee population in a Pension Plan valuation allows the actuary to calculate the actuarial present value of the benefit payments which will be made to those employees who will eventually qualify for death, disability or retirement benefits at a later date provided that they are vested at the time of termination. For purposes of the OPEB Plan, employees who terminate prior to retirement eligibility are not eligible to receive OPEB plan benefits at any future date.

If the assumed termination rates are too low, it will be assumed that more employees will work until retirement eligibility and will qualify for benefits than will actually be the case, and the normal cost and the actuarial liability will be overstated. Conversely, if the assumed termination rates are too high, the normal cost and the actuarial liability will be understated since it will be assumed that fewer employees will qualify for retirement benefits than will actually be the case.

We studied the termination experience among NTMWD employees during the five-year period from January 1, 2018 to December 31, 2022. During this period, 230 employees terminated employment for reasons other than death, disability, or retirement. The current assumed termination rates are derived from a published age-graded actuarial table (i.e., Sarason T-7) issued in the 1950s (see Table 6 below).

Table 6: ***Current Termination Rates Assumption***

Rate of Decrement Due to Termination Per 100 Members					
	Years of Service				
Age	0-2	3	4	5	6+
<21	19.89	17.40	14.92	12.43	9.94
25	19.36	16.94	14.52	12.10	9.68
30	18.62	16.30	13.97	11.64	9.31
35	17.44	15.26	13.08	10.90	8.72
40	15.54	13.60	11.65	9.71	7.77
45	12.75	11.16	9.57	7.97	6.38
50	8.50	7.44	6.38	5.32	4.25
55	3.13	2.74	2.35	1.96	1.57
60	0.30	0.26	0.22	0.19	0.15
63+	0.00	0.00	0.00	0.00	0.00

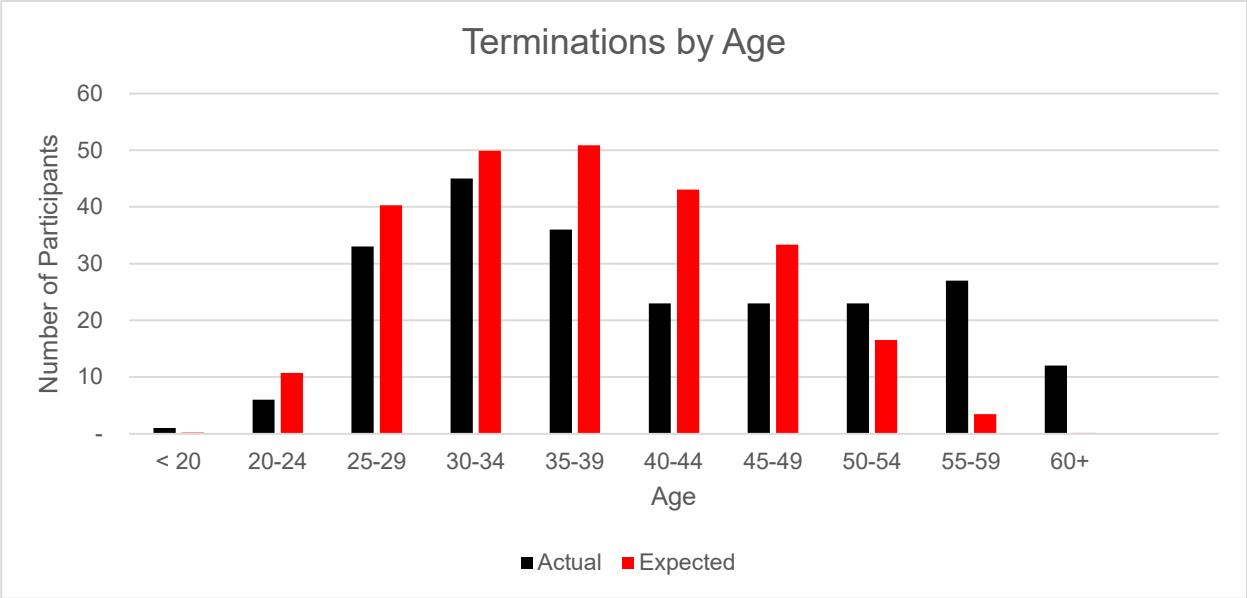
The appropriateness of the currently assumed termination rates was tested by calculating ratios of the number of actual terminations to the number of expected terminations (A/E ratio) based on the currently assumed rates. The A/E ratios in Table 7 below indicate how different the actual termination experience was compared to the expected experience. An A/E ratio greater than 100% indicates that there were more terminations than expected, while a ratio under 100% means there were fewer terminations than expected according to the current assumption.

Table 7: Termination Rate Study by Age (January 2018 through December 2022)

Age	Number of Actual Terminations	Number of Expected Terminations (Current Rates)	A/E (Actual to Expected Ratio)
<20	1	0.20	500%
20-24	6	10.71	56%
25-29	33	40.30	82%
30-34	45	49.88	90%
35-39	36	50.87	71%
40-44	23	43.04	53%
45-49	23	33.32	69%
50-54	23	16.52	139%
55-59	27	3.43	787%
60+	13	0.14	9,286%
Total	230	248.41	93%

This same information is shown in Chart 2 on the following page.

Chart 2: Actual versus Expected Terminations by Age



Observations from Table 7 and Chart 2:

- There were fewer actual terminations than expected below age 50 during the exposure period.
- There were more actual terminations than expected over age 50 during the exposure period.

Before establishing recommended termination rates, we further analyzed the termination data to investigate whether or not the termination patterns varied by service.

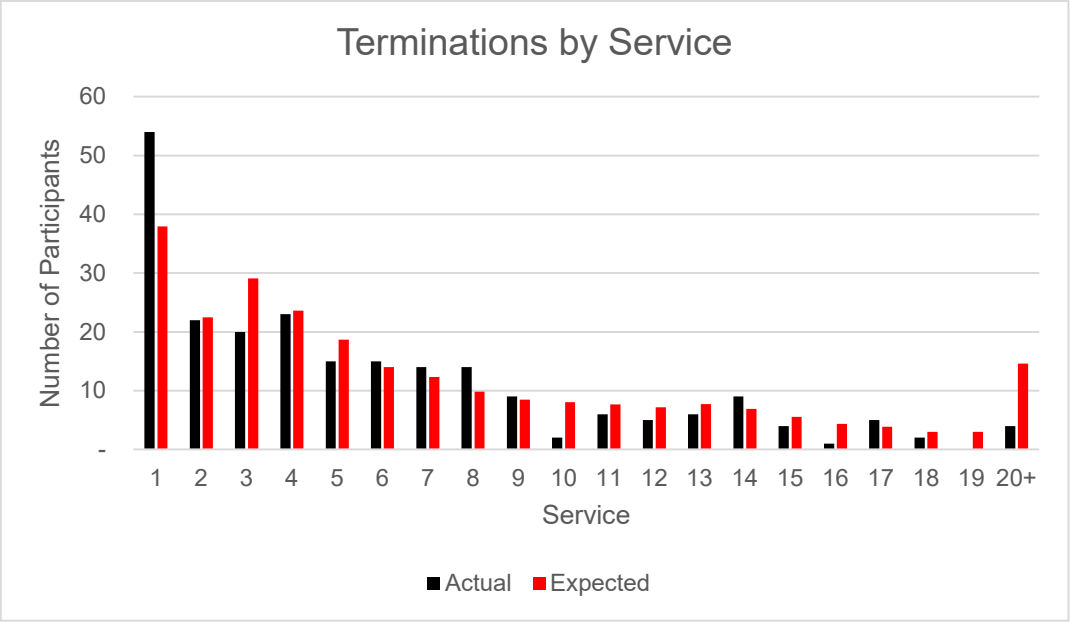
The table and chart below indicate the "fit" for each service group.

Table 8: Termination Rate Study by Service (January 2018 through December 2022)

Service	Number of Actual Terminations	Number of Expected Terminations (Current Rates)	A/E (Actual to Expected Ratio)
0-1	54	37.95	142%
2-4	65	75.19	86%
5-9	67	63.31	106%
10-14	28	37.54	75%
15-19	12	19.83	61%
20+	4	14.59	27%
Total	230	248.41	93%

This same information is shown for each year of service in Chart 3 on the following page.

Chart 3: Actual versus Expected Terminations by Service



Observations from Table 8 and Chart 3:

- Terminations occur at a higher rate in the beginning years of employment and gradually decrease as participants approach 20 years of service.
- In general, there were more terminations than expected in the first ten years of employment.
- There were fewer terminations than expected for participants with 10 or more years of service.

Based on the actual termination rates, we developed preliminary recommended rates of termination based on service that would more closely fit the experience of the five-year study period. We tested the fit of these preliminary rates using ratios of actual to expected terminations and made additional adjustments to arrive at the recommended rates which bring the ratios closer to 100% and retain a consistent overall pattern of rates.

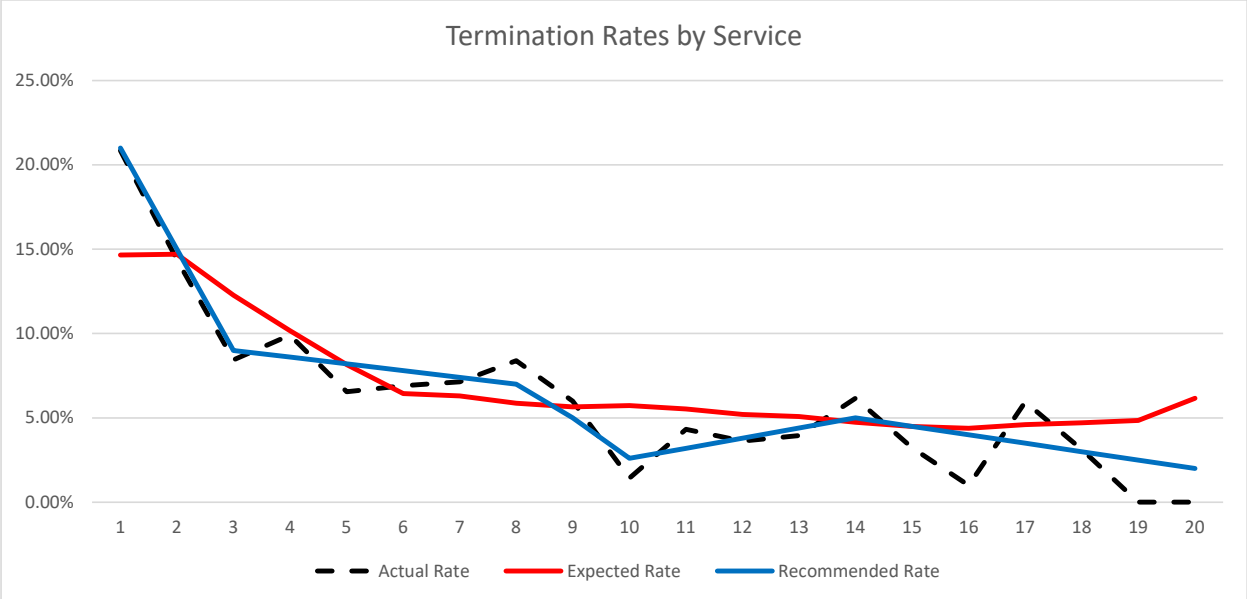
We recommend the termination rates shown in Table 9 below for future Pension Plan and OPEB Plan actuarial valuations.

Table 9: ***Recommended Termination Rates Assumption***

Rate of Decrement Due to Termination Per 100 Members	
Years of Service	**Rate**
<2	21.000
2	15.000
3	9.000
4	8.600
5	8.200
6	7.800
7	7.400
8	7.000
9	5.000
10	2.600
11	3.200
12	3.800
13	4.400
14	5.000
15	4.500
16	4.000
17	3.500
18	3.000
19	2.500
20	2.000
21+	1.500

Chart 4 below illustrates a comparison of the recommended termination rates to the actual termination rates and the current assumed rates.

Chart 4: **Recommended Termination Rates Relative to Actual and Expected Rates**



The resulting aggregate expected number of terminations is 235 using the recommended assumptions which compares to the actual number of terminations of 230; this would produce an A/E ratio of 98% as shown in Table 10 below.

Table 10: Number of Terminations – Actual versus Expected based on Current and Recommended Rates

	Number of Terminations	
	Current Rates	Recommended Rates
Actual Number	230	230
Expected Number	248	235
Actual/Expected Ratio	93%	98%

C. Disability

If an active participant incurs a condition which is determined by NTMWD to be a permanent and total disability and the participant has at least two years of service with NTMWD at the time of the disability certification, they shall be entitled to a monthly disability benefit payable from the Pension Plan beginning six months after their disability certification date. Disability payments continue until one of the following events occurs: (a) the participant recovers, (b) the participant fails to submit proof of continued disability, (c) the participant retires on their normal or early retirement date or (d) the participant dies.

Based on the data provided, there were only two actual disabilities during the five-year exposure period.

Current Disability Assumption: None assumed.

Given the low number of actual disabilities over the exposure period, we believe this is a reasonable assumption.

Recommended Disability Assumption: No changes from the current assumption (i.e., continue to assume no rates of disability).

D. Mortality

The mortality assumption is used to project the expected lifetime for each participant to determine the period over which retirement benefits are expected to be paid.

Current Mortality Assumption: The Pub-2010 General Tables projected from 2010 with generational mortality improvements using Scale MP-2021.

In order for a plan to develop a mortality table based solely on the plan's own experience it must be large enough to have at least 1,000 deaths at each age and gender. The Society of Actuaries' Credibility Educational Resource for Pension Actuaries published a paper called the Application of Credibility Theory to Mortality Assumption in August 2017 which describes a Limited Fluctuation Credibility Theory (LFCT) approach to adjusting a published mortality table by a factor based on a plan's own experience. Per this paper, for plans that have at least 1,082 deaths in aggregate, a custom mortality table can be developed by multiplying the mortality rates in a published table by the ratio of actual to expected deaths. However, during the period from January 2018 to December 2022, the Pension Plan had fewer than 100 deaths. Accordingly, the Pension Plan is not large enough for its actual mortality experience to be the basis of the mortality assumption.

For a plan of this size, it is standard practice to use a published mortality table that is considered appropriate for a retirement plan. Through the years there have been a number of major mortality studies for the purpose of developing a published mortality table or set of mortality tables. One of the common findings of these studies is that mortality rates in the United States have gradually become lower over extended periods of time, often referred to as improvement in mortality (i.e., people are living longer). Therefore, a newer set of mortality tables is usually considered more appropriate for valuing a pension plan than an older set of tables.

In January of 2019, the Society of Actuaries (SOA) published the Pub-2010 Public Retirement Plans Mortality Tables Report. This report is the result of a comprehensive study of the mortality experience of public pension systems across the United States, where such experience comes from calendar years 2008-2013. The report published mortality tables for three different classes of employees, Teachers, Public Safety and General Employees, as well as tables for Retirees, Disabled Retirees and Contingent Survivors. Each of the Employee tables are subdivided into Above-Median Income, Below-Median Income and a Total Dataset, and further subdivided into amount-weighted tables or headcount-weighted tables, where amount-weighted should be used when the benefits are tied to compensation. Similarly, the Retiree tables are divided into Above and Below Median based on benefit amount. The report indicates that the mortality tables should be projected with an appropriate mortality improvement projection scale.

Recommended Mortality Assumption: No changes from the current base mortality rates assumption (i.e., continued use of the Pub-2010 General Amount-Weighted mortality tables) and no changes from the current mortality improvement projection scale assumption (i.e., continued use of the current standard of Scale MP-2021).

E. Other Demographic Assumptions (OPEB Only)

The following are additional recommended demographic assumption changes for use in future OPEB actuarial valuations.

1. Spouse Age Difference:

   The spouse age difference is used in the valuation of OPEB Plan benefits for assumed covered spouses of future retired participants.

   Current Spouse Age Difference Assumption: For future retired participants and their spouses, female spouses are assumed to be three years younger than their male counterparts.

   Our analysis of the age difference between retired participants and covered spouses in the historical OPEB Plan data indicates that, on average, female spouses are approximately 2.5 years younger than their male counterparts. This is consistent with the current assumption of a three-year age difference, so we do not recommend a change in this assumption at this time.

   Recommended Spouse Age Difference Assumption: No changes from the current assumption (i.e., female spouses three years younger than male counterparts).

2. Retiree Coverage Election Percentage:

   The retiree coverage election assumption is used in the OPEB Plan valuation to estimate the percentage of future retirees who will elect coverage at retirement.

   Current Retiree Coverage Election Percentage Assumption: 85% of all future retirees who retire prior to age 65 are assumed to elect coverage at retirement and remain covered until the earlier of death or age 65.

Our analysis of retiree coverage elections over the January 1, 2018 to December 31, 2022 exposure period yielded the results shown in Table 11 below.

Table 11: Retiree Coverage Election Analysis (January 2018 through December 2022)

Year	Number of New Retirees[1] Eligible for OPEB	Number of New Retirees that Elected Coverage	Percentage of New Retirees that Elected Coverage
2018	17	16	94.1%
2019	7	6	85.7%
2020	17	14	82.4%
2021	38	34	89.5%
2022	4	4	100.0%
Total	83	74	89.2%

[1] Includes individuals who retired as a result of the Retirement Incentive Program.

In our professional judgement, the total retiree election percentage over the exposure period of 89.2% does not deviate materially from the current assumption of 85%, so we do not recommend a change in this assumption at this time.

Recommended Retiree Coverage Election Percentage Assumption: No changes from the current assumption (i.e., 85% of all future retirees who retire prior to age 65 are assumed to elect coverage at retirement and remain covered until the earlier of death or age 65).

3. Spouse Coverage Election Percentage:

The spouse coverage election assumption is used in the OPEB Plan valuation to estimate the percentage of future retirees who will elect spousal coverage at retirement.

Current Spouse Coverage Election Percentage Assumption: 60% of participants who elect coverage for themselves upon retirement are assumed to elect coverage for their spouse.

Our analysis of spouse coverage elections over the January 1, 2018 to December 31, 2022 exposure period yielded the results shown in Table 12 below.

Table 12: Spouse Coverage Election Analysis (January 2018 through December 2022)

Year	Number of New Retirees[1] that Elected Coverage	Number of New Retirees that Elected Spouse Coverage	Percentage of New Retirees that Elected Coverage
2018	16	8	50.0%
2019	6	4	66.7%
2020	14	11	78.6%
2021	34	26	76.5%
2022	4	4	100.0%
Total	74	53	71.6%

[1] Includes individuals who retired as a result of the Retirement Incentive Program.

In our professional judgement, the total spouse election percentage over the exposure period of 71.6% deviates enough from the current assumption of 60% to recommend a change in this assumption at this time.

Recommended Spouse Coverage Election Percentage Assumption: 65% of participants who elect coverage for themselves upon retirement are assumed to elect coverage for their spouse.

F. Inflation

Inflation is a building block component of the Compensation Increase assumption, the Social Security Taxable Wage Base increase assumption (Pension Plan), medical and dental trend rate assumptions (OPEB Plan) and the Investment Return assumption. These four economic assumptions should be consistent with each other and contain the same assumed rate of inflation. In addition, the inflation assumption forms the basis for the annual Cost of Living Adjustment (COLA) assumption for the Pension Plan and is used to project the compensation limit under Internal Revenue Code (IRC) §401(a)(17) and the benefit limitations under IRC §415(b) for the Pension Plan. The most widely recognized measure of inflation is the Consumer Price Index for Urban Consumers (CPI-U). Under the terms of the Pension Plan, the annual COLA increases are tied to CPI-W. The table below shows the average annual increase in the CPI-U and the CPI-W for periods of varying duration.

Table 13: 55-Year History of the Average Annual Increase in CPI-U and CPI-W from December to December

Period	Number of Years in Period	Geometric Average Annual Increase	
		CPI-U	CPI-W
1968-2022	55	4.02%	3.98%
1973-2022	50	3.96%	3.91%
1978-2022	45	3.54%	3.48%
1983-2022	40	2.82%	2.76%
1988-2022	35	2.74%	2.71%
1993-2022	30	2.49%	2.47%
1998-2022	25	2.47%	2.47%
2003-2022	20	2.51%	2.52%
2008-2022	15	2.33%	2.34%
2013-2022	10	2.60%	2.57%

We can also take into consideration the prospective inflation assumptions used by other professionals. Investment advisory firm NEPC's capital market assumptions (provided by NTMWD's investment consultant, Westwood Group) indicate expected future annual inflation of 2.50%. In the 2023 OASDI Trust Funds (Social Security Administration) report, the ultimate inflation assumptions for their 75-year projections were 3.0%, 2.4% and 1.8% for the low-cost, intermediate and high-cost assumptions, respectively. In the most recent survey (Q1 2023) of the Society of Professional Forecasters conducted by the Philadelphia Federal Reserve, the forecasters predict annual price inflation of 2.37% over the next ten years.

Peer Data

For informational purposes, this section includes data on the inflation assumption used among public pension plans in Texas. While peer data should not be used to establish an inflation assumption, it can be instructive to know where your inflation assumption falls relative to your peers.

According to data compiled by the Texas Pension Review Board (PRB), the average inflation assumption for the 100 Texas public retirement systems included in the dataset is currently 2.56%. The table below, reproduced from the PRB's '2023 Guide to Public Retirement Systems in Texas', shows the current distribution of the inflation assumption among these retirement systems:

Inflation Rate Assumptions				
Inflation Assumption	Statewide (7)	TLFFRA (42)	Municipal (17)	Special District (34)
Under 2.25%	0%	2%	0%	6%
2.25%-2.49%	57%	2%	12%	21%
2.50%	29%	34%	65%	26%
2.75%	0%	32%	18%	15%
2.76%-2.99%	14%	26%	5%	3%
3.75%	0%	2%	0%	0%
N/A	0%	2%	0%	29%

As shown in Table 13 above, over the long-term (i.e., 30 to 55 years), the CPI-U has averaged an annual increase of 2.49% to 4.02% and the CPI-W has averaged an annual increase of 2.47% to 3.98%. However, in recent past experience (i.e., 10 to 25 years), the CPI-U has averaged an annual increase of 2.33% to 2.60% and the CPI-W has averaged an annual increase of 2.34% to 2.57%. Because the Pension Plan and OPEB Plan valuations project benefit payments over 70 years into the future, long-term expected trends should be emphasized while giving reasonable weight to recent past experience.

Current Annual Inflation Assumption: 2.20% (OPEB Plan) and 2.00% (Pension Plan).

Recommended Annual Inflation Assumption: 2.50% which is at the lower end of the long-term ranges discussed above.

The annual COLA increase in the Pension Plan is based on the prior year's inflation as measured by CPI-W but not greater than 3.00%. Because of the 3.00% cap, we would expect the average COLA increase to be lower than the uncapped inflation rate. In Table 14 below, we have summarized the history of CPI-W increases reflecting a 3.00% cap.

Table 14: 55-Year History of the Average Annual Increase in CPI-W from December to December Reflecting a 3.00% Cap

Period	Number of Years in Period	Geometric Average Annual Increase in CPI-W
1968-2022	55	2.47%
1973-2022	50	2.42%
1978-2022	45	2.35%
1983-2022	40	2.27%
1988-2022	35	2.23%
1993-2022	30	2.12%
1998-2022	25	2.05%
2003-2022	20	2.02%
2008-2022	15	1.82%
2013-2022	10	1.79%

As shown in Table 14 above, over the long-term (i.e., 30 to 55 years), the CPI-W has averaged an annual increase (capped at 3%) of 2.12% to 2.47%. However, in recent past experience (i.e., 10 to 25 years), the CPI-W has averaged an annual increase (capped at 3%) of 1.79% to 2.05%. Because the Pension Plan valuation projects benefit payments over 70 years into the future, long-term expected trends should be emphasized while giving reasonable weight to recent past experience.

Current Annual COLA Assumption: 3.00% for 2023-2025 and 2.00% thereafter.

Recommended Annual COLA Assumption: 2.00%.

The IRC §401(a)(17) and IRC §415(b) limitations in the Pension Plan should be projected to increase annually at the assumed inflation rate.

Current IRC §401(a)(17) and IRC §415(b) Limitations Annual Increase Assumption: 0.00%.

Recommended IRC §401(a)(17) and IRC §415(b) Limitations Annual Increase Assumption: 2.50%.

The Pension Plan benefit accrual formula grants 3% of a participant's annual earnings plus 1% of a participant's annual earnings in excess of covered compensation. Covered compensation is the average of the Social Security Taxable Wage Bases in effect for each calendar year during the 35-year period ending with the year in which the participant attains Social Security Retirement Age. Thus, for purposes of projecting covered compensation into the future, the Social Security Taxable Wage Base in the Pension Plan should be projected to increase annually at the assumed annual inflation rate plus national productivity growth.

Current Social Security Taxable Wage Base Annual Increase Assumption: 4.00%.

Recommended Social Security Taxable Wage Base Annual Increase Assumption: 3.00% (i.e., 50 basis points above assumed inflation).

G. Compensation Increases

When the actuarial cost method for a pension plan requires projection of future retirement benefits that are a function of future earnings, it is necessary to project the current earnings of the individual plan participants for each future year in which they will accrue benefit credits to be financed by the employer. In the actuarial valuations for the Pension Plan and the OPEB Plan, the Entry Age Normal actuarial cost method requires such a projection of future earnings. Salaries are projected through a compensation increase assumption that ideally should reflect the anticipated effect of (1) merit, promotion, and longevity increases and (2) general wage increases, which consist of price inflation increases and increases in excess of price inflation generally referred to as productivity increases.

Table 15: ***Current Compensation Increase Assumption***

Age Range	Average Annual Increase	
	Pension Plan	OPEB Plan
20 - 24	4.00%	3.00%
25 - 29	4.00	3.00
30 - 34	4.00	3.00
35 - 39	4.00	3.00
40 - 44	4.00	3.00
45 - 49	4.00	3.00
50 - 54	4.00	3.00
55 – 59	4.00	3.00
60 - 64	4.00	3.00
65+	4.00	3.00

The prior actuary's valuation reports did not describe the components of this assumption.

The general wage increase assumption is typically the larger part of each annual increase assumed at most ages. The exceptions are for the first few years of employment especially at younger ages. While the actual general wage increase for any year will vary from employer to employer, the average annual general wage increase for the long-term future should be influenced by competitive pressures from other employers in the region. The Merit, Promotion, and Longevity (MPL) component is usually the smaller part of each annual increase assumed. The actual MPL increases will vary from employee to employee; so, the assumed MPL increases are expected averages over a working career for each age.

We have not studied the NTMWD salary experience with the purpose of determining actual productivity increases or real increases in earnings separate from MPL increases. Productivity salary increases would be very difficult to isolate among NTMWD participants because we only have data on the total salary increase. Even though we would expect different levels of salary increases over several years, the salary levels of NTMWD employees over the long term must be reasonably competitive with applicable private and public sector businesses and industries that experience productivity gains and pass some part of them to their employees in salary increases.

For this current experience study of salary increases, we included up to 15 annual compensation increases per participant. We were provided with a 32-year earnings history, but we believe that focusing this study on the most recent 15 years of data yields a more relevant assumption for future compensation increases. Each annual compensation was categorized by age group and the compensation increase rate for each age was determined net of actual inflation. We then compared the actual compensation increase rates for each age group to the current rates in order to see the underlying patterns of compensation increases during that period.

Based on the comparisons to the current assumed rates, we made several adjustments to develop a new compensation increase assumption that we believe to be appropriate for the long-term future. The increases have been determined by age groups based upon the actual experience (net of inflation) demonstrated by the participants. Then those increases were adjusted by assumed inflation to determine the final recommended compensation increase assumption. Since it is important for the inflationary component of the compensation assumption to be consistent with the inflationary component of the investment return assumption, the assumed annual increase in compensation due to price inflation is 2.50%. (See Section III.F. of this report for additional details.)

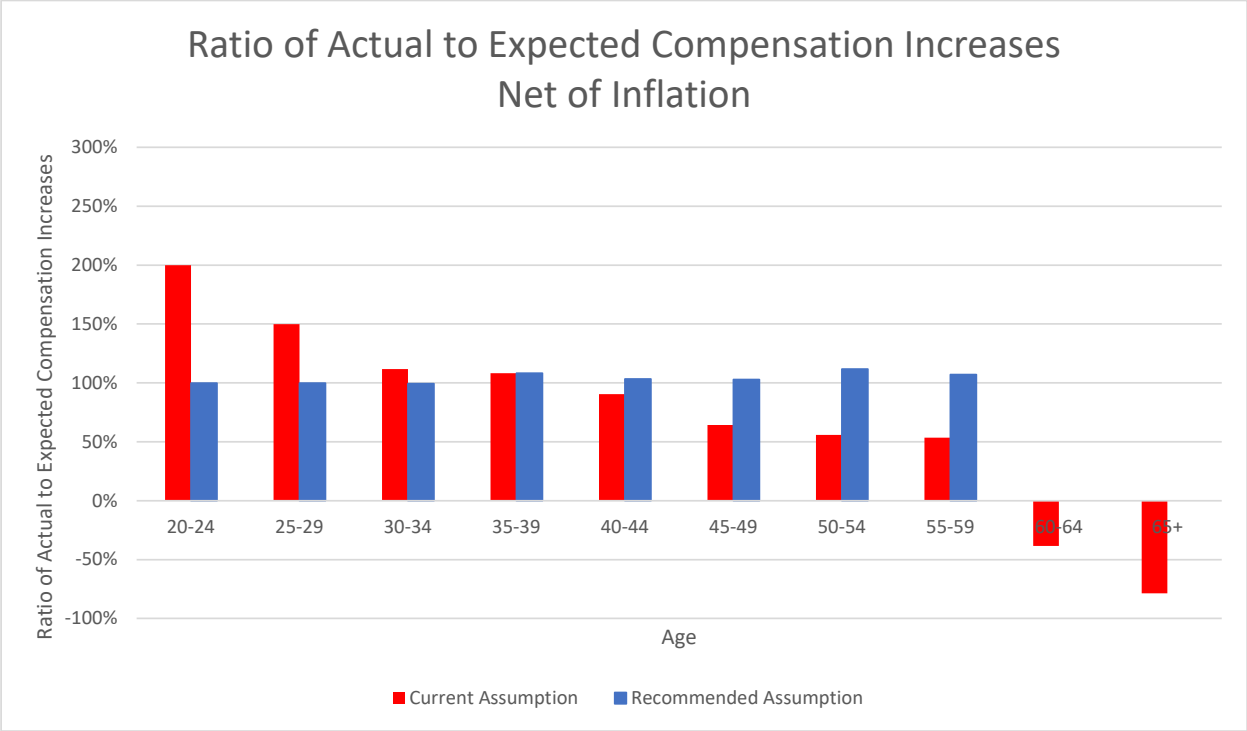
Table 16: ***Recommended Compensation Increase Assumption:***

Age Range	Recommended Average Annual Increase[1]
20 - 24	6.50%
25 - 29	5.50
30 - 34	4.75
35 - 39	4.50
40 - 44	4.25
45 - 49	3.75
50 - 54	3.50
55 – 59	3.50
60 - 64	2.50
65+	2.50

[1] Includes 2.50% recommended inflation component.

Chart 5 below shows the ratio of actual earnings net of inflation to expected earnings under both the current assumption and the recommended assumption for all employees in five-year age bands. This ratio is an indicator of the fit of the assumed compensation increases to the actual compensation increases over the exposure period. A ratio of 100% indicates alignment between the assumption and the actual experience.

Chart 5: Ratio of Actual to Expected Earnings Net of Inflation under the Current Assumption and Recommended Assumption for All Employees



Observations from Chart 5:

- Actual compensation increases (net of inflation) were higher than expected based on the current assumption in the five-year age bands prior to age 35 during the exposure period.

- Actual compensation increases (net of inflation) were lower than expected based on the current assumption in the five-year age bands above age 34 during the exposure period.

- Recommended compensation increases (net of inflation) below age 60 yield approximately the same compensation increases that the plan actually experienced during the exposure period.

- Recommended compensation increases (net of inflation) above age 59 are 0% since the plan's actual experience during the exposure period indicates compensation increases less than inflation.

H. Investment Return

The current investment return assumptions established by the employer are 7.75% (Pension Plan) and 7.50% (OPEB Plan) per year net of investment-related expenses. While we did not provide any input into the establishment of these assumptions, we are obligated under the Actuarial Standards of Practice to assess their reasonableness for use in the actuarial valuations of the Pension Plan and OPEB Plan. This section describes our independent analysis used in this assessment.

A building-block method is used to assess the reasonableness of the Investment Return assumption. There are three components to the investment return assumption: (1) the rate of inflation, (2) the real rate of return (net of inflation) and (3) investment-related expenses. Each component represents the annual average rate expected over the long-term future. While this is a theoretical approach, it provides a reasonable basis for the selection and/or analysis of an investment return assumption.

In the building-block method, historical markets are studied and long-term historical relationships between equities and fixed-income are preserved consistent with the widely accepted capital market principle that assets with higher volatility generate a greater return over the long run. The long-term portfolio return is established via a building block approach with proper consideration of diversification and rebalancing. Next, best-estimate ranges of expected future real rates of return (expected returns, net of inflation) are developed for each major asset class. The ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by an asset allocation percentage which is based on the nature and mix of current and expected plan investments. This weighted-return is then increased by expected inflation and reduced by assumed investment expenses.

Per the NTMWD Investment Policy contained in the Administrative and Finance Policies Manual as amended in August, 2022, the target asset allocation for both plans is broadly defined as 20% to 80% fixed income investments and 20% to 80% equities. Given the broad nature of the target asset allocation, we have used the actual asset allocations as of December 31, 2022 in this analysis. The asset allocations and the associated market indices used to develop the expected real return assumptions are as follows:

Table 17: Asset Allocations

Asset Class	Actual Allocation (Pension Plan)[1]	Actual Allocation (OPEB Plan)[2]	Market Index Used to Develop Expected Real Return of Asset Class
Cash and Cash Equivalents	7%	0%	3-month T-Bills
Fixed Income	29%	36%	Bloomberg Barclays Capital Aggregate Index
U.S. Equities	46%	50%	Standard and Poor's 500 Index
International Equities	15%	8%	MSCI World
Alternative Income	3%	6%	N/A[3]

These indices have the following historical annual real returns (i.e., the return after removing the effect of inflation as measured by CPI-U) for periods ending in 2022:

1 Determined using December 31, 2022 trust statements.
2 Determined using blends of various funds as provided by Westwood.
3 Analysis uses expected return provided by Westwood derived from NEPC's 12/31/2022 Capital Market Assumptions (30-Year Forecast); blend of 50% Hedge Fund Credit and 50% Hedge Fund Macro.

Table 18: Geometric Average Annual Returns of Market Indices

Geometric Average Annual Real Return[1]					
Period	Number of Years	3-month T-Bills	Bloomberg Barclays Capital Aggregate Index	S&P 500 Index	MSCI World
1978-2022	45	0.91%	2.81%	7.83%	6.21%
1993-2022	30	0.05%	1.91%	7.12%	5.03%
1998-2022	25	(0.39)%	1.35%	5.19%	3.62%
2003-2022	20	(0.99)%	0.43%	7.33%	5.76%
2008-2022	15	(1.75)%	0.14%	6.16%	3.13%
2013-2022	10	(1.98)%	(1.71)%	9.42%	5.91%

[1] Information through 2016 as summarized and published by the Society of Actuaries.

Based on these historical returns, the following reasonable real return ranges have been developed giving more weight to longer periods of return:

Table 19: Reasonable Real Investment Return Assumptions for Asset Classes

Reasonable Real Investment Return Assumptions				
Asset Class	Low	Midpoint	High	Selected Assumption
Cash and Cash Equivalents	-2.00%	-0.50%	1.00%	0.25%
Fixed Income	-1.75%	0.50%	2.75%	2.00%
U.S. Equities	5.25%	7.25%	9.50%	7.25%
International Equities	3.25%	4.75%	6.25%	5.25%
Alternative Income[1]	N/A	N/A	N/A	4.10%

[1] Analysis uses expected return provided by Westwood derived from NEPC's 12/31/2022 Capital Market Assumptions (30-Year Forecast); blend of 50% Hedge Fund Credit and 50% Hedge Fund Macro.

The following tables illustrate how the December 31, 2022 allocation of each asset class is multiplied by the real rate of return for each asset class to determine the total expected real rate of return:

Table 20a: Development of Real Rate of Investment Return Assumption for the Pension Plan based on the December 31, 2022 Allocation

Asset Class	12/31/2022 Allocation (A)	Selected Real Rate of Investment Return Assumption (B)	12/31/2022 Allocation Real Rate of Investment Return Assumption (A) x (B)
Cash and Cash Equivalents	7%	0.25%	0.018%
Fixed Income	29%	2.00%	0.580%
U.S. Equities	46%	7.25%	3.335%
International Equities	15%	5.25%	0.788%
Alternative Income	3%	4.10%	0.123%
Total	100%	N/A	4.844%

Table 20b: Development of Real Rate of Investment Return Assumption for the OPEB Plan based on the December 31, 2022 Allocation

Asset Class	12/31/2022 Allocation (A)	Selected Real Rate of Investment Return Assumption (B)	12/31/2022 Allocation Real Rate of Investment Return Assumption (A) x (B)
Cash and Cash Equivalents	0%	0.25%	0.000%
Fixed Income	36%	2.00%	0.720%
U.S. Equities	50%	7.25%	3.625%
International Equities	8%	5.25%	0.420%
Alternative Income	6%	4.10%	0.246%
Total	100%	N/A	5.011%

Using the same approach for the Low, Midpoint and High assumption for each asset class and the allocation percentages of the funds, the following real return range of assumptions and the final assumptions have been developed for the expected range of long-term real return of the funds:

Table 21a: Reasonable Total Trust Portfolio Real Investment Return Assumption (Pension Plan)

Reasonable Total Trust Portfolio Real Investment Assumption Return Assumptions (Before Expenses) – Pension Plan				
	Low	Midpoint	High	Selected Assumption
Weighted Return	2.378%	4.281%	6.298%	**4.844%**

Table 21b: Reasonable Total Trust Portfolio Real Investment Return Assumption (OPEB Plan)

Reasonable Total Trust Portfolio Real Investment Assumption Return Assumptions (Before Expenses) – OPEB Plan				
	Low	Midpoint	High	Selected Assumption
Weighted Return	2.501%	4.431%	6.486%	**5.011%**

The final Investment Return assumptions are based upon the building-block method which combines the Inflation assumption with the Real Investment Return assumption offset by assumed investment expenses as shown below:

Table 22a: Final Investment Return Assumption (Pension Plan)

Development of Final Selected Investment Return Assumption - Pension Plan				
	Low	Midpoint	High	Selected Assumption
Real Rate of Investment Return Assumption	2.378%	4.281%	6.298%	**4.844%**
Assumed Inflation	2.500%	2.500%	2.500%	**2.500%**
Assumed Investment Expenses	(0.200)%	(0.200)%	(0.200)%	**(0.200)%**
Investment Return Assumption	4.678%	6.581%	8.598%	**7.144%**
Final Rounded Selected Investment Return Assumption – Pension Plan	N/A	N/A	N/A	**7.25%**

Given the uncertain nature of estimating future asset returns, one might consider the current Investment Return assumption of 7.75% for the Pension Plan to be within a range of reasonable assumptions. However, in our professional judgement and based on our review described above, we believe that 7.25% would be a more optimal selection for the Pension Plan Investment Return assumption. Therefore, **we recommend the Investment Return assumption net of investment-related expenses for use in future Pension Plan actuarial valuations be reduced to 7.25%.**

Table 22b: Final Investment Return Assumption (OPEB Plan)

Development of Final Selected Investment Return Assumption - OPEB Plan				
	Low	Midpoint	High	Selected Assumption
Real Rate of Investment Return Assumption	2.501%	4.431%	6.486%	**5.011%**
Assumed Inflation	2.500%	2.500%	2.500%	**2.500%**
Assumed Investment Expenses	(0.300)%	(0.300)%	(0.300)%	**(0.300)%**
Investment Return Assumption	4.701%	6.631%	8.686%	**7.211%**
Final Rounded Selected Investment Return Assumption – OPEB Plan	N/A	N/A	N/A	**7.25%**

Given the uncertain nature of estimating future asset returns, one might consider the current Investment Return assumption of 7.50% for the OPEB Plan to be within a range of reasonable assumptions. However, in our professional judgement and based on our review described above, we

believe that 7.25% would be a more optimal selection for the OPEB Plan Investment Return assumption. Therefore, **we recommend the Investment Return assumption net of investment-related expenses for use in future OPEB Plan actuarial valuations be reduced to 7.25%.**

As a basis of comparison, investment advisory firm NEPC's capital market assumptions (provided by NTMWD's investment consultant, Westwood Group) indicate an expected annual nominal 10-year return of 6.01% and 30-year return of 6.74% for the OPEB Plan.

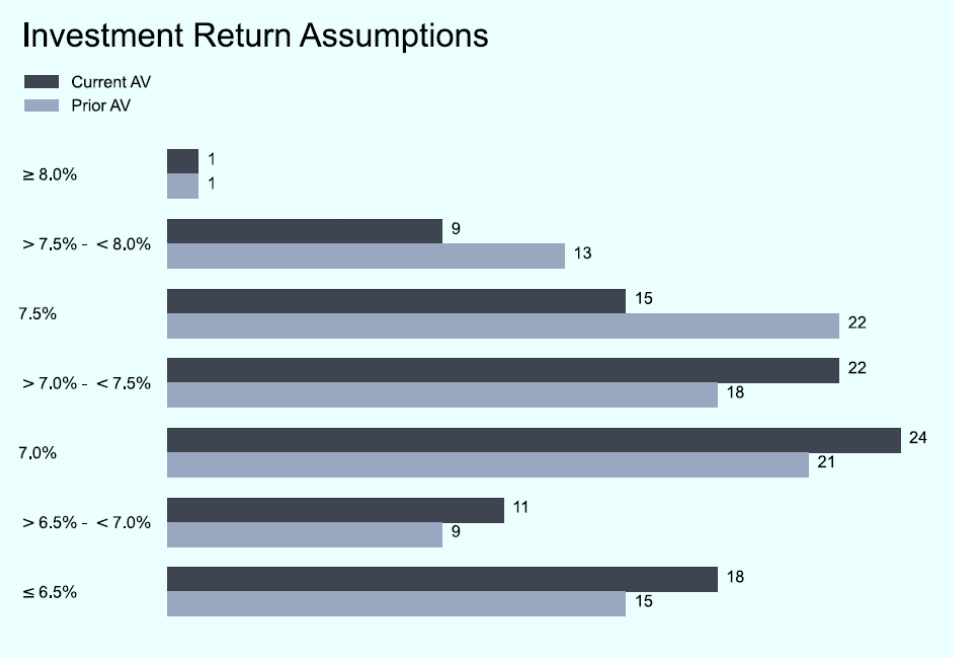
These assumptions should not carry with them the pressure to meet the assumption by changing the quality of fixed income investments or by increasing the asset allocation of equity investments or alternative strategies. It should be considered as a long-term annual average, not as a minimum rate for each future year in the establishment of investment policy.

Peer Data

For informational purposes, this section includes data on the investment return assumptions used among public pension plans in Texas and nationwide. While peer data should not be used to establish an investment return assumption, it can be instructive to know where your investment return assumption falls relative to your peers.

Texas Public Retirement Systems

According to data compiled by the Texas Pension Review Board (PRB), the average investment return assumption for the 100 Texas systems included in the dataset is currently 7.02%. The graph below, reproduced from the PRB's '2023 Guide to Public Retirement Systems in Texas', shows the distribution of the investment return assumption among these retirement systems over the course of the prior and current valuation cycle:

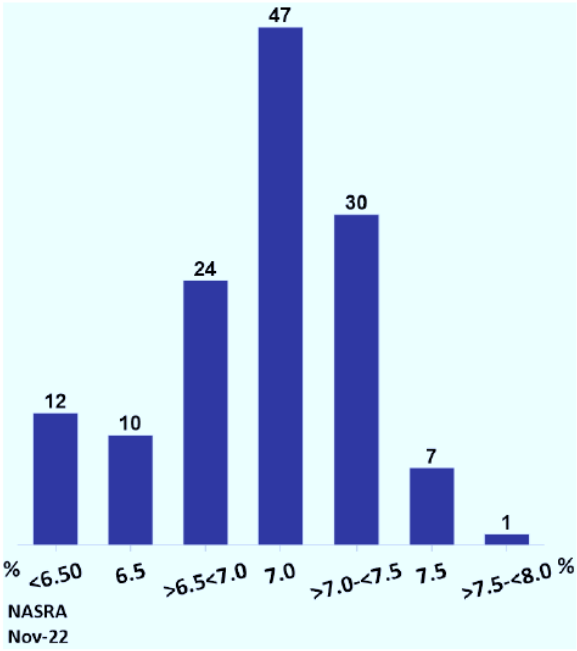


Nationwide State and Local Government Retirement Systems

In their most recent 'Public Pension Plan Investment Return Assumptions' issue brief, the National Association of State Retirement Administrators (NASRA) includes the following distribution of

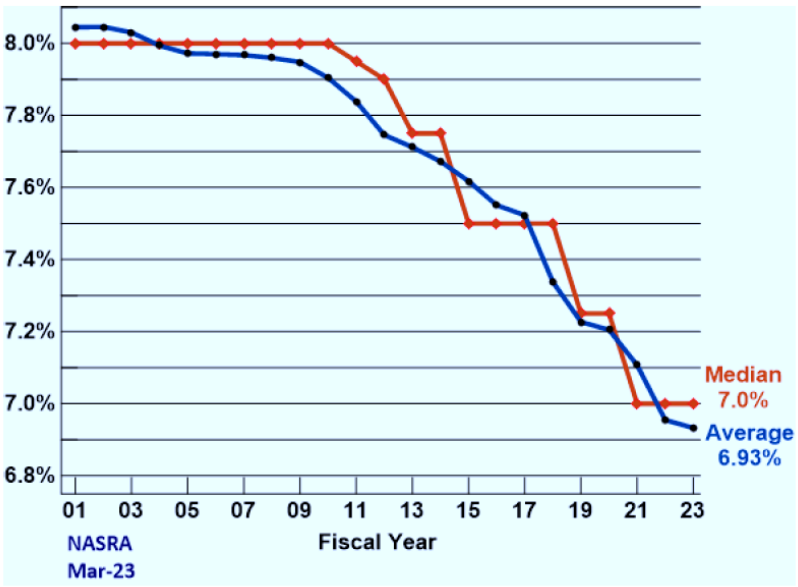
investment return assumptions for the 131 state and local government retirement systems included in their dataset:

Figure 4: Distribution of investment return assumptions



NASRA indicates that the current average investment return assumption in this dataset is 6.93% and the median return assumption is 7.00%. The following graph from the issue brief illustrates the change in the average and median investment return assumption from 2001 to 2023:

Figure 4: Change to average and median investment return assumption, FY 01 to FY 23



Section IV – Comparison of Current and Recommended Assumptions on the Most Recent Actuarial Valuations

Pension Plan January 1, 2023 Valuation Results	Current Assumptions	Recommended Assumptions Excluding Investment Return	Recommended Assumptions Including Investment Return
1. **Present Value of Future Benefits**	$ 242,560,874	$ 250,259,311	$ 272,266,575
2. **Actuarial Accrued Liability**	$ 195,616,391	$ 200,477,496	$ 214,156,359
3. **Actuarial Value of Assets**	$ 112,499,757	$ 112,499,757	$ 112,499,757
4. **Unfunded Accrued Liability (UAAL) (Item 2. – Item 3.)**	$ 83,116,634	$ 87,977,739	$ 101,656,602
5. **Employer Normal Cost**	$ 4,830,465	$ 5,167,597	$ 5,919,587
6. **Actuarially Determined Contribution (ADC)**			
a. Normal Cost[1]	$ 5,030,932	$ 5,382,055	$ 6,149,568
b. Amortization of UAL[2]	7,867,115	8,327,225	9,270,808
c. Total ADC	$ 12,898,047	$ 13,709,280	$ 15,420,376

[1] Includes interest assuming monthly contributions at the end of each month.
[2] Calculated using a 21-year amortization period and assuming monthly contributions at the end of each month.

OPEB Plan September 30, 2022 Valuation Results	Current Assumptions	Recommended Assumptions Excluding Investment Return	Recommended Assumptions Including Investment Return
1. **Total OPEB Liability**	$ 21,413,372	$ 25,131,046	$ 25,627,547
2. **Fiduciary Net Position**	$ 8,687,640	$ 8,687,640	$ 8,687,640
3. **Net OPEB Liability (NOL) (Item 1. – Item 2.)**	$ 12,725,732	$ 16,443,406	$ 16,939,907
4. **Normal Cost**	$ 917,085	$ 1,301,964	$ 1,351,796
5. **Actuarially Determined Contribution (ADC)**			
a. Normal Cost[1]	$ 985,866	$ 1,399,611	$ 1,449,801
b. Amortization of NOL[2]	1,441,663	1,862,828	1,889,387
c. Total ADC	$ 2,427,529	$ 3,262,439	$ 3,339,188

[1] Includes one year of interest.
[2] Calculated using a 15-year amortization period and includes one year of interest.