Board of Governors
PENSION & BENEFITS COMMITTEE
Friday 20 May 2022
9:30 a.m. to 12:00 noon

This meeting will be held via Microsoft Teams

Non-members may arrange to join the open session of the electronic meeting by contacting Diana Goncalves, d3goncalves@uwaterloo.ca

Time		OPEN SESSION	ACTION
9:30	1.	Approval of the 11 March 2022 Minutes (Open Session)* and Business Arising	Decision
		a. Transfer of LTD insurer to Sun Life completed on 1 May 2022 [Hornberger]	Information
		b. Responsible Investment Policy approved at April BOG meeting	Information
	2.	Execution Against the Work Plan* [Grivicic]	Information
9:35	3.	Update on Government Pension Plan Initiatives [Aon]	Information
9:40	4.	Annual Audit of the Pension Plan Fund Financial Statements* [Sarah Hadley, Blaine Hertzberger of EY]	Decision
	5.	Previous Years' Fees and Expenses* [Sarah Hadley]	Information
10:10	6.	Pension Risk Management Dashboard, Q1 2022* [Aon]	Information
10:25	7.	Draft Actuarial Valuation – 31 December 2021*[Aon]	Recommendation to BOG
10:30	8.	University of Waterloo Pension Plan for Faculty and Staff, Draft Amendment No. 8* [Huber, Aon]	Recommendation to BOG
10:35	9.	Carbon Disclosure Report* [Hadley]	Discussion/Feedback
10:45	10.	Recommended Amendments to Policies 23 and 59* [Hornberger, Huber]	Decision
11:00	11.	Benefits Coverage for In Vitro Fertilization* [Hornberger]	Discussion
	12.	Board-approved 2022-23 Operating Budget* Overview (Rush)	Information
	13.	Other Business	
		CONFIDENTIAL SESSION	
	14.	Pension Administration Model, Internal and External Supporting Resources+ [Hornberger]	Discussion
	15.	Approval of the 11 March 2022 Minutes (Confidential Session)+ and Business Arising	Decision

Next Meeting: Friday 24 June 2022, 9:30 a.m. – 12:00 noon

*attached ** to be distributed + distributed separately

13 May 2022
amended 17 May 2022 (add item 12)

Mike Grivicic
Associate University Secretary

Please convey regrets to Diana Goncalves at d3goncalves@uwaterloo.ca

Future Agenda Items

a. Presentation re: the UPP – planned for Fall 2022
b. Pension Contribution for Members on LTD
c. Level of LTD coverage vs. practical requirements
d. EFAP Report Data Requirements
e. Communication Plan re: Handling of Member Questions/Feedback

University of Waterloo
Board of Governors
PENSION & BENEFITS COMMITTEE
Minutes of the 11 March 2022 Meeting
[in agenda order]

Present: Peter Barr (chair), Terrence Birmingham, Sara Cressman, Mike Grivicic (secretary), Lily Hua, Dennis Huber, Ranjini Jha, James Rush, David Saunders, David Taylor, Marilyn Thompson, Ken Vetzal

Regrets: Tony Giovinazzo

Guests/Resources: Linda Byron, Lee Hornberger, Joan Kennedy, Sheryl Kennedy (6,8), Allan Shapira, Michelle St-Amour, Chelsea St-Hill, Tyler Wendland

Organization of Meeting: Peter Barr took the chair, and Mike Grivicic acted as secretary. The secretary advised that a quorum was present. The agenda was accepted as distributed.

OPEN SESSION

1. APPROVAL OF THE 18 FEBRUARY 2022 MINUTES (OPEN SESSION) AND BUSINESS ARISING

There was a motion to approve the minutes as distributed. Saunders and Taylor. Carried.

2. EXECUTION AGAINST THE WORK PLAN

This item was received for information.

3. UPDATE ON GOVERNMENT PENSION PLAN INITIATIVES

There was nothing new to report under this item.

4. ACTUARIAL VALUATIONS (RPP AND PPP) AND REVIEW OF CAPS

Byron provided a PowerPoint presentation: slight change of timing of valuation, moving forward by two seconds to occur at 11:59:59 p.m. on 31 December 2021; reduction to PBGF premium by $3 million; details on current service cost and pension contributions; hard dollar cap for RPP and cap on PPP, with modelling for increases; RPP is in a surplus position on a going concern basis; significant increase to COLA provision this year, compared to previous years. Members discussed: no requirement for payments in excess of normal costs; funding strategy of plan aims to maintain stable contributions in more advantageous periods to help with smoothing in down periods; asset mix for assets reflects strategy to rely upon returns from risk assets to fund future benefits; different between CPI and AIW; as plan adjustments are made over time, there is drift away from 50/50 sharing of current service cost. A motion was heard to accept the valuation as presented and to direct Aon to prepare the valuation for filing with the regulator later in 2022. Huber and Taylor. Carried.

5. GROUP BENEFITS PROGRAM – ANNUAL RENEWAL

Joan Kennedy provided detail on each of the renewal items, and members obtained clarification on technical details. A motion was heard to approve the 10% subsidy for life insurance (option 3 in the report). Huber and Taylor. Carried. Members observed with the transition to Sun Life on 1 May there is a 30% decrease to LTD premiums; a motion was heard to approve the indexing of the maximum insured salary as presented. Hua and Jha. Carried. Members accepted item (c) for information. A motion was heard to approve the budget rates as presented. Jha and Hua. Carried.

6. REPORT FROM PENSION INVESTMENT COMMITTEE

Sheryl Kennedy spoke to the report, highlighting: changes in documents reflect legal opinion; RIP document would be in force for other investment funds beyond the plan's assets; recommendation was made by the Finance & Investment Committee at the meeting the previous day. Members discussed: footnotes provided earlier not included in this version, though the footnotes merely enunciate the same due diligence exercised under existing requirements; suggested changes to wording around "best interest" in the RIP and also in the FIP compliance letter, which will be adjusted subject to concurrence of the external legal counsel; for section 8 re: review, inclusion of reporting to this committee would be appropriate to add; other minor wording amendments suggested for FIP. A motion was heard to approve the revisions to the Fund Implementation Procedures as described in the document (subject to inclusion of minor wording amendments) and to recommend the approval of the Responsible Investment Policy to the Board of Governors (subject to the concurrence of external legal counsel with the suggested amendments). Jha and Huber. Carried.

7. OTHER BUSINESS

The chair reminded members to complete the annual committee self-assessment form.

NEXT MEETING

The next regular meeting is scheduled for Friday 20 May 2022, 9:30 a.m. – 12:00 noon.

12 April 2022

Mike Grivicic
Associate University Secretary

Execution against Work Plan

Pension & Benefits Committee, Board of Governors, University of Waterloo

The below represents the annual responsibilities of the P&B Committee and has been prepared as an aid to planning only. The committee's activities are much broader, however, and include: legislative changes, plan changes and improvements; selection of managers and service providers; and requests from the UW community regarding pension and benefits plans.

Task	Frequency (Target month)	14 May 2021	18 June 2021	10 Sept 2021	22 Oct 2021	19 Nov 2021	10 Dec 2021	14 Jan 2022	18 Feb 2022	11 Mar 2022	20 May 2022
Approval of Actuarial Valuation Assumptions	Annual (Jan)							✓			
Investment Status of PPP	Annual (Feb)								✓		
Cost-of-living Increase for Pensioners	Annual (Feb)								✓		
Pensions for Deferred Members	Annual (Feb)								✓		
Salaries for Pension Purposes for Individuals on Long-term Disability	Annual (Feb)								✓		
Actuarial Valuations (RPP and PPP), with posting to website once approved	Annual (Mar)									✓	
Review of Contribution and Protocol Caps (RPP and PPP)	Annual (Mar)									✓	
Monitor sharing of current service cost between employee and university contributions	Annual (Mar)										
Benefits Plan Premium Renewals	Annual (Mar)									✓	
Indexing of Long-term Disability Plan Benefits and Maxima	Annual (Mar)									✓	
Annual Committee Self-Assessment	Annual (Mar)									✓	
Budget Overview	Annual (May)	✓									✓
Previous Years' Fees and Expenses	Annual (May)	✓									✓
Annual Audit of the Pension Plan Fund Financial Statements	Annual (May)	✓									✓

D = deferred

Task	Frequency	14 May 2021	18 June 2021	10 Sept 2021	22 Oct 2021	19 Nov 2021	10 Dec 2021	14 Jan 2022	18 Feb 2022	11 Mar 2022	
Benefits Utilization Report	Annual (June)		✓								
Annual review re: benefits added/removed from insured plans in the market	Annual (June)		✓								
Review of Committee Terms of Reference	Annual (June)		✓								
Indexing of Plan Maxima – Health, Dental, Retiree Life Insurance	Annual (Nov)					✓					
Employee and Family Assistance Program – report on utilization	Annual (Nov)					✓					
Maximum pension limits and caps adjustments, based on average industrial wage increase (AIW)	Annual (Dec)						✓				
Total Fund Overview	Quarterly		✓	✓			✓				
Investment Manager Review	Semi-annually						✓				
Approval of the Statement of Investment Policies and Procedures (SIPP)	Annual						✓				
Annual Report to the Community	Annual								✓		
Actuarial Filing - Minimum every three years Most recent filings: 2017, 2018, 2020, 2021 2022 (anticipated)											

The University of Waterloo Pension Plan for Faculty and Staff

December 31, 2021

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Members of the Pension & Benefits Committee of
The University of Waterloo Pension Plan for Faculty and Staff

May 13, 2022

We are pleased to provide the required communications related to our audit of the pension plan of the University of Waterloo Pension Plan for Faculty and Staff (the Plan).

Our audit was designed to express an opinion on the statement of net assets available for benefits and the statement of changes in net assets available for benefits as at December 31, 2021 and for the year then ended. We received the full support and assistance of your personnel in conducting our audit. Open and candid dialogue with you is a critical step in the audit process and in the overall governance process and we appreciate this opportunity to share the insights from our audit with you.

This report is intended solely for the information and use of the Pension & Benefit Committee and management. It is not intended to be, and should not be, used by anyone other than these specified parties. We disclaim any responsibility to any third party who may rely on it. Further, this report is a by-product of our audit and indicates matters identified during the course of our audit. Our audit did not necessarily identify all matters that may be of interest to the Pension & Benefits Committee in fulfilling its responsibilities.

If you have any questions or comments, please do not hesitate to contact us.

Sincerely

Ernst & Young LLP

Chartered Professional Accountants
Licensed Public Accountants

Blaine Hertzberger, CPA, CA, LPA
Partner
519 571 3339

Carson Brett, CPA, CA
Senior Manager
519 571 3313

EY services

Our primary deliverable was to express an opinion on the statement of net assets available for benefits and the statement of changes in net assets available for benefits of the Plan. We have completed substantially all of our audit procedures and expect to issue an unqualified audit opinion upon finalization of the following matters:

- Receipt of signed letter of representation from management
- Approval of the financial statements by the Pension & Benefits Committee

Auditor's responsibility under Canadian Auditing Standards (CAS)

The financial statements are the responsibility of management. Our audit is designed in accordance with the CAS to obtain reasonable, rather than absolute, assurance about whether the financial statements are free of material misstatement.

Independence

We confirm our independence to management and the Pension & Benefits Committee pursuant to CAS 260. We are not aware of any relationships that may reasonably be thought to bear on our independence, and we reconfirm our independence up to the date of this report.

Summary of the audit approach

For the purpose of the audit of the financial statements, our audit plan is developed after considering the inherent risks and control risks and the effectiveness of the internal controls related to the Plan. A variety of factors are considered when establishing the audit scope including size, specific risks, the volumes and types of transactions processed, changes in the business environment, and other factors. Our audit strategy focuses on those financial statement items that may be more vulnerable to material misstatement, including the risk of fraud. Our procedures for your Plan were primarily of a substantive nature.

Our principal areas of focus were:

- Completeness and measurement of pension contributions
- Measurement and occurrence of benefit payments
- Completeness and occurrence of investment income, and
- Valuation of investments

At the conclusion of the audit, we formulate our opinion on the financial statements of the Plan as to their fair presentation in all material respects. Our estimation of materiality requires professional judgment and necessarily considers qualitative as well as quantitative considerations. Materiality for net assets can be set at 1-2%. Materiality for the 2021 audit was set at approximately 1.76% (2020 – 1.7%) of net assets, or $42,000,000 (2020 - $36,000,000).

Critical policies, estimates, areas of audit emphasis, and significant risks

Disclosure requirements

There were no changes made to the disclosure requirements in fiscal 2021.

Auditing the valuation of fixed income investments

Canadian auditing standards require us to perform additional procedures to audit the valuation of investments with higher valuation risk or measurement uncertainty risk by performing the following:

- Document an understanding of management's investment strategy
- Understand how the investment portfolio is priced and which pricing sources are used
- Understand the types of securities that compose the portfolio and evaluate them to determine the appropriate classification as higher or lower estimation uncertainty, and
- For securities classified as higher uncertainty estimation, if applicable, perform additional procedures to gain comfort over the appropriateness of the valuations.

EY reviewed the individual fixed income securities held in the plans for any that may be considered to have higher estimation uncertainty and performed additional procedures where necessary. Based on procedures performed in 2021, there were no fixed income investments identified that exhibited higher estimation uncertainty. The bonds and short-term investments held by the Plan are valued based on quoted bids from recognized investment dealers and therefore, are classified as level 2. We did not identify any issues with the valuation of fixed income investments.

Auditing the valuation of equity investments

We updated our understanding of how the fair values of the Plan's investments have been determined. As part of this update of our understanding we obtained the CIBC Mellon and BNY Mellon Service Organization Control reports. We confirmed all investments held at year-end with the custodian (CIBC Mellon) and respective investment managers.

On a sample basis, we tested the market values of equity investments held by the Plan. EY noted no issues with the investment valuation when compared to independent market information. The equity investments held by the Plan are lower estimation uncertainty since they are exchange traded or there is daily pricing and therefore, they are classified as level 1 in the fair value hierarchy disclosure. All pooled fund investments held by the Plan are valued based on inputs that have observable market data and are classified as Level 2. We obtain fund manager statements to support the market value of the pooled funds. As a result of the procedures performed, we did not identify any issues with the valuation of equity or pooled fund investments.

Employer contributions

We updated our understanding of the employer contributions process. With reference to the latest actuarial funding valuation report as of January 1, 2021 we verified that the employer contributions made by the Plan were in accordance with the recommendations of the actuary.

We tested and recalculated on a sample basis the employee and employer contributions. No issues were noted.

Benefit payments

We confirmed our understanding of the benefit payments process and examined, on a test basis, benefit payments to verify they were accurately processed. We performed an analytical review of benefit payments and investigated variances from the prior year. In addition, we confirmed that members who withdrew from the pension plan in the current year but had not yet received payment were properly accrued for at year-end. No issues were noted.

Accounting estimates

There are no significant judgments or estimates required to prepare the financial statements where actual amounts are likely to be significantly different from the estimates.

Fraud considerations and the risk of management override

We are responsible for planning and performing our audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether caused by error or by fraud (CAS 240, *The Auditor's Responsibilities Relating to Fraud in an Audit of Financial Statements*).

Our audit procedures encompassed the requirements of CAS 240: brainstorming, gathering information to facilitate the identification of and response to fraud risks and performing certain procedures to address the risk of management override, including examining journal entries, reviewing accounting estimates and evaluating the business rationale of significant unusual transactions.

We are not aware of any fraud or non-compliance with laws and regulations involving senior management or any fraud or non-compliance with laws and regulations that could cause a material misstatement of the financial statements.

Summary of audit differences (SAD)

During the course of our audit, we accumulate differences between amounts and disclosures recorded by the Plan and amounts and disclosures that we believe are required to be recorded under Canadian accounting standards for pension plans. In fiscal 2021, no audit adjustments were identified during the audit.

Summary of significant disclosure deficiencies

During the course of our audit, we identify those significant disclosures required in the financial statements of the Plan, that we believe were not adequately reflected. We did not identify any significant disclosure deficiencies.

Other required communications

- There were no major issues discussed with the Pension & Benefits Committee or those charged with governance in connection with our initial or recurring retention as the auditors, including, among other matters, any discussions regarding the application of accounting principles and auditing standards, the scope of the audit, financial statement disclosures and the wording of the auditors' report.
- There were no disagreements with management about matters that individually or in the aggregate could be significant to the Plan's financial statements or the auditors' report.
- We are not aware of any instances where management consulted with other accountants about auditing or accounting matters.
- There were no serious difficulties encountered in dealing with management related to the performance of the audit.
- We are not aware of any significant unusual transactions recorded by the Fund or of any significant accounting policies used by the Plan related to controversial or emerging areas for which there is a lack of authoritative guidance.
- We are not aware of any related party transactions that are not in the normal course of operations and that involve significant judgments made by management concerning measurement or disclosure.
- There were no material alternative accounting treatments that have been discussed with management during the current audit period.
- There were no significant matters arising during the audit in connection with the Plan's related parties.
- There are no other findings or issues arising from the audit that are, in our judgment, significant and relevant to those charged with governance regarding the oversight of the financial reporting process.
- Based on our inquiries of management and those charged with governance, we are not aware of any subsequent events which might affect the financial statements.

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University of Waterloo Pension Plan for Faculty and Staff

[Ontario Registration Number 0310565]

Financial statements

December 31, 2021

Independent auditors' report

To the Pension and Benefits Committee of the
University of Waterloo

Opinion

We have audited the accompanying financial statements of the **University of Waterloo Pension Plan for Faculty and Staff** [the "Plan"] [Ontario Registration Number 0310565], which comprise the statement of net assets available for benefits as at December 31, 2021, and the statement of changes in net assets available for benefits for the year then ended, and notes to the financial statements, including a summary of significant account policies.

In our opinion, the accompanying financial statements present fairly, in all material respects, the net assets available for benefits of the Plan as at December 31, 2021, and the changes in its net assets available for benefits for the year then ended. The financial statements have been prepared by management based on the financial reporting provisions of Regulation 909, Section 76 of the *Pension Benefits Act* (Ontario).

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 *Auditor's responsibilities for the audit of the financial statements* section of our report. We are independent of the Plan in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical 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.

Emphasis of matter – Basis of accounting and restriction on use

Without modifying our opinion, we draw attention to note 1 to the financial statements, which describes the basis of accounting. The financial statements are prepared to assist the Pension and Benefits Committee to meet the requirements of the Financial Services Regulatory Authority of Ontario. As a result, the financial statements may not be suitable for another purpose. Our report is intended solely for the Pension and Benefits Committee and the Financial Services Regulatory Authority of Ontario and should not be used by parties other than the Pension and Benefits Committee or the Financial Services Regulatory Authority of Ontario.

Management's responsibility for the financial statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with the financial reporting provisions of Regulation 909, Section 76 of the *Pension Benefits Act* (Ontario), 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 Plan'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 Plan or to cease operations, or has no realistic alternative but to do so.

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

Auditor's 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 auditor's 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 these 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 Plan'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 Plan's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's 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 auditor's report. However, future events or conditions may cause the Plan 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 represent the underlying transactions and events in a manner that achieves fair presentation.

We 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.

Waterloo, Canada
May 20, 2022

University of Waterloo Pension Plan for Faculty and Staff
[Ontario Registration Number 0310565]

Statement of net assets available for benefits

As at December 31

	2021	2020
	$	$
Assets		
Investment income receivable	**2,824,588**	3,377,637
Investments, at fair value *[note 4[a]]*	**2,384,828,746**	2,104,840,179
Total assets	**2,387,653,334**	2,108,217,816
Liabilities		
Benefits payable		
Retirement	**1,084,816**	48,995
Termination	**21,172**	1,437,141
Management and administrative fees payable *[note 7[b]]*	**1,653,125**	1,252,207
Total liabilities	**2,759,113**	2,738,343
Net assets available for benefits	**2,384,894,221**	2,105,479,473

See accompanying notes

University of Waterloo Pension Plan for Faculty and Staff

Statement of changes in net assets available for benefits

Year ended December 31

	2021	2020
	$	$
Increase in net assets		
Employee contributions		
Required	**42,617,608**	39,033,019
Employer contributions		
Current service	**53,992,000**	49,634,000
Special	**9,250,696**	12,156,240
Transfers from other plans *[note 8]*	**858,662**	221,750
Interest income *[note 4[d]]*	**19,933,940**	21,585,286
Dividend income *[note 4[d]]*	**27,922,074**	29,364,504
Realized gains on investments	**58,901,427**	43,417,202
Unrealized gains on investments	**157,806,597**	89,280,789
Total increase in net assets	**371,283,004**	284,692,790
Decrease in net assets		
Benefit expenses		
Retirement benefits	**71,730,066**	67,845,837
Terminations benefits	**10,249,594**	6,937,117
Death benefits	**4,629,190**	2,549,470
Unrealized foreign exchange losses	**7,351**	35,812,722
Management and administrative expenses *[note 7[a]]*	**5,252,055**	4,570,052
Total decrease in net assets	**91,868,256**	117,715,198
Net increase in net assets for the year	**279,414,748**	166,977,592
Net assets available for benefits, beginning of year	**2,105,479,473**	1,938,501,881
Net assets available for benefits, end of year	**2,384,894,221**	2,105,479,473

See accompanying notes

Notes to financial statements

December 31, 2021

1. Basis of presentation

These financial statements of the University of Waterloo Pension Plan for Faculty and Staff [the "Plan"] have been prepared on a going concern basis and in accordance with the significant accounting policies set out below that comply with the financial reporting provisions of the Financial Services Regulatory Authority of Ontario for financial statements under Regulation 909, Section 76 of the *Pension Benefits Act* (Ontario). The basis of accounting used in these financial statements materially differs from Canadian accounting standards for pension plans in Section 4600, *Pension Plans*, in Part IV of the *CPA Canada Handbook* in part because it excludes the Plan's pension obligations and related disclosures. Consequently, these pension fund financial statements do not purport to show the adequacy of the Plan's assets to meet its pension obligations. These financial statements present the information of the Plan as a separate reporting entity independent of the Sponsor and Plan participants.

In accordance with Section 4600, Canadian accounting standards for private enterprises in Part II of the *CPA Canada Handbook* have been adopted for policies that do not relate to the Plan's investment portfolio to the extent that those standards do not conflict with the requirements of Section 4600.

2. Description of the plan

The Plan is a contributory defined benefit pension plan covering employees of the University of Waterloo [the "University" or the "Sponsor"]. The Board of Governors of the University is the administrator of the Plan [the "Administrator"]. The University's Pension and Benefits Committee has been appointed by the Board of Governors to administer the Plan. CIBC Mellon Trust Company is the custodian and trustee of the Plan. The assets of the Plan are held "in trust" within CIBC Mellon Trust Company. Aon has served as the actuary of the Plan during 2021. The Plan is registered under the *Pension Benefits Act* (Ontario) under Registration Number 0310565.

Funding policy

The Plan is open to all full-time and part-time salaried employees who meet certain eligibility requirements. Under the terms of the Plan, the employees are required to contribute 7.40% of base earnings up to the Canada Pension Plan's Yearly Maximum Pensionable Earnings ["YMPE"] limit plus 10.60% of base earnings exceeding the YMPE [refer to note 10 for scheduled increases in employee contribution rates]. The University contributes the balance of the cost required to fund the Plan, as determined by an actuarial valuation of the Plan.

Funding valuation

The most recent actuarial valuation, filed with the Financial Services Regulatory Authority of Ontario, was as of January 1, 2021 and was prepared by Aon. The rate of compensation increase used was 3.0% per year for 3 years; 4% per year thereafter and the discount rate was 5.30%. The next required actuarial valuation is as of January 1, 2024.

Benefits

On the normal retirement date, a member is entitled to an annual pension equal to 1.4% of his or her Final Average Earnings ["FAE"] up to the YMPE average, plus 2.0% of his or her FAE in excess of the YMPE average multiplied by his or her years of credited service. FAE is the member's average annual base earnings during the averaging period's continuous months of highest earnings during the member's last 10 years of employment at the University. The averaging period for FAE is a 60-month averaging period. The YMPE average is determined by averaging the YMPE in the year of retirement plus the YMPE in the four preceding years. Benefits are limited to the lesser of the maximum benefits allowable under the Income Tax Act or a hard dollar cap [$3,400 per year of service as at December 31, 2021].

Effective May 1, 2014, the Plan adjusted its guaranteed indexation related to post-retirement cost of living adjustments. Any pension benefits earned as at December 31, 2013 will be indexed at 100% of the Consumer Price Index ["CPI"] to a maximum of 5%, and any pension benefit earned as of an employee's date of retirement less the pension benefit earned as at December 31, 2013 will be indexed at 75% of CPI to a maximum of 5%.

Vested retirement benefits of the Plan are payable upon satisfaction of early retirement eligibility requirements [as early as age 55] and prior to the member's normal retirement date [age 65]. Vested retirement benefits are also payable in the case of termination of employment prior to retirement. A death benefit is payable to the beneficiary of a member as designated.

Income taxes

The Plan is a Registered Pension Trust as defined in the *Income Tax Act* (Canada) and, as such, is not subject to income taxes.

3. Summary of significant accounting policies

Recognition of contributions and benefits

All contributions from the Sponsor and the Plan participants are reflected in the year of the related participant's earnings.

Contributions and benefits payable are recognized on the accrual basis of accounting. Termination benefits payable consist of amounts owing but not yet paid to employees who were terminated from the Plan before the year end. Retirement benefits payable consist of amounts owing but not yet paid to employees who retired before the year end.

Lump-sum payments or transfers out of the Plan are accounted for in the period in which the election to affect such payment or transfer is made.

Investments

Investments are recorded at fair market value on the statement of net assets available for benefits.

Fair value is the amount of consideration that would be agreed upon in an arm's length transaction between knowledgeable, willing parties who are under no compulsion to act. The fair value of investment assets is determined as follows:

[a] Cash and short-term deposits are valued at amortized cost which approximates fair value.
[b] Bonds, debentures, equities, preferred shares and derivative financial instruments are valued by reference to quoted market prices.
[c] Investments in pooled funds are valued based on fair value information provided by the fund managers.

Investment liabilities are stated at fair value and represent liabilities that are incurred by the Plan in investment related activities. These may include, but are not limited to, derivatives in a liability position, repurchase agreements, financial instruments sold but not yet purchased, and cash collateral received from counterparties.

Net realized gains or losses on disposal and unrealized changes in fair value for the year are recognized in the statement of changes in net assets available for benefits. Interest earned on investments is recorded on an accrual basis. Dividend income is recorded on the ex-dividend date. Transaction costs are expensed as incurred.

Foreign currency translation

Investments denominated in foreign currencies are translated into Canadian dollars at rates of exchange as at the year-end date. Transactions of investments denominated in foreign currencies are translated into Canadian dollars at rates of exchange applicable on the transaction dates.

Use of estimates

The preparation of financial statements requires the Plan's Administrator to make estimates and assumptions. These estimates and assumptions affect the reported amounts of assets and liabilities and disclosure of contingencies as at the date of the financial statements, and the reported amounts of increases and decreases in net assets available for benefits during the reporting period. Actual results could differ from those estimates.

4. Investments

[a] Summary of investments

Investments are comprised of the following:

	2021		2020	
	Fair value $	**Cost** $	**Fair value** $	**Cost** $
Equities				
Canadian equities	**221,273,085**	**98,250,707**	287,122,319	195,707,878
Canadian equity pooled funds	**129,417,083**	**114,659,985**	40,615,506	38,621,717
Foreign equity pooled funds	**1,258,044,072**	**891,827,982**	955,594,279	735,277,560
	1,608,734,240	**1,104,738,674**	1,283,332,104	969,607,155
Bonds, cash and short-term deposits				
Canadian fixed term bonds	**365,551,258**	**365,333,983**	365,724,112	352,292,837
Bond pooled funds	**356,953,976**	**340,687,805**	366,691,449	331,175,253
Cash and short-term deposits	**53,589,272**	**53,589,272**	89,092,514	89,092,519
	776,094,506	**759,611,060**	821,508,075	772,560,609
	2,384,828,746	**1,864,349,734**	2,104,840,179	1,742,167,764

Notes to financial statements

December 31, 2021

[b] Investment managers

The investments are managed by the following investment managers:

	2021		2020	
	Fair value $	**Cost** $	**Fair value** $	**Cost** $
TD Asset Management				
Bonds				
Canadian fixed term bonds	**365,551,258**	**365,333,983**	365,724,112	352,292,837
Bond pooled funds	**356,953,976**	**340,687,805**	366,691,449	331,175,253
Canadian equity pooled funds	**129,417,083**	**114,659,985**	40,615,506	38,621,717
Foreign equity pooled funds	**584,173,115**	**446,955,586**	563,500,071	506,185,127
Cash and short-term deposits	**4,941,601**	**4,941,601**	2,579,475	2,579,475
	1,441,037,033	**1,272,578,960**	1,339,110,613	1,230,854,409
University of Waterloo Managed Fund				
Equities				
Canadian equities [infrastructure and real estate]	**221,273,085**	**98,250,707**	179,543,268	97,484,345
Cash and short-term deposits	**27,446,146**	**27,446,146**	68,669,957	68,669,961
	248,719,231	**125,696,853**	248,213,225	166,154,306
Sionna				
Equities				
Canadian equities	**—**	**—**	107,579,051	98,223,533
Cash and short-term deposits	**—**	**—**	3,039,179	3,039,179
	—	**—**	110,618,230	101,262,712
PH&N				
Equities				
Foreign equity pooled funds	**104,806,364**	**100,875,854**	—	—
Fiera				
Equities				
Foreign equity pooled funds	**104,507,934**	**101,154,560**	—	—
Walter Scott & Partners				
Equities				
Foreign equity pooled funds	**464,556,658**	**242,841,981**	392,094,208	229,092,433
Operating fund at CIBC Mellon Trust Company				
Cash and short-term deposits	**21,201,526**	**21,201,526**	14,803,903	14,803,903
Total investments	**2,384,828,746**	**1,864,349,734**	2,104,840,179	1,742,167,763

Notes to financial statements

December 31, 2021

[c] Significant investments

The Plan contains the following individual investments, which exceed 1% of the cost or market value of the total investments as at December 31, 2021:

	Fair value $	Cost $
Short-term deposits		
CIBC Mellon Short-Term Deposit 0.01%/YR	**26,266,918**	**26,266,918**
Royal Bank BA 0.21% due January 20, 2022	**27,322,354**	**27,322,354**
Pooled funds		
Walter Scott NCS Global Equity Fund	**464,556,658**	**242,841,981**
TD Emerald Canadian Bond Index Fund	**356,953,976**	**340,687,805**
TD Emerald Pooled US Equity Index Fund	**384,843,497**	**270,242,181**
TD Emerald International Equity Index Fund	**199,329,618**	**176,713,405**
TD Emerald Canadian Equity Index Fund	**129,417,083**	**114,659,985**
PH&N RBC Global Equity Focus Fund	**104,806,364**	**100,875,854**
Fiera Mirova Global Sustainable Equity Fund	**104,507,934**	**101,154,560**
Canadian equities		
Brookfield Infrastructure Partners (BIP.UN)	**129,794,130**	**34,588,921**
Ishares S&P/TSX Capped REIT	**75,307,813**	**60,059,180**

[d] Investment income by type

	2021 $	2020 $
Dividend income		
Canadian equities	**11,881,548**	10,319,631
Foreign pooled funds	**16,040,526**	19,044,873
	27,922,074	29,364,504

	2021 $	2020 $
Interest income		
Bonds, cash and short-term deposits	**594,628**	1,567,648
Canadian fixed term bonds	**9,826,719**	10,167,512
Pooled funds	**9,512,593**	9,850,126
	19,933,940	21,585,286

[e] Forward foreign exchange contracts

There were no forward foreign exchange contracts as at December 31, 2021 or December 31, 2020.

Notes to financial statements

December 31, 2021

5. Fair value measurements

Canadian accounting standards for pension plans require disclosure of a three-level hierarchy for fair value measurements based on the transparency of inputs to the valuation of an asset or liability as at the financial statement date. The three levels are defined as follows:

Level 1: Fair value is based on quoted market prices in active markets for identical assets or liabilities. Level 1 assets and liabilities generally include equity securities traded in an active exchange market.

Level 2: Fair value is based on observable inputs other than Level 1 prices, such as quoted market prices for similar [but not identical] assets or liabilities in active markets, quoted market prices for identical assets or liabilities in markets that are not active, and other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities. Level 2 assets and liabilities include debt securities with quoted prices that are traded less frequently than exchange-traded instruments and derivative contracts whose value is determined using a pricing model with inputs that are observable in the market or can be derived principally from or corroborated by observable market data. This category generally includes pooled funds, hedge funds, Government of Canada, provincial and other government bonds, Canadian corporate bonds, and certain derivative contracts.

Level 3: Fair value is based on non-observable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities. This category generally includes private equity investments and securities that have liquidity restrictions.

	2021			
	Level 1	**Level 2**	**Level 3**	**Total**
	$	$	$	$
Assets				
Cash and short-term deposits	**—**	**53,589,272**	**—**	**53,589,272**
Equities	**221,273,085**	**—**	**—**	**221,273,085**
Pooled funds	**—**	**1,744,415,131**	**—**	**1,744,415,131**
Bonds	**—**	**365,551,258**	**—**	**365,551,258**
	221,273,085	**2,163,555,661**	**—**	**2,384,828,746**

	2020			
	Level 1	**Level 2**	**Level 3**	**Total**
	$	$	$	$
Assets				
Cash and short-term deposits	—	89,092,514	—	89,092,514
Equities	287,122,319	—	—	287,122,319
Pooled funds	—	1,362,901,234	—	1,362,901,234
Bonds	—	365,724,112	—	365,724,112
	287,122,319	1,817,717,860	—	2,104,840,179

6. Financial instruments and risk management

The Plan's investment performance is subject to financial risks as a result of its investing activities. These financial risks could impact net assets available for benefits. These financial risks include credit risk, liquidity risk, interest rate risk, other price risk and foreign exchange risk. The Administrator manages these risks in accordance with the Statement of Investment Policies and Procedures [the "SIPP"]. The SIPP includes aggregate investment limits by asset class in order to achieve the Plan's investment objectives at an acceptable level of risk. In addition, the SIPP outlines individual investment limits and diversification objectives within different asset classes and permitted investment categories within the asset classes. The Administrator monitors adherence to the policy and the performance of investment managers relative to the applicable benchmarks and action is taken as deemed necessary.

Credit risk

Credit risk relates to the potential exposure that the other party to a financial instrument will fail to discharge an obligation and cause the Plan to incur a financial loss. Concentration of credit risk exists when a significant proportion of the portfolio is invested in securities with similar characteristics or subject to similar economic, political or other conditions.

The SIPP restrictions require Canadian bonds or debentures to be rated a minimum of BBB or equivalent, establishes a cap of US denominated fixed income securities, which the plan may only invest in if issued by the US government, and does not allow the purchase of other foreign currency fixed income securities. In addition, the SIPP states that no single investment holding shall represent more than 10% of the market value of the Plan's assets.

All of the Plan's fixed term investments are invested in Canadian short-term bonds. The credit risk of the Canadian short-term bonds as at December 31, 2021 and as at December 31, 2020 are detailed in the following chart:

Credit ratings	**AAA**	**AA**	**A**	**BBB**	**Total**
As at December 31 2021	**2.9%**	**9.0%**	**47.8%**	**40.3%**	**100%**
As at December 31 2020	0.4%	14.5%	43.8%	41.3%	100%

Liquidity risk

Liquidity risk is the risk that the Plan may be unable to meet pension payment obligations as they come due. The SIPP requires that all investments should be reasonably liquid so that they can be converted into cash on short notice. As such, the Plan's exposure to liquidity risk is considered negligible.

The following is a maturity analysis of the fixed-term bonds held by the plan:

	2021	2020
	$	$
Less than 1 year	**—**	20,176,328
1 – 5 years	**297,147,583**	259,991,646
5 – 10 years	**68,403,675**	84,543,789
Greater than 10 years	**—**	1,012,349
Total	**365,551,258**	365,724,112

Interest rate risk

Interest rate risk refers to the adverse consequences of interest rate changes on the Plan's net assets available for benefits and changes in net assets available for benefits. This risk arises as changes in market interest rates affect the fair market value of the Plan's assets as well as the returns that the plan can earn. The SIPP outlines a range of 20% – 45% for fixed income securities. The Administrator adjusts the investment mix in the portfolio in response to changes in market interest rates.

The following analysis summarizes the impact on the Plan's net assets available for benefits, following reasonably possible changes in interest rates to each bond category to which the Plan has a significant exposure.

	Impact of change in interest rates	
	-1%	**+1%**
Canadian fixed term bonds	10,016,104	(10,016,104)
Bond pooled funds	30,019,829	(30,019,829)
	40,035,933	(40,035,933)

Other price risk

Other price risk is the risk that the value of the investments will fluctuate as a result of changes in market prices. The COVID-19 pandemic contributed to exceptional volatility in financial markets in the first half of 2020; significant global economic uncertainty and volatility continues to have widespread impact on financial markets. As the Plan records all investments at fair value, investment values reflected in the statement of net assets available for benefits represent the maximum exposure to market risk. As at December 31, 2021, the SIPP outlined a range of 45% – 70% for equities and 0% - 20% for alternatives, which can include listed real assets. The Administrator adjusts the investment mix in the portfolio in response to changes in market conditions.

Foreign exchange risk

The Plan is exposed to foreign currency fluctuations to the extent that its foreign investments are denominated in foreign currencies. Fluctuations in the value of the Canadian dollar against foreign currencies can have an impact on the fair value of foreign investments. The SIPP allows for hedging of portfolio assets denominated in foreign currencies into Canadian dollars as a strategy to mitigate foreign exchange risk.

The following sensitivity analysis summarizes the impact on the Plan's net assets available for benefits, following reasonably possible changes in foreign currency exchange rates, for each currency to which the Plan has a significant exposure.

	Impact of change in exchange rates	
	+5%	**-5%**
United States Dollar [$]	40,195,925	(40,195,925)
Euro [€]	6,774,363	(6,774,363)
Japanese Yen [¥]	4,596,339	(4,596,339)
British Pound Sterling [£]	3,292,863	(3,292,863)
Swiss Francs [₣]	2,682,174	(2,682,174)
Danish Krone [Øre]	1,435,032	(1,435,032)

Market risk for equity investments

The table below demonstrates the sensitivity of the fair value of the Plan's investments in equities to a possible change of 10% in the relevant equity indices. The beta of each equity mandate, a measure of volatility, has been applied in estimating this sensitivity.

	Fluctuation of	**Impact of % change in fair value on net assets**	**Sensitivity** $
Equities			
Canadian	Stock Market Indices	+10%	23,090,576
		-10%	(23,090,576)
Pooled Funds	Stock Market Indices	+10%	129,355,712
		-10%	(129,355,712)

7. Management and administrative expenses

[a] Management and administrative expenses

Management and administrative expenses consist of the following:

	2021 $	**2020** $
Investment management	**3,502,282**	2,867,249
Custodial	**257,447**	239,331
Actuarial	**329,267**	307,200
Audit	**18,900**	19,126
Administration	**726,971**	642,665
Harmonized Sales Tax	**417,188**	494,481
	5,252,055	4,570,052

[b] Management and administrative fees payable

Management and administrative fees payable consist of the following:

	2021 $	2020 $
Investment management	**1,185,340**	826,452
Custodial	**21,987**	44,421
Actuarial	**78,032**	94,209
Audit	**19,100**	21,583
Administration	**248,506**	265,542
HST	**100,160**	—
	1,653,125	1,252,207

[c] Contributions

There were no required contributions past due at December 31, 2021.

8. Transfers from other plans

Transfers from other plans represent transfers into the Plan from external pension plans of a previous employer.

9. Capital management

The capital of the Plan is represented by the net assets available for benefits. The Plan's objectives when managing its capital are to: [i] safeguard its ability to continue as a going concern including compliance with regulatory requirements under the *Pension Benefits Act* (Ontario), and [ii] satisfy its obligations to pay benefits to the Plan participants. In meeting these objectives, the Sponsor periodically reviews the funding and investment policies of the Plan, the results of the actuarial funding valuation and the level of benefits provided to participants.

The Administrator has adopted a SIPP which states investment objectives, guidelines and benchmarks used in investing the capital of the Plan, permitted categories of investments, asset mix diversification and rate of return expectations. The SIPP was last updated effective February 2, 2022. The amendments to the SIPP reflect an investment philosophy that is more reflective of the current portfolio and overall policy objective of maximizing long-term real returns subject to an appropriate level of risk and updated ranges and benchmarks for the asset mix.

In the version of the SIPP in effect as at December 31, 2021, the portfolio return objective was that the annualized rate of return of the Plan must exceed the annualized rate of increase in the CPI by at least 360 basis points, net of the associated investment management fees over any 10 year period. This was achieved as at December 31, 2021.

The SIPP prescribes asset categories that the Plan can invest in along with a targeted asset allocation for each of these categories. The following table presents the asset categories, the permitted asset mix allocation, and the asset mix allocation as at December 31, 2021.

Asset categories	Asset mix allocation	Asset mix allocation as at December 31, 2021
Cash	0 – 5%	2.25%
Fixed income	20 – 45%	30.29%
Total fixed income	**20 – 45%**	**32.54%**
Canadian equity	5 – 15%	5.43%
Global equity	30 – 55%	52.75%
Total equity	**45 – 70%**	**58.18%**
Infrastructure	0 – 10%	6.12%
Real estate	0 – 10%	3.16%
Total alternatives	**0 – 20%**	**9.28%**
		100.00%

The investments fell within the targeted asset mix ranges as specified in the SIPP at December 31, 2021.

10. Subsequent events

Changes to employee contribution rates were approved, effective May 1, 2020, to be phased in through May 1, 2022.

Portion of salary	May 1, 2019	May 1, 2020	May 1, 2021	May 1, 2022
Less than 1x YMPE	6.25%	6.95%	7.40%	7.80%
Between 1x and 2x YMPE	8.95%	9.95%	10.60%	11.20%
Greater than 2x YMPE	9.95%	9.95%	10.60%	11.20%

Pension Plan Management and Administrative Fees Incurred in 2021[1]
with 4 prior years of comparative information

Expense Category	2021 ('000s)	2020 ('000s)	2019 ('000s)	2018 ('000s)	2017 ('000s)
Investment Management Fees					
TD Asset Management	618	559	500	598	504
Walter Scott and Partners Ltd.	2,219	1,843	1,648	1,555	1,411
Fiera Capital Corporation[2]	231	-	-	-	-
RBC Global Asset Management (PH&N Institutional)[2]	201	-	-	-	-
Sionna Investment Managers[3]	233	317	270	216	209
Oldfield[4]	-	933	1,315	1,157	1,072
Trilogy Global Advisors[5]	-	(160)	-	672	1,023
Total Investment Management Fees	**$3,502**	**$3,492**	**$3,733**	**$4,198**	**$4,219**
Custodian Fees	258	239	222	273	211
Aon	329	307	307	235	280
Administration Fees	727	643	722	692	663
Ernst & Young - Audit Fees	19	19	19	19	20
Total Pre-Tax Management and Administrative Fees	**$4,835**	**$4,700**	**$5,003**	**$5,417**	**$5,393**
HST[6]	**417**	**494**	**259**	**696**	**554**
Total Management and Administrative Fees	**$5,252**	**$5,194**	**$5,262**	**$6,113**	**$5,947**

1 Amounts from the audited annual financial statements

2 Initial investments of $100 million each in August 2021.

3 Sionna investment was liquidated in July 2021 and proceeds reinvested in Fiera, RBC GAM and TDAM mandates.

4 Oldfield investment liquidated August 2020 and proceeds reinvested in TDAM mandates. Fees include monthly management fees and termination fees.

5 Trilogy investment liquidated August 2018 and proceeds reinvested in TDAM mandates. 2020 reversal of fees amount is an accounting correction that should have been recorded in 2019 upon conclusion of the Trilogy relationship.

6 UW recovers HST paid by the pension fund where possible through HST rebates. HST recoveries are recorded when the returns are filed.

Pension Risk Management Dashboard

University of Waterloo
As of March 31, 2022

About This Material

This dashboard was prepared for the University of Waterloo to track changes in funded status of the Pension Plan over successive reporting periods, as well as quantify the amount of risk to which the Pension Plan is exposed. The report presents the funded status and performs the analysis on three bases:

Risk-Free Benchmark Basis – This liability is calculated using best estimate assumptions for retirement, termination and other demographic experience, and a discount rate and inflation assumption determined with reference to the risk-free environment. For this report, the liability has been determined at the real return bond yield plus a 40 basis point credit spread to reflect additional yield that can be achieved with relatively little additional risk. This liability differs from the solvency calculation in that the demographic assumptions are best estimate and statutory “grow-in” provisions are not included.

Going Concern Basis – This liability is calculated using the going concern assumptions at the most recent valuation. The analysis is performed using the market value of assets with Provision of Adverse Deviation as prescribed by the *Pension Benefits Act* (Ontario).

Solvency/Hypothetical Wind Up Basis – This liability is calculated using assumptions determined in accordance with the Canadian Institute of Actuaries Annuity Purchase guidance and Commuted Value standards in effect at each measurement date shown in this report. A summary of these assumptions is included on page 16.

This dashboard also contains a reconciliation that compares the going concern liability with the liability calculated using the risk-free benchmark. The difference between the two liabilities represents the amount of return expected to be provided by taking on risk in the investment portfolio. Over successive quarters the tool helps quantify how that risk changes as the underlying interest rates change.

On both bases the following information is shown:

- Current Funded Status and Historical Asset Liability Performance
  - How well funded is the plan?
  - What has been the return on plan assets and liabilities?
- Detailed Asset and Liability Performance Attribution
  - What factors drove the performance of assets and liabilities over the prior period?
  - What is the relative impact of these factors on the assets and liabilities in isolation and in combination?

For the Risk-Free Benchmark Basis, the following information is also shown:

- Scenario Testing
  - What risk exposures does the plan face?
  - What would be the impact of a downside event for each risk factor?

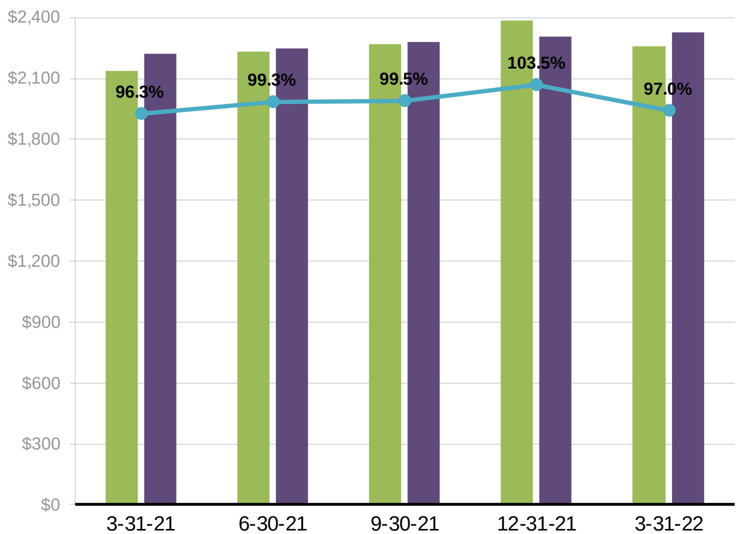
Highlights

- The going concern funded position decreased from a surplus of $81.4 million to a deficit of $69.8 million over the quarter due to asset performance lower than expected.
- The risk-free deficit decreased from $1,255.1 million to $1,020.5 million over the quarter due to a decrease in risk-free liabilities from an increase in risk free rates.
- The solvency position improved from $4.9 million surplus to $164.9 million surplus over the quarter primarily due to an increase in solvency rates.
- The total fund had a rate of return after all fees of -5.3% for last quarter, lower than expectations.
- The estimated March 31, 2022 liabilities are projected based on the most recent actuarial valuation, with membership data as at January 1, 2022.
- The annuity purchase guidance educational note for valuations as of March 31, 2022 and April 1, 2022 (published as of April 25, 2022) has been reflected in the interest rates used to calculate the March 31, 2022 Solvency and Hypothetical Wind Up liabilities.
- The transfer ratio as at March 31, 2022 is 79.0%. Compared to the transfer ratio of 64.8% in the last filed valuation on January 1, 2021, this represents an increase of 22%. Since the transfer ratio did not decrease 10% over the period, no Regulation 19 filing is required. See slide 11 for more details.
- The most recent actuarial valuation was performed as at January 1, 2022 (to be filed).
- All figures are in $1,000,000 (CAD).

Executive Summary – Going Concern

Values in $1,000,000 (CAD)

Funded Status



Highlights for the Quarter-Ending 3/31/22

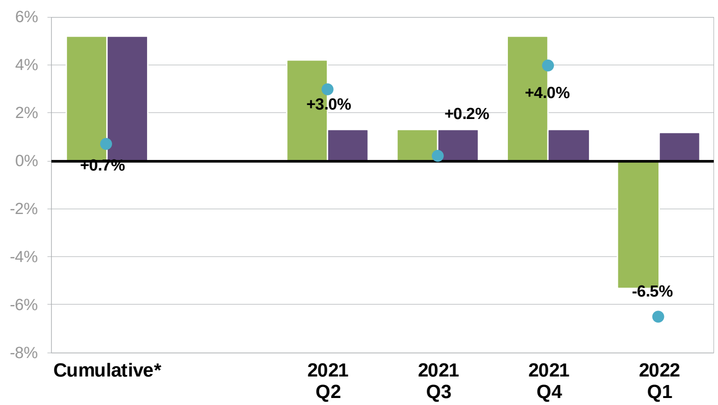
The plans' funded ratio decreased to 97.0% at 3/31/22. This result was primarily due to the combined effects of:

- Asset performance less than expected,
- Contributions of $26.5 million which exceeded new benefit accruals, and
- The impact of a new valuation as at January 1, 2022, changes in discount rate, a plan amendment, and demographics experience which decreased liabilities.

	3/31/21	6/30/21	9/30/21	12/31/21	3/31/22
Market Value of Assets	$ 2,140.1	$ 2,233.1	$ 2,267.7	$ 2,387.7	$ 2,257.3
Going Concern Liability	2,222.3[1]	2,249.7[1]	2,279.0[1]	2,306.3[1]	2,327.1[1]
Surplus/(Deficit)	$ (82.2)	$ (16.6)	$ (11.3)	$ 81.4	$ (69.8)
Periodic Contributions	$ 25.6	$ 26.4	$ 27.1	$ 26.8	$ 26.5
Effective Interest Rate	5.30%	5.30%	5.30%	5.30%	5.50%
Funded Ratio:	96.3%	99.3%	99.5%	103.5%	97.0%
Asset Duration:	1.9	1.8	1.8	1.8	1.6
Going Concern Liability Duration:	14.4	14.4	14.4	14.4	14.1

[1]After application of the PfAD at 9.00%

Asset-Liability Return



Asset Liability Return for Quarter-Ending 3/31/22

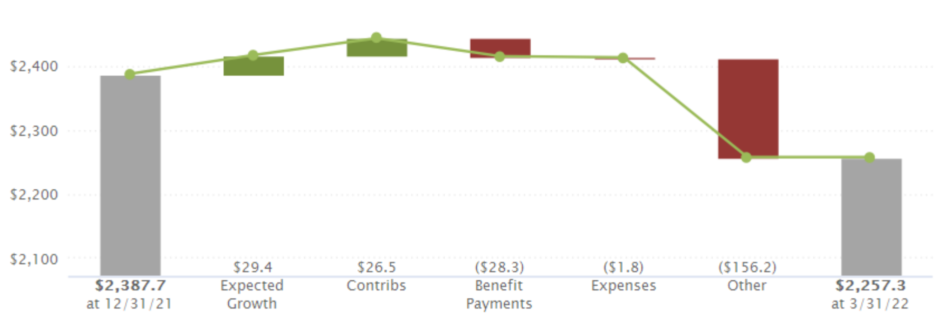
Assets returned -5.3% during the quarter while liabilities returned 1.2%, resulting in a funded status decrease of 6.5%.

Periodic Return/Change	Cumulative	6/30/21	9/30/21	12/31/21	3/31/22
Market Value of Assets Return	5.2%	4.2%	1.3%	5.2%	-5.3%
Going Concern: Return	5.2%	1.3%	1.3%	1.3%	1.2%
Funded Ratio Change	0.7%	3.0%	0.2%	4.0%	-6.5%

Asset-Liability Performance Attribution – Going Concern

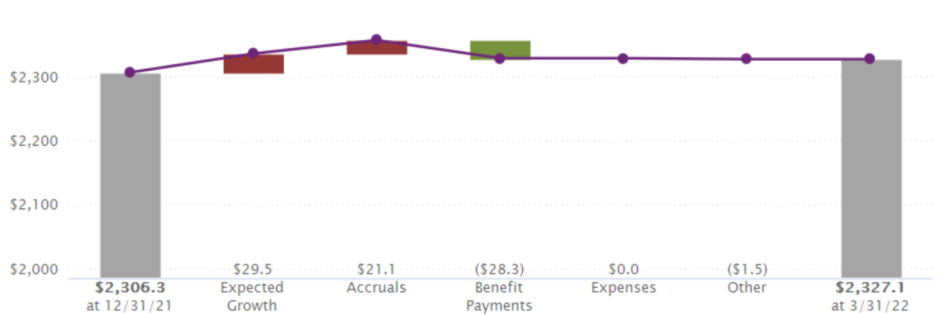
Values in $1,000,000 (CAD)

Assets



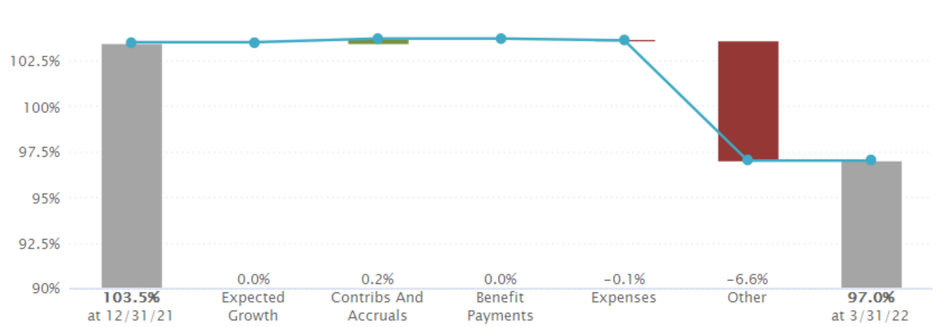
- Overall, assets returned -5.3% during this quarter, as opposed to an expected growth assumption of about 1.3% per quarter.
- The fixed income assets lost value due to an increase in the underlying risk-free rates and widening credit spreads.
- The University and members made $26.5 million in contributions during the quarter and the trust paid $28.3 million in benefits to the participants.
- "Other" includes the impact of active management, and differences between benchmark and actual investment allocations.

Liabilities



- Liabilities as of 3/31/22 are based on 5.50% discount rate compared to 5.30% at January 1, 2022.
- Liabilities were expected to grow by $29.5 million due to interest cost during the quarter.
- New benefit accruals increased the liability by $21.1 million during the quarter.
- Plan liabilities decreased by $28.3 million during the quarter as benefits were paid.
- Other" includes the impact of a new valuation as at January 1, 2022 and changes in discount rate, salary increase assumption, and demographic experience.

Funded Ratio

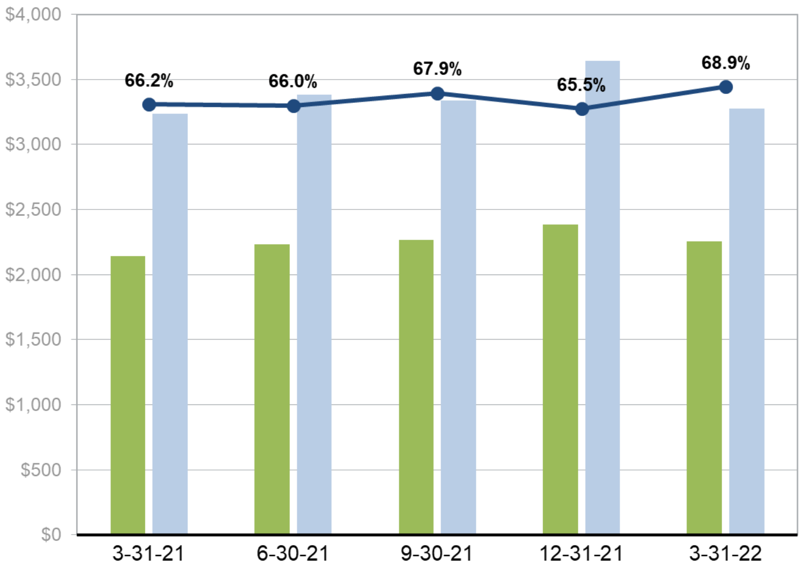


- Assets lost 5.3% during the quarter while liabilities returned 1.2%, resulting in a funded status decrease of 6.5%.

Executive Summary – Risk Free

Funded Status

Values in $1,000,000 (CAD)



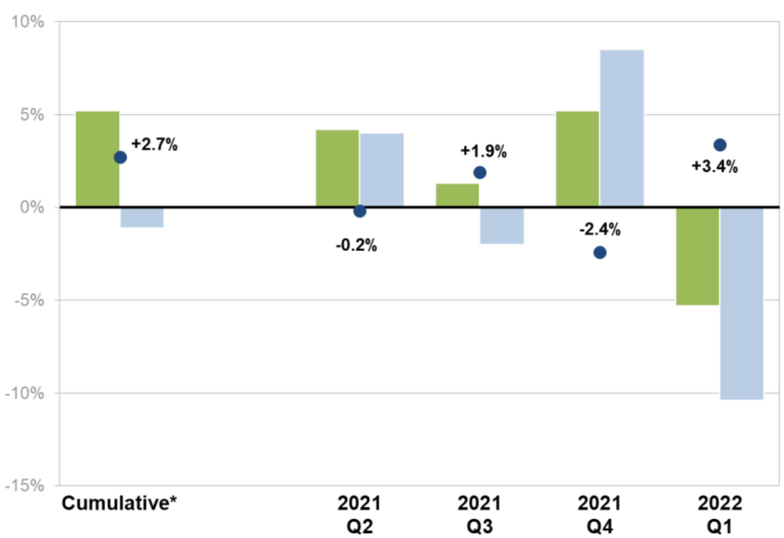
Highlights for the Quarter-Ending 3/31/22

The plans' funded ratio increased to 69.0% at 3/31/22. This result was primarily due to the combined effects of:

- Asset performance less than expected,
- Contributions of $26.5 million, and
- A decrease in liabilities due to an increase in risk-free interest rate.

	3/31/21	6/30/21	9/30/21	12/31/21	3/31/22
Market Value of Assets	$ 2,140.1	$ 2,233.1	$ 2,267.7	$ 2,387.7	$ 2,257.3
Risk-Free Liability	3,235.0	3,383.6	3,337.7	3,642.8	3,277.8
Surplus/(Deficit)	$ (1,094.9)	$ (1,150.5)	$ (1,070.0)	$ (1,255.1)	$ (1,020.5)
Periodic Contributions	$ 25.6	$ 26.4	$ 27.1	$ 26.8	$ 26.5
Discount Rate	0.65%	0.48%	0.62%	0.23%	0.94%
Funded Ratio:					
Assets/Risk-Free Liability	66.2%	66.0%	67.9%	65.5%	68.9%
Asset Duration:	1.9	1.8	1.8	1.8	1.6
Risk-Free Liability Duration:	18.8	19.1	18.8	19.5	19.8

Asset-Liability Return



Asset Liability Return for Quarter-Ending 3/31/22

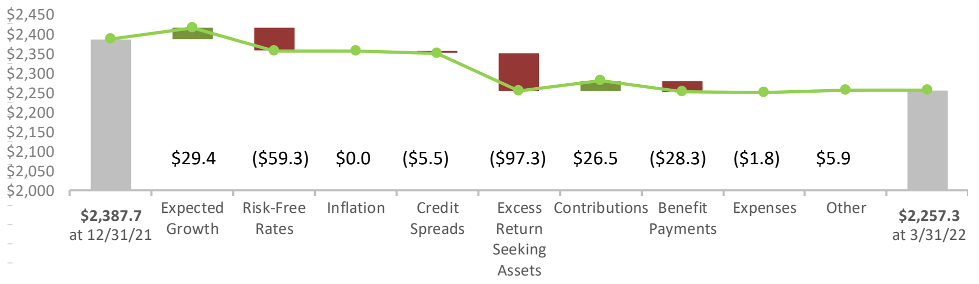
Assets returned -5.3% during the quarter while liabilities returned -10.4%, resulting in a funded status increase of 3.4%.

Periodic Return/Change	Cumulative	6/30/21	9/30/21	12/31/21	3/31/22
Market Value of Assets Return	5.2%	4.2%	1.3%	5.2%	-5.3%
Risk Free: Return	-1.0%	4.0%	-2.0%	8.5%	-10.4%
Funded Ratio Change	2.7%	-0.2%	1.9%	-2.4%	3.4%

Asset-Liability Performance Attribution – Risk Free

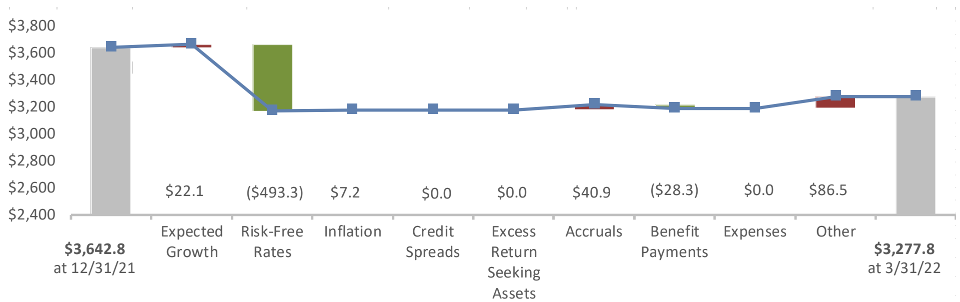
Values in $1,000,000 (CAD)

Assets



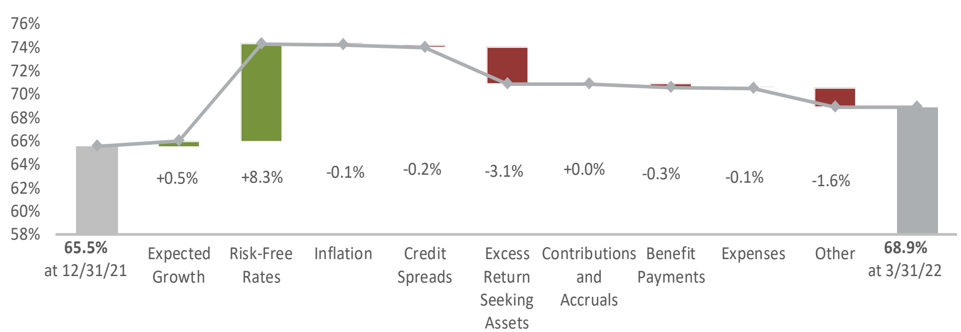
- Assets returned -5.3% during this quarter.
- The fixed income assets lost value due to an increase in the underlying risk-free rates and widening credit spreads.
- The plans' return-seeking assets performed lower than expected during the quarter.
- $26.5 million in contributions during the quarter and the trust paid $28.3 million in benefits to the participants.
- “Other” includes the impact of active management, and differences between benchmark and actual investment allocations.

Liabilities



- Liabilities were expected to grow by $22.1 million due to interest cost during the quarter.
- Risk-free rates used to determine the liabilities increased resulting in a decrease in liabilities of $493.3 million.
- Expected inflation rates increased resulting in an increase in the liabilities of $7.2 million.
- New benefit accruals increased the liability by $40.9 million during the quarter.
- Plan liabilities decreased by $28.3 million during the quarter as benefits were paid.
- “Other” includes impact of a decrease in the underlying long-term nominal and real federal bond yields used to determine the risk-free and implied inflation rates. It also reflects the new valuation as at January 1, 2022.

Funded Ratio

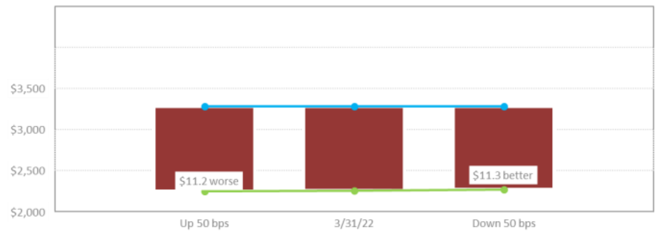


- The difference in exposure to risk-free rates between assets and liabilities combined with changes in risk-free rates resulted in an increase in funded status of 8.3%.
- Changes in credit spreads resulted in a decrease in funded status of 0.2%.
- Return-seeking assets did not perform as well as expected during the quarter, deducting 3.1% from the plans' funded status during the period.

Sensitivity Analysis – Risk-Free Benchmark

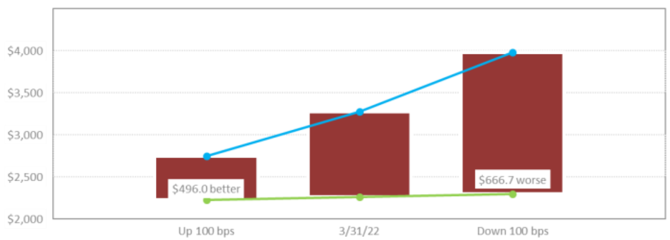
Values in $1,000,000 (CAD)

Credit Spreads



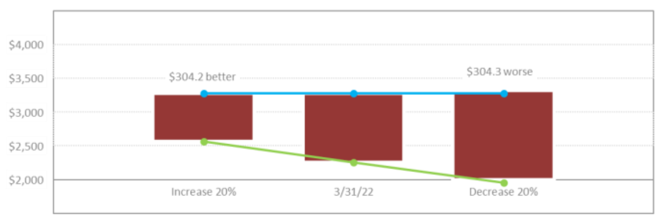
	Up 50bps		Current		Down 50bps
Market Value of Assets	$2,246.1		$2,257.3		$2,268.6
Risk Free	$3,277.8		$3,277.8		$3,277.8
Surplus/(Deficit)	($1,031.7)		($1,020.5)		($1,009.2)
Change		($11.2)		$11.3	

Risk-Free Rates



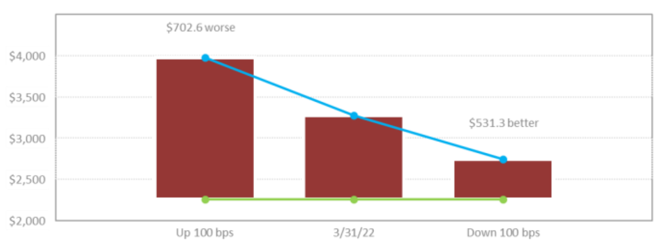
	Up 100bps		Current		Down 100bps
Market Value of Assets	$2,222.0		$2,257.3		$2,293.2
Risk Free	$2,746.5		$3,277.8		$3,980.4
Surplus/(Deficit)	($524.5)		($1,020.5)		($1,687.2)
Change		$496.0		($666.7)	

Return-Seeking Assets



	Increase 20%		Current		Decrease 20%
Market Value of Assets	$2,561.5		$2,257.3		$1,953.0
Risk Free	$3,277.8		$3,277.8		$3,277.8
Surplus/(Deficit)	($716.3)		($1,020.5)		($1,324.8)
Change		$304.2		($304.3)	

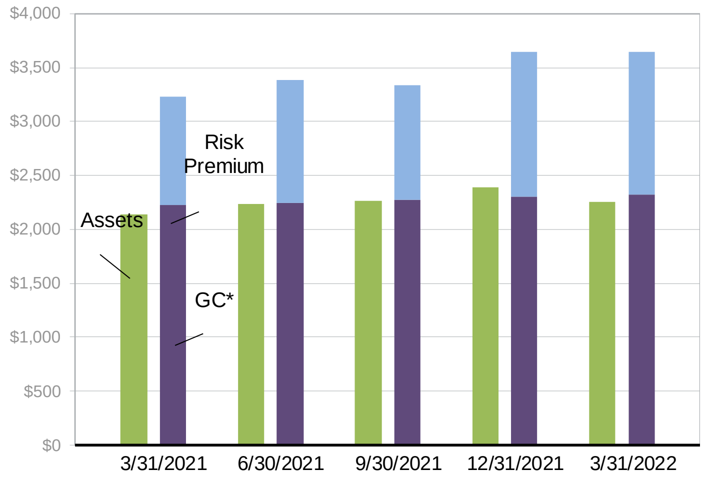
Inflation



	Up 100bps		Inflation		Down 100bps
Market Value of Assets	$2,257.3		$2,257.3		$2257.3
Risk-Free	$3,980.4		$3,277.8		$2,746.5
Surplus/(Deficit)	(1,723.1)		($1,020.5)		($489.2)
Change		($702.6)		$531.3	

Reconciliation of Risk-Free Benchmark and Going Concern Funded Status

Values in $1,000,000 (CAD)



	3/31/21	6/30/21	9/30/21	12/31/21	3/31/22
Market Value of Assets	$ 2,140.1	$ 2,233.1	$ 2,267.7	$ 2,387.7	$ 2,257.3
Going Concern Liability	$ 2,222.3	$ 2,249.7	$ 2,279.0	$ 2,306.3	$ 2,327.1
Risk Premium	1,012.7	1,133.9	1,058.7	1,336.5	950.7
Risk-Free Liability	$ 3,235.0	$ 3,383.6	$ 3,337.7	$ 3,642.8	$ 3,277.8

*Going Concern

The difference between the Risk-Free Liability and the Going Concern Liability is a measure of the amount of risk premium on which the Pension Plan funding is based.

Hypothetical Wind Up (HWU) and Transfer Ratio

Values in $1,000,000 (CAD)

		1/1/2021 (Last Filed)		1/1/2022		4/1/2022
HWU Assets *	$	2,105.4	$	2,387.2	$	2,256.8
HWU Liability		3,247.2		3,228.5		2,870.9
Surplus/(Deficit)	$	(1,141.8)	$	(841.3)	$	(614.1)
Transfer Ratio:						
Market Value of Assets/HWU Liability		64.8%		73.9%		79.0%

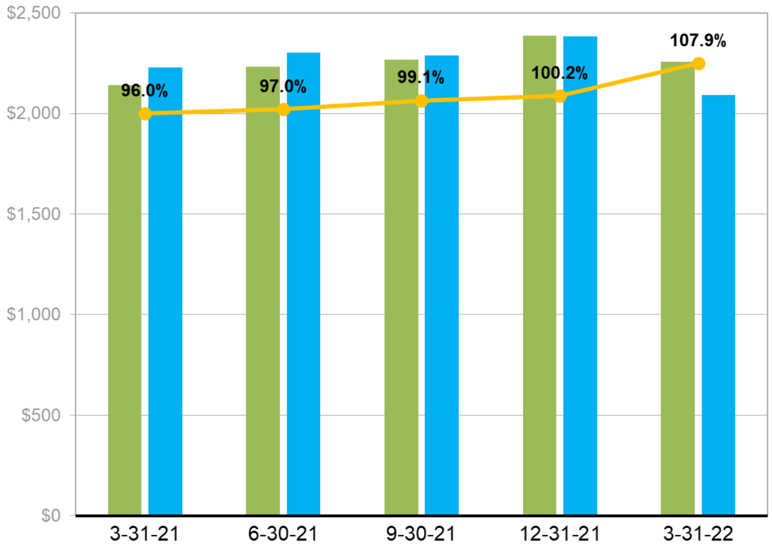
* Net of estimated wind up expenses

- Restrictions on commuted values may come into effect if the administrator of the pension plan knows or ought to know that since the valuation date of the last filed report, events have taken place that may result in the reduction of the transfer ratio by 10% or more of the most recently determined transfer ratio. In such case, the administrator shall not transfer any part of the commuted value without prior approval of the Superintendent.
- If the transfer ratio (the hypothetical wind up assets divided by the hypothetical wind up liabilities including indexation) drops by 10% or more since the last filed valuation, the administrator must stop paying commuted values and seek approval from the regulators to restart paying commuted values. The application is made in a prescribed format. This is generally referred to as a “Regulation 19 Filing”.
- During Q1 2022, the financial position of the Pension Plan as measured on a wind-up basis did not drop by more than 10% since January 1, 2021 (the last filed valuation). Therefore, no Regulation 19 Filing is required as of April 1, 2022.
- The Regulation 19 filing requirements will be monitored throughout 2022 on a quarterly basis.

Executive Summary - Solvency

Values in $1,000,000 (CAD)

Funded Status



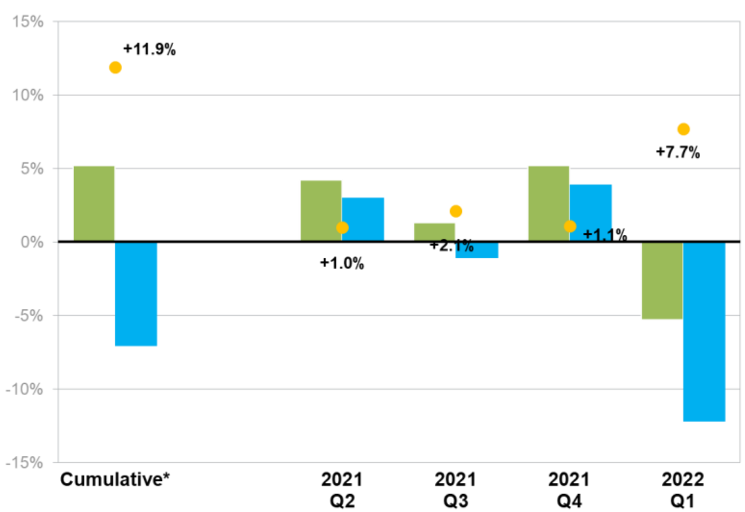
Highlights for the Quarter-Ending 3/31/22

The plans' funded ratio increased to 107.9% at 3/31/22. This result was primarily due to the combined effects of:

- Asset performance less than expected,
- New benefit accruals which exceeded contributions, and
- A decrease in liabilities due to an increase in effective interest rates and the impact of a new valuation at 1/1/2022.

	3/31/2021	6/30/2021	9/30/2021	12/31/2021	3/31/2022
Market Value of Assets	$ 2,140.1	$ 2,233.1	$ 2,267.7	$ 2,387.7	$ 2,257.3
Solvency Liability	2,229.4	2,302.8	2,287.4	2,382.8	2,092.4
Surplus/(Deficit)	$ (89.3)	$ (69.7)	$ (19.7)	$ 4.9	$ 164.9
Periodic Contributions	$ 25.6	$ 26.4	$ 27.1	$ 26.8	$ 26.5
Effective Interest Rate	3.06%	2.88%	3.01%	2.81%	3.70%
Funded Ratio:					
Assets/Solvency Liability	96.0%	97.0%	99.1%	100.2%	107.9%
Assets Duration:	1.9	1.8	1.8	1.8	1.6
Solvency Liability Duration:	14.4	14.8	14.3	14.9	14.6

Asset-Liability Return



Asset Liability Return for Quarter-Ending 3/31/22

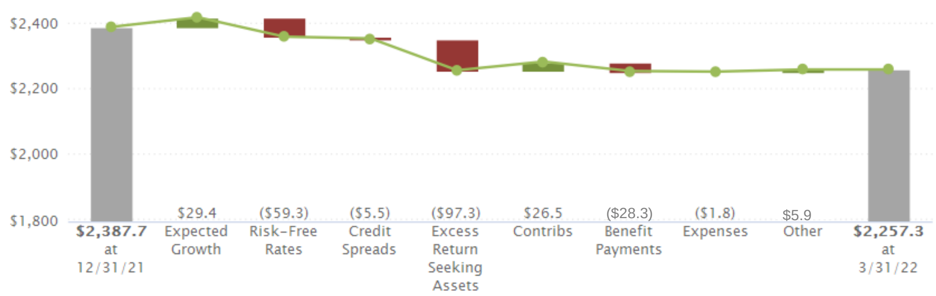
Assets returned -5.3% during the quarter while liabilities returned -12.2%, resulting in a funded status increase of 7.7%.

Periodic Return/Change	Cumulative	6/30/21	9/30/21	12/31/21	3/31/22
Market Value of Assets Return	5.2%	4.2%	1.3%	5.2%	-5.3%
Funding Target: Return	-7.1%	3.0%	-1.1%	3.9%	-12.2%
Funded Ratio Change	11.9%	1.0%	2.1%	1.1%	7.7%

Asset-Liability Performance Attribution - Solvency

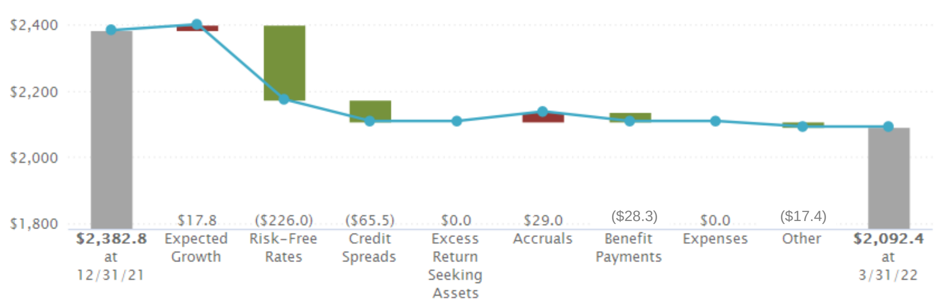
Values in $1,000,000 (CAD)

Assets



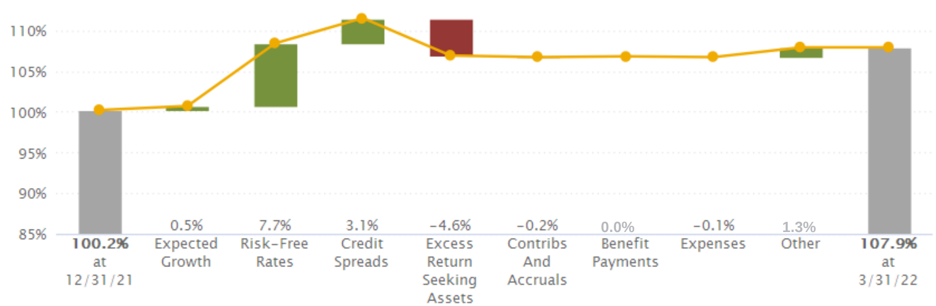
- Assets returned -5.3% during this quarter, as opposed to an expected growth assumption of about 1.3% per quarter.
- The fixed income assets lost value due to an increase in the underlying risk-free rates and widening credit spreads.
- The plans' return-seeking assets performed lower than expected during the quarter.
- The plan sponsor made $26.5 million in contributions during the quarter and the trust paid $28.9 million in benefits to the participants.
- “Other” includes the impact of active management, and differences between benchmark and actual investment allocations.

Liabilities



- Liabilities were expected to grow by $17.8 million due to interest cost during the quarter.
- Risk-free rates increased, and credit spread widened, resulting in a net decrease of $291.5 million ($226.0 million + $65.5 million).
- New benefit accruals increased the liability by $29.0 million during the quarter.
- Plan liabilities decreased by $28.3 million during the quarter as benefits were paid.
- “Other” includes the impact of a new valuation at January 1, 2022.

Funded Ratio

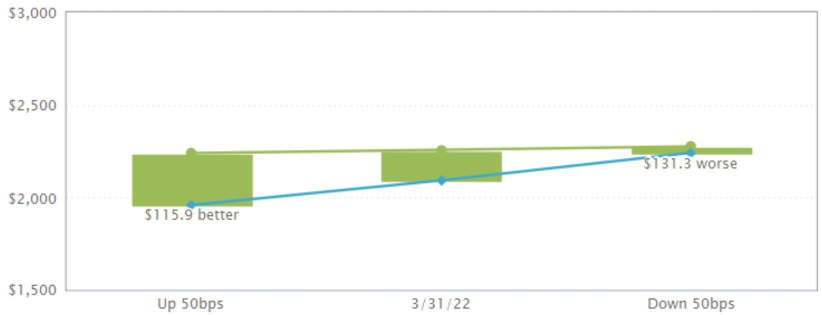


- The difference in exposure to risk-free rates between assets and liabilities combined with changes in risk-free rates resulted in an increase in funded status of 7.7%.
- The difference in exposure to credit spreads between assets and liabilities combined with changes in credit spreads resulted in an increase in funded status of 3.1%.
- Return-seeking assets did not perform as well as expected during the quarter, deducting 4.6% from the plans' funded status during the period.

Sensitivity Analysis - Solvency

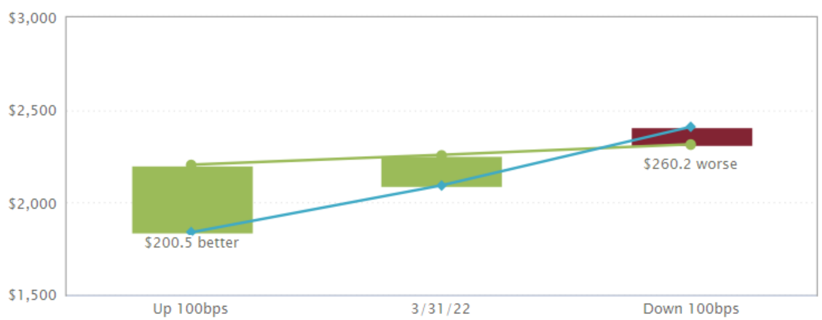
Values in $1,000,000 (CAD)

Credit Spreads



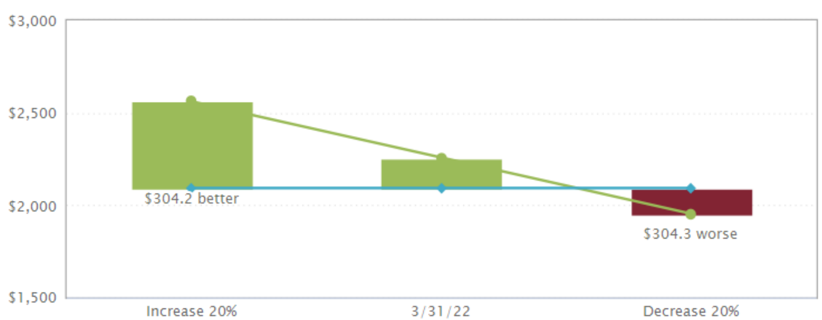
	Up 50bps		Current		Down 50bps
Market Value of Assets	$2,239.5		$2,257.3		$2,275.5
Funding Target	$1,958.7		$2,092.4		$2,241.9
Surplus/(Deficit)	$280.8		$164.9		$33.6
Change		$115.9		($131.3)	

Risk-Free Rates



	Up 100bps		Current		Down 100bps
Market Value of Assets	$2,204.2		$2,257.3		$2,314.5
Funding Target	$1,838.8		$2,092.4		$2,409.8
Surplus/(Deficit)	$365.4		$164.9		($95.3)
Change		$200.5		($260.2)	

Return-Seeking Assets



	Increase 20%		Current		Decrease 20%
Market Value of Assets	$2,561.5		$2,257.3		$1,953.0
Funding Target	$2,092.4		$2,092.4		$2,092.4
Surplus/(Deficit)	$469.1		$164.9		($139.4)
Change		$304.2		($304.3)	

Appendix

Plan Provisions & Membership Data

Same as in the Actuarial Valuation Report as of January 1, 2022.

Actuarial Methods & Assumptions

Our analysis of the estimated financial position of the Pension Plan is based on the following:

	3/31/21	6/30/21	9/30/21	12/31/21	3/31/22
Going Concern					
Discount Rate	5.30%	5.30%	5.30%	5.30%	5.50%
Inflation	2.00%	2.00%	2.00%	2.00%	2.00%
Salary Increase	3.00%/4.00%[1]	3.00%/4.00%[1]	3.00%/4.00%[1]	3.00%/4.00%[1]	3.00%/4.00%[1]
PfAD	9.00%	9.00%	9.00%	9.00%	9.00%
Mortality	CPM2014Public	CPM2014Public	CPM2014Public	CPM2014Public	CPM2014Public
Risk-Free Benchmark					
Discount Rate	0.65%	0.48%	0.62%	0.23%	0.94%
Solvency					
Annuity Purchase Interest Rate	3.10%	2.97%	3.12%	2.86%	3.81%
Effective Date of Annuity Purchase Guidance Used	3/31/21	6/30/21	9/30/21	12/31/21	3/31/22
Lump Sum Value Interest Rate (Years 1-10)[2]	1.90%	1.80%	1.90%	2.10%	3.40%
Lump Sum Value Interest Rate (Years 10+)[2]	3.50%	3.30%	3.40%	3.10%	3.70%
Mortality[3]	CPM2014	CPM2014	CPM2014	CPM2014	CPM2014
Hypothetical Wind Up					
Annuity Purchase Interest Rate (100% Indexed)	-0.22%	-0.39%	-0.25%	-0.54%	0.14%
Annuity Purchase Interest Rate (75% Indexed)	0.61%	0.45%	0.59%	0.26%	1.06%
Effective Date of Annuity Purchase Guidance Used	3/31/21	6/30/21	9/30/21	12/31/21	3/31/22
Lump Sum Value Interest Rate (100% Indexed) (Years 1-10)[2]	0.80%	0.70%	0.80%	0.70%	1.50%
Lump Sum Value Interest Rate (100% Indexed) (Years 10+)[2]	1.40%	1.20%	1.30%	1.00%	1.80%
Lump Sum Value Interest Rate (75% Indexed) (Years 1-10)[2]	1.10%	1.00%	1.00%	1.00%	2.00%
Lump Sum Value Interest Rate (75% Indexed) (Years 10+)[2]	1.90%	1.70%	1.90%	1.50%	2.30%
Mortality[3]	CPM2014	CPM2014	CPM2014	CPM2014	CPM2014
Underlying Canadian Reference Data					
CANSIM v39054 (7 Year)	1.26%	1.15%	1.24%	1.27%	2.37%
CANSIM v39056 (30 Year Long Term)	1.97%	1.84%	1.98%	1.68%	2.37%
CANSIM v39057 (30 Year Real Return)	0.22%	0.11%	0.25%	-0.14%	0.54%
CANSIM v39062 (Over 10 Years)	1.90%	1.77%	1.92%	1.66%	2.41%

[1] 3.00% per year for 2 years; 4.00% year thereafter

[2] Lump Sum Value Interest Rates are based on rates in effective on the first day of the month following quarter end (i.e., January 1st, April 1st, July 1st and October 1st).

[3] With improvement scale MI-2017 for Going Concern and Risk Free and CPM-B for Solvency.

All other assumptions and methods are the same as those shown in the Actuarial Valuation Report as of January 1, 2022. For the Risk-Free Benchmark basis, all other assumptions and methods are the same as those used for the Going Concern basis.

Actuarial Attestation

This document is intended to provide to the University of Waterloo a summary of the performance of the Pension Plan as of March 31, 2022.

This analysis is intended to assist University of Waterloo with a review of the associated issues and options, and its use may not be appropriate for other purposes. This analysis has been prepared solely for the benefit of University of Waterloo. Any further dissemination of this report is not allowed without the written consent of Aon.

In conducting the analysis, we have relied on plan design, demographic and financial information provided by other parties, including the plan sponsor. While we cannot verify the accuracy of all the information, the supplied information was reviewed for consistency and reasonableness. As a result of this review, we have no reason to doubt the substantial accuracy or completeness of the information and believe that it has produced appropriate results.

Experience different than anticipated could have a material impact on the ultimate costs of the benefits. In addition, changes in plan provisions or applicable laws could have a substantial impact on cost. Actual experience may differ from our modeling assumptions.

Aon
May 2022

Asset Allocation and Benchmarking

Asset Class	12/31/21
Alternatives	
■ FTSE EPRA NAREIT DEVELOPED Total Return Index USD	3.2%
■ MSCI USA Infrastructure Index	6.1%
Fixed Income	
■ FTSE TMX Universe Bond Index	32.6%
International Equities	
■ MSCI World Index	52.7%
■ S&P TSX	5.4%
Total	100.0%

Actuarial Valuation as at December 31, 2021 for University of Waterloo Pension Plan

Registration Number: 0310565

June 2022

Empower Results®

Table of Contents

Executive Summary

An actuarial valuation has been prepared for the University of Waterloo Pension Plan (the "Plan") as at December 31, 2021 for the primary purpose of establishing a funding range in accordance with legislative requirements for the Plan until the next actuarial valuation is performed. This section provides an overview of the important results and the key valuation assumptions which have had a bearing on these results. The next actuarial valuation for the purposes of developing funding requirements should be performed no later than as at December 31, 2024.

Summary of Principal Results

Financial Position

	December 31, 2021	January 1, 2021
Going Concern		
Assets	$ 2,380,310,000	$ 2,105,435,000
Liabilities	2,140,625,000	2,036,523,000
Financial Position	$ 239,685,000	$ 68,912,000
Adjustments[1]	(164,656,000)	(158,269,000)
Surplus/(Unfunded Liability)	**$ 75,029,000**	**$ (89,357,000)**
Solvency		
Assets[2]	$ 2,379,810,000	$ 2,104,935,000
Liabilities	2,363,546,000	2,423,689,000
Financial Position	$ 16,264,000	$ (318,754,000)
Adjustments[1]		59,453,000
Surplus/(Unfunded Liability)	**$ 16,264,000**	**$ (259,301,000)**
Hypothetical Wind Up		
Assets[2]	$ 2,379,810,000	$ 2,104,935,000
Liabilities	3,181,638,000	3,247,257,000
Surplus/(Unfunded Liability)	**$ (801,828,000)**	**$ (1,142,322,000)**

Legislative Ratios

	December 31, 2021	January 1, 2021
Funded ratio[3]	1.11	1.03
Solvency ratio	1.01	0.87
Transfer ratio	0.75	0.65

[1] Adjustments include Provision for Adverse Deviation (PfAD), prior year credit balance, and all solvency liability and solvency asset adjustments, where applicable
[2] Net of estimated wind up expenses
[3] Before application of PfAD

Normal Cost

	December 31, 2021	January 1, 2021
Normal cost	$ 89,150,000	$ 89,236,000
Required member contributions	(46,353,000)	(44,027,000)
Provision for non-investment expenses	1,606,000	1,560,000
PfAD	7,226,000	7,223,000
University Normal Cost	**$ 51,629,000**	**$ 53,992,000**
As a % of pensionable earnings	9.82%	10.30%
As a % of member contributions	111.4%	122.6%

Minimum Contribution Requirements

Considering the funding and solvency status of the Plan, the minimum University contributions for the period from January 1, 2022 to December 31, 2024 in accordance with legislative requirements, are as follows:

	January 1, 2022 to December 31, 2022	January 1, 2023 to December 31, 2023	January 1, 2024 to December 31, 2024
Normal cost	$ 89,150,000	$ 91,825,000	$ 95,498,000
Required member contributions[1]	(46,353,000)	(48,523,000)	(50,464,000)
Provision for non-investment expenses	1,606,000	1,654,000	1,720,000
PfAD	7,226,000	7,443,000	7,741,000
University normal cost	$ 51,629,000	$ 52,399,000	$ 54,495,000
Special payments toward amortizing unfunded liability	-	-	-
Adjustments	-	-	-
Minimum Required University Contribution	**$ 51,629,000**	**$ 52,399,000**	**$ 54,495,000**
Additional contribution to bring University contribution to Funding Commitment	13,809,000	15,002,000	15,602,000
Total Required University Contribution under University Funding Commitment[2]	**$ 65,438,000**	**$ 67,401,000**	**$ 70,097,000**
As a % of required member contributions	141.2%	138.9%	138.9%

[1] Reflects increases in required member contributions coming into effect May 1, 2022
[2] The University has committed to maintaining a contribution of 12.45% of pensionable earnings throughout valuation period

Membership Data

	December 31, 2021	January 1, 2021
Active members	4,851	4,905
Disabled members	102	104
Suspended members	1	1
Retired members and beneficiaries	2,315	2,176
Deferred vested members	641	632
Total	**7,910**	**7,818**

Key Assumptions

The principal assumptions to which the valuation results are most sensitive are outlined in the following table.

Going Concern	**December 31, 2021**	**January 1, 2021**
Discount rate	5.50% per year	5.30% per year
Provision for adverse deviation	9.00% of non-indexed liabilities and normal cost	Same
Inflation rate	2.00% per year	Same
Increase in pensionable earnings	3.00% per year for 2 years; 4.00% per year thereafter	3.00% per year for 3 years; 4.00% per year thereafter
Mortality table	2014 Canadian Pensioners' Public Sector Mortality ("CPM2014Public") Table with mortality improvement Scale MI-2017	Same
Increase in Year's Maximum Pensionable Earnings	2.75% per year	Same
Increase in maximum pension	$3,420.00 in 2022; increased after 2022 at 2.75% per year subject to a dollar cap of $4,000 at January 1, 2023 which increases at 0.92% per year beginning in 2024	$3,245.56 in 2021; increased after 2021 at 2.75% per year subject to a dollar cap of $3,400 which increases at 0.92% per year beginning in 2022

Solvency/ Hypothetical Wind Up	**December 31, 2021**	**January 1, 2021**
Discount rate - Solvency	Annuity purchases: 2.86% per year Transfers: 2.30% per year for 10 years, 3.40% per year thereafter	Annuity purchases: 2.50% per year Transfers: 1.20% per year for 10 years, 2.80% per year thereafter
Discount rate – Hypothetical Wind Up (Pre-2014 Accrued Pension)	Annuity purchases: -0.54% per year Transfers: 0.80% per year for 10 years, 1.20% per year thereafter	Annuity purchases: -0.78% per year Transfers: 0.60% per year for 10 years, 0.80% per year thereafter
Discount rate – Hypothetical Wind Up (Post-2013 Accrued Pension)	Annuity purchases: 0.31% per year Transfers: 1.20% per year for 10 years, 1.70% per year thereafter	Annuity purchases: 0.04% per year Transfers: 0.80% per year for 10 years, 1.30% per year thereafter
Mortality table	2014 Canadian Pensioners' Combined Mortality ("CPM2014") Table with mortality improvement Scale CPM-B	Same

Section 1: Introduction

Purpose and Terms of Engagement

We have been engaged by the University of Waterloo (the "University") Pension and Benefits Committee (the "Committee"), to conduct an actuarial valuation of the Plan, registered in Ontario, as at December 31, 2021 for the general purpose of determining the minimum and maximum funding contributions required by pension standards, based on the actuarial assumptions and methods summarized herein. Specifically, the purposes of the valuation are to:

- Determine the financial position of the Plan on a going concern basis as at December 31, 2021;
- Determine the financial position of the Plan as at December 31, 2021 on a solvency and hypothetical wind up basis;
- Determine the funding requirements of the Plan as at December 31, 2021; and
- Provide the necessary actuarial certification required under the *Pension Benefits Act (Ontario)* (the "*Act*") and the *Income Tax Act.*

The results of this report may not be appropriate for accounting purposes or any other purposes not listed above.

The next required valuation will be as at December 31, 2024.

Summary of Changes Since the Last Valuation

The last such actuarial valuation in respect of the Plan was performed as at January 1, 2021. Since the time of the last valuation, we note the following changes have occurred:

- As reported in the January 1, 2021 actuarial valuation, the Plan was amended May 1, 2020 to increase required member contributions and to increase the hard dollar pension cap. The impact of these amendments was included in the January 1, 2021 valuation and continues to be included in this valuation report. In accordance with the amendment, required member contributions will increase as follows over the period covered by this valuation report:

Effective Date	Not in Excess of Year's Maximum Pensionable Earnings (YMPE)	In Excess of YMPE
May 1, 2021	7.40%	10.60%
May 1, 2022	7.80%	11.20%

- The plan has been amended such that the $3,400[1] hard dollar pension cap will increase effective January 1, 2023 to $4,000, and then increase thereafter each calendar year commencing January 1, 2024 by one-third (1/3) of the percentage increase in the Average Industrial Wage, calculated on an annual basis.

University Information and Inputs

In order to prepare our valuation, we have relied upon the following information:

- A copy of the previous valuation report as at January 1, 2021;
- A copy of the Statement of Investment Policies and Procedures for the Plan in effect on the valuation date and a copy of the revised Statement of Investment Policies and Procedures approved subsequent to the valuation date;
- Membership data compiled as at December 31, 2021 by the University;
- Asset data taken from the Plan's unaudited and audited financial statements ; and
- A copy of the latest Plan text and amendments up to and including December 31, 2021.

Furthermore, our actuarial assumptions and methods have been chosen to reflect our understanding of the University's desired funding objectives with due respect to accepted actuarial practice and regulatory constraints.

[1] Per year of credited service

Subsequent Events

As of the date of this report, we have not been made aware of any subsequent events which would have an effect on the results of this valuation. However, the following points should be noted in this regard:

- Actual experience deviating from expected after December 31, 2021 will result in gains or losses which will be reflected in the next actuarial valuation report.
- A revised SIPP was approved by the University effective February 2, 2022. The revised SIPP has been taken into account in setting the discount rate.
- On September 14, 2021, the Canadian Institute of Actuaries released new changes to the Standards of Practice related to the determination of commuted values for indexed pension plans (by changing the determination of the rate of inflation), effective February 1, 2022. Given the effective date of these changes (February 1, 2022), they have not been reflected in the results of the current valuation.
- To the best of our knowledge, the results contained in this report are based on the regulatory and legal environment in effect at the date of this report and do not take into consideration any potential changes that may be currently under review. To the extent that actual changes in the regulatory and legal environment transpire, any financial impact on the Plan as a result of such changes will be reflected in future valuations.

Section 2: Going Concern Valuation Results

Going Concern Financial Position of the Plan

The going concern valuation provides an assessment of the Plan's financial position at the valuation date on the premise that the Plan continues on into the future indefinitely.

The selection of the applicable actuarial assumptions and methods reflect the Plan's funding objectives, as communicated by the University, actuarial standards of practice, and pension standards.

On the basis of the Plan provisions, membership data, going concern assumptions and methods, and asset information described in the Appendices, the going concern financial position of the Plan as at December 31, 2021 is shown in the following table. The results as at January 1, 2021 are also shown for comparison purposes.

Going Concern Financial Position

	December 31, 2021	January 1, 2021
Actuarial Value of Assets	**$ 2,380,310,000**	**$ 2,105,435,000**
Going Concern Liabilities		
Active members	$ 1,151,871,000	$ 1,117,509,000
Disabled and suspended members	23,910,000	24,076,000
Retired members and beneficiaries	887,184,000	840,980,000
Deferred vested members	46,913,000	46,683,000
Additional voluntary contribution balances	245,000	413,000
Member flex contributions	723,000	811,000
Cost of living increase effective May 1st	29,779,000	6,051,000
Total Liabilities	**$ 2,140,625,000**	**$ 2,036,523,000**
Going Concern Position	**$ 239,685,000**	**$ 68,912,000**
Additional liabilities due to PfAD	164,656,000	158,269,000
Prior year credit balance	-	-
Surplus/(Unfunded Liability)	**$ 75,029,000**	**$ (89,357,000)**
Funded Ratio (Before PfAD)	**1.11**	**1.03**
Funded Ratio (After PfAD)	**1.03**	**0.96**

The PfAD is not required to be applied to the liabilities in respect of post-retirement indexation of $311,116,000 as at December 31, 2021 and $277,978,000 as at January 1, 2021.

Going Concern Normal Cost

On the basis of the Plan provisions, membership data, going concern assumptions and methods, asset information and legislative requirement described in the Appendices, the going concern normal cost of the Plan as at December 31, 2021 is shown in the following table. The normal cost as at January 1, 2021 is also shown for comparison purposes.

	December 31, 2021	January 1, 2021
Normal Cost		
Normal cost	$ 89,150,000	$ 89,236,000
Provision for non-investment expenses	1,606,000	1,560,000
Additional normal cost due to PfAD	7,226,000	7,223,000
Total Normal Cost	**$ 97,982,000**	**$ 98,019,000**
Required member contributions	(46,353,000)	(44,027,000)
University Normal Cost	**$ 51,629,000**	**$ 53,992,000**
Total pensionable earnings (in year following valuation date)	$ 525,607,000	$ 524,407,000
University Normal Cost		
As a % of total pensionable earnings	9.82%	10.30%
As a % of member contributions	111.4%	122.6%

The PfAD is not required to be applied to the normal cost in respect of post-retirement indexation of $10,467,000 as at December 31, 2021 and $10,551,000 as at January 1, 2021.

Change in Financial Position

The major components of the change in the Surplus/(Unfunded Liability) for the period from January 1, 2021 to December 31, 2021 are summarized in the following table.

	January 1, 2021 to December 31, 2021
Surplus/(Unfunded Liability) as at Beginning of Plan Year	**$ (89,357,000)**
Total normal cost in inter-valuation period	(94,882,000)
Member contributions in inter-valuation period	42,618,000
University contributions in inter-valuation period	63,243,000
Expected interest on surplus (unfunded liability)	(4,449,000)
Surplus/(Unfunded Liability) as at End of Plan Year	**$ (82,827,000)**
Change in Liabilities Due to Experience Gains/(Losses)	
Return on investment earnings greater/lower than expected	147,479,000
Increase in salaries	2,531,000
Increase in YMPE higher than assumed	2,651,000
Increase in ITA maximum pension higher than assumed	(5,473,000)
Indexation experience	(18,645,000)
Retirement experience	6,273,000
Mortality experience	(6,382,000)
Termination experience	(1,418,000)
Data adjustments / article 12 transfers	520,000
Additional year of deferred COLA	(674,000)
PfAD Experience	7,971,000
Net gain/(loss) due to other experience and miscellaneous items	(861,000)
Going Concern Position After Experience Gains/(Losses) as at End of Plan year	**$ 51,145,000**
Change in discount rate	64,275,000
Increase in Hard Dollar Cap	(40,391,000)
Surplus/(Unfunded Liability) as at End of Plan Year	**$ 75,029,000**

Discussion of Changes in Assumptions

Economic Assumptions

- The following economic assumptions were changed effective December 31, 2021:
  - Discount rate was changed from 5.30% per year to 5.50% per year.

This change in economic assumptions decreased the going concern liabilities by $64,275,000 and the University normal cost by $3,796,000.

Discussion of Plan Amendments

The plan has been amended as follows:

- The plan has been amended such that the $3,400[1] hard dollar pension cap will increase effective January 1, 2023 to $4,000, and then increase thereafter each calendar year commencing January 1, 2024 by one-third (1/3) of the percentage increase in the Average Industrial Wage, calculated on an annual basis.

This change in the plan design increased the going concern liabilities by $40,391,000 and the University normal cost by $3,501,000.

Going Concern Valuation Sensitivity Results

In accordance with the CIA Standards of Practice specific to pension plans, the table below presents the sensitivity of the going concern liabilities and the total normal cost (prior to the application of the Provision for Adverse Deviation) of using a discount rate 1% lower and 1% higher than that used for the going concern valuation.

		Effect	
December 31, 2021		**$**	**%**
Going concern liabilities	$ 2,140,625,000		
Going concern liabilities (discount rate – 1%)	$ 2,482,416,000	$ 341,791,000	16.0%
Going concern liabilities (discount rate + 1%)	$ 1,869,439,000	$ (271,186,000)	(12.7)%
Normal cost	$ 89,150,000		
Normal cost (discount rate – 1%)	$ 111,590,000	$ 22,440,000	25.2%
Normal cost (discount rate + 1%)	$ 72,459,000	$ (16,691,000)	(18.7)%

[1]Per year of credited service

Plausible Adverse Scenarios

In accordance with the Canadian Institute of Actuaries Standards of Practice specific to pension plans, below is summarized scenarios of adverse but plausible assumptions, relative to the best estimate assumptions otherwise selected for the valuation.

Interest Rate Sensitivity

The table below presents the sensitivity of the going concern position and the total normal cost of using interest rates 1% lower than the current level. In order to calculate the impact on the Actuarial Value of Assets, the decrease in interest rates only impacts fixed income assets (35.0% of total assets) and an assumed duration of 8.43 for overall domestic bond index was considered.

	Base Scenario	Adverse Scenario	Impact ($)
Actuarial value of assets	$ 2,380,310,000	$ 2,441,277,000	$ 60,967,000
Going concern liabilities	2,140,625,000	2,482,416,000	341,791,000
Going concern position	$ 239,685,000	$ (41,139,000)	$ (280,824,000)
Additional liabilities due to PfAD	164,656,000	189,150,000	24,494,000
Surplus/(Unfunded Liability)	**$ 75,029,000**	**$ (230,289,000)**	**$ (305,318,000)**
Total Normal Cost (including PfAD)			
January 1, 2022 to December 31, 2022	$ 89,150,000	$ 111,590,000	$ 22,440,000

Deterioration in Asset Value

Considering that the asset allocation as of December 31, 2021 is 2.2% cash, 30.3% fixed income, and 67.5% non-fixed income, for the deterioration in asset value we estimate that the adverse scenario is related to a 20% reduction in the non-fixed income asset values and assume no change in future return expectations.

The table below presents the sensitivity of the going concern position of using the assets with a 20% reduction in non-fixed income asset values.

	Base Scenario	Adverse Scenario	Impact ($)
Actuarial value of assets	$ 2,380,310,000	$ 2,058,168,000	$ (322,142,000)
Going concern liabilities	2,140,625,000	2,140,625,000	-
Going concern position	$ 239,685,000	$ (82,457,000)	$ (322,142,000)
Additional liabilities due to PfAD	164,656,000	164,656,000	-
Surplus/(Unfunded Liability)	**$ 75,029,000**	**$ (247,113,000)**	**$ (322,142,000)**
Total Normal Cost (including PfAD)			
December 31, 2021 to December 31, 2022	$ 89,150,000	$ 89,150,000	$ -

Mortality Sensitivity

The table below presents the sensitivity of the going concern position and the total normal cost of using a mortality assumption with a 10% improvement to the base mortality rates rather than that used for the going concern valuation, thereby 90% of 2014 Canadian Pensioners Public Sector Mortality Table with improvements under Scale MI-2017.

	Base Scenario	Adverse Scenario	Impact ($)
Actuarial value of assets	$ 2,380,310,000	$ 2,380,310,000	$ -
Going concern liabilities	2,140,625,000	2,190,088,000	49,463,000
Going concern position	$ 239,685,000	$ 190,222,000	$ (49,463,000)
Additional liabilities due to PfAD	164,656,000	167,773,000	3,117,000
Surplus/(Unfunded Liability)	**$ 75,029,000**	**$ 22,449,000**	**$ (52,580,000)**
Total Normal Cost (including PfAD)			
December 31, 2021 to December 31, 2022	$ 89,150,000	$ 90,654,000	$ 1,504,000

Section 3: Solvency Valuation Results

Solvency Financial Position of the Plan

The solvency valuation is a financial assessment of the Plan that is required by the *Act* and is performed in accordance with requirements prescribed by that legislation. It is intended to provide an assessment of the Plan's financial position at the valuation date on the premise that certain obligations as prescribed by the *Act* are settled on the valuation date for all members. The liabilities must be calculated based on a postulated scenario that maximizes liabilities on wind up of the Plan. Contingent benefits are included in the liabilities that would be payable under the postulated scenario, unless permitted to be omitted under the definition of solvency liabilities under the Regulations to the *Act.* All assumptions for the solvency valuation are listed in Appendix D.

On the basis of the Plan provisions, membership data, solvency assumptions and methods and asset information described in the Appendices, as well as the requirements of the *Act*, the solvency financial position of the Plan as at December 31, 2021 is shown in the following table. The solvency financial position of the Plan as at January 1, 2021 is shown for comparison purposes.

Solvency Financial Position

	December 31, 2021	January 1, 2021
Assets		
Solvency assets	$ 2,380,310,000	$ 2,105,435,000
Estimated wind up expenses	(500,000)	(500,000)
Total Assets	**$ 2,379,810,000**	**$ 2,104,935,000**
Solvency Liabilities		
Active members	$ 1,327,244,000	$ 1,413,850,000
Disabled and suspended members	30,873,000	32,542,000
Retired members and beneficiaries	942,238,000	911,935,000
Deferred vested members	62,223,000	64,138,000
Additional voluntary contribution balances	245,000	413,000
Member flex contributions	723,000	811,000
Total Liabilities	**$ 2,363,546,000**	**$ 2,423,689,000**
Solvency Position	**$ 16,264,000**	**$ (318,754,000)**
Prior year credit balance	-	-
Present value of special payments	-	59,453,000
Solvency Surplus/(Deficiency)	**$ 16,264,000**	**$ (259,301,000)**
Solvency Ratio[1]	**1.01**	**0.87**

The liability of $818,092,000 representing the value of future indexation has been excluded (“excluded benefits”).

[1] Solvency Assets divided by Solvency Liabilities

Solvency Asset Adjustment

The present value of scheduled special payments for solvency valuation purposes has been calculated by discounting the annual special payments to be remitted up to the end of their amortization period (to a maximum of six years, at the weighted solvency discount rate of 2.70% per year compounded monthly in arrears, which was determined proportionately by the solvency discount rates used to determine the solvency liabilities.

Nature of Deficiency	Effective Date	End Date	Months Included	Annual Special Payment	Present Value as of January 1, 2022
Going concern	January 1, 2022	December 31, 2031	n/a	n/a	-
Present Value of Special Payments					**$ -**

Statutory Solvency Financial Position

The minimum funding requirements under the Regulation are based on the statutory solvency financial position as at the valuation date. In calculating the statutory solvency financial position, various adjustments can be made including solvency funding of a reduced solvency deficiency effective for valuations filed after December 31, 2017. The reduced solvency deficiency is based upon 0.85 of the solvency liabilities and 0.85 of the solvency liability adjustment.

	December 31, 2021	January 1, 2021
The amount by which the sum of:		
85% of solvency liabilities	$ 2,009,014,000	$ 2,060,136,000
85% of solvency liability adjustment	0	0
Prior year credit balance	0	0
	$ 2,009,014,000	$ 2,060,136,000
Exceeds the sum of:		
Solvency assets net of wind-up expenses	$ 2,379,810,000	$ 2,104,935,000
Solvency asset adjustment	-	59,453,000
	$ 2,379,810,000	$ 2,164,388,000
Reduced Solvency Deficiency	**$ Nil**	**$ Nil**

Solvency Concerns

A report indicates solvency concerns under the *Act* if the ratio of the solvency assets to solvency liabilities is less than 0.85.

Where a report indicates solvency concerns, the effective date of the next valuation that needs to be filed under the *Act* is one year from the valuation date of the valuation that gave rise to the solvency concerns.

Since the ratio of solvency assets to solvency liabilities is equal to 1.01, this report does not indicate solvency concerns.

Solvency Valuation Sensitivity Results

In accordance with the CIA Standards of Practice specific to pension plans, the table below presents the sensitivity of the solvency liabilities to using a discount rate of 1% lower and 1% higher than that used for the solvency valuation.

		Effect	
December 31, 2021		**$**	**%**
Solvency liabilities	$ 2,363,546,000		
Solvency liabilities (discount rate – 1%)	$ 2,739,208,000	$ 375,662,000	15.9%
Solvency liabilities (discount rate + 1%)	$ 2,073,787,000	$ (289,759,000)	(12.3)%

Incremental Cost on a Solvency Basis

The incremental cost on a solvency basis represents the present value at December 31, 2021 of the expected aggregate change in the solvency liabilities between December 31, 2021 and the next calculation date, that is December 31, 2024. Appendix D gives more details on the calculation methodology and on assumptions.

Based on this methodology and on these assumptions, the incremental cost on a solvency basis can be found in the following table.

	January 1, 2022 to December 31, 2022	**January 1, 2023 to December 31, 2023**	**January 1, 2024 to December 31, 2024**
Incremental cost on a solvency basis	$ 119,055,000	$ 136,077,000	$ 134,537,000

Pension Benefits Guarantee Fund ("PBGF")

The development of the PBGF Assessment Base is as follows:

PBGF Assessment Base	**December 31, 2021**
(1) Solvency assets	$ 2,380,310,000
(2) PBGF liabilities	$ 2,363,546,000
(3) Solvency liabilities	$ 2,363,546,000
(4) Ontario asset ratio: [(2) divided by (3)]	1.0000
(5) Ontario portion of fund: [(1) multiplied by the ratio in (4)]	$ 2,380,310,000
PBGF Assessment Base: [(2) subtract (5); if negative, enter zero]	**$ 0**

PBGF Exposure

The table below summarizes the information required in relation to PBGF claim exposure.

	Pensions, Including Bridging Benefits, in Pay	**Accrued Pensions, Including Bridging Benefits, Not in Pay**	**Total Amount**
Modified PBGF liabilities (as described in s14(8.0.4.1))	$ 426,449,000	$ 846,041,000	$ 1,272,490,000
Number of Ontario beneficiaries	2,315	5,595	7,910
Number of Ontario beneficiaries at or below the $1,500 per month benefit maximum	1,005	3,821	4,826

Percentile	Pensions, Including Bridging Benefits, In Pay: Maximum Monthly Benefit	Pensions, Including Bridging Benefits, In Pay: PBGF Liability[1]	Accrued Pensions, Including Bridging Benefits, Not in Pay: Maximum Monthly Benefit	Accrued Pensions, Including Bridging Benefits, Not in Pay: PBGF Liability
10th	$ 139	$ 421,000	$ 144	$ 6,221,000
20th	$ 284	$ 3,287,000	$ 285	$ 25,245,000
30th	$ 469	$ 10,804,000	$ 470	$ 56,977,000
40th	$ 734	$ 29,335,000	$ 734	$ 102,994,000
50th	$ 1,063	$ 67,632,000	$ 1,064	$ 169,143,000
60th	$ 1,457	$ 119,817,000	$ 1,456	$ 268,595,000
70th	$ 2,025	$ 197,155,000	$ 2,030	$ 407,892,000
80th	$ 2,989	$ 319,183,000	$ 2,993	$ 609,967,000
90th	$ 4,940	$ 502,572,000	$ 4,940	$ 942,314,000

The amount of the largest monthly pension, including bridging benefits, in pay or accrued not in pay, under the plan to an Ontario beneficiary	$ 12,281

Methodology

The benefit amounts used in the percentiles are as follows:

- For pensions in payment, they are the actual amounts in payment as of the valuation date, including bridge benefits (if any); and
- For amounts not currently in payment, the pension amounts are the accrued lifetime pension plus the accrued bridge benefit (if any), with no reduction for early commencement.

The modified PBGF liabilities represent an estimate of the PBGF liability with benefits capped at $1,500 per month (for lifetime pension and bridge combined, with the bridge benefit reduced first). For pensions not in payment, the modified PBGF liability reflects any early retirement reductions that apply, and reflects any change in optimal commencement age with the application of the $1,500 cap. To avoid extensive modifications to the valuation programs, certain simplifications may have been employed.

[1] In accordance with s 14(8.0.4)(h)(vii)

Section 4: Hypothetical Wind Up Valuation Results

Hypothetical Wind Up Financial Position of the Plan

A hypothetical wind up valuation is performed to determine the financial position of the Plan as at the valuation date on a wind up basis, reflecting market settlement rates as of the valuation date. Unlike the solvency valuation, all benefits are included that would be payable under the postulated scenario that would maximize benefits. The hypothetical wind up valuation is determined using benefit entitlements on the assumption that the Plan has neither a surplus nor a deficit. Contingent benefits are included in the liabilities that would be payable under the postulated scenario. Assets are set equal to market value net of estimated wind up expenses. All assumptions for the hypothetical wind up valuation are listed in Appendix D.

On the basis of Plan provisions, membership data, hypothetical wind up assumptions and methods, and asset information described in the Appendices, as well as the requirements of the *Act*, the hypothetical wind up financial position of the Plan as at December 31, 2021 is shown in the following table. The hypothetical wind up financial position of the Plan as at January 1, 2021 is shown for comparison purposes.

Hypothetical Wind Up Financial Position

	December 31, 2021	January 1, 2021
Assets		
Hypothetical wind up assets	$ 2,380,310,000	$ 2,105,435,000
Estimated wind up expenses	(500,000)	(500,000)
Total Assets	**$ 2,379,810,000**	**$ 2,104,935,000**
Hypothetical Wind Up Liabilities		
Active members	$ 1,725,513,000	$ 1,836,115,000
Disabled and suspended members	44,075,000	42,911,000
Retired members and beneficiaries	1,288,850,000	1,245,784,000
Deferred vested members	122,232,000	121,223,000
Additional voluntary contribution balances	245,000	413,000
Member flex contributions	723,000	811,000
Total Liabilities	**$ 3,181,638,000**	**$ 3,247,257,000**
Hypothetical Wind Up Surplus/(Deficiency)	**$ (801,828,000)**	**$ (1,142,322,000)**

Transfer Ratio

The transfer ratio is determined as follows:

			December 31, 2021	January 1, 2021
(1)	Hypothetical wind up assets		$ 2,380,310,000	$ 2,105,435,000
	Prior year credit balance	(A)	$ -	$ -
	Total University normal cost and required special payments until next mandated valuation	(B)	$ 158,523,000	$ 192,206,000
(2)	Asset adjustment	Lesser of (A) and (B)	$ -	$ -
(3)	Hypothetical wind up liabilities		$ 3,181,638,000	$ 3,247,257,000
Transfer Ratio [(1)-(2)] / (3)			**0.75**	**0.65**

Section 5: Contribution Requirements

Contribution Requirements in Respect of the Normal Cost

The annual going concern cost of benefits in respect of service accruing after the valuation date is known as the normal cost. The following table sets out:

- The development of the rule to determine the normal cost;
- An estimate of the normal cost for the 3 years following the valuation date; and
- The portion of the going concern normal cost that is to be paid by the members.

	January 1, 2022 to December 31, 2022	**January 1, 2023 to December 31, 2023**	**January 1, 2024 to December 31, 2024**
Normal Cost			
Normal cost	$ 89,150,000	$ 91,825,000	$ 95,498,000
Required member contributions	(46,353,000)	(48,523,000)	(50,464,000)
Provision for non-investment expenses	1,606,000	1,654,000	1,720,000
Additional normal cost due to PfAD	7,226,000	7,443,000	7,741,000
University Normal Cost	**$ 51,629,000**	**$ 52,399,000**	**$ 54,495,000**
Total pensionable earnings	$ 525,607,000	$ 541,375,000	$ 563,030,000
University Normal Cost			
As a % of pensionable earnings	9.82%	9.68%	9.68%
As a % of member contributions	111.4%	108.0%	108.0%

In the event an updated funding range in accordance with legislative requirements is not certified before December 31, 2024, the rule for determining the University normal cost contributions outlined in the above table will continue to be appropriate for the plan year commencing on January 1, 2025. Adjustment to the University contributions may be required once the next actuarial funding range in accordance with legislative requirements is certified.

Development of Special Payments

As the solvency ratio as at December 31, 2021 is above 85% and the Plan is in a going concern surplus under Ontario Regulation 250/18, no special payments are required.

Prior Year Credit Balance ("PYCB")

The Plan has no PYCB as at December 31, 2021.

Available Actuarial Surplus

As at December 31, 2021 the Available Actuarial Surplus is calculated as follows:

Going Concern Basis		
(A)	Total assets	$ 2,380,310,000
(B)	Total liabilities	2,140,625,000
(C)	Additional liabilities due to PfAD	164,656,000
(D)	Prior year credit balance	-
(E)	**Available Surplus: Maximum (A – B – C – D); 0)**	**$ 75,029,000**
Solvency Basis[1]		
(F)	**Assets In Excess of a Solvency Ratio of 105%**	**$ -**
(G)	**Available Actuarial Surplus: Minimum (E; F)**	**$ -**

Excess Surplus

The *Income Tax Act* requires that any excess surplus first be applied to reduce or eliminate the University contribution requirements. Excess surplus is defined in Section 147.2(2)(d) of the *Income Tax Act*, as the portion of surplus (if any) that exceeds 25% of the going concern liabilities.

As of the valuation date there is no excess surplus.

[1] The Plan is a broader public sector plan and therefore the solvency ratio threshold applies rather than the transfer ratio.

Development of Minimum Required University Contribution

The table below presents the development of the minimum required University contribution for each of the plan years covered by this report.

While we have shown a fixed University normal cost in the table below, the University may actually fund the normal cost as a percentage of member contributions.

	January 1, 2022 to December 31, 2022	**January 1, 2023 to December 31, 2023**	**January 1, 2024 to December 31, 2024**
University normal cost	$ 51,629,000	$ 52,399,000	$ 54,495,000
Special payments toward amortizing unfunded liability	-	-	-
Special payments toward amortizing solvency deficiency	-	-	-
Required application of excess surplus	-	-	-
Permitted application of available actuarial surplus	-	-	-
Minimum Required University Contribution	**$ 51,629,000**	**$ 52,399,000**	**$ 54,495,000**
Additional contribution to bring University contribution to Funding Commitment	13,809,000	15,002,000	15,602,000
Minimum Required University Contribution	**$ 65,438,000**	**$ 67,401,000**	**$ 70,097,000**
As a % of required member contributions	141.2%	138.9%	138.9%
As a % of pensionable earnings	12.45%	12.45%	12.45%

Development of Maximum Eligible University Contribution

The table below presents the development of the maximum eligible University contribution for each of the plan years covered by this report.

The maximum eligible University contribution presented in the table below for a given plan year is calculated assuming that the University makes the maximum eligible University contribution in the first plan year covered by this report.

While we have shown a fixed University normal cost in the table below, the University may actually fund the normal cost as a percentage of required member contributions.

	January 1, 2022 to December 31, 2022	**January 1, 2023 to December 31, 2023**	**January 1, 2024 to December 31, 2024**
University normal cost	$ 51,629,000	$ 52,399,000	$ 54,495,000
Greater of the Unfunded liability and the hypothetical wind up deficiency/Solvency deficiency	801,828,000	-	-
Required application of excess surplus	-	-	-
Maximum Eligible University Contribution	**$ 853,457,000**	**$ 52,399,000**	**$ 54,495,000**

If the University wishes to make the maximum eligible University contribution, it is advisable to contact the Plan's actuary before making such contribution to ensure that the contribution will be permissible and eligible and that any regulatory requirements are considered.

Section 6: Actuarial Certificate

Actuarial Opinion, Advice and Certification for the University of Waterloo Pension Plan

Registration Number: 0310565

Opinion

This actuarial certification forms an integral part of the actuarial valuation report for the Plan as at December 31, 2021. We confirm that we have prepared an actuarial valuation of the Plan as at December 31, 2021 for the purposes outlined in the Introduction section to this report and consequently:

Our advice on funding is the following:

- The University should contribute the amounts within the range of minimum and maximum contribution amounts as outlined in Section 5 of this report, in accordance with legislative requirements.
- The next actuarial valuation for the purpose of developing funding requirements should be performed no later than as at December 31, 2024.

We hereby certify that, in our opinion:

- The contribution range as outlined in this report is expected to be sufficient to satisfy the Plan's funding requirements.
- The University contribution range outlined in this report qualifies as eligible contributions under Section 147.2(2) of the *Income Tax Act.*
- The pre-1990 maximum pension restrictions in Subsection 8504(6) of the Regulations to the *Income Tax Act* do not apply to any members of the Plan.
- For the purposes of the valuation:
  - The data on which this valuation is based are sufficient and reliable;
  - The assumptions used are appropriate; and
  - The actuarial cost methods and the asset valuation methods used are appropriate.
- This report and its associated work have been prepared, and our opinion given, in accordance with accepted actuarial practice in Canada and in compliance with the requirements outlined in subparagraphs 147.2(2)(a)(iii) and (iv) of the *Income Tax Act*.

- Notwithstanding the above certifications, emerging experience differing from the assumptions will result in gains or losses that will be revealed in subsequent valuations.

Linda M. Byron, FCIA, FSA
Senior Partner

Allan H. Shapira, FCIA, FSA
Managing Director

Aon
20 Bay Street, Suite 2300
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June 2022

Appendix A: Assets

Asset Data

The Plan's assets are held by CIBC Mellon. The asset information presented in this report is based on the financial statements of the pension fund prepared by CIBC Mellon and statements audited by Ernst & Young.

Tests of the sufficiency and reliability of the asset data were performed and the results were satisfactory. The tests included:

- A reconciliation of actual cash flow with expected cash flow from the previous actuarial report; and
- A reconciliation of any anticipated benefit payments (for retirees, terminated, or deceased members) against the financial statements of the pension fund for confirmation of payments.

Market Value of Assets

The following is a summary of the composition of the Plan's assets by asset type as reported by CIBC Mellon as at December 31, 2021. For comparison purposes, the composition at the previous valuation date of January 1, 2021 is also shown.

	December 31, 2021	**January 1, 2021**
Canadian equities	5.4%	7.2%
Global equities	52.8%	45.2%
Fixed-income	30.3%	35.0%
Cash	2.2%	4.0%
Real estate	3.2%	2.7%
Infrastructure	6.1%	5.9%
Total Invested Assets	**100.0%**	**100.0%**

Target Asset Mix

The target asset mix of the Plan is contained in the Plan's Statement of Investment Policies and Procedures in effect on the valuation date and is as follows:

	Target
Canadian equities	15.0%
Global equities	40.0%
Fixed-income	33.0%
Cash	2.0%
Real estate	5.0%
Infrastructure	5.0%
	100.0%

Reconciliation of Changes in Market Value of Assets

The table below reconciles changes in the market value of assets between January 1, 2021 and December 31, 2021.

		January 1, 2021 to December 31, 2021
Market Value of Assets, Beginning of Plan Year	**$**	**2,108,218,000**
Contributions During Plan Year		
Member	$	42,618,000
University current service		53,992,000
University special payments		9,251,000
University ongoing expenses		-
Interest on contributions		-
Total	**$**	**105,861,000**
Benefit Payments During Plan Year		
Non-retired members[1]	$	15,231,000
Retired members		71,758,000
Total	**$**	**86,989,000**
Transfers During Plan Year		
Into plan	$	859,000
Out of plan		-
Total	**$**	**859,000**
Fees/Expenses		
Investment fees/expenses	$	3,048,000
Non-investment fees/expenses		1,803,000
Total	**$**	**4,851,000**
Investment Income	**$**	**264,555,000**
Market Value of Assets, End of Plan Year	**$**	**2,387,653,000**
Rate of Return, Net of Fees/Expenses		**12.26%**

[1] Includes members who have terminated employment or died

Development of Adjusted Market Value of Assets

The adjusted market value of assets is equal to the market value of assets adjusted to reflect any contributions, benefit payments, transfers and fees/expenses in-transit as of the valuation date. The development of the adjusted market value of assets is shown below.

	December 31, 2021
Market Value of Assets	**$ 2,387,653,000**
Contributions receivable	-
Benefits payable	(5,690,000)
Transfers (payable)/receivable	-
Fees/expenses payable	(1,653,000)
Adjusted Market Value of Assets	**$ 2,380,310,000**[1]

Development of Actuarial Value of Assets

The actuarial value of assets is equal to the adjusted market value of assets.

[1] Calculated as $2,384,894,000 as per audited statements, less $4,584,000 of in-transit benefit payments that for valuation purposes are excluded from the liabilities

Appendix B: Membership Data

Source of Data

This valuation was based on member data provided by the University as of December 31, 2021. Tests of the sufficiency and reliability of the member data were performed and the results were satisfactory. The tests included:

- A reconciliation of membership status against the membership status at the last valuation. This test was performed to ensure that all members were accounted for. A summary of this reconciliation follows on the next page;
- A reconciliation of birth, hire, and participation dates against the corresponding dates provided for the last valuation to ensure consistency of data;
- A reconciliation of credited service against the corresponding amount provided for the last valuation to ensure that no member accrued more than 1 year of credited service from January 1, 2021. This test also revealed any members who accrued less than 1 year of credited service;
- A reconciliation of pensionable earnings against the corresponding amounts provided for the last valuation to identify any unusual increases or decreases;
- A reconciliation of accrued benefits against the corresponding amounts provided for the last valuation to identify any unusual benefit accruals;
- A reconciliation of any stated benefit payments since January 1, 2021 (for retired, terminated, or deceased members) against the financial statements of the pension fund for confirmation of the payments; and
- A reconciliation of inactive member benefit amounts against the corresponding amounts provided for the last valuation to ensure consistency of data.

There was no information missing from the data, so no assumptions were required with respect to such data.

A copy of the administrator certification certifying the accuracy and completeness of the member data (and the Plan provisions summarized in this report) is included in Appendix F of this report.

Membership Summary

The table below reconciles the number of members as of December 31, 2021 with the number of members as of January 1, 2021 and the changes due to experience in the period.

	Active	Disabled	Suspended	Retired and Beneficiaries	Deferred Vested	MMO Deferred	Total
Members, January 1, 2021	**4,905**	**104**	**1**	**2,176**	**630**	**2**	**7,818**
Changes due to:							
New entrants	439	-	-	-	-	-	439
Returning Actives	16	(16)					
Termination							
Non-vested	-		-	-	-	-	-
Deferred vested	(91)	-	-	-	91	-	-
Lump sum	(236)	(2)		-	(60)	-	(298)
Death							
No further benefits			-	(36)		-	(36)
Lump Sum	(11)	(2)					(13)
Remaining guarantee	-	-	-	-	-	-	-
Surviving beneficiary	(1)		-	(18)	-	-	(19)
New beneficiary	-	-	-	19	-	-	19
Retirement	(144)	(8)	-	174	(22)		-
Disability	(26)	26	-	-	-	-	-
Return from Disability	-	-	-	-	-	-	-
Transfer to Suspended	-	-	-	-	-	-	-
Re-Entry into Plan	-	-	-	-	-	-	-
New Certain Only beneficiary	-	-	-	-	-	-	-
Certain Only Payments Ceased	-	-	-	-	-	-	-
Data correction	-	-	-	-	-	-	-
Net change	(54)	(2)	-	139	9		92
Members, December 31, 2021	**4,851**	**102**	**1**	**2,315**	**639**	**2**	**7,910**

Active and Transferred Members

	December 31, 2021	January 1, 2021
Number	4,851	4,905
Average age	46.9	47.1
Average Credited Service	10.3	10.2
Average Pensionable Earnings	$ 106,874	$ 105,460
Proportion female	53.0%	52.3%

Disabled Members

	December 31, 2021	January 1, 2021
Number	102	104
Average age	56.8	55.5
Average Credited Service	18.0	17.7
Average Pensionable Earnings	$ 70,222	$ 68,518
Proportion female	66.7%	73.1%

Suspended Members

	December 31, 2021	January 1, 2021
Number	1	1
Average age	*	33.9
Average Credited Service	*	3.1

Deferred Vested Members - Eligible for COLA on All Service

	December 31, 2021	January 1, 2021
Number	331	321
Average age	58.8	58.5
Average Annual Pension	$ 8,676	$ 8,651
Total Annual Pension	$ 2,871,710	$ 2,776,970

Deferred Vested Members - Eligible for COLA on Pre-2008 Service

	December 31, 2021	January 1, 2021
Number	101	105
Average age	47.5	46.9
Average Annual Pension	$ 9,772	$ 9,078
Total Annual Pension	$ 986,900	$ 953,149

Deferred Vested Members - Not Eligible for COLA

	December 31, 2021	January 1, 2021
Number	207	204
Average age	41.6	41.4
Average Annual Pension	$ 4,562	$ 4,073
Total Annual Pension	$ 944,338	$ 830,922

Retired Members and beneficiaries

	December 31, 2021	January 1, 2021
Number	2,315	2,176
Average age	74.7	74.7
Average Annual Pension	$ 32,446	$ 32,149
Total Annual Pension	$ 75,110,368	$ 69,955,961

Active/Disabled Membership Distribution

The following table provides a detailed summary of the active/disabled membership at the valuation date by years of credited service and by age group. For privacy reasons, average pensionable earnings is not shown for groups with two or less members.

Age	< 5	5–10	10–15	15–20	20–25	25–30	>=30	Total
< 30	240	10						250
	$ 63,738	$ 61,013	$	$	$	$	$	$ 63,629
30–35	358	136	7					501
	$ 78,296	$ 79,762	$ 91,347	$	$	$	$	$ 78,876
35–40	390	220	90	7				707
	$ 85,034	$ 99,265	$ 92,325	$ 84,724	$	$	$	$ 90,387
40–45	274	276	129	52	7			738
	$ 85,604	$ 113,108	$ 120,745	$ 111,110	$ 103,368	$	$	$ 103,998
45–50	173	171	170	128	48	2		692
	$ 86,271	$ 110,448	$ 136,786	$ 144,429	$ 105,054	$ 77,427	$	$ 116,690
50–55	110	134	134	155	99	19	3	654
	$ 85,699	$ 97,699	$ 113,983	$ 135,229	$ 134,816	$ 118,605	$ 97,200	$ 114,135
55–60	102	96	96	126	202	54	16	692
	$ 93,555	$ 101,670	$ 114,401	$ 120,900	$ 124,898	$ 153,058	$ 96,763	$ 116,148
60–65	46	79	69	79	89	145	47	554
	$ 98,705	$ 96,546	$ 115,452	$ 132,506	$ 141,826	$ 127,841	$ 149,172	$ 124,138
>=65	9	22	18	22	30	11	54	166
	$ 95,777	$ 117,326	$ 120,087	$ 138,478	$ 139,528	$ 162,371	$ 189,982	$ 149,893
Total								
Count	**1,702**	**1,144**	**713**	**569**	**475**	**231**	**120**	**4,954**
Average Pensionable Earnings	**$ 81,811**	**$ 101,801**	**$ 118,040**	**$ 131,048**	**$ 128,738**	**$ 134,184**	**$ 159,249**	**$ 106,114**

Deferred Vested/Retired Membership Distribution

The following table provides a detailed summary of the deferred vested/retired membership at the valuation date by age group. For privacy reasons, average pensions are not shown for groups with two or less members.

Age		Deferred Vested Members	Retired Members and Beneficiaries
< 50	Count	289	
	Average Monthly Lifetime Pension	$ 439	
50–55	Count	101	
	Average Monthly Lifetime Pension	$ 803	$
55–60	Count	111	46
	Average Monthly Lifetime Pension	$ 912	$ 1,322
60–65	Count	94	192
	Average Monthly Lifetime Pension	$ 799	$ 2,274
65–70	Count	25	515
	Average Monthly Lifetime Pension	$ 555	$ 2,261
70–75	Count	10	551
	Average Monthly Lifetime Pension	$ 126	$ 2,898
75–80	Count	5	419
	Average Monthly Lifetime Pension	$ 86	$ 3,163
>=80	Count	4	592
	Average Monthly Lifetime Pension	$ 81	$ 2,830
Total			
Count		**639**	**2,315**
Average Monthly Lifetime Pension		**$ 626**	**$ 2,704**

Appendix C: Going Concern Assumptions and Methods

Assumptions and Methods

A member's entitlements under a pension plan are generally funded during the period over which service is accrued by the member. The cost of each member's benefits is allocated in some fashion over the member's service. An actuarial valuation provides an assessment of the extent to which allocations relating to periods prior to a valuation date (often referred to as the actuarial liabilities) are covered by the plan's assets.

The going concern valuation provides an assessment of a pension plan on the premise that the plan continues on into the future indefinitely based on assumptions in respect of future events upon which a plan's benefits are contingent and methods that effectively determine the way in which a plan's costs will be allocated over the members' service. The true cost of a plan, however, will emerge only as experience develops, investment earnings are received, and benefit payments are made.

This appendix summarizes the going concern assumptions and methods that have been used for the going concern valuation of the Plan at the valuation date. The going concern assumptions and methods have been chosen to reflect our understanding of the Plan's funding objectives with due respect to accepted actuarial practice and regulatory constraints. For purposes of this valuation, the going concern methods and assumptions were reviewed and changes as indicated were made.

The actuarial assumptions and methods used in the current and previous valuations are summarized below and described on the following pages.

	December 31, 2021	**January 1, 2021**
Economic Assumptions		
Discount rate	5.50% per year	5.30% per year
Inflation rate	2.00% per year	Same
Post-retirement indexation		
Pre-2014 accrued pensions	2.00% per year	Same
Post-2013 accrued pensions	1.50% per year	Same
Increases in pensionable earnings		
Active members	3.00% per year for 2 years; 4.00% per year thereafter	3.00% per year for 3 years; 4.00% per year thereafter
Disabled members	2.00% per year	Same
Increases in year's maximum pensionable earnings (“YMPE”)	2.75% per year	Same
Increases in maximum pension limit	$3,420.00 in 2022; increased after 2022 at 2.75% per year subject to a dollar cap of $4,000 in 2023 which increases at 0.92% per year beginning in 2024	$3,245.56 in 2021; increased after 2021 at 2.75% per year subject to a dollar cap of $3,400 which increases at 0.92% per year beginning in 2022
Interest on member contributions	2.00% per year	2.50% per year
Interest rate used to calculate 50% rule	0.80% per year for 10 years; 1.20% per year thereafter	0.60% per year for 10 years; 0.80% per year thereafter
Investment expenses	Discount rate is net of investment expenses	Same
Non-investment expenses	$1,606,000 (increased at 3% per year) is added to the University normal cost to cover non-investment expenses	$1,560,000 (increased at 3% per year) is added to the University normal cost to cover non-investment expenses
PfAD	9.00% of non-indexed liabilities and normal cost (including provisions for expenses)	Same

	December 31, 2021	January 1, 2021
Demographic Assumptions		
Mortality table	2014 Canadian Pensioners' Public Sector Mortality ("CPM2014 Public") Table with mortality improvement Scale MI-2017	Same
Retirement rates	Variable by age (Table A following)	Same
Termination rates	Variable by age (Table B following)	Same
Election on termination	All terminating members are assumed to elect a deferred pension	Same
Disability rates	None	Same
Methods		
Actuarial cost method	Projected unit credit	Same
Asset valuation method	Market value of assets adjusted to reflect contributions, benefit payments, transfers and fees/expenses in transit as of the valuation date	Same

Table A—Retirement Rates

Retirement rates per 1,000 lives are shown in the following table:

Age	Rates per 100
60	5
61	5
62	25
63	10
64	10
65	50
66	25
67	25
68	25
69	50
70	100

Table B—Termination Rates

Sample rates used in this valuation are shown as rates per 100 lives in the following table:

Age	Male and Female
20	10.0
25	10.0
30	5.6
35	3.2
40	2.2
45	1.7
50	1.2
55	0.7
60	0.2
65	0.0

Justification of Actuarial Assumptions and Methods

Margins for Adverse Deviations

The actuary has discussed the Plan's experience with the University and compared it to the expected experience. This review indicates that the use of the PfAD achieves the University's desire to maintain safety cushions; therefore the decision was made to not include any additional margins for conservatism. The Provision for Adverse Deviation that is required by Ontario Regulation is discussed later in this section.

Economic Assumptions

Discount Rate

The overall expected return ("best-estimate") of 5.50% was developed based on an inflation rate of 2.00% per year, using best-estimate returns for each major asset class in which the pension fund is invested. A Monte Carlo simulation is performed over 30 years where the portfolio returns are projected assuming annual rebalancing. The average of the 30-year geometric return is used to develop an overall best-estimate rate of return for the entire pension fund. Gains from rebalancing and diversification are implicit to this return.

The following table lays out the adjustments that have been made to the overall expected rate of return in order to arrive at our going concern discount rate assumption:

Development of Discount Rate	
Overall expected return	5.57%
Non-investment expenses	0.00%
Passive Investment expenses	(0.07)%
Additional returns due to active management	0.00%
Discount Rate	**5.50%**

Inflation Rate

The inflation rate assumption reflects our best estimate of future inflation considering current economic and financial market conditions, and reflects the mid-point of Bank of Canada target inflation.

Increases in Pensionable Earnings

The assumption for increases in pensionable earnings reflects the assumed rate of inflation, plus allowances for the effect of productivity growth, individual employee merit and promotion. In the near-term, it reflects the anticipated impact of Ontario Bill 124 which limits wage increases in the broader public sector.

Increases in YMPE

As the benefits paid to a member from the Plan are dependent on the future YMPE, it is necessary to make an assumption regarding the future increases in the YMPE.

The assumed increase in the YMPE reflects the assumed rate of inflation plus an allowance for productivity growth.

Increases in the Maximum Pension Limit

Pensions are limited to the maximum limits under the *Income Tax Act*. The *Income Tax Act* specifies both a dollar limit, and in addition pensions cannot exceed 2% of indexed highest average compensation per year of credited service. The assumed increase in the dollar limit reflects the assumed rate of inflation plus an allowance for productivity growth.

Interest on Member Contributions

Interest is credited on member contributions with the rate credited by chartered banks on five-year personal fixed term deposits. The assumption for interest on member contributions reflects our expected increase in these rates, and is consistent with historical rates.

Expenses

Since the discount rate has been established net of investment expenses, no explicit assumption is required for investment expenses.

An explicit provision for non-investment expenses has been included in the normal cost.

Provision for Adverse Deviation

For the purpose of this valuation, the PfAD is established based on the target asset allocation for each category of investments set out in the Statement of Investment Policies and Procedures (SIPP) in effect at the date of this report.

Asset Mix Component	Investment Categorization under Regulation 76 (12)	Categorization under Regulation 11.2 (8)[1]	Target Asset Allocation (%)
Cash and short term	4	Fixed Income ("L")	2.0%
Fixed-income	15	Fixed Income ("L")	33.0%
Canadian equities	13	Non-Fixed Income	15.0%
Global equities	14	Non-Fixed Income	40.0%
Real Estate (REIT)	7	Non-Fixed Income	5.0%
Infrastructure (Listed)	17	Non-Fixed Income	5.0%
			100.0%
Fixed income ("L")			35%
Alternative Investment ("M")			0%
(a) Percentage of fixed income for PfAD ["L" + 50%* "M"]			35.00%
(b) Percentage of non-fixed income for PfAD [100%-(a)]			65.00%
(c) Asset mix component (see table below) [2]			5.00%

Percent of Non-Fixed Income Assets	PfAD for Closed Plans	PfAD for Open Plans
0%	0%	0%
20%	2%	1%
40%	4%	2%
50%	5%	3%
60%	7%	4%
70%	11%	6%
80%	15%	8%
100%	23%	12%

[1] The fixed income investments satisfy the minimum credit rating requirements prescribed by the Regulation.
[2] Based on linear interpolation.

Benchmark Discount Rate (BDR)

(d) V39056 rate at the valuation date	1.68%
(e) BDR [(d)+1.5%*(a)+5.0%*(b)+0.5%]	5.96%
(f) Best estimate discount rate[1]	5.57%
(g) Plan duration	15.97

PfAD is Determined as Follows:

Fixed component (open 4% or closed 5%)	4.00%
Asset mix component	5.00%
BDR component [Max [0, (g)*((f)-(e))]]	0.00%
Total	**9.00%**

[1] Gross of non-investment expenses and passive investment management fees.

Demographic Assumptions

Mortality

At the current valuation, we are using the 2014 Canadian Pensioners' Public Sector Mortality Table with mortality improvements in accordance with MI-2017.

In 2017, the CIA released a research paper introducing a new Mortality Improvement Scale (MI-2017) and subsequently published an Education Note stating that both the MI-2017 and CPM-B Scales "constitute broad and relevant mortality improvement studies for the Canadian population." We have continued to use MI-2017 projection scale for the purposes of this valuation since this scale takes into account a broader thinking on mortality improvements.

Retirement

The rates of retirement vary by age. The rates of retirement have been developed as our expectation of the best-estimate rates of retirement based on the Plan provisions and a review of retirement experience over the 10 year period ending in 2019. We have been using this table since 2020. We compare actual experience to this assumption with each valuation to monitor its continued appropriateness.

Termination of Employment

The rates of termination of employment before retirement represent a best estimate of termination rates for a plan of this size and workforce characteristics of the Plan. Table A was developed by a previous actuary for the Plan. We have been using this table as our assumption since our first valuation in 2005. The resulting gains and losses have been relatively small. Therefore, we continue to find this table appropriate.

Option Elections on Termination

We have assumed all members will elect a deferred annuity on termination.

Disability

If an active Plan member becomes disabled, contributory service continues to accrue until unreduced pension commencement age, but employee contributions are waived. Since this benefit is substantially the same as the benefit that accrues to an active member, no disability assumption was used. Use of an actual disability assumption in this case would reduce liabilities slightly, so a nil disability incidence assumption represents a small element of conservatism. The disability assumption has very little impact on the valuation results.

Proportion of Members with Spouses and Spousal Age Differential

There is no percent married assumption or age difference assumption required since the Plan does not offer a subsidized joint and survivor pension at retirement, nor any specific preretirement death benefit for a spouse that is not offered to any other beneficiary.

Other

Actuarial Cost Method

An actuarial cost method is a technique used to allocate in a systematic and consistent manner the expected cost of a pension plan over the years of service during which Plan members earn benefits under the Plan. By funding the cost of a pension plan in an orderly and rational manner, the security of benefits provided under the terms of the Plan in respect of service that has already been rendered is significantly enhanced.

The projected unit credit actuarial cost method has been used for this valuation. Under this method, the actuarial present value of benefits in respect of service prior to the valuation date, but based on pensionable earnings projected to retirement, is compared with the actuarial asset value, revealing either a surplus or an unfunded actuarial liability.

With respect to service after the valuation date, the expected value of benefits for service in the year following the valuation date (i.e., the normal cost) net of any required employee contributions is expressed as a percentage of the expected value of participating payroll for that year. The employer normal cost contributions are determined each year by applying this percentage to the actual participating payroll for the year.

When calculating the actuarial present value of benefits at the valuation date, the present value of all retirement, withdrawal and preretirement death benefits are included. For each member, the retirement, withdrawal and preretirement death benefits for a particular period of service are first projected each year into the future taking into account future vesting, early retirement entitlements and minimum pension/value entitlements. These projected benefits for each future year are then capitalized, multiplied by the probability of the member leaving the Plan in that year and discounted with interest and survivorship to the valuation date. The actuarial present value of benefits for the particular period of service is then determined by summing the present values of these projected benefits.

The pattern of future contributions necessary to pre fund future benefit accruals for any one particular individual will increase gradually as a percentage of their pensionable earnings as the individual approaches retirement. For a stable population (i.e., one where the demographics of the group remain constant from year to year), the normal cost will remain relatively level as a percentage of payroll. The projected unit credit actuarial cost method therefore allocates contributions among different periods in an orderly and rational manner for a stable population group.

In the event of future adverse experience, contributions in addition to the normal cost calculated under the projected unit credit actuarial cost method may be required to ensure that the Plan's assets are adequate to provide the benefits. Conversely, favourable experience may generate surplus which may serve to reduce future contribution requirements.

Asset Valuation Method

The asset valuation method for this valuation is market value of assets. All other gains and losses have been fully recognized.

Appendix D: Solvency and Hypothetical Wind Up Assumptions and Methods

Valuation Assumptions

	December 31, 2021	January 1, 2021
Economic Assumptions		
Discount Rates—Solvency		
Transfer value basis	2.30% per year for 10 years; 3.40% per year thereafter	1.20% per year for 10 years; 2.80% per year thereafter
Annuity purchase basis	2.86% per year	2.50% per year
Duration used to determine annuity purchase basis	11.33	11.63
Blended rates used to determine solvency special payments	n/a	2.20%
Discount Rates—Hypothetical Wind-Up		
Transfer value basis		
100% CPI Indexed	0.80% per year for 10 years; 1.20% per year thereafter	0.60% per year for 10 years; 0.80% per year thereafter
75% CPI Indexed	1.20% per year for 10 years; 1.70% per year thereafter	0.80% per year for 10 years; 1.30% per year thereafter
Annuity purchase basis		
100% CPI Indexed	-0.54% per year	-0.78% per year
75% CPI Indexed	0.31% per year	0.04% per year

Demographic Assumptions		
Mortality table	2014 Canadian Pensioners' Combined Mortality ("CPM2014") Table with mortality improvement Scale CPM-B[1]	Same
Termination rates	Immediate	Same
Retirement age	50% at age between 55 and 65 that produces highest value and 50% at unreduced age 62	Same

[1] No preretirement mortality was applied

	December 31, 2021	January 1, 2021
Other		
Wind up expenses	$500,000	Same
Actuarial cost method	Unit credit	Same
Asset valuation method	Market value of assets adjusted to reflect contributions, benefit payments, transfers and fees/expenses in transit as of the valuation date	Same
Incremental Cost		
The assumptions for the expected benefit payments and decrement probabilities, service accruals, and projected changes in benefits and/or pensionable earnings	Same as going concern	Same

Based on the CIA's Guidance and information such as pension legislation, Plan provisions and Plan experience, we have made the following assumptions regarding how the Plan's benefits would be settled on Plan wind up:

	Percent of Liability Assumed to be Settled By Purchase of Annuities	Percent of Liability Assumed to be Settled By Lump-Sum Transfer
Active Members		
Not retirement eligible	0%	100%
Retirement eligible	100%	0%
Deferred Vested Members		
Not retirement eligible	100%	0%
Retirement eligible	100%	0%
Retired Members and Beneficiaries	100%	0%

Postulated Scenario

The postulated scenario is the assumption of immediate termination of employment for the active group at the valuation date. Therefore, no allowance for future salary increases or demographic experience are reflected.

Benefits Valued

	Solvency Valuation	Hypothetical Wind Up Valuation
Vesting	We have treated all accrued benefits as vested on Plan wind up.	We have treated all accrued benefits as vested on Plan wind up.
Consent Benefits	None.	None.
Grow-in Benefits	Active members with 55 age-plus-continuous service points as of the valuation date are assumed to grow into the enhanced early retirement reductions of the Plan.	Active members with 55 age-plus-continuous service points as of the valuation date are assumed to grow into the enhanced early retirement reductions of the Plan.
Exclusions	In accordance with the *Pension Benefits Act* (Ontario), the solvency liability excludes the value of future escalated adjustments (future indexation) for both the preretirement and postretirement period.	None.
Post-Valuation Date Benefit Increases	Not applicable	Not applicable
Indexing	Excluded	Included

Justification for Valuation Assumptions

We have set the aforementioned assumptions based on guidance prepared by the CIA Committee on Pension Plan Financial Reporting ("PPFRC") in Educational Note – Assumptions for Hypothetical Wind-Up and Solvency Valuations with Effective Dates between December 31, 2021 and December 30, 2022 ("CIA Guidance") released on January 18, 2022.

For benefit entitlements that are expected to be settled by lump-sum transfer, we based the assumptions on Section 3500 (Pension Commuted Values) of the CIA Standards of Practice, using rates corresponding to a valuation date of December 31, 2021.

For benefit entitlements that are expected to be settled by purchase of annuities, we based the assumptions on information compiled by the PPFRC from insurance companies active in the group annuity market as described in the educational note.

Non-Indexed Rates

Solvency lump-sum discount rate for 10 years	= V122542[1] + 69 bps = 1.63% + 0.74% **= 2.32% (rounded to 2.30%) per year**
Solvency lump-sum discount rate thereafter	= V122544[30]+ 0.5 x (V122544[1] – V122542[1]) + 119 bps = 2.08% + 0.5 x (2.08% – 1.63%) + 1.06% **= 3.36% (rounded to 3.40%) per year**
Solvency annuity purchase discount rate	= V39062 + Duration Adjustment = 1.66% +1.20% **= 2.86% per year**

[1] CANSIM Series (annualized)

Indexed Rates

Theoretical Yield on 7-year RRGCB (r_7) = V122553[1] x (V122542[1] / V122544[1])
= 0.15% x (1.63%/2.08%)
= 0.12% per year

Fully indexed lump-sum discount rate for 10 years ($r_{1\text{-}10}$) = $[(1 + i_{1\text{-}10})/(1 + 1 \times c_{1\text{-}10})] - 1$
= [(1 + 2.32%) / (1+ 1 x 1.51%)] - 1
= 0.80% per year

Fully indexed lump-sum discount rate thereafter (r_{10+}) = $[(1 + i_{10+})/(1 + 1 * c_{10+})] - 1$

= [(1 + 3.36%) / (1+ 1 x 2.14%)] - 1
= 1.20% per year

Full indexed annuity purchase discount rate = V39057 – 40 bps
= -0.14% - 0.40%
= -0.54% per year

Implied 100% CPI for 10 years ($c_{1\text{-}10}$) = $[(1 + i_7) / (1 + r_7)] - 1$
= [(1 + 1.63%) / (1 + -0.12%)] - 1
= 1.51% per year

Implied 100% CPI for 10 years (c_{10+}) = $[(1+i_L+0.5x(i_L-i_7)/(1+r_L+0.5x(r_L - r_7)] - 1$
= 2.14% per year

Partially indexed (75% CPI) lump-sum discount rate for 10 years = $[(1 + i_{1\text{-}10}) / (1 + 0.75 \times c_{1\text{-}10})] - 1$

= [(1 + 2.32%) / (1 + 0.75 x 1.51%)] - 1
= 1.20% per year

Partially indexed (75% CPI) lump-sum discount rate thereafter = $[(1 + i_{10+}) / (1 + 0.75 \times c_{10+})] - 1$

= (1 + 3.36%) / (1 + 0.75 x 2.14%) - 1
= 1.70% per year

Partially indexed (75% CPI) annuity purchase discount rate =

0.25 x Solvency annuity purchase discount rate + 0.75 x Full indexed annuity purchase discount rate
= 0.25 x 2.86% + 0.75 x -0.54%
= 0.31% per year

Mortality Table

The derivation of the discount rate above is in conjunction with CPM2014 in accordance with the CIA Guidance

Preretirement Mortality

We have made no allowance for preretirement mortality. The impact of including such an assumption would not have a material impact on the valuation, since the value of the death benefit is approximately equal to the value of the accrued pension.

Assumptions Not Needed

The following are not relevant to the solvency or hypothetical wind up valuation:

- Increases in pensionable earnings;
- Increases in YMPE; and
- Termination of employment rates.

Estimated Wind Up Expenses

Plan wind up expenses would normally include such items as fees related to preparation of the actuarial wind up report, fees imposed by a pension supervisory authority, legal fees, administration, custodial and investment management expenses. We calculated this as a flat $500,000. We have not made an allowance for expenses related to surplus or deficit resolution. We have assumed that the University will still be solvent on the wind up of the Plan.

Calculation of Special Solvency Payments

To calculate the special payments necessary to liquidate the Solvency deficiency we used a weighted average of the solvency discount rates based on the relative proportions of benefit entitlements that are expected to be settled by purchase of annuities and lump-sum transfer.

Unisex Assumption

The liabilities are valued on a sex-distinct basis. The determination of the unisex percentage used in the payment of commuted values to members eligible for portability is based on the proportion of active and deferred vested liabilities for males and females. As such, the determination of commuted value liabilities on a sex-distinct basis in the solvency/hypothetical wind-up valuation is appropriate.

Actuarial Cost Methods

Unit credit (accrued benefit) cost method as prescribed.

Asset Valuation Method Considerations

Assets for solvency purposes have been determined using market value.

Incremental Cost

The incremental cost represents the present value, at the calculation date (time 0), of the expected aggregate change in the liabilities between time 0 and the next calculation date (time t), adjusted upwards for expected benefit payments between time 0 and time t.

An educational note was published in December 2010 by the CIA Committee on PPFRC to provide guidance for actuaries on the calculation of this new information.

The calculation methodology can be summarized as follows:

- The present value at time 0 of expected benefit payments between time 0 and time t, discounted to time 0,

  plus

- Projected liabilities at time t, discounted to time 0, allowing for, if applicable to the pension plan being valued:
  - expected decrements and related changes in membership status between time 0 and time t,
  - accrual of service to time t,
  - expected changes in benefits to time t,
  - a projection of pensionable earnings to time t,

  minus

- The liabilities at time 0.

The projection calculations take into account the following assumptions and additional considerations:

The assumptions for the expected benefit payments and decrement probabilities, service accruals, and projected changes in benefits and/or pensionable earnings would be consistent with the assumptions used in the pension plan's going concern valuation.

The assumptions used to calculate the projected liability at time t are consistent with the assumptions for the liabilities at time 0, assuming that interest rates remain at the levels applicable at time 0, that the select period is reset at time t for interest rate assumptions that are select and ultimate and that the Standards of Practice for the calculation of commuted values and the guidance for estimated annuity purchase costs in effect at time 0 remain in effect at time t.

- Active and inactive Plan members as of time 0 are considered in calculating the incremental cost.

Appendix E: Summary of Plan Provisions

This funding valuation was based on Plan design information provided by the University as of December 31, 2021. The following is a summary of the main provisions of the Plan.

Plan Provisions—DB Provision

Effective Date	January 1, 2011 (last restatement of the Plan document and as subsequently amended).
Jurisdiction of Registration	Ontario
Eligibility for Membership	Faculty and Staff Employees are eligible to join the Plan on the first day of any month coincident with or next following the date of employment with the University. An eligible Employee must join the Plan no later than the first day of the calendar year coincident with or next following attainment of age 35, or their appointment (if already age 35). Faculty Employees employed as lecturers may elect not to join the Plan. However, a lecturer who has attained age 35 must join the Plan on the first day of the month coincident with or next following the earlier of promotion to a higher rank or completion of five years of service with the University. Any Employee who has either earned at least 35% of the Year's Maximum Pensionable Earnings (YMPE) under the Canada Pension Plan or worked at least 700 hours in each of the two immediately preceding calendar years, shall be eligible to join the Plan on the first day of any month coincident with or next following the date on which such conditions are satisfied.
Normal Retirement	
Eligibility	First day of the month coincident with or next following attainment of age 65.
Benefit	Effective May 1, 1998 on retirement, a member receives an annual pension equal to the sum of the following: 1.4% of Final Average Earnings up to the Average Year's Maximum Pensionable Earnings, plus, 2.0% of Final Average Earnings in excess of the Average Year's Maximum Pensionable Earnings for each year and completed month of Credited Service under the Plan.

The Final Average Earnings is determined based on 36 consecutive months of earnings for retirements on or before January 1, 2014. The averaging period is increased by one month for each month in 2014 and 2015 so that the averaging period is 60 consecutive months for all retirements after December 31, 2015. The Average Year's Maximum Pensionable Earnings is determined over a five-year period.

On retirement prior to May 1, 1998, a member received an annual pension equal to the sum of the following:

1.3% of Final Three-Year Average Earnings up to the Average Year's Maximum Pensionable Earnings, plus,

2.0% of Final Three-Year Average Earnings in excess of the Average Year's Maximum Pensionable Earnings.

for each year and completed month of Credited Service under the Plan.

The Average Year's Maximum Pensionable Earnings was determined over a three-year period.

Maximum Pension

The annual benefit payable in the Normal Form under the Plan for a member determined at the time of pension commencement cannot exceed the lesser of:

- the lesser of (a) and (b):
  - (a) the defined benefit limit for the year as defined in the *Income Tax Act*; and
  - (b) $3,400.00 prior to January 1, 2023 or $4,000.00 effective January 1, 2023, increased thereafter each calendar year commencing January 1, 2024 by one-third (1/3) of the percentage increase in the Average Industrial Wage, calculated on an annual basis.

times the Member's Credited Service; and

- 2.0% of the Member's highest indexed compensation times Credited Service.

For service prior to January 1, 1992, a member's Credited Service shall not exceed 35 years.

Regulation 8504(6) imposes a lower maximum benefit limit in respect of any pre-1990 service that is granted after June 8, 1990 (e.g., buy-back or granting of years of pre-1990 service that was not previously counted as Credited Service).

Early Retirement

Eligibility	Within ten years of normal retirement date and retire from active service.
Benefit	For Members who retired on an early retirement date prior to May 1, 2000, the pension payable on early retirement is reduced by ⅓ of 1% for each of the first 60 complete months by which early retirement precedes the normal retirement date plus ½ of 1% for each additional complete month. For Members who retire on an early retirement date on or after May 1, 2000, the pension payable on early retirement is reduced by 1/2 of 1% for each complete month by which early retirement date precedes the first day of the month coincident with or next following age 62. In any event, the reduced pension cannot be less than the actuarial equivalent of the Member's accrued pension.

Postponed Retirement

Eligibility	Any age after normal retirement date; pension commencement under the Plan may not be postponed beyond the end of the calendar year in which the Member attains age 71.
Benefit	The Member continues to make required contributions, his or her service continues to accrue and the Member will receive a pension on his or her postponed retirement date based on Credited Service, Final Average Earnings and Average Year's Maximum Pensionable Earnings at that date, subject to the paragraphs below. A Member who is a Faculty Employee employed by the University since prior to January 1, 1969 is permitted, if he or she elects on or before normal retirement date to postpone retirement by no more than three years following the first of the month coincident with or next following the end of the contract year during which he or she attains age 65, to elect on or before normal retirement date to cease making any further contributions to the Plan. Such Member shall receive a pension equal to the actuarial equivalent of the pension they would have received at normal retirement date. A Member who is a non-union Staff Employee employed by the University since prior to January 1, 1969 is permitted, if he or she elects on or before normal retirement date to postpone retirement by no more than three years following the first of the month coincident with or next following the normal retirement date, to elect on or before normal retirement date to cease making any further contributions to the Plan. Such Member shall receive a pension equal to the actuarial equivalent of the pension they would have received at normal retirement date.

Termination Benefits	
Eligibility	Immediate (prior to early retirement date)
Benefit	A Member whose service terminates is entitled to a locked-in fully vested deferred pension commencing at his normal retirement date. The early retirement reduction applicable if the former Member commences receipt of the pension prior to normal retirement date, on or after early retirement date, is equal to 1/3 of 1% for each of the first 60 complete months by which early retirement precedes the normal retirement date plus ½ of 1% for each additional complete month. A Member who terminates employment and is entitled to a locked-in vested deferred pension may request that an amount equal to the commuted value of the deferred pension entitlement be transferred to another registered pension plan, to a prescribed locked-in retirement savings arrangement or to an insurance University for the purchase of a life annuity that will not commence benefit payments prior to the Member's early retirement date. Different provisions applied for those members who terminated employment prior to July 1, 2012
Death Benefits	
Eligibility	Immediate
Benefit	On the death of a Member while in the service of the University, a refund of the commuted value of the accrued pension, subject to the 50% minimum employer cost rule plus any additional voluntary contributions, are paid to the Member's spouse, or if no spouse, the Member's designated beneficiary or estate. Different pensions applied prior to July 1, 2012.
Disability	
Eligibility	Immediate (prior to age 65)
Benefit	Members who are in receipt of income disability benefits under the long-term disability insurance plan of the University cease to contribute while disabled but continue to accrue Credited Service for pension purposes. Accrued pensions for LTD Members are based on pensionable earnings, to date of disability, increased each year by a percentage which is determined annually by the Committee.
Normal Form of Payment	The normal form of pension payable to a Member is a life annuity with a ten-year guarantee period. For Members who terminated prior to May 1, 1998 and are entitled to a deferred pension under the Plan, the normal form is a life annuity with a five-year guarantee period.

Cost-of-Living Adjustments

The pension of each Member receiving pension payments on May 1 of any year shall be adjusted by the Postretirement Cost-of-Living Factor for each year, provided that the Member has received at least one regular pension payment prior to May 1.

For any pension benefits accrued prior to January 1, 2014, this factor is obtained by dividing the average Consumer Price Index for the preceding calendar year by the average index for the next preceding calendar year. In the first year of retirement, the increase will be provided on a pro rata basis subject to the *Income Tax Act* rules. However, if this factor exceeds 105% and if the financial position of the Plan is not sufficient to provide for this increase, the factor may be reduced, within certain limits, to maintain the solvency of the Plan.

For any pension benefits accrued on and after January 1, 2014 this factor is obtained by dividing the average Consumer Price Index from the preceding calendar year by the average index for next preceding calendar year, and then multiplying the result by 0.75. However, if this factor exceeds 103.75% and if the financial position of the plan is not sufficient to period for this increase, the factor may be reduced, within certain limits, to maintain the solvency of the Plan.

In 2009, the date of the annual adjustment changed from July 1 to May 1, with the first such adjustment as of May 1, 2009 prorated to reflect the ten-month period since the prior adjustment.

All terminated Members who are entitled to a terminated vested pension except for those who terminated between July 1, 1977 and December 31, 1986 shall have their terminated vested pensions adjusted on May 1 (July 1 prior to 2009) of each year by a cost-of-living factor to be determined annually by the Committee, subject to the *Income Tax Act* Rules. Notwithstanding the foregoing, if a Member terminates employment on or after January 1, 2008 and is not within ten years of his or her Normal Retirement Date, or has not completed 20 years or more of continuous employment, the Cost of Living Factor shall only apply to the terminated vested member's pension earned in respect of Credited Service prior to January 1, 2008.

Increases in the Consumer Price Index and the corresponding postretirement cost-of-living factors for 2017 and the previous years are shown below[1]:

[1] Cost of living factors only shown for pre-2014 accrued benefits

Year	Increase in Prior Year Consumer Price Index (%)	Postretirement Cost-of-Living Factor (%)
1968	-	2.50
1969	-	3.00
1970	4.50	4.50
1971	3.30	2.00
1972	2.90	2.30
1973	4.80	4.80
1974	7.70	6.40
1975	10.90	10.90
1976	10.80	10.80
1977	7.50	7.50
1978	7.99	5.00
1979	8.91	8.91
1980	9.15	9.15
1981	10.16	10.16
1982	12.49	10.00
1983	10.76	10.76
1984	5.83	5.83
1985	4.35	4.35
1986	3.96	3.96
1987	4.17	4.17
1988	4.37	4.37
1989	4.04	4.04
1990	4.97	4.97
1991	4.76	4.76
1992	5.64	5.64
1993	1.49	1.49
1994	1.84	1.84
1995	0.19	0.19
1996	2.17	2.17
1997	1.56	1.56
1998	1.63	1.63
1999	0.97	0.97
2000	1.74	1.74
2001	2.68	2.68
2002	2.56	2.56
2003	2.23	2.23
2004	2.77	2.77
2005	1.88	1.88
2006	2.17	2.17
2007	2.04	2.04
2008	2.20	2.20
2009[1]	1.94	1.94
2010	0.29	0.29
2011	1.78	1.78
2012	2.91	2.91
2013	1.52	1.52
2014	0.94	0.94
2015[2]	1.91	1.91
2016	1.13	1.13
2017	1.43	1.43
2018	1.60	1.60
2019	2.27	2.27
2020	1.95	1.95
2021	0.72	0.72
2022	3.40	3.40

[1] Effective May 1, 2009 the indexation date was changed from July 1 to May 1. Therefore, the indexation adjustment made in 2009 is prorated for ten months since the prior adjustment

[2] Pensions earned up to December 31, 2013 are indexed annually at 100% of the postretirement cost-of-living factor; pensions earned on and after January 1, 2014 are indexed at 75% of the postretirement cost-of-living factor

Member Contributions

Effective May 1, 2020, Members are required to contribute to the Plan in accordance with the following table:

	Contribution Rate on Earnings	
Effective Date	**Not in Excess of Year's Maximum Pensionable Earnings**	**In Excess of Year's Maximum Pensionable Earnings**
May 1, 2020	6.95%	9.95%
May 1, 2021	7.40%	10.60%
May 1, 2022	7.80%	11.20%

Effective January 1, 2013, members are required to contribute 6.25% of annual earnings up to the YMPE, 8.95% of annual earnings that exceed the YMPE but are less than two times the YMPE, and 9.95% of annual earnings in excess of two times the YMPE, subject to the amount permitted under the *Income Tax Act* for the year.

Effective May 1, 2009, Members were required to contribute 5.80% of annual Earnings up to the YMPE, 8.30% of annual Earnings that exceed the YMPE but are less than two times the YMPE, and 9.65% of annual Earnings in excess of two times the YMPE, subject to the amount permitted under the *Income Tax Act* for the year.

Effective July 1, 2008, Members were required to contribute 5.05% of annual Earnings up to the YMPE, 7.85% of annual Earnings that exceed the YMPE but are less than two times the YMPE, and 9.20% of annual Earnings in excess of two times the YMPE, subject to the maximum amount permitted under the *Income Tax Act* for the year.

Effective July 1, 2007, Members were required to contribute 4.80% of annual Earnings up to the YMPE, 7.175% of annual Earnings that exceeds the YMPE but are less than two times the YMPE, and 7.85% of annual Earnings in excess of two times the YMPE, subject to the maximum amount permitted under the *Income Tax Act* for the year.

For the period January 1, 2003 to June 30, 2007, Members were required to contribute 4.55% of annual Earnings up to the YMPE and 6.50% of the excess of Earnings above the YMPE, subject to the maximum amount permitted under the *Income Tax Act* for the year.

Prior to May 1, 1998, Members were required to contribute 4.875% of annual Earnings up to the YMPE and 6.50% of the excess of annual Earnings above the YMPE, subject to the maximum amount permitted under the *Income Tax Act* for the year. Between May 1, 1998 and January 1, 2003, there were temporary reductions in these member contribution rates.

Prior to January 1, 2012, these contributions were credited with interest each year at the four-year arithmetical average rate of return on the pension fund, excluding real return bonds, calculated at December 31st of the prior year. Effective January 1, 2012, the interest credit is the CANSIM rate.

Member Flexible Pension Plan Contributions

Prior to January 1, 2014, members are permitted to make additional flexible Pension Plan contributions on December 31st of each year up to the maximum deductible contribution permitted by the *Income Tax Act*.

On retirement or termination of membership, a Member’s flexible Pension Plan contribution balance may be used to purchase additional ancillary benefits under the Pension Plan, up to the maximum ancillary benefits permitted by the *Income Tax Act*.

Flexible contributions that cannot be used to purchase ancillary benefits will be forfeited by the Member.

Transfers to the Pension Fund

A new Member may transfer the value of his or her benefits earned under the registered pension plan of a previous employer into the pension fund. The terms and conditions of such transfer and the benefits that will be payable are determined in accordance with Article 12 of the Plan, as amended from time to time.

Definitions

Pensionable earnings	**Staff Employees** Base salary, excluding overtime pay, reimbursement for expenses, special payments, shift premiums, week-end provisions, special allowances and other like payments. **Faculty Employees** Base salary, excluding reimbursement for expenses, administrative stipends, faculty research fellowships, seasonal stipends, summer teaching stipends, special payments, special allowances and other like payments.
Credited service	Member's years and completed months of continuous employment with the University while a member in the Plan. For service of a member employed on a part-time basis, the period of service is multiplied by the proportion the member's reduced workload bears to a regular full-time workload.

A copy of a letter from the University certifying the accuracy and completeness of the Plan provisions summarized in this report is included in Appendix F of this report.

Appendix F: Administrator Certification

With respect to the University of Waterloo Pension Plan, forming part of the actuarial report as at December 31, 2021, I hereby certify that, to the best of my knowledge and belief:

- The asset data provided or made available to the actuary is complete and accurate;
- The membership data and subsequent query answers provided or made available to the actuary are complete and accurate for all persons who are entitled to benefits under the terms of the Plan in respect of service up to the date of the valuation;
- The Plan provisions provided or made available to the actuary are complete and accurate;
- The actuary has been notified of all relevant events subsequent to the valuation measurement date; and
- The terms of engagement contained in Section 1 of this report are accurate and reflect the plan administrator's direction.

Name (print) of Authorized Signatory	Title
Signature	Date

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UNIVERSITY OF WATERLOO
PENSION PLAN FOR FACULTY AND STAFF

Amendment No. 8

The Board of Governors of the University of Waterloo resolves that the University of Waterloo Pension Plan for Faculty and Staff (amended and restated effective January 1, 2011), Registration Number 0310565 (the "Plan"), is amended to as follows:

1. Effective January 1, 2023, the definition of "Pension Cap" in Section 2.22.1 shall be deleted and replaced with the following:

   "2.22.1 "**Pension Cap**" means $3,400 effective January 1, 2021, increased effective January 1, 2022 by one-third (1/3) of the percentage increase in the Average Industrial Wage, calculated on an annual basis.

   Effective January 1, 2023, "Pension Cap" means $4,000, increased thereafter each calendar year commencing January 1, 2024 by one-third (1/3) of the percentage increase in the Average Industry Wage, calculated on an annual basis.

   For purposes of this Section, "Average Industrial Wage" means the average industrial wage as published by Statistics Canada under the authority of the *Statistics Act* (Canada) for purposes of increasing the Year's Maximum Pensionable Earnings and the maximum pension pursuant to the Income Tax Act."

CERTIFICATION

I ____________________________, Secretary to the Board of Governors of the University of Waterloo, do hereby certify under the seal of the University that the foregoing resolution was duly approved by the Board of Governors at a meeting held on the ___ day of ______________, 2022.

____
Signature

____
Date

PENSION INVESTMENTS CARBON ANALYSIS & DISCLOSURES

As at December 31, 2021

UNIVERSITY OF WATERLOO

Responsible Investing Advisory Group

In June 2021, the Board of Governors endorsed recommendations from the Responsible Investing Advisory Group related to the Pension and Endowment investments. These recommendations included:

- Adopt a scorecard approach to carbon measurement including: Total Carbon Emissions, Carbon Footprint, and Weighted Average Carbon Intensity
  - Equity measurements for 2021
  - Fixed income and real assets for 2023
- Carbon footprint reduction targets, for scope 1 & 2 emissions
  - 50% by 2030, relative to 2018
  - Carbon Neutral by 2040
- Recommendations formalized in Responsible Investment Policy, approved by Board in April 2022

Carbon Measurement Process

The University has contracted with MSCI to provide the following services:

- MSCI index data (used for benchmarking)
- Access to ESG Manager portal and carbon data*
- Analysis and calculation of carbon metrics for 2018

*MSCI carbon data is based on reported carbon from individual companies, or is estimated using a proprietary carbon emissions estimation model. MSCI carbon assessments and estimates are generated semi-annually; however due to timing differences and fiscal year cycles, carbon data could lag up to two years.

Carbon Measurements

- Total Carbon Emissions
  - The absolute greenhouse gas emissions associated with a portfolio, expressed in tons CO2e

Formula

$$\sum_{n}^{i}\left(\frac{\text{current value of investment}_i}{\text{issuer's market capitalization}_i} * \text{issuer's Scope 1 and Scope 2 GHG emissions}_i\right)$$

- Carbon Footprint
  - Total carbon emissions for a portfolio, normalized by the market value of the portfolio, expressed in tons CO2e / $M USD invested

Formula

$$\frac{\sum_{n}^{i}\left(\frac{\text{current value of investment}_i}{\text{issuer's market capitalization}_i} * \text{issuer's Scope 1 and Scope 2 GHG emissions}_i\right)}{\text{current portfolio value (\$M)}}$$

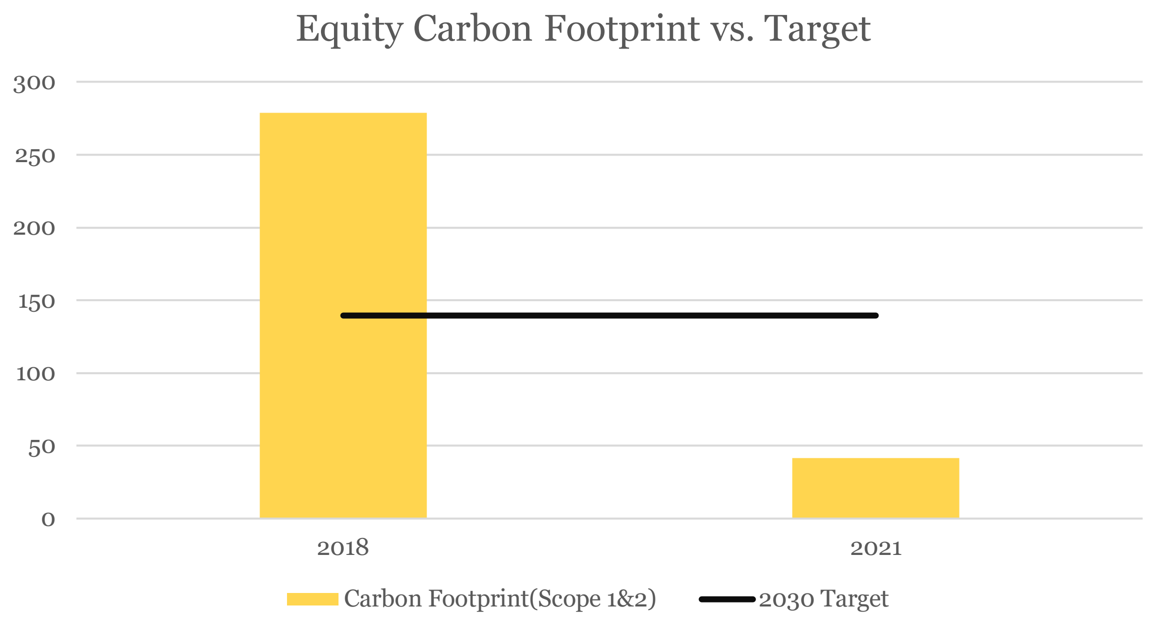
- Weighted Average Carbon Intensity
  - The portfolio's exposure to carbon-intensive companies, expressed in tons CO2e / $M USD revenue

Formula

$$\sum_{n}^{i}\left(\frac{\text{current value of investment}_i}{\text{current portfolio value}} * \frac{\text{issuer's Scope 1 and Scope 2 GHG emissions}_i}{\text{issuer's \$M revenue}_i}\right)$$

Pension Equity – Scorecard

Carbon Measure	Total Carbon Emissions	Carbon Footprint	Weighted Average Carbon Intensity	Coverage	Equity Market Value (CAD)
2018 Equity Portfolio	123,798	278.8	239.8	96.1%	678,893,000
2018 Benchmark	69,878	146.2	255.8	93.5%	
2021 Equity Portfolio	51,698	41.5	115.6	99.4%	$1,364,899,000
2021 Benchmark	89,036	71.5	174.1	96.9%	



UNIVERSITY OF WATERLOO

Scorecard Takeaways

Carbon Footprint for equity investments has achieved the 2030 target, 50% reduction

- Please note that:
  - Carbon footprint measurement does not yet include Fixed Income or Real Asset investments
  - Global carbon emissions were suppressed in 2020 and 2021 due to pandemic shutdowns and restrictions

It will be appropriate to revisit the carbon reduction target after the carbon scorecard includes all asset categories and further trending in the carbon metrics are available.

UNIVERSITY OF WATERLOO

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Report to the Faculty Relations Committee and Staff Relations Committee
Pension & Benefits Committee
27 May 2022

The Pension & Benefits (PB) Committee met on 20 May 2022 and agreed to recommend revisions to Policy 23 and Policy 59 to both the Faculty Relations Committee and Staff Relations Committee, in order to clarify service definitions under those policies.

RECOMMENDATION

1. REVISION TO POLICY 23 – ELIGIBILITY FOR PENSION & INSURED BENEFITS

Motion: That the [*Faculty Relations Committee or Staff Relations Committee*] approve the following change to section 2(D) of Policy 23 – Eligibility for Pension and Insured Benefits (new text: underlined):

> **"**D. Retirees Receiving a Monthly UW Pension
>
> To be eligible for post-retirement benefits, retirees must have at least 10 years of continuous University of Waterloo service in a regular ongoing position, in definite term/temporary consecutive contracts whose lengths are a minimum of one year, or a combination thereof, followed by immediate receipt of a monthly UW pension. Approved leaves of absence, temporary reduced workloads, maternity/parental leaves and sick leaves/LTD are not deemed as interruptions in service for purposes of this policy.

2. REVISION TO POLICY 59 – REDUCED WORKLOAD TO RETIREMENT

Motion: That the [*Faculty Relations Committee or Staff Relations Committee*] approves the following change to section 2 of Policy 59 – Reduced Workload to Retirement, as follows (new text: underlined, deleted text = ~~strikeout~~):

> "Reduced Workload to Retirement
>
> ~~Faculty and staff members who are at least 45 years of age with completion of at least 10 years of uninterrupted regular full-time service immediately prior to the commencement of the arrangement, may request a reduction of their daily, weekly, monthly or annual period of work to as low as 50% of that required for a full-time position.~~ To be eligible to request a reduced workload to retirement arrangement, employees must be at least 45 years of age with completion of at least 10 years of continuous University of Waterloo service in a full-time regular ongoing position, in definite term/temporary consecutive contracts whose lengths are a minimum of one year, or a combination thereof, prior to the commencement of the arrangement. Eligible employees may request a reduction of their daily, weekly, monthly or annual period of work to as low as 50% of that required for a full-time position. Salary is adjusted proportionately to reflect reduction of work. ~~Leaves~~ Approved leaves of absence, temporary reduced workloads, maternity/parental leaves and sick leave/LTD are not deemed as interruptions in service for purposes of this policy.
>
> …"

BACKGROUND AND RATIONALE

In September 2020, the committee struck a working group to review the interpretation of retiree benefits eligibility under Policy 23 and Policy 59. The wording pertaining to eligibility criteria differs between these two policies (i.e. 10 years of continuous service in Policy 23 versus 10 years of uninterrupted regular full-time service in Policy 59) but in practice the administrative interpretation has been the same (i.e. 10 years of participation in the full benefits program).

At the May 2021 committee meeting, the working group submitted the following recommendations pertaining to Policies 23 and 59:

> *Agree that the interpretation of the ten-year eligibility criteria is such that the ten-year period shall be deemed to have commenced on the earlier of the start date of the regular ongoing appointment or with the start of participation in the temporary benefits program (for those not having a regular ongoing appointment). This interpretation would apply to both Policy 23 and Policy 59 wording as defined in the group's mandate.*

The proposed amendments will bring a clear and consistent interpretation of these policies on a go-forward basis.

In addition to requiring policy revisions to align with this clarified eligibility criteria, this represents a change in administration practice where employees with 10 years of participation in either of the full benefits program or the temporary benefits program are considered eligible. Human Resources has implemented this change to the retiree benefits administration as per the direction from the committee; however, it has not been communicated to campus (i.e. benefits booklet, HR website, etc.) and such communication are not planned until the applicable policies are revised to ensure alignment.

OTHER INFORMATION *(for inclusion with the Staff Relations Committee exhibit only)*

The working group reviewed the eligibility for active employees to participate in the full benefits program through Policy 23. A difference in administration was observed between the eligibility criteria for academic and non-academic/staff positions which was identified as contradictory to the wording within Policy 23 that indicates no difference in eligibility criteria across employee groups.

Effective June 1, 2022, benefits administration for active staff (unionized and non-unionized) employees will be revised to fully align with Policy 23, with eligibility for full benefits commencing as follows:

(a) at the start date for regular ongoing positions; or
(b) at the start date for a contract with an initial appointment of two years; or
(c) once two years of service is accumulated for consecutive contracts (with a one year minimum since contracts of a lesser duration do not attract benefits).

Administration of these changes needs to be sensitive to the potentially regressive nature of a blanket implementation. To ensure fairness to impacted employees, those currently employed on a contract basis who have achieved the eligibility criteria for the full benefits program based on the above criteria will be contacted and provided an opportunity to opt into participation effective June 1, 2022 or their date of eligibility (if later). Implementing this change via optional enrolment is necessary as any employee who opts into the full benefits program will also incur certain premiums - specifically the Long Term Disability benefit, and also a share of the cost associated with the Dental benefit (for those employed on a part-time basis). As new contracts are agreed to with staff employees, participation in the full benefits program will become mandatory based on the achievement of eligibility criteria as defined in Policy 23.

Peter Barr
Chair, Pension & Benefits Committee

Benefits Coverage for In Vitro Fertilization (IVF)

Earlier this year, members of the Pension & Benefits Committee observed that the current coverage for In Vitro Fertilization (IVF) does not extend to those without a uterus or those whose uterus cannot or will not be used for such a purpose. Concerns were expressed as to the legality of the plan design and the lack of inclusion of the aforementioned groups. Human Resources was tasked with examining the matter further with the aim of reporting back at the May 2022 meeting.

Background on Existing Coverage

Based on the recommendation from the Pension & Benefits Committee's holistic benefits review working group, the extended health benefit was amended effective May 1, 2021. Among the changes, new coverage for IVF was approved by the Board of Governors on February 2, 2021 with "80% reimbursement for eligible expenses, subject to reasonable and customary limits".

Shortly thereafter, Canada Life identified to Human Resources that IVF coverage is not standardly available to their clients and as such, reasonable and customary limits do not exist; however, they agreed to administer the coverage with plan design parameters to be defined by the University. On March 12, 2021, the Pension & Benefits Committee decided that the following coverage would apply, as recommended by Aon:

Eligible expenses:**

- anesthetist fees
- cycle monitoring fee
- 1 ultrasound and blood test once the in-vitro procedure has begun (usually only one is required to confirm pregnancy)
- embryo freezing - initial process, preparation and annual storage (annual storage limit of 1 year)
- embryo thawing
- in-vitro fertilization procedure
- sperm thawing
- sperm washing
- transfer of frozen embryo

**Includes expenses which are part of the IVF process. Coverage available through provincial healthcare programs must be exhausted first.

Ineligible expenses:

- embryo donation program (fee paid to a recognized clinic or qualified medical practitioner)
- donation to a sperm bank
- donor's fee or cost
- medical expenses or services incurred by the surrogate mother

- surrogate agency fee
- surrogate mother's fee

Coverage maximum: A lifetime maximum of $30,000 per member. This maximum should enable two IVF attempts through the plan (in addition to the first attempt covered through provincial healthcare).

Age limitation: Provincial coverage in Ontario requires a patient to be under 43 years old and as such, the University plan design should align accordingly.

The above coverage was added to the extended health benefit by Canada Life on May 1, 2021 and is being administered in accordance with the defined parameters.

Implications of Existing Coverage

IVF coverage provides financial support to extended health benefit members (i.e. employees/retirees and their eligible dependents) with family aspirations; however, as the coverage is available for eligible expenses incurred by those who are eligible for the extended health benefit only, some members with family aspirations are excluded from this financial support (i.e. those without a uterus or those whose uterus cannot or will not be used for such a purpose).

Legal Input

Consultation with internal legal counsel yielded a response that the current plan design is not considered discriminatory under the Ontario Human Rights Code.

Administrative Feasibility

Currently, it would not be possible to amend the extended health benefit to provide an employee with reimbursement for an expense incurred by their surrogate, as those charges do not meet the criteria that governs Private Health Service Plans nor do the charges qualify as an eligible Medical Expense Tax Credit (METC) under the *Income Tax Act*. However, a surrogate would be eligible for IVF coverage if they are already members (i.e. either as an eligible employee/retiree or their eligible dependents) of the extended health benefit.

To comply with the *Act* and also provide reimbursement to employees for IVF expenses incurred by a surrogate who is not a member of the extended health benefit would require the establishment of a new benefit with an external vendor, such as a taxable spending account. Amounts reimbursed would be included as a taxable benefit on annual tax slips.

Aon's April 2022 Information Bulletin highlights that the Federal Budget 2022 includes initiatives intended to address diversity and inclusion, including a proposal to include surrogacy as an eligible METC. Allowing these costs as eligible for METC would enable the University to allow for related expense coverage in the benefit program on a non-taxable basis, through the establishment of a new benefit with an external vendor, such as a health care spending account.

Next Steps

The above brings to light an area of demand for IVF coverage which extends beyond the current design as a tax-free benefit. Should the committee seek to examine the matter further, it may be advisable to strike a subcommittee including representatives from the employee stakeholder groups and representatives from Aon, the future healthcare provider (i.e. Green Shield Canada effective January 1, 2023), Finance, and Human Resources. A future report would require further examination of the financial implications and regulatory/contractual requirements, and would likely occur against a backdrop of an evolving federal tax framework.

Topic: Equitable access to IVF benefit

Background: IVF benefits were added to our benefits package in 2020. So if a member is seeking treatment then many of the costs associated with IVF would be covered. However, there are members of the community who can not access these IVF benefit even though they are going through IVF procedures and are members of the plan. These are members who require the use of a surrogate because they lack a womb, or are unable to use their womb, and it is the surrogate that's going through IVF to conceive.

Proposal: The cost of IVF process incurred by the surrogate be made claimable as if it was incurred by a member of the plan though an exceptional process.

April 2022

Information Bulletin

In this issue

Federal Budget 2022

On April 7, 2022, the Canadian government released *Budget 2022: A Plan to Grow Our Economy and Make Life More Affordable* (**Budget 2022**).

A big focus of Budget 2022 is on making the cost of living more affordable for Canadians. Included are proposed measures to make housing more affordable and dental care more accessible. Alongside these issues, are key initiatives intended to address the current economy, climate change, and diversity and inclusion. This bulletin addresses the potential impact of Budget 2022 on benefit and retirement savings plans.

Health Solutions

Medical Expense Tax Credit for Surrogacy and Other Expenses

Although costs related to the use of reproductive technologies are already eligible expenses for the purposes of the medical expense tax credit (**METC**), they are not available to those who need to pay the medical expenses of others in order to become a parent.

Budget 2022 proposes to allow medical expenses related to a surrogate mother or a sperm, ova, or embryo donor, that are incurred in Canada for 2022 and subsequent taxation years, to be claimed under the METC. This would include costs that have been reimbursed to a surrogate for in vitro fertilization expenses and fees paid to fertility clinics and donor banks in Canada in order to obtain donor sperm and ova.

Allowing these costs as eligible METC expenses is relevant for benefit plan sponsors who could begin to allow for related expense coverage in their benefits plans, including their health care spending accounts. Diversity, equity and inclusion (**DEI**) conversations

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frequently touch on coverage of surrogacy expenses. This change will provide opportunities for plan sponsors to provide new avenues of conception support coverage for all employees with family aspirations.

Dental Care

As previously announced by the agreement between the federal Liberal Party and the federal New Democratic Party, Budget 2022 proposes to provide funding of $5.3 billion over five years, starting in 2022-23, and $1.7 billion ongoing, to Health Canada to provide dental care for Canadians. This will start with under 12-year-olds in 2022, and then expand to under 18-year-olds, seniors, and persons living with a disability in 2023, with full implementation by 2025. The program would be restricted to families with an income of less than $90,000 annually, with no co-pays for those under $70,000 annually in income.

For now, there are few details available on how this public dental care plan will be integrated with private group dental insurance. As further detail is released, Aon will provide more information on the full impact and advise on available strategies for plan sponsors.

Pharmacare

Budget 2022 pledges continued ongoing progress towards a universal national pharmacare program. This will include tabling a Canada pharmacare bill and working to have it passed by the end of 2023, and then tasking the Canadian Drug Agency to develop a national formulary of essential medicines and bulk purchasing plan.

Budget 2022 reiterates information provided when the Supply and Confidence Agreement between the federal Liberal Party and the federal New Democratic Party was announced in March 2022. Details on the proposed plan are limited. A national pharmacare plan is likely to have a notable impact on private drugs plans, the extent of which will depend on details released as the program takes shape. For now, there are more questions than answers, but employers will want to prepare for a strategic review of their drug benefit offer in the not-so-distant future. Aon continues to monitor these important developments closely and will provide plan sponsors with updates and analysis as the federal strategy evolves.

Mental Health and Wellbeing

To help Canadian receive the mental health care they need, the federal government will invest in identifying and expanding effective mental health interventions. The government also intends to engage with provinces and territories to inform the development of a new Canada Mental Health Transfer that will support the expansion and delivery of high quality and accessible mental health services across Canada.

Budget 2022 proposes to provide ongoing funding to Health Canada for the Wellness Together Canada portal, which provides Canadians with tools and services to support their mental health and well-being. The Wellness Together Canada portal complements PocketWell, a free app launched in January 2022 that helps Canadians access free and confidential sessions with social workers, psychologists and other professionals, as well as other mental health and substance use prevention services from their phone.

The federal government focus on mental health and wellness is welcome and parallels ongoing plan sponsor efforts to address and improve mental health strategies in support of their employees and contributing to their overall health and productivity. Equally encouraging is the government's attention to those whose challenges are greater, in particular, among youth, Indigenous peoples, Black and racialized Canadians, and members of the LGBTQ2 community. At a time when, DEI is central to many employer conversations, these federal programs and initiatives provide clear examples of how DEI can be relevant in the context of employee benefit programs.

Employment Insurance Sickness Benefits

Budget 2021 announced an increase to the length of Employment Insurance (**EI**) sickness benefits from 15 to 26 weeks. Budget 2022 pledges to bring this change into effect in the summer of 2022.

Changes to the length of EI sickness benefits will have a follow-on effect for employers who participate in the EI premium reduction program. The program provides reduced EI premium rates for employers who implement disability plans that meet certain specifications, thereby eliminating the need for their employees to draw on the federal program. Aon expects more information on the impact to the premium reduction program when the final implementation date of the EI benefit changes is known.

Wealth Solutions

Strengthening the Federal Pension Framework

In Budget 2022, the federal government proposes to amend the *Pension Benefits Standards Act, 1985* (Canada) and the *Pooled Registered Pension Plans Act* (Canada) to improve the sustainability and long-term security of federally-regulated pensions for all plan members and retirees through improved governance and administration and new frameworks for solvency reserve accounts and variable payment life annuities (**VPLAs**). Details on the exact nature of the proposed changes are not provided in the budget documents.

Changes to the *Income Tax Regulations* (Canada) were introduced in 2019 to allow the payment of VPLAs directly from money purchase pension plans. This decumulation option allows pooling of investment and mortality risk - the pension is not fixed, but can go up or down depending on investment and mortality experience of the plan. Although the income tax regulations currently permit these annuities, federal pension legislation has yet to include provisions to support this option.

The Canadian Association of Pension Supervisory Authorities (**CAPSA**) has also established a Decumulation Committee, tasked with developing a VPLA framework that is harmonized across jurisdictions for both money purchase pension plans and pooled registered pension plans (**PRPPs**). This committee is developing recommendations for legislative amendments and regulatory guidance which will presumably help inform the changes proposed in Budget 2022 for federal plans.

Encouraging the private sector to invest in the transition to a low-carbon economy

To help direct private sector capital towards investments needed for the transition to net zero and a low-carbon global economy, the Sustainable Finance Action Council (which includes 25 of Canada's largest financial institutions and pension funds) will develop and report on strategies for aligning investments with net zero. The Canadian Climate Institute (a non-partisan charity and policy organization) and the Net-Zero Advisory Body (a group of independent experts) will provide support for these efforts. This new guidance on net zero will be welcomed by federally-regulated pension plans as the government also confirms in Budget 2022 that it will be implementing new requirements for federal pensions to disclose how they take environmental, social, and governance (**ESG**) considerations, including climate-related risks, into account. We note that a December 2021 Mandate Letter to the Minister of Environment and Climate Change indicated that federal pensions should also be required to disclose net-zero plans, however, this specific requirement was not reiterated in Budget 2022.

The Department of Finance Canada will also work to establish an investment tax credit of up to 30% for investments in net-zero technology, battery storage solutions and clean hydrogen. The details are not expected until the 2022 fall economic and fiscal update so it is not known whether this credit will be available for investments through retirement plans specifically. However, it is possible the credit could align with the 2019 recommendation of Canada's Expert Panel on Sustainable Finance to provide a tax-based financial incentive for Canadians to invest in accredited climate-conscious products through their registered retirement savings plans and defined contribution pension plans.

Tax-Free Home Savings Account

Budget 2022 proposes a new Tax-Free First Home Savings Account (**TFHSA**) that would give prospective first-time home buyers the ability to save up to $40,000 towards the purchase of a home. The proposed TFHSA would enjoy superior tax benefits, both tax-deductible contributions (like an RRSP) and tax-free withdrawals (like a TFSA). The combined tax benefit of both tax-free contributions in, and tax-free withdrawals out, will make this vehicle extremely attractive for first-time home buyers. The federal government hopes to work with financial institutions to implement this new option in 2023. If group savings plans providers (the major insurers) add this tax vehicle to the range of savings vehicles offered on a group basis, it may be an attractive option for employers to consider adding to their savings programs.

Contact Information

Should you wish additional information on this topic, please contact your local Aon consultant, or send an email to canada.retirement@aon.com.

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Finance & Investment Committee
Consent Report, Attachment #1

UNIVERSITY OF WATERLOO

2022/23 Operating Income Budget (in thousands)

Board of Governors
April 5, 2022

	2021/22 Base Budget	Increase / (Decrease) $	2022/23 Base Budget	Notes
INCOME				
Operating Grant				
Enrolment	162,703	-	162,703	Note 1
SMA3 Performance Outcomes	87,920	-	87,920	Note 1
Special Purpose	5,605	-	5,605	
International Student Recovery	(5,898)	298	(5,600)	
Transfers to AFIW	(12,804)	(386)	(13,190)	
	237,526	(88)	237,438	
Tuition				
Domestic - Undergraduate	239,908	(6,008)	233,900	Note 2
Domestic - Graduate	29,068	(668)	28,400	
International - Undergraduate	249,012	14,888	263,900	Note 3
International - Graduate	53,531	569	54,100	
Transfers to AFIW	(20,829)	(511)	(21,340)	
	550,690	8,270	558,960	
Other Revenue				
Co-op Recovery	25,583	117	25,700	
Student Services Fees	13,725	1,595	15,320	Note 4
Interest	9,600	1,000	10,600	Note 5
Services to AFIW	3,945	105	4,050	
Miscellaneous Income	9,670	-	9,670	
	62,523	2,817	65,340	
Total Income	850,739	10,999	861,738	

Note 1 - Under the Strategic Mandate Agreement (SMA3), the Ministry of Colleges and Universities (MCU) planned to annually increase the share of total grant funding contingent upon performance outcomes. The full implementation of this plan was adjusted in response to the COVID-19 pandemic, with the province temporarily 'decoupling' funding and performance. As of March 1, 2022, communications from MCU have signaled a change in the planned shift of funding between envelopes. This change will not impact the total grant funding, only the division of funds between envelopes. Until more detail is confirmed, the distribution between envelopes has been left unchanged from 2021/22.

Note 2 - The projected decrease in Domestic Undergraduate tuition revenue represents a return to expected new enrolments in 2022/23 after exceeding 2021/22 new enrolment targets. The Board of Governors approved maintaining 2022/23 domestic tuition rates consistent with 2021/22 rates at their February meeting pending a provincial tuition framework for 2022/23. As at March 1, 2022, the provincial tuition framework for 2022/23 has not been announced.

Note 3 - The increase in International Undergraduate tuition revenue is consistent with tuition rate increases approved by the Board of Governors at its February meeting, partially offset by a projected decrease in international undergraduate enrolments.

Note 4 - The student services fees revenue relates to decisions of the Student Services Advisory Committee to provide funding for designated student services. The 2021/22 base budget incorporated the pandemic related waiver of Athletics and Recreation fees in Spring 2021. The increase reflects an assumption of no fee waivers in 2022/23.

Note 5 - The investment income earned on operational funds is based on current and forecasted cash management and investment plans.

General: 'Base 2021/22' budget balances have been reallocated for consistency with the current year presentation, including the removal of the $10,607 research overhead income and expense budgets which offset each other and were historically reported on a flow-through basis.

UNIVERSITY OF WATERLOO

2022/23 Operating Expense Budget (in thousands)

Board of Governors
April 5, 2022

	2021/22 Base Budget	Increase / (Decrease) $	2022/23 Base Budget	2022/23 Base Budget as % of Income	Notes
EXPENSES					
Salary and Benefits					
Current salaries and wages	491,577	19,000	510,577	59.2%	Note 1
Current benefits	119,592	5,868	125,460	14.6%	Note 2
	611,169	24,868	636,037	73.8%	
Non Salary Expenses - Strategic and Priority Spending					
Student Support	75,737	230	75,967	8.8%	Note 3
University Fund	43,100	-	43,100	5.0%	Note 4
Capital Project Financing	2,000	1,300	3,300	0.4%	Note 5
	120,837	1,530	122,367	14.2%	
Non-Salary Expenses - Other					
Insurance	3,000	250	3,250	0.4%	
Municipal taxes	3,050	-	3,050	0.3%	
Utilities	22,925	-	22,925	2.7%	
Other non-salary expenses	101,841	(9,315)	92,526	10.7%	Note 6
Total other - before budget reduction	130,816	(9,065)	121,751	14.1%	
Budget reduction	-	(5,300)	(5,300)	-0.6%	Note 7
Total other - after budget reduction	130,816	(14,365)	116,451	13.5%	
Gross expenses	862,822	12,033	874,855	101.5%	
Cost recoveries	(11,520)	(380)	(11,900)	-1.4%	Note 8
Estimated net expenses	851,302	11,653	862,955	100.1%	
Estimated income	850,739		861,738		
Surplus (Unfunded deficit)	(563)		(1,217)		
Surplus(Deficit) as percentage of income	-0.07%		-0.14%		

UNIVERSITY OF WATERLOO

2022/23 Operating Expense Budget (in thousands)

Note 1 - The budget increase reflects estimated May 1 salary increases and estimated new positions.

Note 2 - The budget increase reflects increases in benefits costs related to a number of factors including the impact of salary increases, new positions and rate/premium increases. In the current year, increases in the CPP and EI employer contribution rates and maximum earnings limits contributed to an increase in benefits greater than the relative increase in salaries.

Note 3 - Student Support includes Tuition Set Aside (TSA), as well as undergraduate and graduate support in the form of scholarships, bursaries and awards. The TSA amount (approximately $26 million) is calculated based on a formula mandated by the Ministry of Colleges and Universities. It is to be used for needs based student support programs.

Note 4 - The University Fund is used for funding the University's strategic priorities and managing risk.

Note 5 - The Capital Project Financing budget supports central funding of internally financed capital projects. Other support for capital projects includes other central operating funds, faculty funding, donations and other sources.

Note 6 - Other non-salary expenses reflects the budget for a variety of non-salary operating expenses of the faculties and academic support units such as supplies, travel, library acquisitions, enterprise software, professional services, equipment costs and funding towards capital projects etc. The decrease mainly reflects a reallocation of budget to salaries.

Note 7 - This reflects a budget cut of 1%, subject to limited exceptions, which include the following centrally funded items: benefits, student support, University fund, utilities, enterprise software, library acquisitions, municipal taxes and insurance.

Note 8 - Chargeouts and cost recoveries primarily include recoveries from Ancillary Enterprises (Housing, Food Services, Print & Retail Solutions, Watcard and Parking) for space charges and administrative support.

General: 'Base 2021/22' budget balances have been reallocated for consistency with the current year presentation, including the removal of the $10,607 research overhead income and expense budgets which offset each other and were historically reported on a flow-through basis.