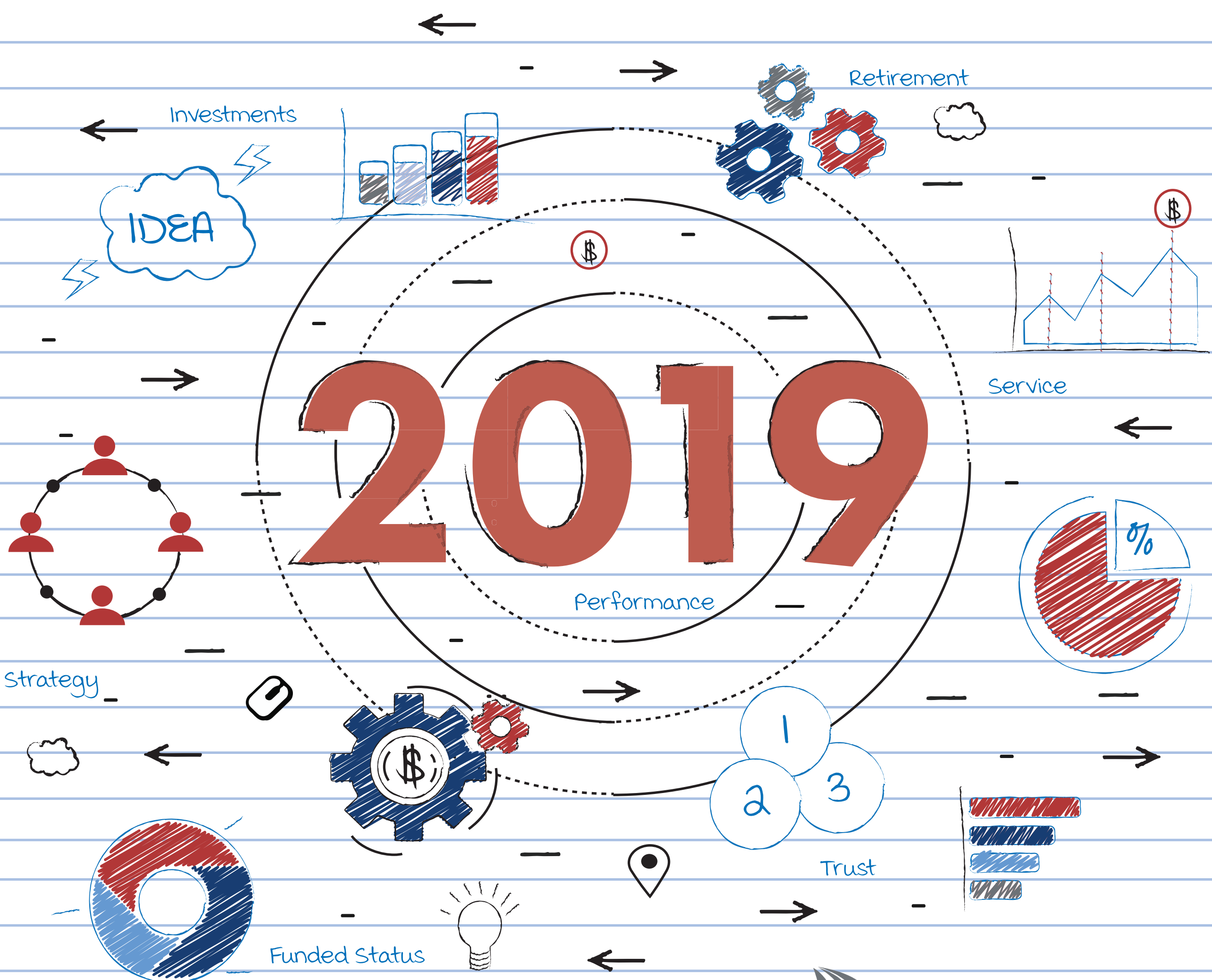
Nova Scotia Teachers' Pension Plan

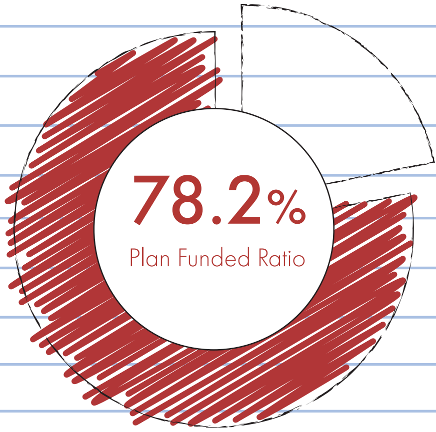
Annual Report 2019



Teachers' Pension Plan Trustee Inc.

At a glance...

As at December 31, 2019

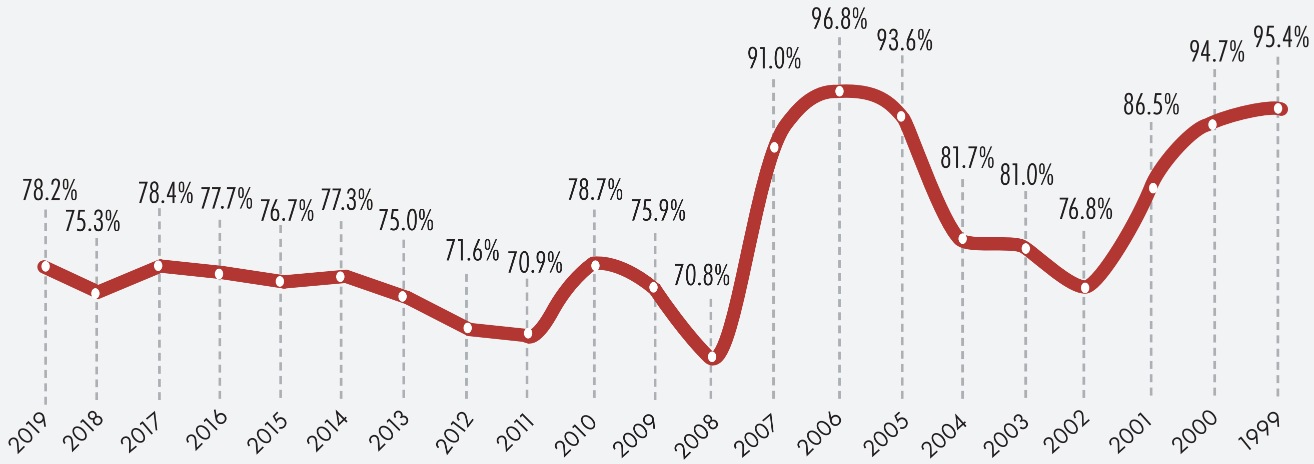


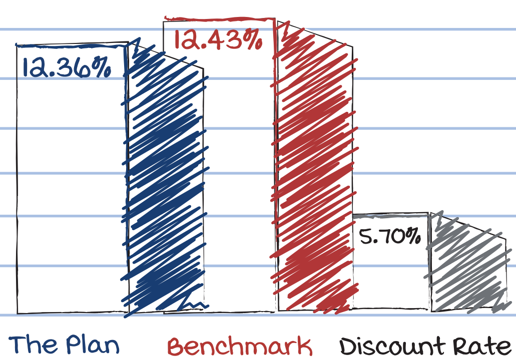
Plan Funded Ratio

The Nova Scotia Teachers' Pension Plan's (Plan or TPP) *funded ratio* increased to 78.2 per cent from 75.3 per cent in 2018. A *funded ratio* of 100 per cent or more would mean that the Plan is fully funded.

A look back...

The chart below highlights the Plan's funded status over the past 20 years.





Investment Return

The Plan achieved a positive *return on investments* of +12.36 per cent (*net of investment management fees).* The Fund underperformed the policy *benchmark* of +12.43 per cent on a net basis, and outperformed the *actuarial assumed rate of return*, or *discount rate*, of 5.70 per cent. The investment return *gross of investment management fees* was +12.61 per cent.

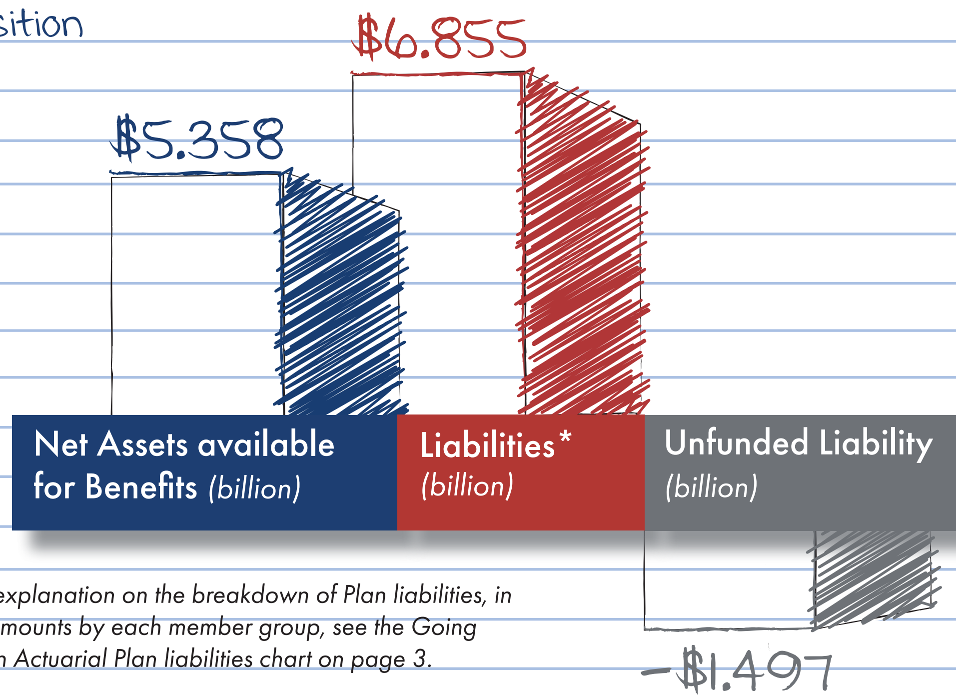
At a glance...

As at December 31, 2019

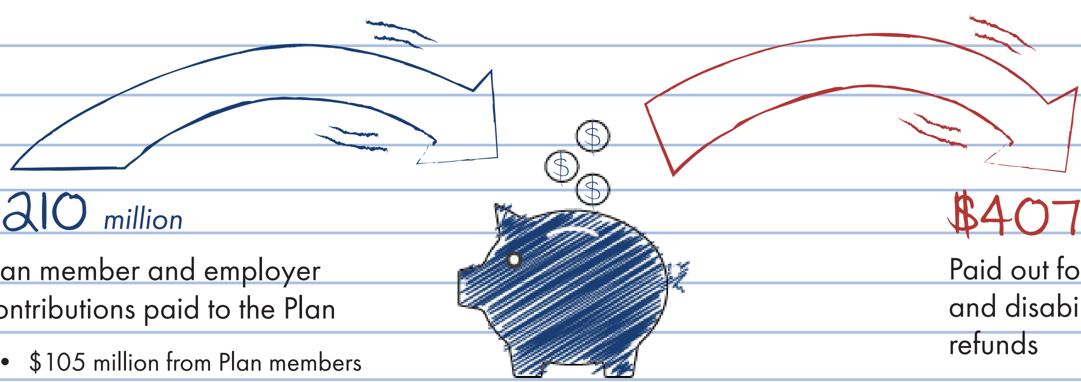
Why was there a reduction in the Discount Rate?

The *discount rate* used for the TPP's valuation as at December 31, 2019 was 5.70%, being a significant reduction from the 2018 *discount rate* of 6.05%. This reduction of the *discount rate* is not specific to the TPP. Rather, it is reflective of the TPP actuary's forecast of a protracted lower interest rate environment and a prolonged slowdown of global economic activity. A lower *discount rate* means an increase in the actuarial calculation of pension obligations and makes it more costly to fund pension benefits. It is anticipated that most defined benefit plans in Canada will be booking declines in their *discount rates* this year.

Financial Position



* *For an explanation on the breakdown of Plan liabilities, in dollar amounts by each member group, see the Going Concern Actuarial Plan liabilities chart on page 3.*



$210 *million*

Plan member and employer contributions paid to the Plan

- $105 million from Plan members
- $105 million from Plan employers

$407 *million*

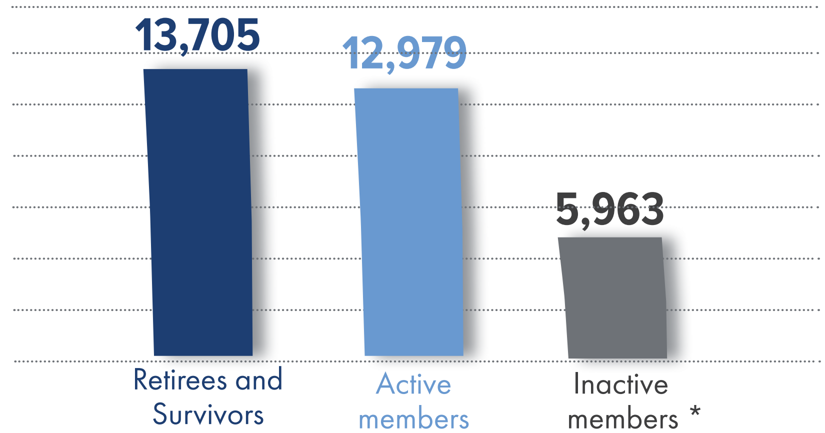
Paid out for retiree, survivor and disability benefits, and refunds

Membership

As at December 31, 2019

32,647
Total members

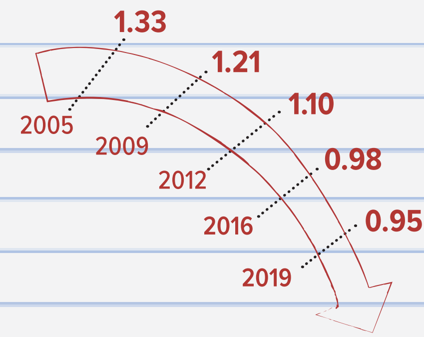
The Plan had a total of 32,647 members. The number of retirees grew by 208 from 13,500 to 13,705 in 2019, while the number of active Plan members increased by 97 from 12,882 to 12,979 in 2019.



* *Includes Plan members who have not contributed to the Plan in the past 1.5 years and have not retired or removed their funds from the Plan.*

The Plan had 0.95 active member for 1 retiree.

The Plan's number of retirees continued to grow. A low ratio of working-to-retired members creates a greater impact on working members and employers to cover any shortfalls or investment losses. The chart below highlights the decline in the active membership ratio.



Average age

43.7 Working member

65.3 Retired member

Retirees* over 100 years of age

32

* Includes survivors

Average pensionable earnings

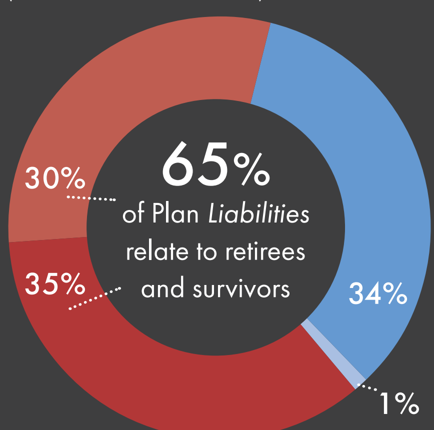
$74,667 Active members

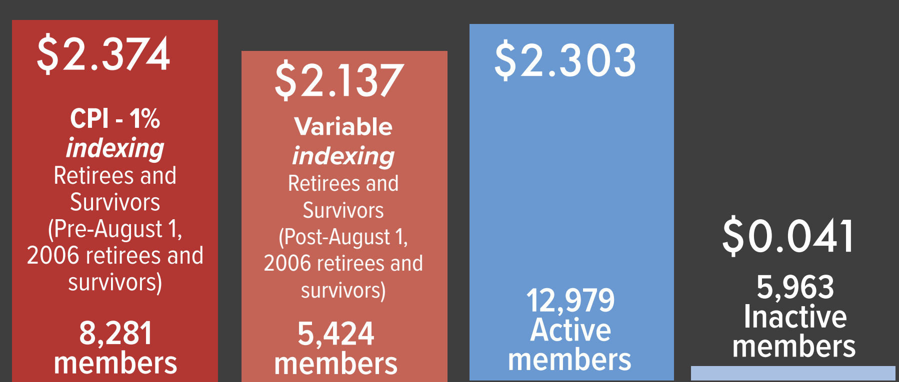
Average lifetime pension

$29,639 Retirees

Going Concern Actuarial Plan liabilities increased to $6.855 billion

Retirees and survivors who began receiving their pension prior to August 1, 2006 account for the greatest portion of Plan *liabilities*. The chart below details the Plan *liabilities,* in dollar amounts*, by each member group (as at December 31st).





* *Rounded to the nearest billion*

Contents

About the Teachers' Pension Plan

The Nova Scotia Teachers' Pension Plan (Plan or TPP) is one of the largest public sector pension plans in the Province. The Plan is a defined benefit registered pension plan that offers you a lifetime pension benefit when you retire. Your pension benefit is funded by contributions made by you and your employer, as well as investment income generated by the Plan's investment *assets*. This Annual Report details the Plan's investment performance and financial health at December 31, 2019.

All information presented in this document is premised on the Plan rules and criteria which currently exist under the Teachers' Pension Act and the Regulations made thereunder. This document explains in plain language the financial status of the Nova Scotia Teachers' Pension Plan. Plan members, beneficiaries, and others who wish to determine their legal rights and obligations under the Plan should refer to the Plan text. In the event of a discrepancy between the information provided in this document and the Plan text, the latter takes precedence.

Message from the Trustee Chair

John B. Carter, FCPA, FCA, ICD.D

On behalf of the Board of Teachers' Pension Plan Trustee Inc. (TPPTI), I am pleased to present the annual report of the Teachers' Pension Plan for the fiscal year ended December 31, 2019. This report provides you with details on the financial health of the Plan as at December 31, 2019 and a comprehensive review of its investment activities.

The Fund achieved a positive return of +12.36 per cent, net of investment management fees (+12.61 per cent gross of investment management fees)

In 2019, global growth was recorded at its weakest pace since the financial crisis of 2008-2009 and interest rates declined significantly. The Canadian economy stalled in late 2019 in response to one-off factors, such as the General Motors and Canadian National Railway strikes, and more long-term constraints such as elevated household debt and a depressed energy sector.

Even though 2019 presented an interesting investment climate, the Fund achieved a positive return of +12.36 per cent, net of investment management fees (+12.61 per cent gross of investment management fees). The Fund underperformed the policy benchmark of +12.43 per cent on a net basis, and outperformed the actuarial assumed rate of return, or discount rate, of 5.70 per cent. The discount rate for the TPP moved from 6.05% in 2018 to 5.70% in 2019. The reduction of the discount rate in 2019 does not indicate a devaluation of the TPP's assets. Rather, it reflects the TPP actuary's forecast of a protracted lower interest rate environment and a prolonged slowdown of global economic activity. A lower discount rate means higher actuarial liabilities. It is anticipated that most defined benefit plans in Canada will be booking declines in their discount rates for 2019.

> While there is no immediate risk that the Plan will be unable to meet its ongoing pension obligations, it is important to note that the Plan's financial position could further deteriorate going forward unless the Plan Sponsors take significant steps to address these challenges.

At December 31st, the Plan was 78.2 per cent funded on a going-concern basis. This represents an increase over last year's funded ratio of 75.3 per cent, even allowing for the significantly reduced discount rate being used to determine liabilities. It was only the robust investment returns of 2019 that enabled a modest increase in the funded ratio. The Plan's deficit was $1,497.7 million, being the difference between the net assets for benefits of $5,357.7 million and the actuarially-calculated liabilities of $6,855.4 million. This substantial deficit continues to greatly trouble the TPPTI Board.

The Plan had a ratio of 0.95 active Plan members to each pensioner. This ratio has been steadily declining over the past number of years. The increasing maturity of the Plan remains a very significant concern. It is a constant headwind that is difficult to overcome. Each year, approximately $200 million more in pension benefits is paid out than is collected by way of contributions from active members and employers; this places a continuous and unfair burden on active members paying high rates of contributions.

In 2019, the Plan Sponsors (the Province and the Teachers Union) commissioned a comprehensive review of the Plan by an independent pension consultant, Kathryn Bush of Blake, Cassels & Graydon LLP. The purpose of the review was to identify meaningful changes in order to improve the long-term financial sustainability of the Plan and increase the retirement security of its members. The TPPTI Board has urged, and continues to urge, the Plan Sponsors to take action and effect amendments that will improve the Plan's long-term financial sustainability. While there is no immediate risk that the Plan will be unable to meet its ongoing pension obligations, it is important to note that the Plan's financial position could further deteriorate going forward unless the Plan Sponsors take significant steps to address these challenges. I feel compelled to note that the unprecedented events of early 2020 may materially worsen the Plan's position.

Lastly, as my tenure as TPPTI Board Chair is winding down, I wanted to say that it has been a privilege serving for the past decade. I have been consistently impressed by the expertise and diligence of my fellow Board members as they have worked during times of challenge and change for the retirement security of the TPP's members. I have every confidence in the TPPTI Board and its new Chair, and know that they will continue the efforts to strengthen the TPP's position for the future.

On behalf of the TPPTI Board, I would like to recognize the talented, dedicated and supportive staff of Nova Scotia Pension Services Corporation and their commitment to provide excellent service to our members.

John B. Carter
TPPTI Chair

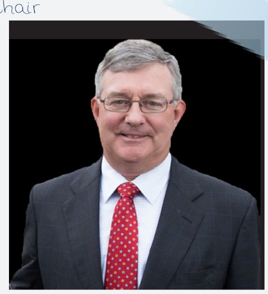
Teachers’ Pension Plan Trustee Inc.

Board of Directors *(as at December 31, 2019)*

Teachers’ Pension Plan Trustee Inc. (TPPTI) is comprised of nine directors. Four directors are appointed by the Nova Scotia Teachers Union (NSTU) and four directors are appointed by Nova Scotia’s Minister of Finance and Treasury Board.

The independent Chair of the TPPTI is mutually appointed by the NSTU and the Minister of Finance and Treasury Board. TPPTI directors have extensive experience in a wide range of disciplines required to oversee the Plan. The TPPTI Board meets five to six times a year.

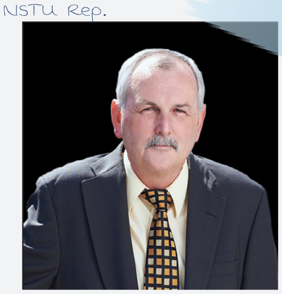
Chair



John Carter, FCPA, FCA, ICD.D
Retired, Ernst and Young LLP

The Chair is an Ex-Officio member on all committees.
Appointed: 2010

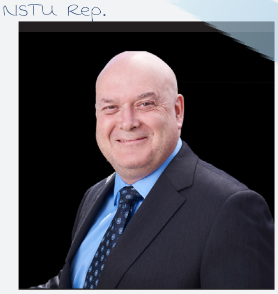
NSTU Rep.



Allan Maclean
Retired

Committee: Investment
Appointed: 2018

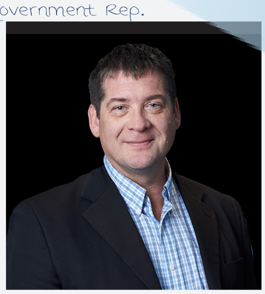
NSTU Rep.



Phil Doucette
Teacher

Committee: Governance
Appointed: 2017

Government Rep.



Bruce Osborne
Executive Director

Department of Fisheries and Aquaculture
Committee: Audit and Actuarial
Appointed: 2016

Government Rep.

Vicki Clark, CPA, CMA
Retired

Committee:
- Investment
- Audit and Actuarial, Chair

Appointed: 2016

NSTU Rep.

Steve Mahoney
CFA, FSA, CAIA, PRM

Vice President, Institutional Sales
Connor, Clark & Lunn Financial Group
Committee: Investment
Appointed: 2016

continues on next page...

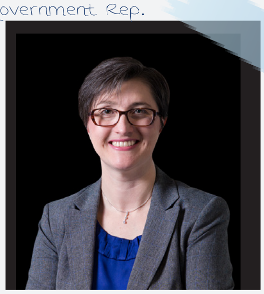
Teachers' Pension Plan Trustee Inc. continued...

Government Rep.

Charles Allian
Executive Director

Liability Management & Treasury Services, Department of Finance and Treasury Board
Committee: Investment, Chair
Appointed: 2016

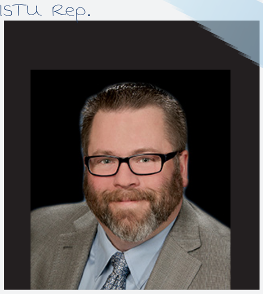
Government Rep.



Karen Gatien
Associate Deputy Minister

Department of Education and Early Childhood Development
Committee: Governance, Chair
Appointed: 2015

NSTU Rep.



Kyle Marryatt
Staff Officer, Member Services

Nova Scotia Teachers Union
Committee:
- Audit and Actuarial
- Governance

Appointed: 2018

Directors of the TPPTI oversee all aspects of the Plan through three committees. The TPPTI committees are:

- **Audit and Actuarial Committee:**
  Oversight of the Plan's auditors and actuaries. Conducts a detailed review of the audited financial statements and actuarial valuation reports. Reviews quarterly compliance reports.

- **Governance, Communications, and Member Services Committee:**
  Ensures the Trustee's duties and responsibilities are clear and sets the goals for the Plan administrator.

- **Investment:**
  Reviews, monitors, and approves all investment management policies and investment decisions.

Plan Governance

TPPTI is the Trustee of the Plan. TPPTI was established in 2006 under a Joint Trust Agreement (which was amended in 2014) among the NSTU, the Province of Nova Scotia (Province) and TPPTI. TPPTI ensures that the Plan is operated with strong controls and risk management practices, transparent reporting, and prudent management of the Plan's investment *assets*.

The Plan Sponsors are the NSTU and the Province. The Sponsors are advised by the Teachers' Pension Board (Board), which includes representation from the NSTU and the Province. The Board is responsible for determining contribution rates, Plan regulations and benefits, and the Plan's funding targets. The Board is also responsible for setting the Plan's actuarial assumptions.

The roles and responsibilities within the Plan's governance structure are highlighted below:

Teachers' Pension Board *

Sets the actuarial assumptions used to value Plan *liabilities* and advises the Plan Sponsors on:

- Plan regulations and benefits
- Employer and member contribution rates
- The Plan's funding targets

** Includes representatives from the NSTU and the Province.*

Teachers' Pension Plan Trustee Inc. (TPPTI) *

- Fiduciary responsibility for the Plan and its investment *assets*
- Responsible for the Plan's overall operations and investment decisions
- Sets policy framework and strategic direction for the investment *assets*

** Includes representatives from the NSTU and the Province.*

Nova Scotia Pension Services Corporation

- Manages the day-to-day operation of Plan investments and pension administration
- Provides Plan member, retiree, and employer services
- Jointly owned by TPPTI and Public Service Superannuation Plan Trustee Inc.

** See page 10 for more information*

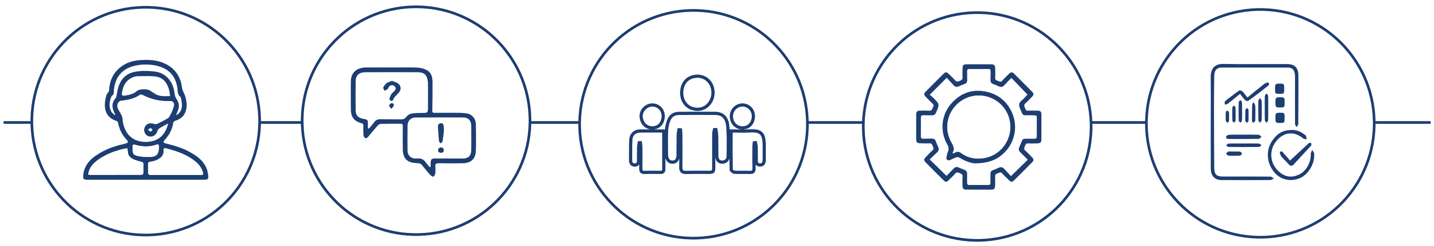
The Board of Directors of Pension Services Corporation

- Oversight of Pension Services Corporation
- Sets strategic direction, approves operational budget, and makes key decisions

** Includes directors from TPPTI and Public Service Superannuation Plan Trustee Inc.*

Nova Scotia Pension Services Corporation

nspension Services Corporation



Nova Scotia Pension Services Corporation's (Pension Corp.) client and employer services teams are responsible for providing pension services to Plan members, retirees, and employers. When a Plan member retires, Pension Corp. client and employer services teams manage pension payments and provide assistance throughout the retirement process. Pension Corp. also assists Plan members with support in making informed retirement decisions.

Client Services – 2019 Results

88%
Percentage of calls were answered in less than 20 seconds

24,045
The number of calls that were answered by Client Services

15
Pre-Retirement seminars were held across the province

My Retirement Plan website usage – https://nspensions.hroffice.com

5,922
The number of times the Pension Projection tool was used

1,501
The number of times the Pension Profile tool was used

11,833
The number of times the Annual Statement tool was used

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The Plan's Financial Position

(as at December 31, 2019)

Plan Assets

Plan *assets* were \$5.358 billion and the Plan's *funded ratio* was 78.2 per cent. The Plan *funded ratio* is the ratio of Plan *assets* to Plan *liabilities.* The *funded ratio* increased by 2.9 per cent from 75.3 per cent in 2018.

The Plan is not at risk of being unable to meet its pension obligations over the short term; however, with a funding deficit of \$1.497 billion, the Plan remains significantly under-funded.

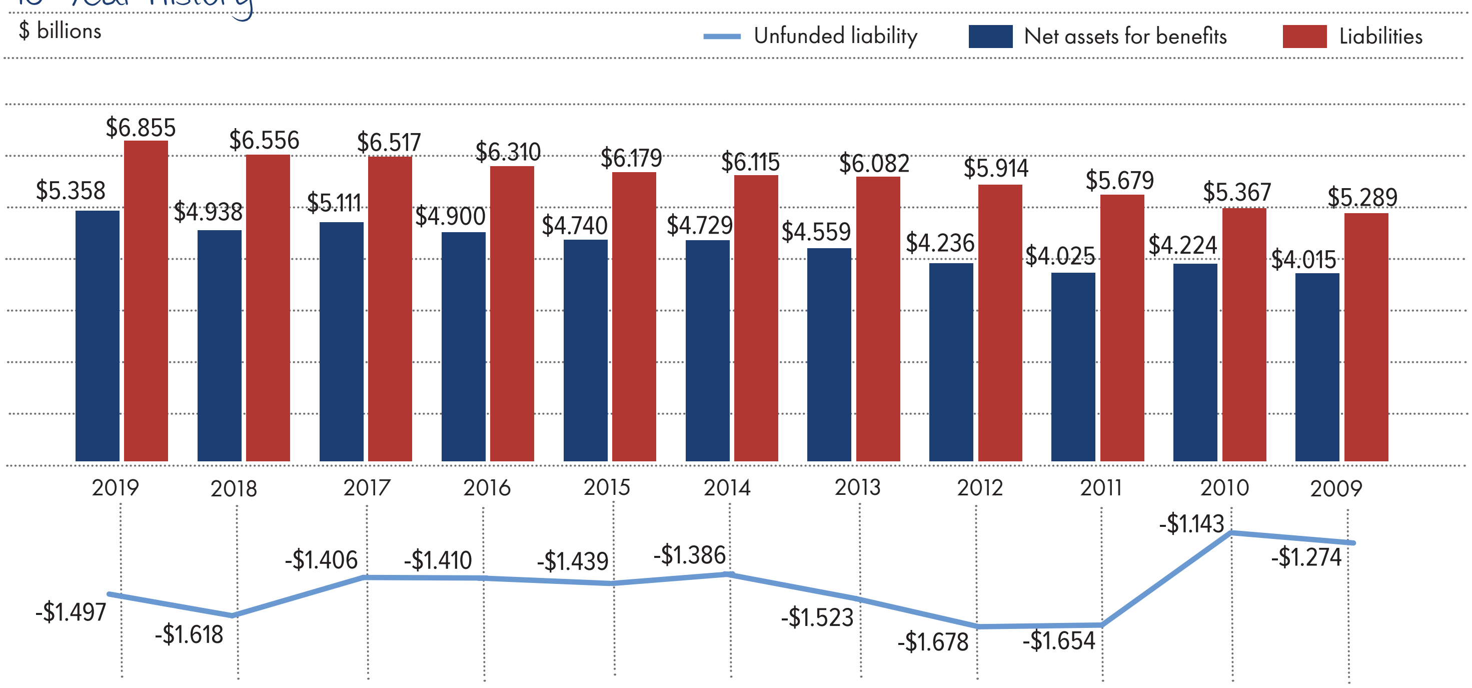
Plan Liabilities

Plan *liabilities* were calculated to be \$6.855 billion. The calculation of Plan *liabilities* is derived by using several key assumptions. The most impactful assumption is the *discount rate* which is a forecast of the long-term *rate of return* from investment *assets*.

For the 2019 valuation, the *discount rate* for the TPP moved to 5.70% in 2019 from 6.05% in 2018. The reduction of the *discount rate* in 2019 does not indicate a devaluation of the TPP's *assets*. Rather, it reflects the TPP actuary's forecast of a protracted lower interest rate environment and a prolonged slowdown of global economic activity. A lower *discount rate* means higher actuarial *liabilities.*

All other assumptions also remained constant.

10-Year History



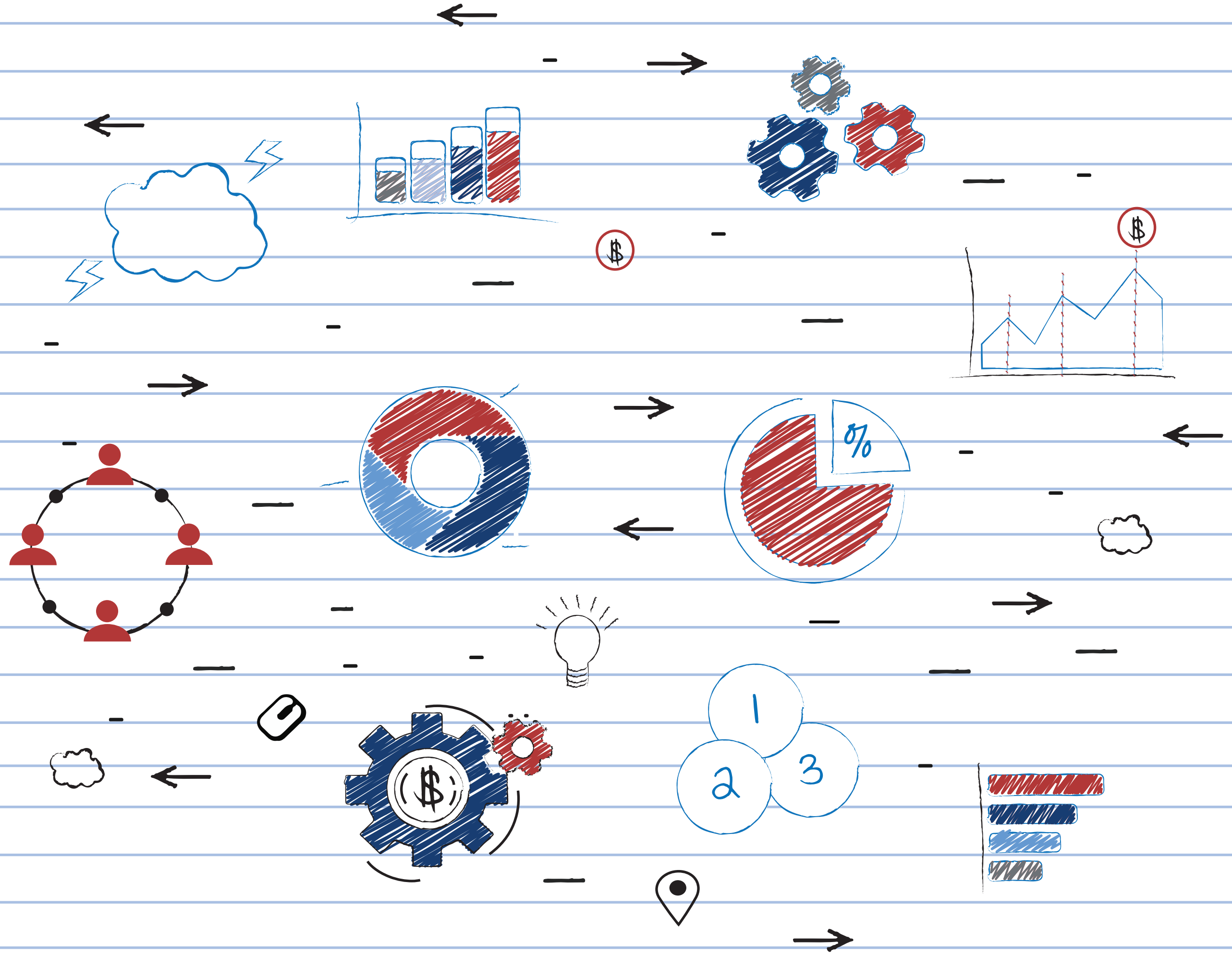
Detailed information on the Plan's investment performance is in the Investment Management Discussion and Analysis section of this Annual Report on page 12.

You can learn more about the financial position of the Plan by referring to the audited financial statements for the year ended December 31, 2019 located on page 22 of this Annual Report or on our website: www.nstpp.ca

You can also refer to the Actuarial Valuation Report as at December 31, 2019, which is available on our website: www.nstpp.ca

Investment Management
Discussion and Analysis

This section includes information on the TPP Fund and the factors that influenced its 2019 investment performance.



Overview

The Goal

The primary goal of the Teachers' Pension Fund (Fund) is to invest Plan *assets* in a manner that maximizes investment returns, within an acceptable level of risk, to enable the Plan to meet its long-term funding requirements.

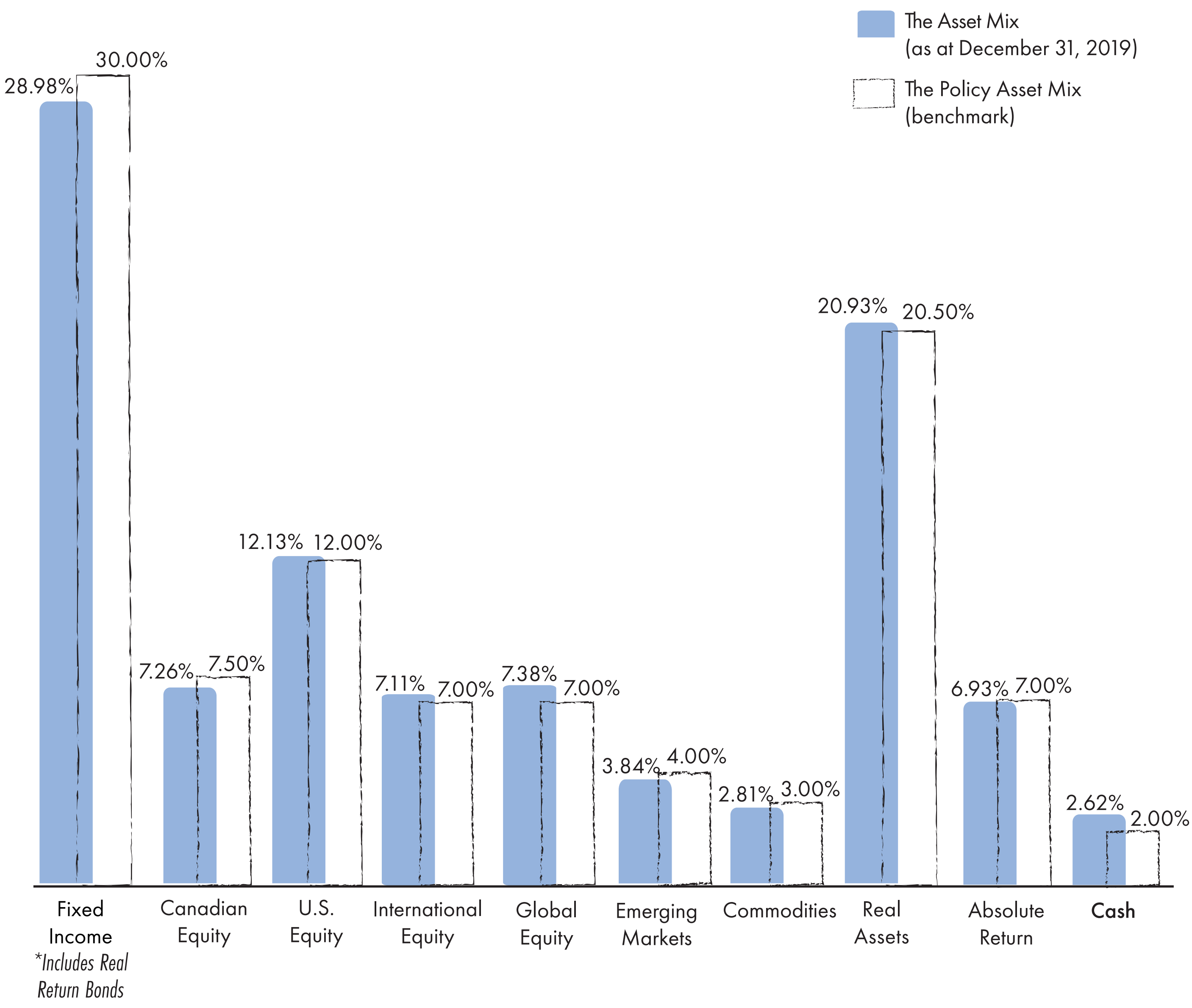
The SIP&G

The investment of Plan *assets* is guided by the Fund's Statement of Investment Policies & Goals (SIP&G) as written by Teachers' Pension Plan Trustee Inc. The SIP&G sets out the parameters within which investments may be made.

These parameters include permissible investments and the policy *asset mix*. The investment beliefs, also found within the SIP&G, state the general principles upon which the investments are made.

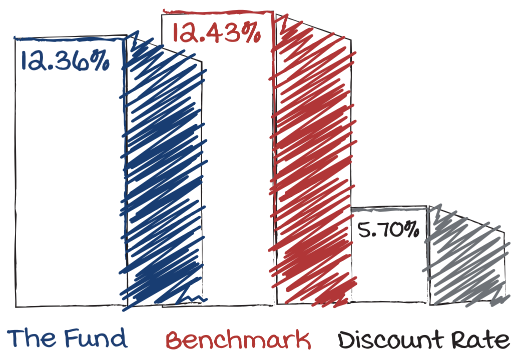
The Asset Mix

Over the year, positioning of the Fund's *asset* classes was maintained close to *benchmark*. Global economies began to lose momentum in the beginning of 2019 on the backdrop of tighter monetary policy in the US, trade policy uncertainty and concerns about China's outlook. Central banks shifted their policy stances and began easing monetary policy.



2019 Investment Performance

In 2019, the Fund achieved a one-year return of 12.36 per cent, *net of investment management fees (12.61 per cent gross of investment management fees)*. The Fund underperformed the policy *benchmark* of 12.43 per cent on a net basis and outperformed the *actuarial assumed rate of return* of 5.70 per cent.



The US *equity* market, as measured by the S&P 500 Index, returned a staggering 31.49 per cent during the year. Trade tensions and central bank actions dominated much of the news cycle and equity market narrative in 2019. The Federal Reserve shifted guidance early in the year fearing a slowdown in economic growth and followed up with 3 successive rate cuts in June, September and October. This easing in monetary policy was welcomed by investors as they looked through the trade tensions and lower corporate earnings estimates to push equities higher. The signing of the US-China "phase one" deal fueled an end-of-year surge, adding 9.07 per cent in the fourth quarter.

Canadian *equities*, as measured by the S&P TSX Composite index, gained a robust 22.88 per cent. Healthy labour markets, solid consumer spending, a recovering housing market, and higher commodity prices underpinned strong positive returns for Canadian *equities*.

International *equities*, as measured by the *MSCI EAFE index*, returned 21.67 per cent. International *equities* produced strong positive returns but slightly trailed their North American peers. Weak economic growth and subdued inflation prompted the European Central Bank and the Bank of Japan to adopt accommodative policy, most notably with negative policy rates, which supported positive *equity* returns.

Emerging Market equities, as measured by the *MSCI EM index*, returned 18.05 per cent. Trade uncertainty and Chinese growth concerns weighed on export-focused economies with outsized impact on Asian firms heavily reliant on China.

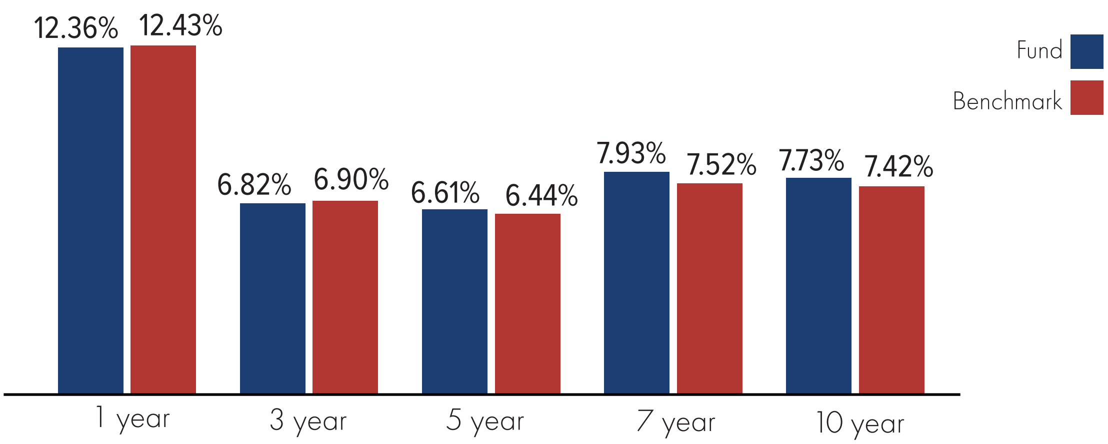
US fixed income delivered positive results with the Bloomberg Barclays US Credit index returning 13.80 per cent. Softer economic data, particularly in manufacturing, renewed concerns over growth during the summer months. Bond yields declined rapidly with 10-year bond yields falling below 3-month and 2-year yields, resulting in yield curve inversion in the US. The Federal Reserve rate cuts in June, September and October helped the US yield curve rise out of inversion to an upward sloping trajectory as the year progressed. In October the US repo market ran into liquidity issues and the Fed injected stimulus by once again growing its balance sheet. They were however quick to point out this was not more quantitative easing.

2019 Investment Performance continued...

Canadian fixed income delivered positive results, despite trailing US fixed income, with the FTSE Canada Universe Bond index returning 6.87 per cent. Canadian government yield curves also entered inversion territory on softer economic data and global trade tensions. Unlike the Federal Reserve, the Bank of Canada left rates unchanged in 2019. It indicated it will continue to monitor developments domestically and abroad but showed some resistance in cutting rates; not wanting to encourage more borrowing amongst already indebted businesses and households.

For the Fund, active performance was negative as its conservative profile underperformed as global markets rallied significantly during the year. Positive relative performance from the Fund's hedge fund, corporate fixed income, and real asset portfolios was offset by weak Canadian and Emerging Market *equity* manager relative performance. The Fund's overall performance, on a net basis, trailed the *benchmark* by 7 basis points.

Investment Returns



2019 Economic Review

Global

Global growth in 2019 recorded its weakest pace since the global financial crisis of 2009. Uncertainty over rising trade tensions led to weakened business sentiment and lower activity around the globe. Central banks were accommodative with 49 central banks cutting rates 71 times in what was the most synchronized monetary action since the global financial crisis.[1] Signs of stabilization emerged near the end of the year as the US and China signed a "phase one" trade deal.

Global growth for 2019 was 2.9 per cent.

Global growth for 2019 was 2.9 per cent, a 0.1 per cent reduction from the October World Economic Outlook Published by the *IMF*.

North America

The Canadian economy stalled in late 2019 in response to one-off factors, such as the General Motors and Canadian National Railway strikes and less temporary constraints such as elevated household debt and a depressed energy sector. The Canadian economy grew by 1.6 per cent in 2019.

The Canadian economy grew by 1.6 per cent in 2019.

In the United States *GDP* growth decelerated from the 2.9 per cent in 2018, buoyed by tax cuts, down to 2.3 per cent in 2019.[2] This pace is nonetheless still above the long-run potential of the economy of about 1.8 per cent. The US economy navigated many obstacles during 2019, including US-China trade tension, a slowing manufacturing sector and fading support from tax cuts. Despite head-winds, the labor market remained robust and enjoyed a rising participation rate. US unemployment in 2019 was near a five-decade low and wage growth was solid, fueling resilient consumer spending.

[1] *https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020*
[2] *Ibid*

2019 Economic Review continued...

Developed International

Growth in the Euro area decelerated from 1.9 per cent in 2018 to 1.2 per cent in 2019 as economic activity deteriorated significantly.[3] Several economies were on the verge of recession at some point last year, with weakness in the German industrial sector as it struggled with falling demand from Asia and disruptions to car production. The European Central Bank continued to provide monetary stimulus by pushing its policy rate deeper into negative territory, restarting quantitative easing and providing inexpensive credit to banks.

Growth in the Euro area decelerated to 1.2 per cent.

The pace of economic growth in the United Kingdom was at 1.4 per cent in 2019.[4] Political uncertainty weighed on business investment, consumer spending and manufacturing production. Increased government spending partially offset weak consumer spending during the year on continued Brexit uncertainty through much of 2019.

Japanese growth increased to 0.7 per cent in 2019.[5] The economy continued to suffer from acute weakness in manufacturing and exports, particularly those to China, alongside declining consumer confidence. In response, the government provided significant support. Despite recent weakness in activity, the unemployment rate remained near multi-decade lows, labor force participation continued to climb, and per capita income growth remained healthy.

Emerging Markets

Emerging Market growth decelerated to 3.7 per cent in 2019 from 4.5 per cent in 2018. [6] Substantial weakness in industrial production, trade flows, and investment weighed on Emerging Market growth during the year.

Emerging market growth decelerated to 3.7 per cent.

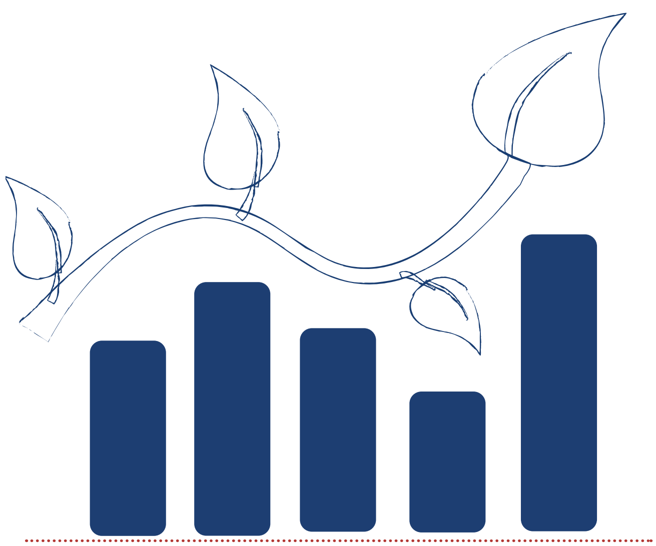
[3] *https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020*
[4] *Ibid*
[5] *Ibid*
[6] *Ibid*

Sustainable Investing and the TPPTI

Sustainable investing and climate risk have been a growing focus for the TPPTI over the past 5 years. Sustainable investing is an investment approach that, in addition to achieving targeted investment returns, gives consideration to long term investing and environmental, social and corporate governance factors.

In 2015 a Sustainable Investment Policy was approved, an annual Sustainable Investment Report became a reoccurring item on the Trustee's agenda, and in 2016 the TPPTI's Statement on Climate Change was posted to the website at: *www.nstpp.ca/teachers/about/investments/investment-policies*

The Trustee's focus on sustainable investing has continued to evolve. More recently, this has included development of an engagement strategy to influence corporate management on issues of climate risk and financial disclosures; creation of sustainable strategies within the Fund's direct real estate portfolio, expansion of investments in renewable energy, and identification of like-minded partners to help develop the sustainable investment approach.



Sustainable investing is an investment approach that, in addition to achieving targeted investment returns, gives consideration to long term investing and environmental, social and corporate governance factors.

2019 Significant Investment Accomplishments

In 2019, strong public and private markets drove the performance of the Fund. Improving trade conditions and central bank monetary easing contributed to the investment environment as did further diversification of the Fund and strong broad-based returns across *asset* classes.

During the year, the Trustee focused on various initiatives including preparing for the 2020 *asset liability study*; implementing a new strategy to enhance Fund liquidity; and bringing the Fund's passive currency hedging program in-house. The Trustee focused on further diversifying the Fund; real *assets* continued to grow with the approval of new infrastructure mandates and expansion of real estate and agriculture/timber investments.

The Trustee continued to make sustainable investing an important part of its investment processes and discussions. Some of the initiatives included engaging with external investment managers and monitoring proxy voting to influence corporate behaviors; investing in renewable *assets*; tracking of real estate transmissions and identifying green capital projects and working with environmentally focused partners.

Looking Ahead to 2020

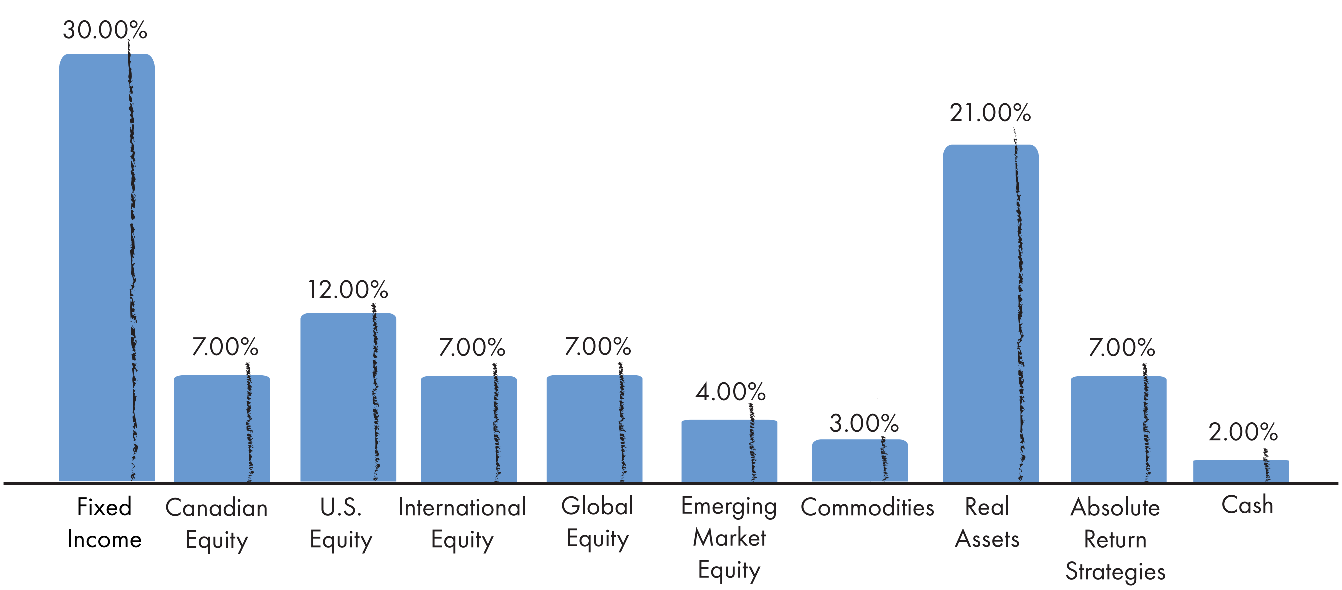
Early in the new year, the positive investment environment rapidly changed as the world began to learn about the coronavirus. It is unknown as to how deeply the virus will impact 2020, but current expectations are that global growth will be negatively impacted. All will be dependent on the ability of governments to bring the spread of the virus under control and to adopt measures that help global economies.

The Trustee will monitor events as they unfold, relying on the *asset mix* that has been developed over the past ten years. The Fund's shift to *assets* such as absolute return strategies and real *assets* will hopefully provide protection and dampen the impact of volatile *equity* markets.

The Trustee will focus on the upcoming *asset liability study*. Identifying potential improvements to *asset* classes and investment strategies will be the focal point to ensure investment performance of the Fund is maximized. As part of the process, the Fund's investment beliefs will also be reviewed to ensure they are aligned with the investment environment and the needs of the Plan.

Sustainability will continue to be a focus as it has been in other years. A sustainability report will be released this year to provide members with more information on the Fund's ongoing sustainable activities. A new initiative will also be introduced that will focus on the resiliency of portfolios such as real estate to protect *assets* that could be negatively impacted by climate change.

The New Target Policy Asset Mix



Financial Statements of
TEACHERS' PENSION PLAN
Year ended December 31, 2019

KPMG LLP
Purdy's Wharf Tower One
1959 Upper Water Street, Suite 1500
Halifax Nova Scotia B3J 3N2
Canada
Telephone (902) 492-6000
Fax (902) 429-1307

INDEPENDENT AUDITORS' REPORT

To the Teachers' Pension Plan Trustee Inc.

Opinion

We have audited the financial statements of Teachers' Pension Plan (the "Entity"), which comprise:

- the statement of financial position as at December 31, 2019;
- the statement of changes net assets available for benefits for the year then ended;
- the statement of changes in pension obligation for the year then ended;
- the statement of changes in deficit for the year then ended;
- and notes, comprising a summary of significant accounting policies and other explanatory information

(Hereinafter referred to as the "financial statements").

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the Entity as at December 31, 2019, and the changes in net assets available for benefits, changes in pension obligation and changes in deficit for the year then ended in accordance with Canadian accounting standards for pension plans.

Basis for Opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the ***"Auditors' Responsibilities for the Audit of the Financial Statements"*** section of our auditors' report.

We are independent of the Entity in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada and we have fulfilled our other responsibilities in accordance with these requirements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Other Information
Management is responsible for the other information. Other information comprises the information, other than the financial statements and the auditors' report thereon, included in a document entitled "Annual Report"

Our opinion on the financial statements does not cover the other information and we do not and will not express any form of assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information identified above and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit and remain alert for indications that the other information appears to be materially misstated.

We obtained the information, other than the financial statements and the auditors' report thereon, included in the Annual Report as at the date of this auditors' report. If, based on the work we have performed on this other information, we conclude that there is a material misstatement of this other information, we are required to report that fact in the auditors' report.

We have nothing to report in this regard.

Responsibilities of Management and Those Charged with Governance for the Financial Statements
Management is responsible for the preparation and fair presentation of the financial statements in accordance with Canadian accounting standards for pension plans, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Entity's ability to continue as a going concern, disclosing as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Entity or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Entity's financial reporting process.

Auditors' Responsibilities for the Audit of the Financial Statements
Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion.

Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists.

Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit.

We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion.

  The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Entity's internal control.

- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.

- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Entity's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditors' report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditors' report. However, future events or conditions may cause the Entity to cease to continue as a going concern.

- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represents the underlying transactions and events in a manner that achieves fair presentation.

- Communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

KPMG LLP

Chartered Professional Accountants
Halifax, Canada
April 21, 2020

Financial Statements of

TEACHERS' PENSION PLAN

Year ended December 31, 2019

Contents

Statement of Financial Position

December 31, 2019, with comparative information for 2018	2019	2018
(in thousands of dollars)		
Net assets available for benefits		
Assets		
Cash	$ 149,131	$ 31,552
Contributions receivable:		
Employers'	7,795	8,838
Employees'	3,487	3,709
Receivable from pending trades	8,672	10,034
Accounts receivable	1,689	2,651
Accrued investment income	13,875	12,708
Investments (note 5)	5,220,975	4,991,347
Total assets	5,405,624	5,060,839
Liabilities		
Due to administrator (note 12)	1,672	404
Payable for pending trades	39,817	50,795
Accounts payable and accrued liabilities	3,745	3,446
Investment-related liabilities (note 5)	2,674	68,307
Total liabilities	47,908	122,952
Net assets available for benefits	$ 5,357,716	$ $4,937,887
Accrued pension obligation and deficit		
Accrued pension obligation (note 7)	$ 6,855,448	$ $6,555,529
Deficit (note 7)	(1,497,732)	(1,617,642)
Commitments (note 8)		
Subsequent event (note 16)		
Accrued pension obligation and deficit	$ 5,357,716	$ $4,937,887

The accompanying notes are an integral part of these financial statements.

On behalf of the Board:

John B. Carter
Chair

Karen M. Gatien
Director

Kyle Marryatt
Director

Statement of Changes in Net Assets Available for Benefits

Year ended December 31, 2019, with comparative information for 2018	2019	2018
(in thousands of dollars)		
Increase in assets		
Contributions (note 4)	$ 233,709	$ 221,007
Transfers from other pension plans	3,551	3,275
Investment activities (note 5)	147,117	157,119
Change in market value of investments (note 5)	467,048	-
Total increase in assets	851,425	381,401
Decrease in assets		
Benefits paid (note 9)	406,730	398,697
Transfers to other pension plans	3,375	2,034
Administrative expenses (note 10)	21,491	21,559
Change in market value of investments (note 5)	-	132,333
Total decrease in assets	431,596	554,623
Increase (decrease) in net assets available for benefits	419,829	(173,222)
Net assets available for benefits, beginning of year	4,937,887	5,111,109
Net assets available for benefits, end of year	$ 5,357,716	$ 4,937,887

The accompanying notes are an integral part of these financial statements.

Statement of Changes in Pension Obligation

Year ended December 31, 2019, with comparative information for 2018	2019	2018
(in thousands of dollars)		
Accrued pension obligation, beginning of year	$ 6,555,529	$ 6,517,343
Increase in accrued pension benefits		
Interest on accrued pension obligation	396,610	394,299
Benefits accrued	137,754	126,559
Changes in actuarial assumptions (note 7)	211,406	-
	745,770	520,858
Decrease in accrued pension benefits		
Benefits paid and transfers to other pension plans	410,106	400,731
Net experience gains (note 7)	35,745	81,941
	445,851	482,672
Net increase in accrued pension benefits	299,919	38,186
Accrued pension obligation, end of year	$ 6,855,448	$ 6,555,529

Statement of Changes in Deficit

Year ended December 31, 2019, with comparative information for 2018	2019	2018
(in thousands of dollars)		
Deficit, beginning of year	$ 1,617,642	$ 1,406,234
(Increase) decrease in net assets available for benefits	(419,829)	173,222
Net increase in accrued pension obligation	299,919	38,186
Deficit, end of year	$ 1,497,732	$ 1,617,642

See accompanying notes to financial statements.

Notes to Financial Statements

Year ended December 31, 2019
(in thousands of dollars)

1. Authority and description of Plan

The following description of the Teachers' Pension Plan (the "Plan") is a summary only. For more complete information, reference should be made to the Plan legislative documents and agreements.

General

The Plan is governed by the Teachers' Pension Act (the "*Act*") as part of the Acts of Nova Scotia. It is a contributory defined benefit pension plan covering public school and community college teachers and is co-sponsored by the Province of Nova Scotia (the "Province") and the Nova Scotia Teachers' Union (the "Union"). The *Act* established the Nova Scotia Teachers' Pension Fund (the "Fund") for the purpose of crediting employer and employee contributions, investment earnings and meeting the Plan's obligations.

The detailed provisions of the Plan, including pension eligibility criteria and benefit formulas, are contained in the *Act* and in the Regulations made under the *Act*.

As part of the June 22, 2005 Agreement between the Province and the Union, the Province and the Union agreed to joint and equal participation in the governance of the Plan including the sharing of any actuarial surpluses or deficits between the Province and the beneficiaries of the Plan upon the transfer of the Plan to a newly formed trustee entity. Teachers' Pension Plan Trustee Inc. (the "TPPTI") was incorporated to act as trustee of the Fund and on April 1, 2006, the TPPTI became the trustee of the Fund. The 2005 Agreement was rescinded and replaced with a new agreement on July 2, 2014. However, there were no changes to the governance of the Plan or the sharing of actuarial surpluses or deficits.

The TPPTI is responsible for the administration of the Plan and the investment management of the Fund assets. The investment of the Fund assets is guided by the Fund's Statement of Investment Policies & Goals (the "SIP&G") as written by the TPPTI. The SIP&G sets out the parameters within which the investments are made. These parameters include permissible investments and the policy asset mix. The Investment Beliefs, also found within the SIP&G, state the general principles upon which the investments are made.

Funding

Plan benefits are funded by contributions and investment earnings. Contributions are made by active members of the Plan and are matched by either the Province or participating employers. The determination of the value of the benefits and required contributions is made on the basis of periodic actuarial valuations (note 7).

In accordance with the Plan regulations, employers and employees are required to contribute 11.3% of salary up to the Year's Maximum Pensionable Earnings (the "YMPE") per the Canada Pension Plan (the "CPP") and 12.9% of salary above the YMPE.

Authority and description of Plan (continued)

Retirement benefits

The pension benefit consists of two components. The lifetime pension, for every year of pensionable service, is 1.3% times the 5-year highest average salary at retirement (the "HAS-5") up to the average YMPE, plus 2.0% times the portion of the HAS-5 in excess of the average YMPE (if applicable). The bridge benefit, for every year of pensionable service, is 0.7% times the lesser of (i) the HAS-5, and (ii) the average YMPE. The lifetime pension is payable for life, while the bridge benefit is payable until age 65, at which point it ceases as a result of integration with the CPP.

Plan members are eligible for a pension upon reaching any of the following criteria:

- 35 years of service;
- age 50 with 30 years of service (reduced pension);
- age 55 with an age plus service factor of 85 "Rule of 85";
- age 55 with two years of service (reduced pension);
- age 60 with 10 years of service;
- age 65 with 2 years of service.

Indexing

For pensions with an effective date before August 1, 2006, the rate is equal to the increase in the 12-month average Consumer Price Index ("CPI") for Canada, less 1%, to a maximum of 6%.

Indexing in a given year for pensions with an effective date on or after August 1, 2006, as well as those of existing pensioners who opted for the new indexing arrangement, depends on the funding level of the Plan. If the funding level as at December 31 of the preceding fiscal year is less than 90%, no indexing will be provided. At a funding level of between 90% and 100%, indexing may be granted at 50% of the increase in the 12-month average CPI up to a maximum of 6%, at the discretion of the Board of Trustees.

If the funding level is greater than 100%, indexing will be provided at 100% of the increase in the 12-month average CPI up to a maximum of 6%, to the extent that it does not reduce the funding level to below 100%; however, pensions will be increased by at least 50% of the increase in the 12-month average CPI up to a maximum of 6%. For the purposes of the valuation, it was assumed that indexing would not be paid in years in which it is discretionary.

Disability benefits

Prior to August 1, 2014, active members who became mentally or physically disabled were entitled to apply for a disability pension from the Plan. Effective August 1, 2014, however, disability coverage was moved to the union's long-term disability insurance plan, and the ability to apply for a disability pension from the Plan was discontinued except in very limited circumstances.

Authority and description of Plan (continued)

Death benefits

Upon the death of a vested member, the surviving spouse is entitled to receive 60% of the vested member's pension benefit payable for life, or a higher percentage if the member elected an optional form of pension. Eligible children are entitled to receive 10% of the vested member's pension benefit, payable until age 18 (or 25 while still in school).

Termination benefits

Upon termination of employment, a vested member may choose to defer their pension until they satisfy one of the above eligibility criteria, or they may remove their funds from the Plan in the form of a commuted value (or refund of contributions, for service prior to January 1, 1988).

Refunds

The benefit payable upon termination or death of a non-vested member, or upon death prior to retirement of a vested member with no eligible survivors, is a lump sum refund of the member's contributions with interest.

2. Basis of preparation

a. Basis of presentation

These financial statements are prepared in Canadian dollars, which is the Plan's functional currency in accordance with the accounting standards for pension plans in Part IV of the Canadian Institute of the Chartered Professional Accountants (CPA) Canada Handbook (Section 4600). Section 4600 provides specific accounting guidance on investments and pension obligations. For accounting policies that do not relate to either investments or pension obligations, the Plan must consistently comply with either International Financial Reporting Standards ("IFRS") in Part I or Accounting Standards for Private Enterprises in Part II of the CPA Canada Handbook. The Plan has elected to comply on a consistent basis with IFRS in Part I of the CPA Canada Handbook. To the extent that IFRS in Part I is inconsistent with Section 4600, Section 4600 takes precedence.

Consistent with Section 4600, investment assets and liabilities are presented on a non-consolidated basis even when the investment is in an entity over which the Plan has effective control. Earnings of such entities are recognized as income as earned and as dividends are declared. The Plan's total investment income includes valuation adjustments required to bring the investments to their fair value.

These financial statements are prepared on a going concern basis and present the aggregate financial position of the Plan as a separate reporting entity.

These financial statements were authorized for issue by the Board of Trustees of the Teachers' Pension Plan Trustee Inc. on April 21, 2020.

b. Basis of measurement

The financial statements have been prepared on the historical cost basis except for financial instruments which are measured at fair value through the statement of changes in net assets available for benefits and derivative financial instruments which are measured at fair value. Units of subsidiaries held are measured at the fair value of the underlying assets and liabilities.

c. Use of estimates and judgments

The preparation of the financial statements in conformity with Section 4600 and IFRS requires management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets and liabilities at the date of the statement of financial position, the reported amounts of changes in net assets available for benefits and accrued pension benefits during the year. Actual results may differ from those estimates. Significant estimates included in the financial statements relate to the valuation of real estate, infrastructure, agriculture & timber and the determination of the accrued pension obligation.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the period in which the estimates are revised and in any future years affected.

3. Significant accounting policies

a. Investment transactions, income recognition and transaction costs

i. **Investment transactions:**
Investment transactions are accounted for on a trade date basis.

ii. **Income recognition:**
Income from investments is recorded on an accrual basis and includes interest, dividends and gains and losses that have been realized on disposal of investments and the unrealized appreciation and depreciation in the fair value of investments.

iii. **Transaction costs:**
Brokers' commissions and other transaction costs are recorded in the statement of changes in net assets available for benefits when incurred.

b. Foreign currency translation

Transactions denominated in foreign currencies are translated into Canadian dollars at the rates of exchange prevailing on the dates of the transactions. Monetary assets and liabilities denominated in foreign currencies at the reporting date are re-translated into Canadian dollars at the exchange rate at that date.

Foreign currency differences arising on re-translation are recognized in the statement of changes in net assets available for benefits as a change in net unrealized gains (losses).

c. Financial assets and liabilities

i. **Non-derivative financial assets:**
Financial assets are recognized initially on the trade date, which is the date that the Plan becomes a party to the contractual provisions of the instrument.

The Plan classifies all of its financial assets at fair value through the statement of changes in net assets available for benefits if it is classified as held for trading or is designated as such upon initial recognition. Financial assets are designated at fair value through the statement of changes in net assets available for benefits if the Plan manages such investment and makes purchase and sale decisions based on their fair value in accordance with the Plan's documented risk management or investment strategy. Upon initial recognition, attributed transaction costs are recognized in the statement of changes in net assets available for benefits as incurred. Financial assets at fair value through the statement of changes in net assets available for benefits are measured at fair value and changes therein are recognized in the statement of changes in net assets available for benefits.

ii. **Non-derivative financial liabilities:**
All financial liabilities are recognized initially on the trade date at which the Plan becomes a party to the contractual provisions of the instrument.

Financial assets and liabilities are presented in the statement of financial position. The net amount is presented in the statement of financial position, when and only when, the Plan has a legal right to offset the amounts and it intends either to settle on a net basis or to realize the asset and settle the liability simultaneously.

The Plan considers its amounts payable to be a non-derivative financial liability.

Significant accounting policies (continued)

iii. **Derivative financial instruments:**

Derivative financial instruments are recognized initially at fair value and their related transaction costs are recognized in the statement of changes in net assets available for benefits as incurred. Subsequent to initial recognition, derivatives are measured at fair value, and all changes are recognized immediately in the statement of changes in net assets available for benefits.

Derivative-related assets and liabilities are presented in the statement of financial position. The net amount is presented in the statement of financial position, when and only when, the Plan has a legal right to offset the amounts and it intends either to settle on a net basis or to realize the asset and settle the liability simultaneously.

d. Fair value measurement

Fair value is the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction on the measurement date.

As allowed under IFRS 13, if an asset or a liability measured at fair value has a bid and an ask price, the price within the bid-ask spread that is the most representative of fair value in the circumstances shall be used to measure fair value. The Plan uses closing market price as a practical expedient for fair value measurement.

When available, the Plan measures the fair value of an instrument using quoted prices in an active market for that instrument. A market is regarded as active if quoted prices are readily and regularly available and represent actual and regularly occurring market transactions on an arm's length basis.

If a market for a financial instrument is not active, then the Plan establishes fair value using a valuation technique. Valuation techniques include using recent arm's length transactions between knowledgeable, willing parties (if available), reference to the current fair value of other instruments that are substantially the same, discounted cash flow analyses and option pricing models.

The best evidence of the fair value of a financial instrument at initial recognition is the transaction price, i.e. the fair value of the consideration given or received, unless the fair value of that instrument is evidenced by comparison with other observable current market transactions in the same instrument or based on a valuation technique whose variables include only data from observable markets. When a transaction price provides the best evidence of fair value at initial recognition, the financial instrument is initially measured at the transaction price and any difference between this price and the value initially obtained from a valuation model is subsequently recognized in profit or loss on an appropriate basis over the life of the instrument but not later than when the valuation is supported wholly by observable market data or the transaction is closed out.

All changes in fair value, other than interest and dividend income and expense, are recognized in the statement of changes in net assets available for benefits as part of the change in market value of investments.

Significant accounting policies (continued)

Fair values of investments are determined as follows:

i. Fixed income securities and equities are valued at year-end quoted closing prices, where available. Where quoted prices are not available, estimated fair values are calculated using comparable securities.

ii. Short-term notes, treasury bills, term deposits, and agreements to repurchase or resell securities maturing within one year, and promissory notes payable on demand are stated at cost, which together with accrued interest income approximates fair value given the short-term nature of these investments.

iii. Pooled fund investments include investments in fixed income, equities, real estate and commodities. Pooled funds are valued at the unit values supplied by the pooled fund administrator, which represent the Plan's proportionate share of underlying net assets at fair values determined using closing market prices. These net asset values are reviewed by management.

iv. Directly held real estate is valued based on estimated fair values determined by appropriate techniques and best estimates by management, appraisers, or both. Where external appraisers are engaged to perform the valuation, management ensures the appraisers are independent and compares the assumptions used by the appraisers with management's expectations based on current market conditions and industry practice to ensure the valuation captures the business and economic conditions specific to the investment.

v. Private fund investments include investments in real estate, infrastructure and agriculture & timber assets. The fair value of a private fund investment where the Plan's ability to access information on underlying individual fund investments is restricted, such as under the terms of a limited partnership agreement, is equal to the value provided by the fund's general partner unless there is a specific and objectively verifiable reason to vary from the value provided by the general partner. These net asset values are reviewed by management.

vi. Derivatives, including futures, options, interest rate swaps, credit default swaps, total return swaps, and currency forward contracts, are valued at year-end quoted market prices, interest, spot and forward rates, where available. Where quoted prices are not available, appropriate alternative valuation techniques are used to determine fair value. The gains or losses from derivative contracts are included in the realized and unrealized gains or losses on investments.

vii. Absolute return strategy investments, comprised of hedge funds, are recorded at fair value based on net asset values obtained from each of the hedge funds' administrators. These net asset values are reviewed by management.

Significant accounting policies (continued)

e. Non-investment assets and liabilities

The fair value of non-investment assets and liabilities are equal to their amortized cost value and are adjusted for foreign exchange where applicable.

f. Receivable/payable for pending trades

For securities transactions, the fair value of receivable from pending trades and payable for pending trades approximate their carrying amounts due to their short-term nature.

g. Accrued pension obligation

The value of the accrued pension obligation of the Plan is based on a going concern method actuarial valuation prepared by an independent firm of actuaries using the projected unit credit method. The accrued pension obligation is measured in accordance with accepted actuarial methods using actuarial assumptions and methods adopted by the TPPTI for the purpose of establishing the long-term funding requirements of the Plan. The actuarial valuation included in the financial statements is consistent with the valuation for funding purposes.

h. Contributions

Basic contributions from employers and members are recorded on an accrual basis. Service purchases that include but are not limited to leaves of absence and transfers from other pension plans are recorded and service is credited when the purchase amount is received.

In certain years, an additional contribution to the Plan may be required from the Minister of Finance and Treasury Board. In any indexing period in which there is an actuarial deficit and clause 27B(3)(a) of the Teachers' Pension Plan Regulations applies, the Minister must contribute to the Plan, no later than the beginning of the following indexing period, an amount equal to the actuarial value, as calculated by the Plan's actuary at the beginning of the indexing period, of the difference between:

i. the indexing of all pensions to which subsection 27B(3) applies for that indexing period at a rate of one-half of the percentage increase in the 12-month average CPI for that indexing period over the 12-month average CPI for the preceding indexing period to a maximum of 6% and, for all future indexing periods, at a rate of one-half of the assumed percentage increase in the 12-month average CPI determined in accordance with the actuarial assumptions and methods; and

ii. no indexing of all pensions to which subsection 27B(3) applies for that indexing period and, for all future indexing periods, indexing at a rate of one-half of the assumed percentage increase in the 12-month average CPI determined in accordance with the actuarial assumptions and methods.

Significant accounting policies (continued)

i. Benefits

Benefit payments to retired, surviving and disabled members, commuted value payments and refunds to former members, and transfers to other pension plans are recorded in the period in which they are paid. Accrued benefits are recorded as part of the accrued pension benefit obligation.

j. Administrative expenses

Administrative expenses, incurred for plan administration and direct investment management services, are recorded on an accrual basis. Plan administration expenses represent expenses incurred to provide direct services to the Plan members and employers. Investment management expenses represent expenses incurred to manage the Fund. Base external manager fees for portfolio management are expensed in investment management expenses as incurred.

k. Income taxes

The Fund is the funding vehicle for a registered pension plan, as defined by the Income Tax Act (Canada) and, accordingly is not subject to income taxes.

l. Future changes to accounting policies

No relevant new guidance has been issued by the International Accounting Standards Board.

4. Contributions

(in thousands of dollars)		2019		2018
Employer:				
Matched current service	$	105,095	$	102,314
Matched past service		15		55
		105,110		102,369
Employee:				
Matched current service		105,095		102,314
Matched past service		15		55
Unmatched current service		3		3
Unmatched past service		160		433
		105,273		102,805
Special contribution from the Province of Nova Scotia		23,326		15,833
	$	233,709	$	221,007

5. Investments and investment-related liabilities

a. The fair value of the Plan's investments and investment-related liabilities along with the related income as at December 31 are summarized in the following tables:

		2019			2018	
(in thousands of dollars)			%			%
Investments						
Fixed income						
Money market	$	149,933	2.9	$	158,269	3.2
Canadian bonds & debentures		453,690	8.7		513,475	10.4
Non-Canadian bonds & debentures		791,897	15.2		750,195	15.0
Canadian real return bonds		154,086	3.0		146,638	2.9
Equities						
Canadian		380,850	7.3		338,131	6.8
US		808,251	15.5		712,339	14.3
Global		773,792	14.8		713,695	14.3
Commodities		148,605	2.8		146,387	2.9
Real assets						
Real estate		746,256	14.3		725,603	14.5
Infrastructure		333,642	6.4		318,104	6.4
Agriculture & timber		24,053	0.5		12,063	0.2
Absolute return strategies						
Hedge funds		367,195	7.0		383,705	7.7
Investment-related receivables						
Agreements to resell securities		47,720	0.8		61,734	1.2
Promissory note		6,981	0.1		6,981	0.1
Derivative-related, net		34,024	0.7		4,028	0.1
	$	5,220,975	100.0	$	4,991,347	100.0
Investment-related liabilities						
Agreements to repurchase securities	$	-	-	$	(1,190)	1.7
Derivative-related, net		(2,674)	100.0		(67,117)	98.3
	$	(2,674)	100.0	$	(68,307)	100.0
Net investments	$	5,218,301		$	4,923,040	

Investments and investment-related liabilities (continued)

2019

(in thousands of dollars)

	Investment income	Changes in market value of investments and derivatives: Realized	Unrealized	Total
Fixed income	$ 51,868	$ 14,389	$ 43,813	$ 58,202
Equities	46,617	74,518	208,696	283,214
Commodities	-	-	2,218	2,218
Real assets	45,628	9,336	7,617	16,953
Absolute return strategies	-	16,570	(7,003)	9,567
Derivatives	1,533	305	96,589	96,894
Other	1,471	-	-	-
	$ 147,117	$ 115,118	$ 351,930	$ 467,048

2018

(in thousands of dollars)

	Investment income	Changes in market value of investments and derivatives: Realized	Unrealized	Total
Fixed income	$ 53,731	$ 10,704	$ 75,645	$ 86,349
Equities	46,054	104,475	(186,650)	(82,175)
Commodities	-	1,513	(6,374)	(4,861)
Real assets	55,699	(2,449)	60,788	58,339
Absolute return strategies	-	10,022	25,022	35,044
Derivatives	468	(63,041)	(161,988)	(225,029)
Other	1,167	-	-	-
	$ 157,119	$ 61,224	$ (193,557)	$ (132,333)

b. Derivatives

Derivatives are financial contracts, the value of which is "derived" from the value of underlying assets or interest or exchange rates. The Plan utilizes such contracts to provide flexibility in implementing investment strategies and for managing exposure to interest rate and foreign currency volatility.

Notional amounts of derivative contracts are the contract amounts used to calculate the cash flows to be exchanged. They represent the contractual amount to which a rate or price is applied for computing the cash to be paid or received. Notional amounts are the basis upon which the returns from, and the fair value of, the contracts are determined. They do not necessarily indicate the amounts of future cash flows involved or the current fair value of the derivative contracts. They are a common measure of volume of outstanding transactions but do not represent credit or market risk exposure. The derivative contracts become favourable (assets) or unfavourable (liabilities) as a result of fluctuations in either market rates or prices relative to their terms. The aggregate notional amounts and fair values of derivative contracts can fluctuate significantly.

Investments and investment-related liabilities (continued)

Derivative contracts transacted either on a regulated exchange market or in the over-the-counter ("OTC") market, directly between two counterparties include the following:

Futures

Futures are transacted in standardized amounts on regulated exchanges and are subject to daily cash margining. The futures contracts that the Plan enters into are as follows:

- Government futures - contractual obligations to either buy or sell at a fixed value (the contracted price) government fixed income financial instruments at a predetermined future date. They are used to adjust interest rate exposure and replicate government bond positions. Long future positions are backed with high grade, liquid debt securities.

- Money market futures - contractual obligations to either buy or sell money market financial instruments at a predetermined future date at a specified price. They are used to manage exposures at the front end of the yield curve. Futures are based on short-term interest rates and do not require delivery of an asset at expiration. Therefore they do not require cash backing.

Options

Options are contractual agreements under which the seller (writer) grants the purchaser the right, but not the obligation, either to buy (call option) or sell (put option), a security, exchange rate, interest rate, or other financial instrument or commodity at a predetermined price, at or by a specified future date. The seller (writer) of an option can also settle the contract by paying the cash settlement value of the purchaser's right. The seller (writer) receives a premium from the purchaser for this right. Purchased options are used to manage interest rate volatility exposures. Written options generate income in expected interest rate scenarios and may generate capital losses if unexpected interest rate environments are realized. Both written and purchased options will become worthless at expiration if the underlying instrument does not reach the strike price of the option. In-the-money portion of written options are covered by high grade, liquid debt securities.

Swaptions are contractual agreements that convey to the purchaser the right but not the obligation to enter into or cancel a swap agreement at a fixed future date or at any time within a fixed future period. The seller receives a premium from the purchaser for this right.

Investments and investment-related liabilities (continued)

Credit default swaps

Credit default swaps ("CDS") provide protection against the decline in value of the referenced asset as a result of specified events such as payment default or insolvency. The purchaser pays a premium to the seller of the CDS in return for payment related to the deterioration in the value of the referenced asset. The referenced asset for CDS is a debt instrument. They are used to manage credit exposure without buying or selling securities outright. Written CDS increase credit exposure (selling protection), obligating the Plan to buy bonds from counterparties in the event of a default. Purchased CDS decrease exposure (buying protection), providing the right to "put" bonds to the counterparty in the event of a default. Net long exposures are backed with high grade, liquid debt securities. Underlying credit exposures are continuously monitored.

Interest rate swaps

Interest rate swaps involve contractual agreements between two counterparties to exchange fixed and floating interest payments based on notional amounts. They are used to adjust interest rate yield curve exposures and substitute for physical securities. Long swap positions increase exposure to long-term interest rates and short positions decrease exposure. Long swap positions are backed with high grade, liquid debt securities.

Total return swaps

Total return swaps are contractual agreements under which the total return receiver assumes market and credit risk on a bond or loan, where the total return payer forfeits risk associated with market performance but takes on the credit exposure that the total return receiver may be subject to. The total return receiver receives income and capital gains generated by an underlying loan or bond. In return, the total return receiver must pay a set rate and any capital losses generated by the underlying loan or bond over the life of the swap.

Currency forwards

Currency forwards are contractual obligations to exchange one currency for another at a specified price or settlement at a predetermined future date. Forward contracts are used to manage the currency exposure of investments held in foreign currencies. The notional amount of a currency forward represents the contracted amount purchased or sold for settlement at a future date. The fair value is determined by the difference between the market value and the notional value upon settlement.

Investments and investment-related liabilities (continued)

The following tables set out the notional values of the Plan's derivatives and their related assets and liabilities as at December 31:

2019

(in thousands of dollars)	Notional value	Fair value Assets	Fair value Liabilities	Fair value Net
Derivatives				
Futures	$ 6,803	$ 132	$ (255)	$ (123)
Options	-	-	-	-
Credit default swaps	5,331	299	(88)	211
Interest rate swaps	18,100	164	(359)	(195)
Total return swaps	105,318	-	(1,686)	(1,686)
Currency forwards	2,144,269	31,513	(30)	31,483
	2,279,821	32,108	(2,418)	29,690
Cash collateral	-	1,916	(256)	1,660
Notional and fair value	$ 2,279,821	$ 34,024	$ (2,674)	$ 31,350

2018

(in thousands of dollars)	Notional value	Fair value Assets	Fair value Liabilities	Fair value Net
Derivatives				
Futures	$ 22,547	$ 788	$ (194)	$ 594
Options	24,450	614	(580)	34
Credit default swaps	6,625	117	(69)	48
Interest rate swaps	39,500	336	(233)	103
Total return swaps	8,700	-	(333)	(333)
Currency forwards	2,237,120	22	(65,708)	(65,686)
	2,338,942	1,877	(67,117)	(65,240)
Cash collateral	-	2,151	-	2,151
Notional and fair value	$ 2,338,942	$ 4,028	$ (67,117)	$ (63,089)

Investments and investment-related liabilities (continued)

The following tables set out the contractual maturities of the Plan's derivatives and their net related assets and liabilities as at December 31:

2019

(in thousands of dollars)	Under 1 year	1 to 5 years	5 to 10 years	Over 10 years	Total
Derivatives, net					
Futures	$ (123)	$ -	$ -	$ -	$ (123)
Options	-	-	-	-	-
Credit default swaps	-	211	-	-	211
Interest rate swaps	-	(187)	(8)	-	(195)
Total return swaps	-	(1,686)	-	-	(1,686)
Currency forwards	31,483	-	-	-	31,483
	31,360	(1,662)	(8)	-	29,690
Cash collateral, net	$ 1,660	$ -	$ -	$ -	$ 1,660
Fair value, net	$ 33,020	$ (1,662)	$ (8)	$ -	$ 31,350

2018

(in thousands of dollars)	Under 1 year	1 to 5 years	5 to 10 years	Over 10 years	Total
Derivatives, net					
Futures	$ 594	$ -	$ -	$ -	$ 594
Options	34	-	-	-	34
Credit default swaps	6	42	-	-	48
Interest rate swaps	76	134	(107)	-	103
Total return swaps	(333)	-	-	-	(333)
Currency forwards	(65,686)	-	-	-	(65,686)
	(65,309)	176	(107)	-	(65,240)
Cash collateral, net	$ 2,151	$ -	$ -	$ -	$ 2,151
Fair value, net	$ (63,158)	$ 176	$ (107)	$ -	$ (63,089)

Cash is deposited or pledged with various financial institutions as collateral if the Plan was to default on payment obligations on its derivative contracts. On the statement of financial position, collateral is represented as part of the net balance of derivative-related receivables and liabilities.

6. Financial Instruments

a. Fair Values

The fair values of investments and derivatives are as described in note 3(d). The fair values of other financial assets and liabilities, being cash, contributions receivable, receivable from repurchase agreements, receivable from pending trades, accrued investment income, pension benefits payable, payable for repurchase agreements , and payable from pending trades, approximate their carrying values due to the short-term nature of these financial instruments.

Fair value measurements recognized in the statement of financial position are categorized using a fair value hierarchy that reflects the significance of inputs used in determining the fair values. Level 1: Fair value is based on inputs that reflect unadjusted quoted prices in active markets for identical assets or liabilities that the Investment Manager has the ability to access at the measurement date. Level 1 primarily includes publicly listed investments.

Level 2: Fair value is based on valuation methods that make use of inputs other than quoted prices included in Level 1, that are observable for the asset or liability, either directly or indirectly, including inputs in markets that are not considered to be active. Level 2 primarily includes debt securities and derivative contracts not traded on a public exchange and public equities not traded in an active market.

Level 3: Fair value is based on valuation methods where inputs that are based on non-observable market data have a significant impact on the valuation. Level 3 primarily includes real estate, infrastructure, and private equity investments valued based on discounted future cash flow models which reflect assumptions that a market participant would use when valuing such an asset or liability.

Financial Instruments (continued)

2019 (in thousands of dollars)	Level 1	Level 2	Level 3	Total
Investments				
Fixed income				
Money market	$ 29,524	$ 120,409	$ -	$ 149,933
Canadian bonds & debentures	126,536	327,154	-	453,690
Non-Canadian bonds & debentures	35,675	756,222	-	791,897
Canadian real return bonds	-	74,234	79,852	154,086
Equities				
Canadian	371,425	9,425	-	380,850
US	429,468	378,783	-	808,251
Global	568,339	205,453	-	773,792
Commodities	-	148,605	-	148,605
Real assets				
Real estate	-	142,718	603,538	746,256
Infrastructure	-	-	333,642	333,642
Agriculture & timber	-	-	24,053	24,053
Absolute return strategies				
Hedge funds	-	367,195	-	367,195
Investment-related receivables				
Agreements to resell securities	-	47,720	-	47,720
Promissory notes	-	-	6,981	6,981
Derivative-related, net	2,048	31,976	-	34,024
	$ 1,563,015	$ 2,609,894	$ 1,048,066	$ 5,220,975
Investment-related liabilities				
Agreements to repurchase securities	$ -	$ -	$ -	$ -
Derivative-related, net	(513)	(2,161)	-	(2,674)
	$ (513)	$ (2,161)	$ -	$ (2,674)
Net investments	$ 1,562,502	$ 2,607,733	$ 1,048,066	$ 5,218,301

Financial Instruments (continued)

2018 (in thousands of dollars)	Level 1	Level 2	Level 3	Total
Investments				
Fixed income				
Money market	$ 39,846	$ $ 118,423	$ -	$ 158,269
Canadian bonds & debentures	166,839	346,636	-	513,475
Non-Canadian bonds & debentures	42,660	707,535	-	750,195
Canadian real return bonds	-	68,759	77,879	146,638
Equities				
Canadian	330,226	7,905	-	338,131
US	386,894	325,445	-	712,339
Global	525,904	187,791	-	713,695
Commodities	-	146,387	-	146,387
Real assets				
Real estate	-	113,962	611,641	725,603
Infrastructure	-	-	318,104	318,104
Agriculture & timber	-	-	12,063	12,063
Absolute return strategies				
Hedge funds	-	383,705	-	383,705
Investment-related receivables				
Agreements to resell securities	-	61,734	-	61,734
Promissory notes	-	-	6,981	6,981
Derivative-related, net	3,553	475	-	4,028
	1,495,922	2,468,757	1,026,668	4,991,347
Investment-related liabilities				
Agreements to repurchase securities	$ -	$ (1,190)	$ -	$ $(1,190)
Derivative-related, net	(774)	(66,343)	-	(67,117)
	$ (774)	$ (67,533)	$ -	$ (68,307)
Net investments	$ 1,495,148	$ 2,401,224	$ 1,026,668	$ 4,923,040

There were no significant transfers between level 1 and level 2 financial instruments during the years ended December 31, 2019 and 2018.

Financial Instruments (continued)

The following tables present the changes in the fair value measurement in Level 3 of the fair value hierarchy:

2019

(in thousands of dollars)	Fixed income	Real assets	Investment-related receivables	Total
Balance, beginning of year	$ 77,879	$ 941,808	$ 6,981	$ 1,026,668
Purchases, contributed capital	-	60,722	-	60,722
Sales, capital returned	(1,091)	(47,728)	-	(48,819)
Realized gains (losses)	248	7,071	-	7,319
Unrealized gains (losses)	2,816	(640)	-	2,176
Balance, end of year	$ 79,852	$ 961,233	$ 6,981	$ 1,048,066

2018

(in thousands of dollars)	Fixed income	Real assets	Investment-related receivables	Total
Balance, beginning of year	$ 81,652	$ 807,995	$ 12,678	$ 902,325
Purchases, contributed capital	-	123,461	-	123,461
Sales, capital returned	(1,036)	(39,668)	(5,697)	(46,401)
Realized gains (losses)	236	(4,477)	-	(4,241)
Unrealized gains (losses)	(2,973)	54,497	-	51,524
Balance, end of year	$ 77,879	$ 941,808	$ 6,981	$ 1,026,668

The total realized and unrealized gains (losses) included in the change in market value of investments from level 3 financial instruments held as at December 31, 2019 and 2018, respectively, was $9,498 and $47,283.

Fair value assumptions and sensitivity

Level 3 financial instruments are valued using various methods. Listed real return bonds are valued by a third-party using broker prices and comparable securities. Certain unlisted private equity, real estate and infrastructure funds are valued using various methods including overall capitalization method and discount rate method. Real estate subsidiaries are valued using the overall capitalization method and discount rate method and the valuations are significantly affected by non-observable inputs, the most significant of which are the capitalization rate and the discount rate.

Financial Instruments (continued)

Significant unobservable inputs used in measuring fair value:

The table below sets out information about significant unobservable inputs used at December 31, 2019 in measuring financial instruments categorized as level 3 in the fair value hierarchy.

(in thousands of dollars)

Description	2019 Fair value	2018 Fair value	Valuation technique	Unobservable inputs
Unlisted real estate subsidiaries	$ 532,540	$ 530,215	Income approach technique: overall capitalization rate method and discounted cash flow method	Capitalization rates, discount rates
Unlisted funds: real estate, infrastructure, agriculture & timber	428,693	411,593	Net asset value – audited financial statements	Information not available
Listed real return bond	79,852	77,879	Vendor supplied price - proprietary price model	Information not available
Unlisted promissory notes	6,981	6,981	Valued at cost	N/A
	$ 1,048,066	$ 1,026,668		

The following analysis illustrates the sensitivity of the Level 3 valuations to reasonably possible capitalization rate and discount rate assumptions for real estate properties where reasonably possible alternative assumptions would change the fair value significantly.

Valuations determined by the direct capitalization method and discount cash flow method are most sensitive to changes in the capitalization rates and discount rates.

(in thousands of dollars)	2019	2018
Unlisted direct real estate subsidiaries		
Direct capitalization method		
Minimum capitalization rate	3.50%	3.60%
Maximum capitalization rate	6.80%	8.00%
Increase of 25 basis points in capitalization rate	$ (31,053)	$ (30,622)
Decrease of 25 basis points in capitalization rate	$ 32,478	$ 31,173
Discounted cash flow method		
Minimum discount rate	3.50%	3.70%
Maximum discount rate	8.22%	9.00%
Increase of 25 basis points in discount rate	$ (13,820)	$ (10,406)
Decrease of 25 basis points in discount rate	$ 14,113	$ 11,113

Note: 1 basis point is equal to 0.01%

Financial Instruments (continued)

The Plan does not have access to underlying information that comprises the fair market value of real return bonds, and certain real estate and infrastructure fund investments. The fair market value is provided by the general partner or other external managers. In the absence of information supporting the fair market value, no other reasonably possible alternative assumptions could be applied.

Significant investments

The Plan's investments, each having a fair value or cost exceeding one per cent of the fair market value or cost of net investment assets and liabilities as follows:

As at December 31, 2019

(in thousands of dollars)

	Number of investments	Fair value	Cost
Public market investments	1	$ 79,852	$ 30,511
Private market investments	19	2,122,617	1,579,855
	20	$ 2,202,469	$ 1,610,366

As at December 31, 2018

(in thousands of dollars)

	Number of investments	Fair value	Cost
Public market investments	1	$ 77,879	$ 31,354
Private market investments	17	1,871,860	1,546,036
	18	$ 1,949,739	$ 1,577,390

The Plan's significant private market investments consist of fixed income and equity pooled funds, commodities, real estate, and infrastructure.

Financial Instruments (continued)

b. Investment risk management

Risk management relates to the understanding and active management of risks associated with all areas of the business and the associated operating environment. Investments are primarily exposed to interest rate volatility, market price fluctuations, credit risk, foreign currency risk and liquidity risk. The Plan has set formal goals, policies, and operating procedures that establish an asset mix among equity, fixed income, real assets, absolute return strategy investments and derivatives that requires diversification of investments within categories, and set limits on the size of exposure to individual investments and counterparties. Risk and credit committees have been created to regularly monitor the risks and exposures of the Plan. Trustee oversight, procedures and compliance functions are incorporated into Plan processes to achieve consistent controls and to mitigate operational risk.

i. Interest rate risk

Interest rate risk refers to the fact that the Plan's financial position will change with market interest rate changes, as fixed income securities are sensitive to changes in nominal interest rates. Interest rate risk is inherent in the management of a pension plan due to prolonged timing differences between cash flows related to the Plan's assets and cash flows related to the Plan's liabilities. To properly manage the Plan's interest rate risk, appropriate guidelines on the weighting and duration for the bonds and other fixed income investments are set and monitored.

Financial Instruments (continued)

2019 (in thousands of dollars)	Under 1 year	1 to 5 years	5 to 10 years	Over 10 years	Total	Average yield (%)(1)
Fixed income						
Money market	$ 146,916	$ -	$ -	$ -	$ 146,916	-
Bonds & debentures	5,537	269,628	244,240	250,881	770,286	4.1
Real return bonds (2)	-	-	-	79,852	79,852	5.3
	$ 152,453	$ 269,628	$ 244,240	$ 330,733	$ 997,054	3.6
Pooled funds					552,552	
Total fixed income					$ 1,549,606	

2018 (in thousands of dollars)	Under 1 year	1 to 5 years	5 to 10 years	Over 10 years	Total	Average yield (%)(1)
Fixed income						
Money market	$ 157,465	$ -	$ -	$ -	$ 157,465	-
Bonds & debentures	11,135	312,694	251,862	244,025	819,716	3.9
Real return bonds (2)	-	-	-	77,879	77,879	5.3
	$ 168,600	$ 312,694	$ 251,862	$ 321,904	$ 1,055,060	3.4
Pooled funds					513,517	
Total fixed income					$ 1,568,577	

1. The average effective yield reflects the estimated annual income of a security as a percentage of its year-end fair value. The total average yield is the weighted average of the average yields shown.

2. Real return bond yields are based on real interest rates. The ultimate yield will be impacted by inflation as it occurs.

The fair value of the Plan's investments is affected by short-term changes in nominal interest rates. Pension liabilities are exposed to the long-term expectation of rate of return of the Fund as well as expectations of inflation and salary escalation.

Financial Instruments (continued)

Interest rate sensitivity

The Plan's investments in fixed income and fixed income related derivatives are sensitive to interest rate movements. The following table represents the assets held in the Plan as at December 31, subject to interest rate changes, average duration due to a one percent increase (decrease) in interest rate and the change in fair value of those assets:

(in thousands of dollars)		2019		2018
Interest rate sensitive assets	$	996,920	$	1,055,505
Average duration for 1% increase in interest rates		(6.2)		(5.8)
Sensitivity to 1% increase in interest rates		(61,343)		(62,005)
Fair value after 1% increase in rates	$	935,577	$	$993,500
Average duration for 1% decrease in interest rates		6.2		5.8
Sensitivity to 1% decrease in interest rates		61,343		62,005
Fair value after 1% decrease in rates	$	1,058,263	$	1,117,510

ii. **Market price risk**

Market price risk is the risk of fluctuation in market values of investments from influences specific to a particular investment or from influences on the market as a whole. Market price risk does not include interest rate risk and foreign currency risk which are also discussed in this note. As all of the Plan's financial instruments are carried at fair value with fair value changes recognized in the statement of changes in financial position, all changes in market conditions will directly result in an increase (decrease) in net assets. Market price risk is managed by the Plan through the construction of a diversified portfolio of instruments traded on various markets and across various industries.

Financial Instruments (continued)

Market sensitivity

The Plan's investments in equities are sensitive to market fluctuations. The following table represents the change in fair value of the Plan's investment in public and private equities due to a ten percent increase (decrease) in fair market values as at December 31:

(in thousands of dollars)	2019	2018
Total equity	$ 1,962,893	$ 1,764,165
10% increase in market values	196,289	176,417
Fair value after 10% increase in market values	$ 2,159,182	$ 1,940,582
10% decrease in market values	(196,289)	(176,417)
Fair value after 10% decrease in market values	$ 1,766,604	$ 1,587,748

iii. **Credit risk**

Credit risk is the risk of loss in the event the counterparty to a transaction fails to discharge an obligation and causes the other party to incur a loss. Credit risk is generally higher when a non-exchange traded financial instrument is involved because the counterparty for the traded financial instrument is not backed by an exchange clearing house. Credit risk associated with the Plan is regularly monitored and analyzed through risk and credit committees.

Fixed income

The Plan's Fixed Income Program includes two main sectors: the Government Sector and the Corporate Sector. One benefit to managing these two pieces separately is to provide the opportunity to access physical government bonds when required. When markets are at their utmost distress these may be the only securities available for liquidation. Managing the Corporate Sector and the Government Sector separately allows for the adjustment of credit risk within the Fixed Income Program by changing the allocation between these two sectors - increasing the Government Sector through periods of market duress and increasing the Corporate Sector through periods of stability. This approach also allows the active management of the Corporate Sector and taking active decisions where returns can be maximized. In order to minimize the exposure to credit risk, a comprehensive investment policy has been developed. There were no significant concentrations of credit risk in the portfolio in 2018.

Financial Instruments (continued)

The fair values of the Plan's fixed income investments exposed to credit risk are categorized in the following table as at December 31:

(in thousands of dollars)	2019	2018
Fixed income		
Canadian		
Governments	$ 351,601	$ 425,732
Corporate	160,139	163,447
Non-Canadian		
Governments	35,675	42,660
Corporate	449,639	423,221
	$ 997,054	$ 1,055,060
Pooled funds	552,552	513,517
Total fixed income	$ 1,549,606	$ 1,568,577

Financial Instruments (continued)

Derivatives
The Plan is exposed to credit-related losses in the event counterparties fail to meet their payment obligations upon maturity of derivative contracts. The Plan limits derivative contract risk by dealing with counterparties that have a minimum "A" credit rating. In order to mitigate this risk, the Fund:

i. Deals only with highly rated counterparties, with whom International Swap and Derivative Association agreements have been executed, normally major financial institutions with a minimum credit standard of "A" rating, as supported by a recognized credit rating agency; and
ii. Credit risk represents the maximum amount that would be at risk as at the reporting date if the counterparties failed completely to perform under the contracts, and if the right of offset proved to be non-enforceable. Credit risk exposure on derivative contracts is represented by the receivable replacement cost of contracts with counterparties, less any prepayment collateral or margin received, as at the reporting date.

Securities lending
The Plan engages in securities lending to enhance portfolio returns (see note 11). Through a securities lending program at the Plan's custodian, the Plan lends securities for a fee to approved borrowers. Credit risk associated with securities lending is mitigated by requiring the borrowers to provide high quality collateral. In the event that a borrower defaults completely or in part, the custodian will replace the security at its expense. Regular reporting of the securities lending program ensures that its various components are continuously being monitored.

iv. Foreign currency risk

Foreign currency risk is the risk that the value of future cash flows of a financial instrument will fluctuate because of changes in foreign exchange rates. The Plan primarily invests in financial instruments and enters into transactions denominated in various foreign currencies, other than its measurement currency. Consequently, the Plan is exposed to risk that the exchange rates of the various currencies may change in a manner that has an adverse effect on the value of the portion of the Plan's investment and non-investment assets or liabilities denominated in currencies other than the Canadian dollar. Foreign currency risk is hedged by using foreign exchange forward contracts. A policy of hedging up to 100% of the currency exposure helps to mitigate this risk.

The Plan's currency policy allows for the management of risk of investment and non-investments assets and liabilities held in the Fund through hedging strategies that are implemented through the purchase of forward currency contracts. The forward currency contracts offset the Plan's foreign currency exposure, hence reducing the Plan's foreign currency risk.

Financial Instruments (continued)

The Plan's investment and non-investment assets and liabilities that are held in the Fund are represented as unhedged and hedged currency exposures as at December 31 in the following table:

December 31, 2019	Unhedged	Hedged
(in thousands of dollars)		
Summary FX exposure		
Canadian dollar	$ 2,247,209	$ 4,203,508
United States dollar	2,480,541	1,092,140
Euro	191,547	(90,787)
British pound sterling	118,532	(848)
Japanese yen	83,899	60,244
Other	196,701	85,655
	$ 5,318,429	$ 5,349,912

December 31, 2018	Unhedged	Hedged
(in thousands of dollars)		
Summary FX exposure		
Canadian dollar	$ 2,229,424	$ 4,031,267
United States dollar	2,205,893	866,322
Euro	186,814	(112,121)
British pound sterling	130,750	17,665
Japanese yen	74,995	53,719
Other	164,178	69,516
	$ 4,992,054	$ 4,926,368

After the effect of hedging, and without change in all other variables, a ten percent increase (decrease) in the Canadian dollar against all other currencies would (decrease) increase the fair value of the Plan's investment and non-investment assets and liabilities held in the Fund, respectively.

Financial Instruments (continued)

The following table below represents these changes in the Plan's investment and non-investment assets and liabilities held in the Fund as at December 31:

(in thousands of dollars)	2019	2018
Fund assets and liabilities	**$ 5,349,912**	$ 4,992,368
10% increase in Canadian Dollar	**(104,219)**	(81,373)
Fund assets and liabilities after increase	**$ 5,245,693**	$ 4,910,995
10% decrease in Canadian Dollar	**127,378**	99,456
Fund assets and liabilities after decrease	**$ 5,477,290**	$ 5,091,824

v. **Liquidity risk:**

Liquidity risk is the risk that the Plan's does not have sufficient cash to meet its current payment liabilities and acquire investments in a timely and cost-effective manner. Liquidity risk is inherent in the Plan's operations and can be impacted by a range of situation specific and market-wide events including, but not limited to, credit events and significant movements in the market. Cash obligations are fulfilled from contributions to the Plan, cash income of the Plan and planned dispositions of Plan assets as required. Cash requirements of the Plan are reviewed on an ongoing basis to provide for the orderly availability of resources to meet the financial obligations of the Plan. The Plan's cash management policy ensures that the quality and liquidity of the investment vehicles within the cash portfolios are consistent with the needs of the Plan.

Approximately 43% (2018 - 45%) of the Plan's investments are in liquid securities traded in public markets, consisting of fixed income and equities. Pooled funds consisting of exchange traded fixed income and equities are approximately 27% (2018 - 27%) of the Plan's investments and are liquid within 30 days or less. Although market events could lead to some investments becoming illiquid, the diversity of the Plan's portfolios should ensure that liquidity is available for benefit payments. The Plan also maintains cash on hand for liquidly purposes and for payment of Plan liabilities. At December 31, 2019, the Plan had cash in the amount of $149,131 (2018 - $31,552).

7. Accrued pension obligation

a. Actuarial assumptions

The actuarial present value of the accrued pension obligation is an estimate of the value of pension obligations of the Plan in respect of benefits accrued to date for all active and inactive members including pensioners and survivors. As the experience of the Plan unfolds, and as underlying conditions change over time, the actual value of accrued benefits payable in the future could be materially different than the actuarial present value.

Actuarial valuations of the Plan are required every year by the Act and provide an estimate of the accrued pension obligation (Plan liabilities) calculated using various economic and demographic assumptions, based on membership data as at the valuation date. The Plan's consulting actuaries, Eckler Limited, performed a valuation as at December 31, 2019 and issued their report in April 2020. The report indicated that the Plan had an unfunded liability of $1,497,732 (2018 - $1,617,642).

The actuarial valuation calculates liabilities for each member on the basis of service earned to date and the employee's projected five-year highest average salary at the expected date of retirement, or in the case of pensioners and survivors, on the basis of the amount of pension being paid to them. The projected unit credit method was adopted for the actuarial valuation to determine the current service cost and actuarial liability.

	2019	2018
Discount rate	**5.70% per annum**	6.05% per annum
Inflation	**1.80% per annum**	2.00% per annum
Salary	**1.80% per annum plus promotional ranging from 0.00% to 3.25%**	2.00% per annum plus promotional ranging from 0.00% to 3.25%
YMPE and maximum pension increase	**2.30% per annum**	2.50% per annum
Indexing	**0.80% per annum for retirements prior to August 1, 2006 and no indexing for retirements on or after August 1, 2006**	1.00% per annum for retirements prior to August 1, 2006 and no indexing for retirements on or after August 1, 2006
Retirement age	**50% of active members who achieve eligibility for an unreduced pension under the rule of 85 prior to age 62 will retire when they first become eligible; the remainder of active and all inactive members will retire at the earliest of:** • **age 65 with 2 years of service,** • **35 years of service; and** • **age 62 with 10 years of service**	50% of active members who achieve eligibility for an unreduced pension under the rule of 85 prior to age 62 will retire when they first become eligible; the remainder of active and all inactive members will retire at the earliest of: • age 65 with 2 years of service, • 35 years of service; and • age 62 with 10 years of service
Mortality	**2014 Public Sector Mortality Table projected generationally with CPM improvement Scale B**	2014 Public Sector Mortality Table projected generationally with CPM improvement Scale B

Accrued pension obligation (continued)

The assumed real rates of increases in pensionable earnings (i.e. increase in excess of the assumed inflation rate) are dependent on the attained age of the members.

Demographic assumptions are used to estimate when future benefits are payable to members and beneficiaries, including assumptions about mortality rates, termination rates, and patterns of early retirement. Each of these assumptions is updated periodically, based on a detailed review of the experience of the Plan and on the expectations for future trends.

b. Changes in actuarial assumptions

The following changes in the actuarial assumptions as at December 31, 2019 resulted in an increase (decrease) to the accrued pension obligation:

	2019	2018
(in thousands of dollars)		
Change in the discount rate	$ 284,194	$ -
Change in rate of increase in YMPE and maximum pension	5,648	-
Change in pension indexing	(35,833)	-
Change in salary inflation	(42,603)	-
	$ 211,406	$ -

c. Experience gains

Experience gains on the accrued pension obligation of $35,745 (2018 – $81,941) arose from differences between the actuarial assumptions and actual results.

8. Commitments

The Plan has committed capital to investments in real estate, infrastructure, and agriculture & timber over a definitive period of time. The future commitments are generally payable on demand based on the capital needs of the related investment. The table below indicates the capital amount committed and outstanding as at December 31, 2019.

December 31, 2019	Committed	Outstanding
(in thousands of dollars)		
United States dollar		
Real estate	25,000	4,711
Infrastructure	185,000	31,877
Agriculture & timber	25,000	6,625
	USD 235,000	USD 43,213
Euro		
Infrastructure	20,000	19,080
	EUR 20,000	EUR 19, 080

9. Benefits

(in thousands of dollars)	2019	2018
Pension benefits paid	$ 359,093	$ 356,553
Survivor benefits paid	22,920	20,067
Disability benefits paid	20,215	18,932
Refunds paid to terminated members	4,502	3,145
	$ 406,730	$ 398,697

10. Administrative Expenses

The Plan is charged by its service providers, including Nova Scotia Pension Services Corporation, a related entity, for professional and administrative services. The following is a summary of these administrative expenses.

	2019	2018
(in thousands of dollars)		
Plan administration:		
Office and administration services	$ 5,510	$ 4,909
Actuarial and consulting services	403	204
Legal services	43	61
Audit services	37	37
Other professional services	31	32
	6,024	5,243
Investment expenses:		
Investment management services	11,987	12,533
Transaction costs	584	935
Custody services	470	483
Advisory and consulting services	317	312
Information services	211	197
	13,569	14,460
HST	1,898	1,856
	$ 21,491	$ 21,559

Investment management and performance fees included in the unrealized gains/ (losses) on investments consisting of pooled funds, limited partnerships and subsidiaries are estimated at $19,068 (2018 - $16,021). These fees are not direct expenses of the Plan and therefore are not included in administrative expenses.

11. Securities lending

The Plan participates in a securities lending program where it lends securities that it owns to third parties for a fee. For securities lent, the Plan receives a fee and the borrower provides readily marketable securities of higher value as collateral which mitigates the credit risk associated with the program. When the Plan lends securities, the risk of failure by the borrower to return the loaned securities is alleviated by such loans being continually collateralized. The securities lending agent also provides indemnification if there is a shortfall between collateral and the lent security that cannot be recovered. The securities lending contracts are collateralized by securities issued by, or guaranteed without any limitation or qualification by, the government of Canada or the governments of other countries.

The following table represents the estimated fair value of securities that were loaned out and the related collateral as at December 31:

	2019	2018
(in thousands of dollars)		
Securities on loan	$ 365,242	$ 361,627
Collateral held	$ 396,224	$ 387,098

12. Related party transactions

Investments held by the Plan include bonds & debentures of the Province of Nova Scotia. The total fair value of these investments is $2,703 (0.1% of Fund assets and liabilities) as at December 31, 2019 ($2,991 (0.1% of Fund assets and liabilities) at December 31, 2018).

The Plan's administrator, Nova Scotia Pension Services Corporation, an entity co-owned by Teachers' Pension Plan Trustee Inc. and Public Service Superannuation Plan Trustee Inc. for the purpose of providing pension plan administration and investment services, charges the Plan at cost, an amount equal to the expenses incurred in order to service the Plan. As Nova Scotia Pension Services Corporation operates on a cost recovery basis, the Plan loans cash to its administrator, as required to pay upcoming expenses or to purchase capital assets. The administration expense charged to the Plan for the year ending December 31, 2019 was $5,826 (2018 - $5,231). The amount due to the administrator as at December 31, 2019 was $1,672 (2018 – $404).

13. Interest in subsidiaries

The Plan's subsidiaries were created for the purposes of providing investment earnings from real estate, infrastructure and other investment arrangements. The Plan's subsidiaries are presented on a non-consolidated basis. The following table shows the fair values of the Plan's subsidiaries as at December 31:

Subsidiary	Purpose	Ownership %	2019 Fair value	2018 Fair value
(in thousands of dollars)				
TPP Investments RE Inc.	Real estate	100	$ 450,366	$ 464,738
NT Combined Investments Inc.	Equities	45	378,783	325,445
TPP Investments II Inc.	Real estate	100	116,384	109,031
TPP Investments CS Inc.	Infrastructure	100	97,829	92,969
TPP Investments AX Inc.	Infrastructure	100	54,934	53,178
TPP Investments ES Inc.	Real estate	100	36,787	37,871
HV Combined Investments Inc.	Hedge funds	37	20,382	18,004
			$ 1,155,465	$ 1,101,236

The Plan either has 100% controlling interest or significant influence over its subsidiaries' cash flows. Funding is made via capital investment from the Plan. Certain subsidiaries have commitments that must be funded directly through capital investment by the Plan. These amounts are included in the Plan's commitments (note 8). Financing is provided as required via shareholder loans and is payable on demand to the Plan.

14. Capital management

The main objective of the Fund is to sustain a certain level of net assets in order to meet the Plan's pension obligations. The TPPTI (see note 1) manages the contributions and plan benefits as required by the Teachers' Pension Act and its related Regulations. The TPPTI approves and incurs expenses to administer the commerce of the Fund as required by agreement between the Province and the Union. Under the direction of the TPPTI, the Fund provides for the short-term financial needs of current benefit payments while investing members' contributions for the longer-term security of pensioner payments. The TPPTI exercises duly diligent practices and has established written investment policies and procedures, and approval processes. Operating budgets, audited financial statements, yearly actuarial valuations and reports, and as required, the retention of supplementary professional, technical and other advisors, are part of the Fund governance structure.

The Fund fulfils its primary objective by adhering to specific investment policies outlined in its SIP&G, which is reviewed annually by TPPTI. The Fund manages net assets by engaging knowledgeable investment managers who are charged with the responsibility of investing existing funds and new funds (current year's employee and employer contributions) in accordance with the SIP&G. Increases in net assets are a direct result of investment income generated by investments held by the Fund and contributions into the Fund by eligible employees and participating employers. The main use of net assets is for benefit payments to eligible Plan members.

Under the 2014 Agreement, minimum funding targets were established, with objectives of having assets of the Plan reach levels of 80-90% of the actuarial liabilities on or before December 31, 2025, at least 85-95% on or before December 31, 2030, and at least 90-100% on or before December 31, 2035. These funding targets are required to be regularly reviewed, including a comprehensive review in 2020 and further reviews every 5 years thereafter.

15. Comparative information

Certain 2018 comparative information has been reclassified to conform to the financial statement presentation adopted for the current year.

16. Subsequent event

After December 31, 2019, the COVID-19 outbreak was declared a pandemic by the World Health Organization. This has resulted in governments worldwide, including the Canadian government, enacting emergency measures to combat the spread of the virus. These measures, which include the implementation of travel bans, self-imposed quarantine periods and social distancing, have caused material disruption to businesses globally and in Canada resulting in an economic slowdown. Governments and central banks have reacted with significant monetary and fiscal interventions designed to stabilize economic conditions however the success of these interventions is not currently determinable. The current challenging economic climate may lead to adverse changes in cash flows, which may also have a direct impact on the Plan's financial position in the future. The situation is dynamic and the ultimate duration and magnitude of the impact on the economy and the financial effect the Plan is not known at this time.

Glossary

Actuarial assumed rate of return: The long term *rate of return* assumed by the Plan's external actuary in determining the value of the Plan's *liabilities*. Also, referred to as the *discount rate*.

Asset(s): Financial and real items owned by the Plan which have a monetary value, including cash, stocks, bonds, real estate, etc.

Asset Mix: The allocation of funds to be used for investment purposes between different types of *assets*, including cash, stocks, bonds, real estate, etc.

Asset Liability Study: An *asset liability study* analyzes a pension fund's risk and reward profile by examining not only the plan's *assets* but also the Plan's *liabilities*. The study is designed to evaluate the probable change in *liabilities* over time in order to develop *asset* allocation recommendations that best meet these *liabilities*.

Benchmark: A standard against which the performance of the Plan's *return on investment* can be measured.

Discount Rate: See *actuarial assumed rate of return*.

Equity(ies): Common or preferred stock representing ownership in a company.

Funded Ratio: A ratio of the Plan's *assets* to *liabilities*, expressed as a percentage. A ratio above 100 per cent indicates that the Plan has more *assets* than required to fund its future estimated *liabilities*.

Gross Domestic Product (GDP): Is the total market value of all final goods and services produced in a country in a given year. GDP is one of the primary indicators used to gauge the health of a country's economy.

Gross of investment management fees: Refers to the fact that the *return on investment* is reported before the deduction of management fees or expenses.

Indexing: Refers to the linking of retirement payments made to some retirees with overall price increases in the economy, as measured by the Consumer Price Index.

International Monetary Fund (IMF): An organization of 188 countries working to foster global monetary cooperation, secure financial stability, facilitate international trade, promote high employment and sustainable economic growth, and reduce poverty around the world.

Liabilities: An estimate of the current value of future obligations of the Plan as a result of retirement commitments made to past, current, and future employees.

MSCI Europe, Australasia and Far East (EAFE) Index: Is a stock market index that is designed to measure the *equity* market performance of developed markets outside of the U.S. and Canada.

MSCI Emerging Markets (EM) Index: Is a stock market index that captures large and mid-capitalization representation across 23 emerging market countries.

Net of investment management fees: Refers to the fact that the *return on investment* is reported after the deduction of management fees or expenses.

Overweight/Underweight: Refers to the difference relative to the *benchmark* portfolio. *Underweight* indicates less than the *benchmark*, while *overweight* indicates more than the *benchmark*.

Return on investment(s): A performance measure used to evaluate the efficiency of the Plan's investments, expressed as a percentage gain or loss on the initial investment at the beginning of the period.

Unfunded Liability: An *unfunded liability* is present when the Plan's *funded ratio* is below 100 per cent. The *unfunded liability* is a measure, in dollars, of the amount by which the Plan's *liabilities* exceed its *assets*.

Volatility: A measure of the variation in the price of a security or the returns of the Plan. High *volatility* indicates increased risk.

nspension
Services Corporation

1-800-774-5070 (toll free in NS)
902-424-5070

pensionsinfo@nspension.ca

www.nstpp.ca
www.novascotiapension.ca

@yourNSTPP

Purdy's Landing, Suite 400,
1949 Upper Water Street,
Halifax, NS B3J 3N3

PO Box 371,
Halifax NS B3J 2P8