

**NOVA SCOTIA TEACHERS' PENSION PLAN**

**REPORT ON THE ACTUARIAL VALUATION**  
**AS AT DECEMBER 31, 2019**

**(REGISTRATION No. 0355438)**

**APRIL 2020**

**PREPARED BY:**

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## SUMMARY OF RESULTS

Going Concern Financial Position	December 31, 2018	December 31, 2019
Going concern value of assets	\$4,937,887,000	\$5,357,716,000
Going concern actuarial liability	(\$6,555,529,000)	(\$6,855,448,000)
Going concern excess / (unfunded liability)	(\$1,617,642,000)	(\$1,497,732,000)
Funded ratio (going concern basis)	75.3%	78.2%

Funding Requirements	December 31, 2018		December 31, 2019	
	% of Payroll	\$	% of Payroll	\$
Estimated pensionable earnings for the following year		\$847 million		\$869 million
Total annual current service cost	(14.95%)	(\$126,559,000)	(15.86%)	(\$137,754,000)
Estimated member required contributions	11.78%	\$99,723,000	11.77%	\$102,221,000
Estimated employer required contributions	11.78%	\$99,723,000	11.77%	\$102,221,000
Excess contributions	8.61%	\$72,887,000	7.68%	\$66,688,000

## SECTION I INTRODUCTION AND PURPOSE OF THE VALUATION

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At the request of Teachers' Pension Plan Trustee Inc. (the "Trustee", or "TPPTI" – both are used in this report), we have completed an actuarial valuation of the Nova Scotia Teachers' Pension Plan (the "Plan" or "Teachers' Plan") as at December 31, 2019. The last valuation was performed as at December 31, 2018, and the next valuation will be performed as at December 31, 2020.

The purposes of this actuarial valuation are as follows:

- to report on the financial position of the Plan as at December 31, 2019;
- to establish the minimum contributions required and maximum contributions permitted for the period from January 1, 2020 until the results of the next valuation are available; and
- to provide the actuarial certifications required under the federal Income Tax Act.

The intended users of this report are Teachers' Pension Plan Trustee Inc. and the Canada Revenue Agency. This report is not intended or necessarily suitable for purposes other than those listed above. Any party reviewing this report for other purposes should have their own actuary or other qualified professional assist in their review to ensure that the party understands the assumptions, results and uncertainties inherent in our estimates.

### Changes Since the Previous Valuation

The going concern actuarial assumptions were revised from the previous valuation. In particular, the discount rate was lowered in view of current long-term expectation of interest rates from 6.05% per annum used at the previous valuation to 5.70% per annum for this valuation. The inflation assumption was lowered in view of the overall economic outlook from 2.00% per annum used at the previous valuation to 1.80% per annum for this valuation. The change in inflation outlook affects a number of other assumptions as well – the salary inflation assumption was lowered from 2.00% to 1.80% per annum, the assumption for the increase in the Year's Maximum Pensionable Earnings (YMPE) and Canada Revenue Agency defined benefit limit were lowered from 2.50% per annum to 2.30% per annum for this valuation, and the pension indexing assumption for those with guaranteed indexing was reduced from 1.00% per annum to 0.8% per annum. See Appendix B for details of the assumptions used in this valuation and the rationale employed in setting these assumptions. See Section III for the impact of the changes in assumptions on the valuation results.

The wind-up economic assumptions were changed to reflect market conditions as at the valuation date. These assumptions are summarized in Appendix B.

### Reliance

We have relied on asset information as provided by the Nova Scotia Pension Services Corporation. We have also relied on the Nova Scotia Pension Services Corporation to provide all relevant data and to confirm the pertinent Plan terms.

### Report Format

In this report, we have first provided the valuation results, along with our actuarial opinion of the recommended funding levels for use until the next valuation. The data, actuarial assumptions and methodology used in valuing both the assets and the liabilities are provided by way of Appendices for ease of reference.

Finally, we note that in some cases, figures in the tables contained in this report may not add exactly due to rounding.

## **SECTION II      PLAN CHANGES AND SUBSEQUENT EVENTS**

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Since December 31, 2019, and as of the date of this report, there has been a significant deterioration to global equity markets as well as declining bond yields in connection with COVID-19. At the time this report was prepared, it was too soon to know the impact on the market value of assets, underlying assumptions and any other effects related to COVID-19. These effects therefore are not reflected in the valuation results and as such, the plan's financial position shown in this report may be materially different if those factors were incorporated in our valuation. These effects, once better understood, will be revealed in future valuations.

The Actuarial Standards Board (ASB) published amendments to the CIA Standards of Practice (Section 3500: practice-specific standards for pension commuted values) on January 24, 2020 with an effective date of August 1, 2020. On April 6, 2020, the ASB announced it has decided to delay the effective date of the new Standard of Practice to be a date no earlier than December 1, 2020. The effect, if any, of this new Standard of Practice has not been incorporated into this valuation.

We are not aware of any other events that occurred between the valuation date and the date this report was completed that would have a material impact on the results of this valuation.

There were no material Plan amendments from the date of the prior valuation to the date of the current valuation that would impact the results of the actuarial valuation.

## SECTION III FINANCIAL POSITION OF THE PLAN

### A. Going Concern Basis: Financial Position as at December 31, 2019

Our calculations show that the going concern actuarial liabilities as at December 31, 2019 for all benefits accrued to active, inactive and retired members is \$6,855,448,000. This compares to going concern assets of \$5,357,716,000 as shown below, and results in a going concern unfunded actuarial liability of \$1,497,732,000 and a funded ratio (the ratio of net assets to total liabilities) of 78.2% as at December 31, 2019.

The valuation balance sheet shown below summarizes the components of the liabilities and the corresponding asset values as at December 31, 2019 and as at December 31, 2018 for comparative purposes.

#### FINANCIAL POSITION – GOING CONCERN BASIS

	December 31, 2018	December 31, 2019
<b>Going concern assets</b>		
Net assets available for benefits <sup>1</sup>	\$4,937,887,000	\$5,357,716,000
<b>Going concern actuarial liabilities</b>		
Active members	\$2,132,289,000	\$2,303,061,000
Pensioners and survivors (CPI - 1% indexing)	2,438,025,000	2,374,109,000
Pensioners and survivors (variable indexing)	1,949,210,000	2,136,648,000
Inactive members	36,005,000	41,630,000
Total going concern liabilities	\$6,555,529,000	\$6,855,448,000
<b>Going concern excess / (unfunded liability)</b>	<b>(\$1,617,642,000)</b>	<b>(\$1,497,732,000)</b>
<b>Funded ratio (going concern basis)</b>	<b>75.3%</b>	<b>78.2%</b>

### Sensitivity of Going Concern Financial Position

The going concern actuarial liabilities shown above at December 31, 2019 are based upon a discount rate of 5.70% per annum. To illustrate the sensitivity of the valuation results to changes in the discount rate, we report the impact on the going concern liabilities of a 1% decrease in the discount rate. Had the Plan's liabilities been calculated using a 4.70% discount rate, the liabilities would be \$7,790,136,000, or 13.6% higher.

<sup>1</sup> Asset values are based on information received from the Nova Scotia Pension Services Corporation, and are developed more fully in Appendix A.

## Reconciliation of Going Concern Financial Position

The reconciliation provides an independent cross-check of the calculations performed, and also determines the main reasons for the change in the going concern financial position that have occurred since the previous valuation date.

The table below summarizes the results of our reconciliation of the going concern financial position.

### RECONCILIATION OF GOING CONCERN FINANCIAL POSITION

	2019
<b>Going concern excess / (unfunded liability) as at December 31, 2018</b>	<b>(\$1,617,642,000)</b>
Interest on unfunded liability at 6.05% per annum	(97,867,000)
Investment experience gain (return on assets higher than actuarial discount rate)	299,083,000
Contributions in excess of current service cost	79,114,000
Government contribution due to no indexing on variable provision	24,021,000
Net Plan liability experience (see table below)	24,762,000
Change in pensioner indexing assumption	35,833,000
Change in salary inflation assumption	42,603,000
Change in discount rate assumption	(284,194,000)
Change in assumed rate of increase in YMPE and maximum pension	(5,648,000)
Miscellaneous gains (including data changes)	2,203,000
<b>Going concern excess / (unfunded liability) as at December 31, 2019</b>	<b>(\$1,497,732,000)</b>

### PLAN EXPERIENCE

	2019
	<b>\$ Gain / (Loss)</b>
Salary increases different from assumed	27,259,000
YMPE increases different from assumed	(716,000)
CPI - 1% indexing different from assumed	(2,331,000)
Retirement experience	(729,000)
Mortality experience	1,279,000
<b>Net Plan liability experience</b>	<b>\$24,762,000</b>

## **B. Wind-up Basis: Financial Position as at December 31, 2019**

“Wind-up basis” in the context of the Teachers’ Plan is a hypothetical construct intended to portray the funded status of the Plan had it been terminated or wound-up effective on the valuation date. That is, an assessment is made as to whether the assets of the pension fund would be sufficient if no further benefits were earned and all members were paid their entitlements as an annuity, a deferred annuity, or as a commuted value.

The financial position of the Plan on a wind-up basis as at December 31, 2019 and as at December 31, 2018 for comparative purposes is as follows:

### **FINANCIAL POSITION – WIND-UP BASIS**

	<b>December 31, 2018</b>	<b>December 31, 2019</b>
<b>Wind-up assets</b>		
Net assets available for benefits	\$4,937,887,000	\$5,357,716,000
Estimated wind-up expenses	(10,000,000)	(10,000,000)
Total wind-up assets	\$4,927,887,000	\$5,347,716,000
<b>Wind-up liabilities</b>		
Active members	\$2,804,035,000	\$3,271,389,000
Pensioners and survivors (CPI - 1% indexing)	3,399,061,000	3,357,075,000
Pensioners and survivors (variable indexing)	2,602,415,000	2,838,307,000
Inactive members	67,315,000	82,456,000
Total wind-up liabilities	\$8,872,826,000	\$9,549,227,000
<b>Wind-up excess / (deficiency)</b>	<b>(\$3,944,939,000)</b>	<b>(\$4,201,511,000)</b>
<b>Funded ratio (wind-up basis)</b>	<b>55.5%</b>	<b>56.0%</b>

As shown above, on a wind-up basis there is a deficiency of \$4,201,511,000 in the Plan after providing for the settlement of all accrued benefit entitlements as at December 31, 2019. The funded ratio on a wind-up basis is 56.0%, as compared to 55.5% as at December 31, 2018.

The wind-up assumptions and the wind-up scenario modeled as at December 31, 2019 can be found in Appendix B.

### **Sensitivity of Wind-up Financial Position and Wind-up Incremental Cost**

The wind-up liabilities shown as at December 31, 2019 are based upon the discount rates as shown in Appendix B. Had the Plan's wind-up liabilities been calculated using discount rates that were 1% lower than those used, the wind-up liabilities would be \$11,103,862,000, or 16.3% higher.

In addition, we have determined the Plan's incremental cost between the valuation date and the next expected valuation date, which we have assumed to be December 31, 2020. The incremental cost is calculated on a wind-up basis; between December 31, 2019 and December 31, 2020 we have calculated the incremental cost to be \$228,299,000. This cost represents the expected change in liability over the course of the year subsequent to the valuation date due to factors including service rendered during the period, expected changes in settlement method for each member, expected changes in plan provisions, and new entrants. This incremental cost differs from the Plan's current service cost, as the current service cost is calculated on a going concern basis and only considers the increase in liability due to service rendered during the period. Note that the effect, if any, of the new CIA Standard of Practice (Section 3500) has not been incorporated into this valuation, including in the determination of the incremental cost (see Section II for further details on the new Standard of Practice).

The incremental cost assumptions as at December 31, 2019 can be found in Appendix B.

## SECTION IV FUNDING REQUIREMENTS

### Current Service Cost

The Plan's current service cost is the value of the benefits accruing to members in the year following the valuation, determined on a going concern basis.

The table below summarizes the Plan's current service cost for the 12-month period from January 1, 2020 and the comparison with the current service cost for the prior year. The actuarial cost in respect of the benefits to be earned on account of service in the year commencing January 1, 2020 is \$137,754,000.

Estimated member and employer required contributions for 2020 amount to \$102,221,000 each.

	2019	2020
Total current service cost	(\$126,559,000)	(\$137,754,000)
Member required contributions	\$99,723,000	\$102,221,000
Employer required contributions	\$99,723,000	\$102,221,000
Current service cost funding excess	\$72,887,000	\$66,688,000
Total current service cost as a % of payroll	(14.95%)	(15.86%)
Total member and employer contributions as a % of payroll	23.56%	23.53%
Current service cost funding excess as a % of payroll	8.61%	7.68%
Estimated pensionable payroll	\$847 million	\$869 million

The current service cost funding excess of \$66,688,000 for 2020 is the amount by which total member and employer required contributions are expected to exceed the Plan's current service cost, and may be applied towards funding the Plan's going concern unfunded actuarial liability. We also note, however, that these excess contributions are not sufficient to amortize the unfunded liability. One year of interest at 5.70% on the current unfunded liability of \$1,497,732,000 amounts to \$85,371,000, and as such, the unfunded liability is expected to grow during the next year should plan experience turn out as expected, and prior to accounting for any contributions from the Province for missed indexing.

The Income Tax Act and Regulations restrict employer contributions to those that are deemed "eligible". In determining whether or not an employer contribution is an eligible contribution, the funded position of the Plan must be considered. If it is found that a Plan's actuarial surplus is greater than a certain threshold amount, then the employer's contributions may be restricted. In the Teachers' Plan, this restriction does not apply as the Plan has an unfunded actuarial liability at December 31, 2019.

Accordingly, we believe that the employer contributions to the Plan in respect of both current service, and the current service cost funding excess, if made in accordance with the recommendations contained in this report, will meet the requirements of an “eligible contribution” as set forth in Section 147.2 of the Income Tax Act.

We also note that contributions for all active Plan members exceed 9% of earnings. Paragraph 8503(4)(a) of the Income Tax Regulations (ITR), specifies a limit on the level of employee contributions that are eligible under a defined benefit pension plan. This limit is essentially 9% of earnings (the semantics of paragraph 8503(4)(a) are not quite that simple, but this is generally the result), including employee contributions made in respect of an unfunded liability (which are allowed under subsection 8501(6.1) of the ITR). Employee contributions in excess of 9% are not prohibited, but they require a Ministerial waiver through the Registered Plans Directorate. We understand this waiver has been granted by CRA and is currently effective until December 31, 2021.

The total current service cost has changed from 14.95% of pensionable payroll for 2019 to 15.86% of pensionable payroll for 2020. The sources of the changes are as follows:

## CURRENT SERVICE COST RECONCILIATION

	% of Payroll
Current service cost as at January 1, 2019	14.95%
Change in demographics	0.04%
Change in salaries	(0.03%)
Change in inflation assumption	(0.41%)
Change in discount rate assumption	1.24%
Change in assumed rate of increase in YMPE and maximum pension	0.07%
<b>Current service cost as at January 1, 2020</b>	<b>15.86%</b>

## Sensitivity of Current Service Cost

The current service cost shown above for the year beginning January 1, 2020 is based upon a discount rate of 5.70% per annum. To illustrate the sensitivity of the valuation results to changes in the discount rate, we report the impact on the Plan’s current service cost of a 1% decrease in the discount rate. Had the Plan’s current service cost been calculated using a 4.70% discount rate, the cost would be \$174,751,000, or 26.9% higher. This cost would be equivalent to 20.11% of pensionable payroll.

## SECTION V ACTUARIAL OPINION

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The following represent our primary conclusions as a result of our actuarial valuation as at December 31, 2019:

1. The Plan has a going concern unfunded liability of \$1,497,732,000 and a funded ratio of 78.2%.
2. The current service cost in respect of 2020 is \$137,754,000, which amounts to 15.86% of pensionable payroll. The required contribution rate for members is 11.3% of pensionable earnings up to the YMPE and 12.9% of pensionable earnings above the YMPE, with employer matching contributions required at the same rates. We estimate these contributions together will amount to \$204,442,000 for 2020, resulting in a current service cost funding excess of \$66,688,000, which may be used towards funding the Plan's going concern unfunded liability.
3. The adequacy and appropriateness of this funding level should be reviewed at the next actuarial valuation of this Plan, which is expected to take place as at December 31, 2020.
4. For purposes of paragraph 147.2(2)(d) of the Income Tax Act, the excess surplus based on the going concern valuation was nil as at December 31, 2019.
5. If the Plan were to be wound-up on the valuation date with benefits payable as described in Appendix D of this report, the value of Plan assets would be less than actuarial liabilities by an amount of \$4,201,511,000.
6. Since December 31, 2019, and as of the date of this report, there has been a significant deterioration to global equity markets as well as declining bond yields in connection with COVID-19. At the time this report was prepared, it was too soon to know the impact on the market value of assets, underlying assumptions and any other effects related to COVID-19. These effects therefore are not reflected in the valuation results and as such, the plan's financial position shown in this report may be materially different if those factors were incorporated in our valuation. These effects, once better understood, will be revealed in future valuations. In our opinion,
  - a. the membership data on which the valuation is based are sufficient and reliable for the purposes of the valuation as described in Section I;
  - b. the assumptions described herein are appropriate for the purposes of the valuation; and
  - c. the methods employed in the valuation are appropriate for the purposes of the valuation.

This report has been prepared, and our opinions given, in accordance with accepted actuarial practice in Canada.

Nonetheless, emerging experience, differing from the assumptions, will result in gains or losses which will be revealed in future valuations.

Respectfully submitted,



Mary Kate Archibald, FSA, FCIA, CFA



Jill Wagman, FSA, FCIA

April 2020

## APPENDIX A PLAN ASSETS

The assets of the pension plan are held in trust by Teachers' Pension Plan Trustee Inc. We have relied on information provided by the Nova Scotia Pension Services Corporation as the source of the Plan's assets. The market value of the Plan's invested assets at December 31, 2019 was \$5,367,432,000.

### BREAKDOWN OF INVESTED PLAN ASSETS BY ASSET CLASS

Asset Class	Market Value at December 31, 2019	% of Assets
Cash / money market	299,064,000	5.6%
Canadian Bonds & Debentures	453,690,000	8.5%
Non-Canadian Bonds & Debentures	791,897,000	14.8%
Canadian Real Return Bonds	154,086,000	2.9%
Canadian equities	380,850,000	7.1%
US equities	808,251,000	15.1%
Global equities	773,792,000	14.4%
Real estate	746,256,000	13.9%
Infrastructure	333,642,000	6.2%
Commodities	172,658,000	3.2%
Hedge funds	367,195,000	6.8%
Forwards and other derivative assets	31,350,000	0.6%
Other assets	54,701,000	1.0%
<b>Total market value of invested assets</b>	<b>\$5,367,432,000</b>	<b>100.0%</b>

### Valuation of Assets

The table below summarizes the calculation of the net assets available for benefits at December 31, 2019, rounded to the nearest \$1,000.

### NET ASSETS AVAILABLE FOR BENEFITS

	December 31, 2019
Market value of invested assets	\$5,367,432,000
Net receivables	35,518,000
Net payables	(45,234,000)
<b>Net assets available for benefits</b>	<b>\$5,357,716,000</b>

## Reconciliation of Net Plan Assets

A summary of pension fund transactions for the periods January 1, 2018 to December 31, 2018 and from January 1, 2019 to December 31, 2019 is provided below:

### RECONCILIATION OF NET PLAN ASSETS

	2018	2019
<b>Net assets available for benefits as at January 1</b>	<b>\$5,111,109,000</b>	<b>\$4,937,887,000</b>
Member contributions	102,369,000	105,110,000
Employer contributions	102,369,000	105,110,000
Member contributions (not matched)	435,000	163,000
Employer contributions (not matched)	15,833,000	23,326,000
Net transfers to/from other plans	1,242,000	176,000
Investment income, gains and losses	24,786,000	614,166,000
Benefits paid	(398,697,000)	(406,730,000)
Expenses	(21,559,000)	(21,492,000)
<b>Net assets available for benefits as at December 31</b>	<b>\$4,937,887,000</b>	<b>\$5,357,716,000</b>

## Performance of Plan Assets

The estimated rate of return net of all Plan expenses on the pension fund's net assets over the past two years is shown below:

### ANNUALIZED RATES OF RETURN

Year Ending	December 31, 2018	December 31, 2019
Rate of return (net of expenses)	0.06%	12.22%

The net rate of return since the last valuation was 12.22%, or 6.17% higher than the assumed net rate of return of 6.05% per annum used in the last valuation. This return has been calculated net of all plan expenses, using the Simple Dietz method assuming mid-year cash flows.

## **APPENDIX B     ACTUARIAL METHODS AND ASSUMPTIONS**

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### **A. Asset Valuation Method**

As with the previous valuation, we have used the net assets available for benefits for the going concern and wind-up valuations. Net assets are the market value of assets adjusted for amounts receivable and amounts payable.

### **B. Going Concern Valuation**

For the purposes of a going concern valuation, we select actuarial assumptions with a long-term focus. That is, we anticipate that the Plan will continue indefinitely into the future. Actuarial assumptions are selected considering historical trends, future expectations and Plan specific experience, where possible.

The purpose of this part of our analysis is to determine an appropriate method and series of assumptions to make proper allowance for the Plan's future liabilities by way of payment of pensions and other benefits. In making these calculations, assumptions must be made as to:

- the probability that a particular payment will be made at a certain time (for example, depending upon whether or not the individual concerned survives to that date); and
- the expected amount of each such payment.

To do this, we make a series of assumptions in connection with the many factors which will impact the future financial operation of the Plan. These include the following:

- future rates of mortality (and the corresponding life expectancies of the Plan members and their spouses);
- future rates of salary increase for members of the Plan;
- future rates of member turnover (withdrawal from the Plan);
- future retirement ages; and
- the rate of return that will be earned on the assets of the pension fund in future years.

As part of our process of analysis, all of these factors were considered. Where applicable, we have taken into account the actual experience of this pension plan. However, it should be noted that from a statistical point of view, actual experience data developed from a single pension plan may have limited validity. Therefore, it may become necessary to take into account statistics developed from many other pension plans.

## Going Concern Discount Rate

The discount rate assumption, net of expenses, has been changed from 6.05% per annum in the previous valuation to 5.70% per annum.

The economic assumptions (i.e., those related to interest rates and inflation) for this valuation are based on reasonable expectations with respect to the relationships among key economic variables over the long-term, as well as the expected impact of those economic variables on the investment performance of the pension fund given the fund's investment policy.

We have taken a "best estimate" approach to the determination of the discount rate, based on the expected future investment return on the assets of the pension plan. In particular, our approach consists of:

- determining the best estimate of long-term, expected future investment returns for each of the asset classes in which the Teachers' Plan invests;
- combining these best estimate long-term, expected future investment returns to reflect the Plan's investment policy, thereby creating an "expected" total fund return that is a weighted average of the asset class returns;
- including an allowance for additional return due to active versus passive management, and the impact of rebalancing and diversification, which we have considered appropriate in the circumstance based on the results of stochastic modelling conducted specific to the Plan's target asset mix; and
- making appropriate provision for expenses.

In employing this approach, we recognize that there are a range of reasonable assumptions for each component of the model. In determining an overall best estimate assumption, we have neither selected the most optimistic nor the most pessimistic point of the range for each of these components.

In establishing the discount rate assumption, we have assumed that there will be a small additional return achieved due to active management over and above the cost of active management, based on a long term sustained history of additional value added.

As a last step, we have included a provision for adverse deviation to take into account the effect of the uncertainty of the best estimate assumptions used in the calculation. The provision was determined in conjunction with the Trustee with an objective of promoting benefit and financial security. The result of our analysis is depicted in the following table:

### DISCOUNT RATE

	Discount Rate
Unadjusted "best estimate" return reflecting the Plan's investment policy	5.48%
Less provision for explicit Plan expenses	(0.44%)
Plus value added return from active management	0.45%
Plus "rebalancing and diversification effect"	0.49%
Less provision for adverse deviation	(0.28%)
<b>Going concern discount rate assumption</b>	<b>5.70%</b>

The unadjusted best estimate asset return assumption was determined using the Plan's target investment mix and the expected return for each asset class. Expected returns are developed each year through a rigorous stochastic modelling process. This model is designed to simulate all key economic and market variables over thousands of different paths that are path-wise consistent. Key variables include bond yields (nominal and real), inflation, equity market returns, and alternative asset class returns. Adjustments for specific approaches to investment implementation are applied to asset class expected returns where appropriate. The details are depicted in the following table:

Asset Class	Policy Weight	Expected Return
Cash	2.0%	2.08%
Bank loan	1.0%	4.75%
Canadian equity	7.0%	6.77%
US Large cap equity	7.0%	7.02%
US Mid cap equity	5.0%	7.02%
International equity	7.0%	7.00%
Global equity	7.0%	7.06%
Emerging markets equity	4.0%	8.73%
Canadian bonds	12.0%	2.31%
US Credit (investment grade)	6.0%	3.31%
US High yield bonds	3.0%	4.99%
Global credit (investment grade)	2.0%	4.99%
Emerging market debt	3.0%	5.25%
Real return bonds	3.0%	2.24%
Hedge funds	7.0%	4.95%
Real assets	21.0%	6.60%
Commodities	3.0%	2.00%
<b>Total portfolio</b>	<b>100.0%</b>	<b>5.48%</b>

## Inflation

The inflation assumption has a direct bearing on the assumption with respect to pensioner indexing and active member salary increases. The inflation assumption has been revised from 2.00% per annum to 1.80% per annum, in alignment with our overall economic outlook. This rate is within the Bank of Canada's 1% - 3% inflation-control target range.

## Salary Increase

The salary increase assumption includes an inflation component as well as a promotional component, and varies by age. The rates used were as follows:

**ANNUAL SALARY INCREASE RATES**

Age Group	Inflation Component	Promotional Component
< Age 30	1.80%	3.25%
30 – 34	1.80%	2.75%
35 – 39	1.80%	2.25%
40 – 44	1.80%	1.75%
45 – 49	1.80%	1.25%
50 – 59	1.80%	0.75%
Age 60 +	1.80%	0.00%

The promotional component of the salary increase assumption remains unchanged since the last valuation.

With respect to the pattern of increases, our assumption considered historic salary experience, current and past collective agreements, and discussion with the Trustee.

Annualized pensionable earnings assumed for each member for 2019 were based on 7 months of the annualized actual 2018-2019 school year earnings plus 5 months of the annualized estimated 2019-2020 school year earnings as calculated using the actual salary inflation adjustments and assumed promotional increases according to the table above. This is the same method as used in the previous valuation. For new members after July 31, 2019, we used the annualized pensionable earnings from the 2019-2020 school year to estimate their 2019 earnings, which is then used to estimate future earnings levels.

## YMPE and CRA Defined Benefit Limit Increase

We have assumed the Year's Maximum Pensionable Earnings (YMPE) would increase at a rate of 2.30% per annum. This is a change from the previous valuation assumption of 2.50% per annum. The YMPE for 2020 was \$58,700.

We have assumed the Canada Revenue Agency defined benefit limit would also increase at a rate of 2.30% per annum. This is a change from the previous valuation assumption of 2.50% per annum. The defined benefit limit for 2020 is \$3,092.22. In combination with a member's pensionable service and their year of retirement, this limit determines the maximum pension that may be payable from a registered defined benefit pension plan under the Income Tax Act.

## Pensioner Indexing

Pensioners are categorized into two groups, generally depending upon whether the pensioner retired before or on/after August 1, 2006.

Retirements prior to August 1, 2006 are eligible for indexing at each July 1. Indexing occurs at a rate equal to the year-over-year percentage increase in the “pension index” minus 1%, with indexing no higher than 6% and no less than 0%. Effective July 1, 2007, the “pension index” was defined as the average of the Consumer Price Index for all items for Canada published by Statistics Canada for each month in the 12-month period ending on April 30 of the preceding indexing period. This is referred to as the “CPI-1%” provision. For this group, we have assumed future indexing at a rate of 0.80% per annum.

Retirements on or after August 1, 2006 are eligible for variable indexing at each July 1. The amount of the increase at each July 1 will be based upon the Plan’s funded status according to the most recent actuarial valuation:

- if the Plan has a deficit of 10% or more of the Plan’s actuarial liabilities, no indexing is provided;
- with a deficit that is less than 10%, indexing may be provided at the discretion of the Trustee at a rate of one half the year-over-year percentage increase in the “pension index” as defined above; and
- and if the Plan is in an actuarial surplus position, indexing will be provided at a rate, as high as possible without putting the Plan into a deficit position, between one half and the full percentage increase in the “pension index” as defined above.

As with the CPI-1% provision, indexing will be no higher than 6% and no less than 0%. For this group, we have assumed no indexing in the future.

## Contribution Crediting

As at the valuation date, members currently contribute at a rate of 11.3% of pensionable earnings up to the YMPE and 12.9% of pensionable earnings above the YMPE. Interest is credited on these contributions at a rate based on the 5-year personal fixed term chartered bank deposit rate as determined from the Canadian Socio-Economic Information Management (CANSIM) Series V122515, published in the Bank of Canada Review.

In order to project member contribution-with-interest balances to the expected date of termination, death or retirement, we have assumed contribution rates as a percent of pensionable earnings would continue into the future, and that interest would be credited on those contributions at a rate of 2.50% per annum.

## Mortality

For this valuation we have continued to use the CPM 2014 Public Sector Mortality Table (CPM2014Publ), and we have assumed mortality improvements in accordance with CPM Improvement Scale B (CPM-B). The CPM2014Publ table represents mortality patterns of Canadians participating in, or retired from, defined benefit pension plans in the public sector, and as such is considered to offer an appropriate “best estimate” of mortality patterns for participants in this Plan. The appropriateness of this assumption was confirmed with a mortality study on the Plan conducted in 2014. Experience continues to be monitored through the annual gain and loss analysis.

## Retirement Age

We have assumed 50% of active members who achieve eligibility for the rule of 85 prior to age 62 will retire when first eligible; the remainder of active members and all inactive members are assumed to retire at the earliest of:

- age 65 with 2 years of service;
- 35 years of service; and
- age 62 with 10 years of service.

For members who have already met the eligibility for the rule of 85, we have assumed that 50% will retire immediately, and the remainder at the earliest of age 65 with 2 years of service, 35 years of service or age 62 with 10 years of service. This assumption represents no change from the previous valuation.

Our assumption is based on a review conducted in 2013 of past retirement patterns for teachers as they reach the various retirement eligibility criteria, as well as continued monitoring of the Plan’s retirement experience through the annual gain and loss analysis. It can be shown that approximately half the teachers who attain “rule of 85” retire when they become eligible. However, as teachers become eligible for the next unreduced early retirement threshold (i.e., age 60 with 10 years of service), they tend to wait to retire. On average, these teachers postpone their retirement two years. Finally, very few teachers postpone retirement to after age 65.

## Marital Status

There has been no change since the previous valuation in the marital status assumptions. The assumption varies by gender and by status in the Plan. For members who have not yet retired, we have assumed that 85% of male members and 75% of female members will have an eligible spouse on the earlier of death or retirement. For members who have retired, we have assumed that where the member data shows a married status, that there is an 85% chance that the member is still married at the valuation date. If the member data shows a single status, we have assumed that the member is still single. We have continued to assume that male spouses are 3 years older than female spouses. We have also continued to assume that no members will have an eligible orphan or dependent recipient upon death unless currently in receipt of such a benefit.

### Termination Rates

The annual termination decrement rate assumption used in this valuation represents no change from the previous valuation. The rates vary by service in the Plan and are as follows:

#### TERMINATION RATES

Service in Plan	Annual Termination Decrement Rate
0 – 1 years	5.0%
1 – 2 years	5.0%
> 2 years	0.0%

Actual termination rates from the Plan are relatively low, and if a teacher terminates after two years of service there is relatively little impact on the valuation since they are vested in their accrued benefit. Therefore, we have made an assumption of termination only for teachers very early in their career.

### Disability Rates

As a result of the 2014 amendment which removed the disability pension provisions from the Plan for future applicants, instead providing disability benefits under the teachers' long-term disability insurance plan, a disability decrement is no longer needed or used. This represents no change from the previous valuation.

## Actuarial Method

The actuarial cost method used in conducting this valuation is the projected unit credit method. This is the same method as was used in the previous valuation.

In using this method, as a first step, a calculation is made of the liability in respect of all benefits that have accrued to members for service up to and including the valuation date. This represents the "accrued liability". This calculation takes into account projected future salary increases for each member up to and including expected retirement, termination or pre-retirement death.

As a completely separate process, the current service cost has been calculated (using the same actuarial assumptions). This cost represents the additional cost of the benefits that will accrue in respect of the 12-month period following the valuation date. This is compared with the amount of the required member and employer contributions over that period. The difference represents the current service cost funding excess for the Plan for that period.

For an individual member, the funding pattern produced by the projected unit credit cost method is one that increases (as a percentage of salary) over time. However, for the group as a whole, if the average age remains constant (which can occur through the retirement of older members and the addition of new, younger members) the current service cost under this method will remain relatively constant, provided there have been no changes to the valuation assumptions or methods. If the Plan's average age increases, on the other hand, the current service cost will also increase. Such increases would be revealed in future valuations.

The following table summarizes the actuarial assumptions that have been used in the going concern valuation.

## GOING CONCERN VALUATION ACTUARIAL ASSUMPTIONS

December 31, 2019		
Net of expense discount rate:	5.70% per annum	
Retirement age:	50% of active members who achieve eligibility for an unreduced pension under rule of 85 prior to age 62 will retire when they first become eligible; remainder of active and all inactive will retire at earliest of (i) age 65 with 2 years of service; (ii) 35 years of service; (iii) age 62 with 10 years of service	
Termination rates:	5.00% in each of the first two years of service, 0% thereafter	
Disability rates:	No rates	
Annual salary increase:	<u>Promotional component:</u> 3.25% if under age 30; ranging to 0.00% if over age 60	<u>Inflation component:</u> 1.80%
Pensioner indexing:	CPI-1% indexing provision: 0.80% per annum Variable indexing provision: 0.00% per annum	
Contribution crediting:	2.50% per annum	
Mortality:	CPM 2014 Public Sector Mortality Table projected generationally with CPM Improvement Scale B	
Marital status:	Active & Inactive males: 85% married Active & Inactive females: 75% married Retired males and females (married in data): 85% married Retired males and females (single in data): 0% married Male spouse is assumed to be 3 years older than female spouse	
Maximum pension and YMPE increase rates:	2020: \$3,092.22 and \$58,700 2021+: Increase at 2.30% per annum	
Actuarial method:	Projected Unit Credit	

## **C. Hypothetical Wind-up Valuation**

The Canadian Institute of Actuaries' Standards of Practice mandate a hypothetical wind-up valuation. This valuation allows the sponsor to assess the funded status of the Plan should it terminate or wind up effective on the valuation date. That is, an assessment is made as to whether the assets of the pension fund would be sufficient if no further benefits were provided and all members were paid their entitlements as an annuity, a deferred annuity, or as a commuted value.

Active and deferred members not eligible for immediate retirement (i.e., those under age 50) are assumed to elect to receive the commuted value of their benefits as a lump sum transfer. The interest rate used for calculating these commuted values was 2.40% per annum for 10 years from the valuation date and 2.50% per annum thereafter. Implicit in these rates is an assumption that the variable indexing provision will provide for no (0%) indexing. This indexing assumption represents no change from the previous valuation.

The CPM 2014 Mortality Table projected generationally with CPM Improvement Scale B was used as the mortality assumption for calculating the pension commuted values.

The above wind-up basis is in accordance with Section 3500 of the CIA *Standards of Practice – Practice-Specific Standards for Pension Plans* with rates and methods in effect for the month of December 2019.

Active and inactive members eligible for immediate retirement (i.e., those 50 or older) as well as current retirees (pensioners and survivors) are assumed to elect to have their pensions purchased as an annuity from an insurance company. The discount rate used to estimate the cost of purchasing annuities as at the valuation date was 2.96% per annum for the pre-retirement period as well as for the post-retirement period for members under the variable indexing provision. A net discount rate of 0.69% per annum was applied for the post-retirement period to members under the CPI-1% indexing provision. The CPM 2014 Mortality Table projected generationally with CPM Improvement Scale B was used as the mortality assumption for all members assumed to be settled through the purchase of annuities. These assumptions were determined in accordance with the *Educational Note—Assumptions for Hypothetical Wind-Up and Solvency Valuations with Effective Dates between December 31, 2019 and December 30, 2020*.

Note that the wind-up valuation does not make any assumptions about future pay increases or future terminations of employment, as all members are assumed to terminate on the valuation date. The actuarial assumptions for the wind-up valuation are summarized in the table on the following page.

## HYPOTHETICAL WIND-UP VALUATION ACTUARIAL ASSUMPTIONS

December 31, 2019	
Annual interest rates:	<p>Actives and Inactives under age 50:</p> <ul style="list-style-type: none"> <li>Pre-retirement: 2.40% per annum for the first 10 years, 2.50% thereafter</li> <li>Post-retirement: 2.40% per annum for the first 10 years, 2.50% thereafter</li> </ul> <p>Actives and Inactives 50 and over and current retirees:</p> <ul style="list-style-type: none"> <li>Pre-retirement: 2.96% per annum</li> <li>Post-retirement (CPI-1% indexing provision): 0.69% per annum</li> <li>Post-retirement (variable indexing provision): 2.96% per annum</li> </ul>
Retirement age:	100% when first eligible for an unreduced pension (the earliest of (i) age 65 with 2 years of service; (ii) 35 years of service; (iii) age 60 with 10 years of service and (iv) 85 points with age 55)
Termination rates:	None
Salary increase:	None
Mortality:	CPM 2014 Mortality Table projected generationally with CPM Improvement Scale B
Disability rates:	None
Wind-up expenses:	\$10,000,000
Marital status:	<p>Active &amp; Inactive males: 85% married</p> <p>Active &amp; Inactive females: 75% married</p> <p>Retired males and females (married in data): 85% married</p> <p>Retired males and females (single in data): 0% married</p> <p>Male spouse is assumed to be 3 years older than female spouse</p>
Actuarial method:	Termination Method

## D. Incremental Cost

The incremental cost calculation involves a wind-up valuation at December 31, 2019 and at December 31, 2020, as well as assumptions regarding benefits paid, new entrants and member decrements between the two valuations.

The assumptions used in the valuation at December 31, 2020 are the same as those used for the December 31, 2019 wind-up valuation, detailed in the previous section. We note that implicit in this is an assumption that the prescribed discount rates will not change between December 31, 2019 and December 31, 2020. Note that the effect, if any, of the new CIA Standard of Practice (Section 3500) has not been incorporated into this valuation including the determination of the incremental cost (see Section II for further details on the new Standard of Practice).

In addition to the valuation assumptions, the following projection assumptions and approximations were used to project the dataset between December 31, 2019 and December 31, 2020:

### INCREMENTAL COST ACTUARIAL ASSUMPTIONS

December 31, 2019 – December 31, 2020													
New entrant profile:	Each Active or Inactive member who dies, retires or terminates from the Plan will be replaced by a new entrant with the following profile:												
	<table><tr><th>Proportion</th><th>Sex</th><th>Age</th><th>Salary</th></tr><tr><td>73%</td><td>F</td><td>34.5</td><td>\$51,750</td></tr><tr><td>27%</td><td>M</td><td>38.0</td><td>\$54,797</td></tr></table>	Proportion	Sex	Age	Salary	73%	F	34.5	\$51,750	27%	M	38.0	\$54,797
Proportion	Sex	Age	Salary										
73%	F	34.5	\$51,750										
27%	M	38.0	\$54,797										
Retirement rate:	50% of active members who achieve eligibility for an unreduced pension under rule of 85 prior to age 62 will retire when they first become eligible; remainder of active and all inactive will retire at earliest of (i) age 65 with 2 years of service; (ii) 35 years of service; (iii) age 62 with 10 years of service.												
Termination rates:	5.00% in each of the first two years of service, 0% thereafter												
Disability rates:	None												
Mortality:	CPM 2014 Public Mortality Table projected generationally with CPM Improvement Scale B												
Salary increase:	<table><tr><td><u>Promotional component:</u></td><td><u>Inflation component:</u></td></tr><tr><td>3.25% if under age 30; ranging to 0.00% if over age 60.</td><td>1.80%</td></tr></table>	<u>Promotional component:</u>	<u>Inflation component:</u>	3.25% if under age 30; ranging to 0.00% if over age 60.	1.80%								
<u>Promotional component:</u>	<u>Inflation component:</u>												
3.25% if under age 30; ranging to 0.00% if over age 60.	1.80%												
Marital status:	Active & Inactive males: 85% married Active & Inactive females: 75% married Retired males and females (married in data): 85% married Retired males and females (single in data): 0% married Male spouse is assumed to be 3 years older than female spouse												

## APPENDIX C MEMBERSHIP DATA

The records are maintained and provided by the Nova Scotia Pension Services Corporation for purposes of the actuarial valuation.

We have reviewed the data as to accuracy and reasonableness. By comparing the data to those provided in previous years and examining the level of membership cessation over the previous years, we are satisfied that the data is complete. This review included a comparison of lists of active members with lists of inactive and retired members to check for unintended duplicate records.

Various checks of reasonableness were performed on pensions, dates of employment, Plan membership and birth, as well as pensionable earnings, contributions with interest and credited service. The Nova Scotia Pension Services Corporation was provided with a report on the results of our data verifications where any questions arose from our reasonableness and consistency checks. They either confirmed the data provided or advised of adjustments to the data. Accordingly, we are satisfied that the data is sufficient and reliable for the purposes of this actuarial valuation.

Appendix E contains the Data Certification regarding the data provided.

Plan membership data is summarized in Schedule C1. For comparison, we have also included the summary of the membership data from the previous valuation. Schedule C2 outlines the membership movement in the Plan. Schedule C3 illustrates the distribution of active teachers by age and pensionable service. Schedule C4 illustrates the distribution of non-active members by age.

### SCHEDULE C1: MEMBERSHIP DATA

	December 31, 2018	December 31, 2019
<b>Active Members</b>		
Number	12,882	12,979
Average annualized pensionable earnings for year	\$73,716	\$74,667
Average years of pensionable service	11.8 years	11.8 years
Average age	43.6	43.7
<b>Inactive Members</b>		
Number	5,961	5,963
Average annual pension	\$891	\$948
Average age	49.5	50.2

December 31	CPI-1% Indexing Provision		Variable Indexing Provision	
	2018	2019	2018	2019
<b>Retired members</b>				
Number	7,204	6,989	4,763	5,095
Average annual lifetime pension	\$29,176	\$29,490	\$29,742	\$29,845
Average annual temporary pension	\$4,407	\$5,441	\$9,658	\$9,839
Average age	75.7	76.5	64.7	65.3
<b>Spouses, ex-spouses &amp; dependants</b>				
Number	1,237	1,284	265	298
Average annual lifetime pension	\$16,938	\$17,223	\$11,978	\$12,050
Average annual temporary pension	\$2,051	\$2,085	\$3,748	\$3,525
Average age	77.2	77.9	64.3	65
<b>Orphans</b>				
Number	9	8	22	31
Average annual pension	\$2,972	\$3,084	\$1,829	\$2,583
Average age	18.4	18.3	16.6	16.0
<b>Total number</b>	<b>8,450</b>	<b>8,281</b>	<b>5,050</b>	<b>5,424</b>

## SCHEDULE C2: RECONCILIATION OF MEMBERSHIP

	Active Members	Inactive Members	Retired Members	Spouses Ex-Spouses	Orphans
<b>Total at December 31, 2018</b>	<b>12,882</b>	<b>5,961</b>	<b>11,967</b>	<b>1,502</b>	<b>31</b>
Net adjustments	-	-	-	7	1
New entrants	692	-	-	9	-
Transfers to active	202	(202)	-	-	-
Transfers to inactive	(364)	364	-	-	-
Terminations	(88)	(135)	-	-	-
Pensioners returned to work	1	1	(2)	-	-
Deaths – without survivor	(3)	(3)	(123)	(59)	-
Deaths – with survivor (spouse and possibly orphans)	(3)	(3)	(117)	123	7
Deaths – orphan only	(1)	-	-	-	2
Pensions ceased	-	-	-	-	(2)
Regular retirements	(339)	(20)	359	-	-
<b>Total at December 31, 2019</b>	<b>12,979</b>	<b>5,963</b>	<b>12,084</b>	<b>1,582</b>	<b>39</b>

**SCHEDULE C3: DISTRIBUTION OF ACTIVE MEMBERS  
BY AGE GROUP AND PENSIONABLE SERVICE AS AT DECEMBER 31, 2019**

Age	Years of Pensionable Service								Total
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35-40	
<20	1	0	0	0	0	0	0	0	1
20 - 24	139	0	0	0	0	0	0	0	139
25 - 29	976	42	0	0	0	0	0	0	1,018
30 - 34	824	731	37	0	0	0	0	0	1,592
35 - 39	596	646	929	50	0	0	0	0	2,221
40 - 44	410	287	793	660	41	0	0	0	2,191
45 - 49	300	209	375	586	686	70	0	0	2,226
50 - 54	171	118	213	295	456	406	82	0	1,741
55 - 59	163	85	168	207	200	208	143	6	1,180
60 - 64	107	52	61	87	95	59	49	20	530
65 - 69	31	20	15	21	19	11	11	7	135
70 - 74	1	0	2	1	0	0	0	1	5
<b>Total</b>	<b>3,719</b>	<b>2,190</b>	<b>2,593</b>	<b>1,907</b>	<b>1,497</b>	<b>754</b>	<b>285</b>	<b>34</b>	<b>12,979</b>

**SCHEDULE C4: DISTRIBUTION OF NON-ACTIVE MEMBERS  
BY AGE GROUP AS AT DECEMBER 31, 2019**

Age	Inactive Members		Pensioners, Survivors and Orphans (CPI-1% indexing)		Pensioners, Survivors and Orphans (variable indexing)	
	Number	Average Annual Pension	Number	Average Annual Pension	Number	Average Annual Pension
<20	0	\$0	5	\$2,954	26	\$2,480
20 - 24	9	\$193	3	\$3,301	5	\$3,123
25 - 29	146	\$272	0	\$0	0	\$0
30 - 34	459	\$477	0	\$0	0	\$0
35 - 39	788	\$858	3	\$23,870	3	\$6,225
40 - 44	822	\$1,091	3	\$11,623	14	\$7,517
45 - 49	929	\$1,255	5	\$8,869	17	\$9,657
50 - 54	825	\$1,342	9	\$14,887	29	\$18,020
55 - 59	671	\$1,303	31	\$14,121	599	\$33,458
60 - 64	529	\$895	87	\$14,919	1,818	\$31,586
65 - 69	355	\$251	1,074	\$29,361	2,169	\$28,711
70 - 74	252	\$334	2,783	\$29,090	645	\$21,268
75 - 79	109	\$152	1,961	\$27,550	86	\$12,751
80 - 84	40	\$163	1,147	\$26,647	5	\$31,748
85 - 89	10	\$48	721	\$25,406	1	*
90 - 94	11	\$14	303	\$25,607	2	*
95 - 99	5	\$27	115	\$21,189	4	\$19,943
100+	3	\$319	31	\$19,397	1	*
<b>Total</b>	<b>5,963</b>	<b>\$948</b>	<b>8,281</b>	<b>\$27,562</b>	<b>5,424</b>	<b>\$28,712</b>

\* Cells with less than three Members are not shown for confidentiality reasons.

## APPENDIX D SUMMARY OF PLAN PROVISIONS

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The following is a summary of the Plan's main provisions in effect on December 31, 2019. This summary is not intended as a complete description of the Plan. For specific details of the Plan provisions, reference should be made to the Teachers' Pension Act and Regulations (the "Regulations").

### **Type of Pension Plan**

This Plan can be categorized as a "final average defined benefit plan" in which the benefit is a function of the member's highest five years' of earnings. The Plan also provides for death, disability and termination benefits.

### **Effective Date**

The Plan was established effective August 1, 1949.

### **Eligibility**

All teachers, with few exceptions, must join the Plan on their date of employment.

### **Vesting**

A member will become vested, and entitled to a retirement pension, upon completion of two years of service in the Plan.

### **Contribution Rates**

Contribution rates for the teachers and the employer are as follows:

- 11.3% of pensionable earnings up to the YMPE and 12.9% of pensionable earnings above the YMPE beginning August 1, 2016.

### **Normal Retirement Date**

The normal retirement date is the last day of the month coincident with the attainment of age 65 with two years of pensionable service.

## Early Retirement

A member may retire prior to the Normal Retirement Date. Early retirement reductions may apply in accordance with the following table:

**EARLY RETIREMENT PROVISIONS**

Age	Service or Points	Retirement Eligibility
50	30 years	Eligible with reduction
55	2 years	Eligible with reduction
No minimum age	35 years	Eligible without reduction
55	85 points	Eligible without reduction
60	10 years	Eligible without reduction
65	2 years	Eligible without reduction

## Normal Retirement Benefits

The amount of lifetime pension payable at normal retirement is equal to the sum of:

- 2.0% of HAS-5 x non-CPP service, plus
- 1.3% of HAS-5 up to the AvgYMPE x CPP service, plus
- 2.0% of HAS-5 above the AvgYMPE x CPP service, plus

The amount of bridge pension payable at unreduced early retirement until age 65 is equal to:

- 0.7% of HAS-5 up to the AvgYMPE x CPP service.

HAS-5: the average of member's highest five years' of pensionable earnings.

AvgYMPE: the average of the Year's Maximum Pensionable Earnings (YMPE) over the same years as in the HAS-5.

CPP service: pensionable service that is also pensionable under the Canada Pension Plan.

Non-CPP service: pensionable service that is not pensionable under the Canada Pension Plan.

## Pre-Retirement Death Benefit

The death benefit payable to a surviving eligible spouse upon pre-retirement death of a vested member is a pension payable for the life of the spouse at a level of 60% of the member's accrued lifetime pension to the date of death. In addition, 60% of the bridge pension accrued by the member prior to January 1, 1992 will be payable to the surviving spouse for his or her lifetime provided the member's death occurred prior to his or her age 65.

Additionally, a 10% orphan benefit will be payable to all surviving children, up to a maximum of a 40% benefit, until the age of 18 (or 25 while still in school).

Should a vested member die without an eligible spouse or child, but with a dependant as defined in the Regulations, the dependant will be entitled to a pension in the amount of the spousal pension as described above, payable until the earlier of the death of the dependant or until the dependant's disability ceases.

The death benefit payable to the beneficiary of a non-vested member (or of a member with no surviving spouse, children or dependants), is the member's contributions with interest to the date of death.

### **Post-Retirement Death Benefit**

The normal form of pension is a pension payable for the life of the member with payments continuing at 60% to the member's surviving eligible spouse for his or her lifetime. If the member dies prior to age 65, 60% of the bridge pension will be payable to the surviving spouse, with the portion accrued by the member on or after January 1, 1992 ceasing upon the member's 65<sup>th</sup> birthday.

Additionally, a 10% orphan benefit will be payable to all surviving children, up to a maximum of a 40% benefit, until the age of 18 (or 25 while still in school).

Should a vested member die without an eligible spouse or child, but with a dependant as defined in the Regulations, the dependant will be entitled to a pension in the amount of the spousal pension as described above, payable until the earlier of the death of the dependant or until the dependant's disability ceases.

Members may elect an optional form upon retirement, providing for a guarantee of full payments for 5, 10 or 15 years and/or a survivor benefit of 80% or 100%.

### **Termination Benefit**

The termination benefit payable upon termination of a vested member is a deferred pension payable at normal or early retirement date.

Alternatively, the member may elect to transfer the commuted value of the deferred pension in respect of service after December 31, 1987 to another registered account in accordance with the Regulations, and receive a refund of contributions with interest in respect of service prior to January 1, 1988. A member electing this option will also be entitled to a refund of any member contributions made in respect of service after December 31, 1987, with interest, in excess of the corresponding commuted value.

The termination benefit payable upon termination of a non-vested member is a lump sum refund of the member's contributions with interest to the date of termination.

### **Disability Benefit**

Effective August 1, 2014, the former disability pension provisions have been removed as a benefit from the pension plan for future applicants, and instead are provided for under the teachers' long-term disability insurance plan. Members who are on unpaid sick leave as of June 30, 2014 may still qualify for a disability pension under the pension plan, however the application for the disability pension must have been received by July 31, 2016.

## Post-Retirement Indexing

Pensioners are categorized into two groups, depending upon whether the pensioner retired before or on/ after August 1, 2006.

Retirements prior to August 1, 2006 are eligible for indexing at each July 1. Indexing occurs at a rate equal to the year-over-year percentage increase in the “pension index” minus 1%, with indexing no higher than 6% and no less than 0%. Effective July 1, 2007, the “pension index” was defined as the average of the Consumer Price Index for all items for Canada published by Statistics Canada for each month in the 12-month period ending on April 30 of the preceding indexing period. This is referred to as the “CPI-1%” provision.

Retirements on or after August 1, 2006 are eligible for variable indexing at each July 1. The amount of the increase at each July 1 will be based upon the Plan’s funded status according to the most recent actuarial valuation:

- if the Plan has a deficit of 10% or more of the Plan’s actuarial liabilities, no indexing is provided;
- with a deficit that is less than 10%, indexing may be provided at the discretion of the Trustee at a rate of one half the year-over-year percentage increase in the “pension index” as defined above;
- and if the Plan is in an actuarial surplus position, indexing will be provided at a rate, as high as possible without putting the Plan into a deficit position, between one half and the full percentage increase in the “pension index” as defined above.

As with the CPI-1% provision, indexing will be no higher than 6% and no less than 0%.

## APPENDIX E DATA CERTIFICATION

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On behalf of the Nova Scotia Teachers' Pension Plan, I hereby certify that the member data provided to Eckler Ltd. for the purposes of the actuarial valuation of the Nova Scotia Teachers' Pension Plan as at December 31, 2019 are accurate and complete.

*Kim Blinn*

Name

*Kim Blinn*

Signature

*Chief Pensions Officer*

Title

*March 31, 2020*

Date