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University of Windsor Retirement Plan for Faculty and Certain Employees

Report on the Actuarial Valuation for Funding Purposes as at July 1, 2021

March 2022

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This valuation report may not be relied upon for any purpose other than those explicitly noted in the Introduction, nor may it be relied upon by any party other than the parties noted in the Introduction. Mercer is not responsible for the consequences of any other use. A valuation report is a snapshot of a plan's estimated financial condition at a particular point in time; it does not predict a pension plan's future financial condition or its ability to pay benefits in the future. If maintained indefinitely, a plan's total cost will depend on a number of factors, including the amount of benefits the plan pays, the number of people paid benefits, the amount of plan expenses, and the amount earned on any assets invested to pay the benefits. These amounts and other variables are uncertain and unknowable at the valuation date. The content of the report may not be modified, incorporated into or used in other material, sold or otherwise provided, in whole or in part, to any other person or entity, without Mercer's permission. All parts of this report, including any documents incorporated by reference, are integral to understanding and explaining its contents; no part may be taken out of context, used, or relied upon without reference to the report as a whole.

To prepare the results in this report, actuarial assumptions are used to model a single scenario from a range of possibilities for each valuation basis. The results based on that single scenario are included in this report. However, the future is uncertain and the Plan's actual experience will differ from those assumptions; these differences may be significant or material. Different assumptions or scenarios within the range of possibilities may also be reasonable, and results based on those assumptions would be different. Furthermore, actuarial assumptions may be changed from one valuation to the next because of changes in regulatory and professional requirements, developments in case law, plan experience, changes in expectations about the future, and other factors.

The valuation results shown in this report also illustrate the sensitivity to one of the key actuarial assumptions, the discount rate, and the sensitivity to three adverse scenarios. We note that the results presented herein rely on many assumptions, all of which are subject to uncertainty, with a broad range of possible outcomes, and the results are sensitive to all the assumptions used in the valuation.

Should the Plan be wound up, the going concern funded status and solvency financial position, if different from the wind-up financial position, become irrelevant. The hypothetical wind-up financial position estimates the financial position of the Plan assuming it is wound up on the valuation date. Emerging experience will affect the wind-up financial position of the Plan assuming it is wound up in the future. In fact, even if the Plan were wound up on the valuation date, the financial position would continue to fluctuate until the benefits are fully settled.

Decisions about benefit changes, granting new benefits, investment policy, funding policy, benefit security, and/or benefit-related issues should not be made solely on the basis of this valuation, but only after careful consideration of alternative economic, financial, demographic, and societal factors, including financial scenarios that assume future sustained investment losses.

Funding calculations reflect our understanding of the requirements of the *Pension Benefits Act (Ontario)*, the Income Tax Act, and related regulations that are effective as of the valuation date. Mercer is not a law firm, and the analysis presented in this report is not intended to be a legal opinion. You should consider securing the advice of legal counsel with respect to any legal matters related to this report.

Contents

Section 1

Summary of Results

	07.01.2021		01.01.2020	
	Excluding Money Purchase Component[1]	Including Money Purchase Component[1]	Excluding Money Purchase Component[1]	Including Money Purchase Component[1]
Going Concern Financial Status				
Market value of assets	$211,936,200	$689,562,500	$175,228,000	$590,728,800
Going concern funding target	$170,784,100	$648,410,400	$190,400,000	$605,900,800
Provision for adverse deviations in respect of the going concern liabilities	$6,475,700	$6,475,700	$7,954,000	$7,954,000
Funding excess (shortfall)	$34,676,400	$34,676,400	($23,126,000)	($23,126,000)
Hypothetical Wind-up Financial Position				
Wind-up assets	$211,486,200	$689,112,500	$174,778,000	$590,278,800
Wind-up liability	$340,704,700	$818,331,000	$329,369,700	$744,870,500
Wind-up excess (shortfall)	($129,218,500)	($129,218,500)	($154,591,700)	($154,591,700)
Solvency Financial Position				
Solvency assets	$211,486,200	$689,112,500	$174,778,000	$590,278,800
Solvency liability[2]	$79,778,700	$557,405,000	$92,940,900	$508,441,700
Solvency excess (deficiency)	$131,707,500	$131,707,500	$81,837,100	$81,837,100
Transfer ratio	0.62	0.84	0.53	0.79
Solvency ratio	2.66	1.24	1.88	1.16

[1] Money Purchase Account, Additional Voluntary Contribution Account, Past Service Account, Special Transfer Fund and Variable Annuity Fund

[2] Excluding the value of the contractual indexing of pensions after retirement.

	07.01.2021	01.01.2020
Funding Requirements in the Year Following the Valuation[3]		
Total current service cost	$20,016,200	$19,562,200
Estimated members' required contributions	($8,881,500)	($8,286,400)
Estimated University's current service cost	$11,134,700	$11,275,800
Provision for adverse deviations in respect of current service cost	$144,600	$211,300
Total	$11,279,300	$11,487,100
University's current service cost and provision for adverse deviations in respect of the current service cost expressed as a percentage of members' pensionable earnings	11.4%	12.3%
Minimum special payments	$0	$6,372,600[4]
Estimated minimum University contribution	$11,279,300	$17,859,700[4]
Estimated maximum eligible University contribution	$140,497,800	$166,078,800
Next required valuation date	July 1, 2024	January 1, 2023

[3] Provided for reference purposes only. Contributions must be remitted to the Plan in accordance with the Minimum Funding Requirements and Maximum Eligible Contributions sections of this report.

[4] Reflects one-year deferral of new going concern special payments. Annual special payment requirement will reduced to $2,280,900 effective January 1, 2021.

Section 2
Introduction

To the University of Windsor

At the request of the University of Windsor (the "University"), we have conducted an actuarial valuation of the University of Windsor Retirement Plan for Faculty and Certain Employees (the "Plan"), sponsored by the University, as at the valuation date, July 1, 2021. We are pleased to present the results of the valuation.

Purpose

The purpose of this valuation is to determine:

- The funded status of the Plan as at July 1, 2021 on going concern, hypothetical wind-up, and solvency bases;
- The minimum required funding contributions from July 1, 2021, in accordance with the *Pension Benefits Act (Ontario)* (the "Act"); and
- The maximum permissible funding contributions from July 1, 2021 in accordance with the *Income Tax Act.*

The information contained in this report was prepared for the internal use of the University, and for filing with the Financial Services Regulatory Authority of Ontario and with the Canada Revenue Agency, in connection with our actuarial valuation of the Plan. This report will be filed with the Financial Services Regulatory Authority of Ontario and with the Canada Revenue Agency. This report is not intended or suitable for any other purpose.

In accordance with pension benefits legislation, the next actuarial valuation of the Plan will be required as at a date not later than July 1, 2024, or as at the date of an earlier amendment to the Plan depending on any funding implications.

Terms of Engagement

In accordance with our terms of engagement with the University, our actuarial valuation of the Plan is based on the following material terms:

- It has been prepared in accordance with applicable pension legislation and actuarial standards of practice in Canada.
- As instructed by the University, we have not reflected a margin for adverse deviations in the going concern valuation in excess of the provision for adverse deviations prescribed by the Act.
- As instructed by the University, the provision for adverse deviations prescribed by the Act has been determined in respect of the supplement benefits required to provide a total pension equal to the Minimum Guaranteed Benefit. The Provision for Adverse Deviations is not applied to benefits payable under the Money Purchase Account, Additional Voluntary Contribution Account, Past Service Account, Special Transfer Fund and Variable Annuity Fund.
- We have reflected the University's decisions for determining the solvency funding requirements, summarized as follows:
  - The same plan wind-up scenario was hypothesized for both hypothetical wind-up and solvency valuations.
  - Certain excludable benefits were excluded from the solvency liabilities.
  - The solvency financial position was determined on a market value basis.

  See the Valuation Results - Solvency section of the report for more information.

Events since the Last Valuation at January 1, 2020

Pension Plan

The University amended its Statement of Investment Policies and Procedures document effective November 24, 2020.

There have been no other special events since the last valuation date.

This valuation reflects the provisions of the Plan as at July 1, 2021. The Plan has not been amended since the date of the previous valuation, and we are not aware of any pending definitive or virtually definitive amendments coming into effect during the period covered by this report. The Plan provisions are summarized in Appendix F.

Assumptions

We have used the same going concern valuation assumptions and methods as were used for the previous valuation, except for the following:

	Current valuation	Previous valuation
Discount rate:	5.40%	5.25%
Interest on Money Purchase Component Account balances:	5.40%	5.25%
Post retirement money purchase pension increases:	(0.60%)	(0.75%)
Pensionable earnings increases:	3.00% for 3 years and 5.00% thereafter	2.00% for 3 years and 5.00% thereafter
Discount rate for calculation of commuted value assumed to be settled	3.05%	2.55%
Mortality rates:	90% of the rates of the 2014 Public Sector Canadian Pensioners Mortality Table (CPM2014Publ)	95% of the rates of the 2014 Public Sector Canadian Pensioners Mortality Table (CPM2014Publ)

A summary of the going concern methods and assumptions is provided in Appendix C.

The hypothetical wind-up and solvency assumptions have been updated to reflect market conditions at the valuation date. A summary of the hypothetical wind-up and solvency methods and assumptions is provided in Appendix D.

Regulatory Environment and Actuarial Standards

There have been a number of changes to the Act and regulations that impact the funding of the Plan.

On September 21, 2020, the Ontario government filed Regulation 520/20, providing potential temporary funding relief for eligible single employer defined benefit pension plans registered in Ontario. The new regulation allows sponsors of eligible plans to defer required employer contributions starting with those contributions due in October 2020 and ending with contributions due in March 2021. Each deferred monthly contributions plus interest are due to be paid in 2 consecutive monthly payments ranging no later than April/May 2021 to February/March 2022.

On July 2, 2020, the Minister of Finance of Canada released draft regulations that would permit sponsors of pension plans to recognize full pensionable service in 2020 for employees who are working reduced hours or who are receiving reduced earnings. The eligible period of reduced pay will be subject to the limit of five years of full-time equivalent compensation. In addition, effective May 5, 2020, the Canada Revenue Agency waived the one percent minimum required employer contributions on defined contribution pension plans for the remainder of 2020.

On July 23, 2020, the CIA published the final version of Section 3500 of the Standards of Practice on Pension Commuted Values and confirmed that the effective date of the new standards is December 1, 2020.

From the effective date, the revised standards affect the assumptions used to value the going concern, solvency and wind-up liabilities for benefits assumed to be settled through a lump sum transfer. The financial impact of those changes is reflected in this actuarial valuation on a solvency and hypothetical wind-up basis.

Subsequent Events

After checking with representatives of the University, to the best of our knowledge there have been no events subsequent to the valuation date that, in our opinion, would have a material impact on the results of the valuation as at July 1, 2021. However, since the valuation date, there have been significant fluctuations in the financial markets, which may have led to a deterioration of the funded position of the Plan after the valuation date. Our valuation reflects the financial position of the Plan as of the valuation date and does not take into account any experience after the valuation date.

Impact of Case Law

This report has been prepared on the assumption that all claims on the Plan after the valuation date will be in respect of benefits payable to members of the Plan determined in accordance with the Plan terms and that all Plan assets are available to provide for these benefits. It is possible that court and regulatory decisions and changes in legislation could give rise to additional entitlements to benefits under the Plan and cause the results in this report to change. By way of example, we bring your attention to the following decisions:

- The Ontario Court of Appeal's 2003 decision in *Aegon Canada Inc. and Transamerica Life Canada versus ING Canada Inc.* restricted the use of original plan surplus where two or more pension plans were merged.

- The Supreme Court of Canada's 2004 decision in *Monsanto Canada Inc. versus Superintendent of Financial Services* upheld the requirement, with retroactive effect, to distribute surplus on partial plan wind-up under the *Pension Benefits Act (Ontario).*

We are not in a position to assess the impact that such decisions or changes could have on the assumption that all plan assets on the valuation date are available to provide for benefits determined in accordance with the Plan terms. If such a claim arises subsequent to the date of this report, the consequences will be dealt with in a subsequent report. We are making no representation as to likelihood of such a claim.

Section 3
Valuation Results – Going Concern

Financial Status

A going concern valuation compares the relationship between the value of Plan assets and the present value of expected future benefit cash flows in respect of accrued service, assuming the Plan will be maintained indefinitely.

The results of the current valuation, compared with those from the previous valuation, are summarized as follows:

	07.01.2021		01.01.2020	
	Excluding Money Purchase Component	Including Money Purchase Component	Excluding Money Purchase Component	Including Money Purchase Component
Assets				
Market value of assets	$211,936,200	$689,562,500	$175,228,000	$590,728,800
Going concern funding target				
• Active members				
– money purchase accounts	n/a	$251,895,900	n/a	$209,945,500
– minimum guarantee benefits	$72,415,100	$72,415,100	$79,265,000	$79,265,000
• Pensioners and survivors				
– money purchase benefits	n/a	$207,022,200	n/a	$189,434,100
– minimum guarantee benefits	$98,197,600	$98,197,600	$110,867,700	$110,867,700
• Deferred pensioners				
– money purchase benefits	n/a	$17,397,400	n/a	$14,926,700
– minimum guarantee benefits	$171,400	$171,400	$267,300	$267,300
• Additional Voluntary Contribution Fund	n/a	$221,900	n/a	$230,400
• Special Transferred Contribution Fund	n/a	$1,088,900	n/a	$920,900
• Past Service Account	n/a	$0	n/a	$43,200
Subtotal	$170,784,100	$648,410,400	$190,400,000	$605,900,800
Provision for adverse deviations in respect of going concern liabilities as prescribed by the Act	$6,475,700	$6,475,700	$7,954,000	$7,954,000
Total	$177,259,800	$654,886,100	$198,354,000	$613,854,800
Funding excess (shortfall)	$34,676,400	$34,676,400	($23,126,000)	($23,126,000)

The going concern liabilities do not include an additional margin for adverse deviations beyond the provision for adverse deviations prescribed by the Act.

Reconciliation of Financial Status

Funding excess (shortfall) as at previous valuation		($23,126,000)
Provision for Adverse Deviations (PfAD) at previous valuation		$7,954,000
Funding excess (shortfall) as at previous valuation before PfAD		($15,172,000)
Interest on funding excess (shortfall) at 5.25% per year		($1,210,000)
University's special payments, with interest		$7,808,900
University's PfAD funding contributions, with interest		$329,300
Net experience gains (losses)		
• Net investment return	$17,870,300	
• Increases in pensionable earnings	($2,983,500)	
• Increases in YMPE, ITA maximum pension and CRA contribution limits	($1,238,000)	
• Retirement	$159,200	
• Termination	($161,800)	
• Mortality	$1,423,900	
• Money Purchase Account balance accumulation	$28,324,500	
• Pensioner indexing	$206,100	
• Total experience gains (losses)		$43,600,700
Impact of changes in assumptions		
• Discount rate	$10,918,800	
• Mortality	($7,448,100)	
• Discount rate for calculation of commuted value assumed to be settled	$619,400	
• Salary scale	$1,668,000	
Total assumption changes gains (losses)		$5,758,100
Net impact of other elements of gains and losses		$37,100
Funding excess (shortfall) before Provision for Adverse Deviations		$41,152,100
Provision for Adverse Deviations at current valuation		($6,475,700)
Funding excess (shortfall) as at current valuation		$34,676,400

Current Service Cost

The current service cost is an estimate of the present value of the additional expected future benefit cash flows in respect of pensionable service that will accrue after the valuation date, assuming the Plan will be maintained indefinitely. A provision for adverse deviations in respect of the current service cost is determined in accordance with the Act.

The current service cost and the provision for adverse deviations in respect of the current service cost, during the year following the valuation date, compared with the corresponding values determined in the previous valuation, is as follows:

University's Current Service Cost				
	2021/2022		2020	
	Amount	% Covered Earnings	Amount	% Covered Earnings
University money purchase component contribution[5]	$5,921,000	6.0%	$5,524,200	6.0%
Current service cost for supplemental benefits excluding provision for adverse deviations	$5,213,700[6]	5.2%	$5,751,600[7]	6.1%
Estimated University's current service cost excluding provision for adverse deviations	$11,134,700	11.2%	$11,275,800	12.1%
Provision for adverse deviations in respect of the current service cost (based on the percentage defined in Appendix A)	$144,600	0.2%	$211,300	0.2%
Total Estimated University's current service cost	$11,279,300	11.4%	$11,487,100	12.3%
Estimated members' required contributions	$8,881,500		$8,286,400	

[5] Member and University contributions to the Money Purchase Account are subject to the annual maximum contribution limits under the Income Tax Act

[6] Includes $3,406,400 in respect of escalated adjustments that are not subject to application of the PfAD

[7] Includes $3,266,200 in respect of escalated adjustments that are not subject to application of the PfAD

The key factors that have caused a change in the University's current service cost since the previous valuation are summarized in the following table:

University's current service cost as at previous valuation	12.3%
Demographic changes	(0.3%)
Changes in assumptions	(0.6%)
University's current service cost as at current valuation	11.4%

Discount Rate Sensitivity

The following table summarizes the effect on the going funding target and current service cost shown in this report of using a discount rate which is 1% lower than that used in the valuation. For the purposes of the illustration, we have not changed the interest rate used to determine commuted values upon termination of employment. The effect of a change in the discount rate on the provision for adverse deviations is not reflected.

Scenario	Valuation Basis	Reduce Discount Rate by 1%
Going concern funding target		
• Including Money Purchase Component	$648,410,400	$731,778,300
• Excluding Money Purchase Component	$170,784,100	$254,152,000
Current service cost		
• Total current service cost	$20,016,200	$24,262,700
• Estimated members' required contributions	($8,881,500)	($8,881,500)
Estimated University's current service cost	$11,134,700	$15,381,200

Plausible Adverse Scenarios

The financial impact on the going concern results of plausible adverse scenarios that would pose threats to the Plan's future financial condition is presented in Appendix G.

Section 4

Valuation Results – Hypothetical Wind-up

Financial Position

When conducting a hypothetical wind-up valuation, we determine the relationship between the respective values of the Plan's assets and its liabilities assuming the Plan is wound up and settled on the valuation date, assuming benefits are settled in accordance with the Act and under circumstances consistent with the hypothesized scenario on the valuation date. More details on such scenario are provided in Appendix D.

The hypothetical wind-up financial position as of the valuation date, compared with that at the previous valuation, is as follows:

	07.01.2021		01.01.2020	
	Excluding Money Purchase Component	Including Money Purchase Component	Excluding Money Purchase Component	Including Money Purchase Component
Assets				
Market value of assets	$211,936,200	$689,562,500	$175,228,000	$590,728,800
Termination expense provision	($450,000)	($450,000)	($450,000)	($450,000)
Wind-up assets	$211,486,200	$689,112,500	$174,778,000	$590,278,800
Present value of accrued benefits for:				
• Active members				
– money purchase accounts	n/a	$251,895,900	n/a	$209,945,500
– minimum guarantee benefits	$169,959,000	$169,959,000	$150,703,800	$150,703,800
• Pensioners and survivors				
– money purchase benefits	n/a	$207,022,200	n/a	$189,434,100
– minimum guarantee benefits	$167,693,700	$167,693,700	$175,769,700	$175,769,700
• Deferred pensioners				
– money purchase benefits	n/a	$17,397,400	n/a	$14,926,700
– minimum guarantee benefits	$3,052,000	$3,052,000	$2,896,200	$2,896,200
• Additional Voluntary Contribution Fund	n/a	$221,900	n/a	$230,400
• Special Transferred Contribution Fund	n/a	$1,088,900	n/a	$920,900
• Past Service Account	n/a	$0	n/a	$43,200
Total	$340,704,700	$818,331,000	$329,369,700	$744,870,500
Funding excess (shortfall)	($129,218,500)	($129,218,500)	($154,591,700)	($154,591,700)

Wind-up Incremental Cost

The wind-up incremental cost is an estimate of the present value of the projected change in the hypothetical wind-up liabilities from the valuation date until the next scheduled valuation date, adjusted for the benefit payments expected to be made in that period.

The hypothetical wind-up incremental cost determined in this valuation, compared with the corresponding value determined in the previous valuation, is as follows:

	07.01.2021	01.01.2020
Number of years covered by report	3 years	3 years
Total hypothetical wind-up liabilities at the valuation date (A)	$818,331,000	$744,870,500
Present value at the valuation date of projected hypothetical wind-up liability at the next required valuation (including expected new entrants) plus expected benefit payments until the next required valuation (B)	$917,097,900	$837,605,500
Hypothetical wind-up incremental cost (B – A)	$98,766,900	$92,735,000

The incremental cost is not an appropriate measure of the contributions that would be required to maintain the windup position of the Plan even if actual experience is exactly in accordance with the going concern valuation assumptions. For example, the expected return on plan assets (based on the going concern assumptions) is greater than the discount rate used to determine the hypothetical wind-up liabilities.

Discount Rate Sensitivity

The following table summarizes the effect on the hypothetical wind-up liabilities shown in this report of using a discount rate which is 1% lower than that used in the valuation:

Scenario	Valuation Basis	Reduce Discount Rate by 1%
Total hypothetical wind-up liability		
• Including Money Purchase Component	$818,331,000	$948,095,500
• Excluding Money Purchase Component	$340,704,700	$470,469,200

Plausible Adverse Scenarios

The financial impact on the hypothetical wind-up financial position of plausible adverse scenarios that would pose threats to the Plan’s future financial condition is presented in Appendix G

Section 5

Valuation Results – Solvency

Overview

The Act also requires the financial position of the Plan to be determined on a solvency basis. The financial position on a solvency basis is determined in a similar manner to the Hypothetical Wind-up Basis, except for the following:

Exceptions	Reflected in valuation based on the terms of engagement
The circumstance under which the Plan is assumed to be wound up could differ for the solvency and hypothetical wind-up valuations.	The same circumstances were assumed for the solvency valuation as were assumed for the hypothetical wind-up valuation.
Certain benefits can be excluded from the solvency financial position. These include: (a) any escalated adjustment (e.g. indexing), (b) certain plant closure benefits, (c) certain permanent layoff benefits, (d) special allowances other than funded special allowances, (e) consent benefits other than funded consent benefits, (f) prospective benefit increases, (g) potential early retirement window benefit values, and (h) pension benefits and ancillary benefits payable under a qualifying annuity contract.	The following benefits were excluded from the solvency liabilities shown in this valuation: • Post–retirement indexing
The financial position on the solvency basis needs to be adjusted for any Prior Year Credit Balance.	Not applicable.
The solvency financial position can be determined by smoothing assets and the solvency discount rate over a period of up to 5 years.	Smoothing was not used.
The benefit rate increases coming into effect after the valuation date can be reflected in the solvency valuation.	Not applicable.

Financial Position

The financial position on a solvency basis, compared with the corresponding figures from the previous valuation, is as follows:

	07.01.2021		01.01.2020	
	Excluding Money Purchase Component	**Including Money Purchase Component**	**Excluding Money Purchase Component**	**Including Money Purchase Component**
Assets				
Market value of assets	$211,936,200	$689,562,500	$175,228,000	$590,728,800
Termination expense provision	($450,000)	($450,000)	($450,000)	($450,000)
Net assets	$211,486,200	$689,112,500	$174,778,000	$590,278,800
Liabilities				
Total hypothetical wind-up liabilities	$340,704,700	$818,331,000	$329,369,700	$744,870,500
Difference in circumstances of assumed wind-up	$0	$0	$0	$0
Value of excluded benefits	($260,926,000)	($260,926,000)	($236,428,800)	($236,428,800)
Liabilities on a solvency basis	$79,778,700	$557,405,000	$92,940,900	$508,441,700
Surplus (shortfall) on a solvency basis	$131,707,500	$131,707,500	$81,837,100	$81,837,100
Transfer ratio	0.62	0.84	0.53	0.79
Solvency ratio	2.66	1.24	1.88	1.16

Section 6

Minimum Funding Requirements

The Act prescribes the minimum contributions that the University must make to the Plan. The minimum contributions in respect of a defined benefit component of a pension plan are comprised of going concern current service cost, the provision for adverse deviations in respect of the current service cost, and special payments to fund any funding shortfall or solvency shortfall that exceeds the level as set out under the Act.

On the basis of the assumptions and methods described in this report, no special payments are required. However, since the available actuarial surplus is zero, the Act requires the contribution of the current service cost including the provision for adverse deviations. The determination of the provision for adverse deviations is shown in Appendix A. On the basis of the assumptions and methods described in this report, the rule for determining the minimum required University monthly contributions, as well as an estimate of the employee and University contributions, from the valuation date until the next required valuation are as follows:

		University's contribution rule [A + B]		Estimated University's contributions		
Period beginning	Monthly Employee Contribution	Monthly current service cost including money purchase contributions[8] [A]	Provision for adverse deviations[8] [B]	Monthly current service cost including money purchase contributions[9] [C]	Provision for adverse deviations [D]	Total minimum monthly contributions [C + D]
July 1, 2021	$740,125	11.2%	0.2%	$927,892	$12,050	$939,942
July 1, 2022	$762,329	11.2%	0.2%	$955,728	$12,412	$968,140
July 1, 2023	$785,199	11.2%	0.2%	$984,400	$12,784	$997,184

The estimated contribution amounts for current service cost and the provision for adverse deviations in respect of the current service cost shown above are based on projected members' pensionable earnings. Therefore, the actual University's current service cost and provision for adverse deviations may be different from the above estimates and, as such, the contribution requirements should be monitored closely to ensure contributions are made in accordance with the Act.

Appendix A includes details on the determination of the provision for adverse deviations.

[8] Expressed as a percentage of members' earnings.

[9] University contributions to the Money Purchase Account are subject to the annual maximum contribution limits under the Income Tax Act

Other Considerations

Differences between Valuation Bases

There is no provision in the minimum funding requirements to fund the difference between the hypothetical wind-up and solvency shortfalls, if any.

In addition, although minimum funding requirements do include a requirement to fund the going concern current service cost and a provision for adverse deviations in respect of the current service cost, there is no requirement to fund the expected growth in the hypothetical wind-up or solvency liability after the valuation date, which could be greater.

Timing of Contributions

Funding contributions are due on a monthly basis. Contributions for current service cost and the provision for adverse deviations must be made within 30 days following the month to which they apply. Special payment contributions must be made in the month to which they apply.

Retroactive Contributions

The University must contribute the excess, if any, of the minimum contribution recommended in this report over contributions actually made in respect of the period following the valuation date. This contribution, along with an allowance for interest, is due no later than 60 days following the date this report is filed.

Payment of Benefits

The Act imposes certain restrictions on the payment of lump sums from the Plan when the transfer ratio revealed in an actuarial valuation is less than one. If the transfer ratio shown in this report is less than one, the plan administrator should ensure that the monthly special payments are sufficient to meet the requirements of the Act to allow for the full payment of benefits, and otherwise should take the prescribed actions.

Additional restrictions are imposed when:

- The transfer ratio revealed in the most recently filed actuarial valuation is less than one and the administrator knows or ‘ought to know’ that the transfer ratio of the Plan has declined by 10% or more since the date the last valuation was filed.

- The transfer ratio revealed in the most recently filed actuarial valuation is greater than or equal to one and the administrator knows or ‘ought to know’ that the transfer ratio of the Plan has declined to less than 0.9 since the date the last valuation was filed.

As such, the administrator should monitor the transfer ratio of the Plan and, if necessary, take the prescribed actions.

For purposes of this section, the Plan’s Transfer Ratio calculated without reference to the Money Purchase Component will be used.

Letters of Credit

Minimum funding requirements in respect of solvency deficiencies that otherwise require monthly contributions to the pension fund may be met, in the alternative, by establishing an irrevocable letter of credit subject to the conditions established by the Act. Required solvency special payments in excess of those met by a letter of credit must be met by monthly contributions to the pension fund.

Section 7

Maximum Eligible Contributions

The *Income Tax Act* (the "ITA") limits the amount of employer contributions that can be remitted to the defined benefit component of a registered pension plan. For purposes of this section on maximum eligible contributions only, any reference to the current service cost includes the provision for adverse deviations in respect of the current service cost.

In accordance with Section 147.2 of the ITA and *Income Tax Regulation* 8516, for a plan which is underfunded on either a going concern or on a hypothetical wind-up basis, the maximum permitted contributions are equal to the University's current service cost, including the explicit expense allowance if applicable, plus the greater of the going concern funding shortfall and hypothetical wind-up shortfall.

For a plan that is fully funded on both going concern and hypothetical wind-up bases, the employer can remit a contribution equal to the employer's current service cost, including the explicit expense allowance if applicable, as long as the surplus in the plan does not exceed a prescribed threshold. Specifically, in accordance with Section 147.2 of the ITA, for a plan that is fully funded on both going concern and hypothetical wind-up bases, the plan may not retain its registered status if the employer makes a contribution while the going concern funding excess exceeds 25% of the going concern funding target.

Notwithstanding the above, any contributions that are required to be made in accordance with pension benefits legislation are eligible contributions in accordance with Section 147.2 of the ITA and can be remitted.

Schedule of Maximum Contributions

The University is permitted to fully fund the greater of the going concern and hypothetical wind-up shortfalls ($129,218,500) as well as make current service cost contributions. The portion of this contribution representing the payment of the hypothetical wind-up shortfall can be increased with interest at 2.67% per year from the valuation date to the date the payment is made, and must be reduced by the amount of any deficit funding made from the valuation date to the date the payment is made.

Assuming the University contributes the greater of the going concern and hypothetical wind-up shortfall of $129,218,500 as of the valuation date, the rule for determining the estimated maximum eligible annual contributions, as well as an estimate of the maximum eligible contributions until the next valuation, are as follows:

	University's contribution rule		Estimated University's contributions
Year beginning	**Monthly current service cost including money purchase contributions and provision for adverse deviations** [10]	**Deficit Funding**	**Monthly current service cost including money purchase contributions and provision for adverse deviations**[11]
July 1, 2021	11.4%	n/a	$939,942
July 1, 2022	11.4%	n/a	$968,140
July 1, 2023	11.4%	n/a	$997,184

The University's current service cost in the above table was estimated based on projected members' pensionable earnings and projected members' required contributions. The University's actual current service cost will be different from these estimates and, as such, the contribution requirements should be monitored closely to ensure compliance with the ITA.

[10] Expressed as a percentage of members' earnings

[11] University contributions to the Money Purchase Account are subject to the annual maximum contribution limits under the Income Tax Act

Section 8

Actuarial Opinion

In our opinion, for the purposes of the valuations,

- The membership data on which the valuation is based are sufficient and reliable.
- The assumptions are appropriate.
- The methods employed in the valuation are appropriate.

This report has been prepared, and our opinions given, in accordance with accepted actuarial practice in Canada. It has also been prepared in accordance with the funding and solvency standards set by the *Pension Benefits Act* (Ontario).

Bill Watson	Brad Duce
Fellow of the Society of Actuaries	Fellow of the Society of Actuaries
Fellow of the Canadian Institute of Actuaries	Fellow of the Canadian Institute of Actuaries
March 28, 2022	March 28, 2022
Date	Date

Appendix A
Prescribed Disclosure

Definitions

The Act defines a number of terms as follows:

Defined Term	Description				Result
Going Concern Assets	Total value of assets plus the sum of the following:				$211,936,200
	(a)	the present value of special payments in respect of any past service unfunded liability identified in a previously filed report		$0	
	(b)	the present value of special payments in respect of any plan amendment that increases going concern liabilities		$0	
	(c)	present value of special payments in respect of going concern unfunded liabilities identified in a previously filed report that are scheduled for payment within one year of the date of this report		$0	
Going concern excess / (unfunded liability)	The Going Concern Assets minus the sum of the following:				$34,676,400
	a.	the going concern liabilities			
		(i)	liabilities excluding the value of escalated adjustments	$80,945,600	
		(ii)	liabilities in respect of escalated adjustments	$89,838,500	
	b.	the provision for adverse deviations in respect of the going concern liabilities excluding the value of escalated adjustments		$6,475,700	
	c.	Prior Year Credit Balance		$0	

Defined Term	Description	Result
Going concern funded ratio	The ratio of: (a) Total value of assets (excluding letters of credit) less the Prior Year Credit Balance; to (b) going concern liabilities	1.24
Transfer Ratio	The ratio of: (a) Solvency Assets minus the lesser of the Prior Year Credit Balance and the minimum required employer contributions including the provision for adverse deviations until the next required valuation; to (b) the sum of the Solvency Liabilities and liabilities for benefits, other than benefits payable under qualifying annuity contracts that were excluded in calculating the Solvency Liabilities.	0.62
Solvency Ratio	The ratio of: (a) Solvency Assets related to defined benefits and ancillary benefits plus the total amount of any letters of credit minus the Prior Year Credit Balance (b) the sum of the Solvency Liabilities related to defined benefits and ancillary benefits	2.66
Prior Year Credit Balance	Accumulated sum of contributions made to the pension plan in excess of the minimum required contributions (note: only applies if the University chooses to treat the excess contributions as a Prior Year Credit Balance).	$0
Solvency Assets	Market value of assets including accrued or receivable income and excluding the value of any qualifying annuity contracts.	$211,936,200
Solvency Asset Adjustment	The sum of:	
	(a) the difference between smoothed value of assets and the market value of assets	$0
	(b) the present value of going concern special payments required to liquidate any past service unfunded liability	$0
	(c) the present value of going concern special payments identified in January 1, 2020 valuation and scheduled for 2021/2022	$0
	(d) the present value of going concern special payments (identified in this report) that are scheduled for payment within 6 years following the valuation date	$0
	(e) the present value of any previously scheduled solvency special payments (excluding those identified in this report)	$0
	(f) the total value of all letters of credit in respect of the special payments due before the valuation date, subject to the limit of 15% of solvency liabilities	$0
		$0

Defined Term	Description	Result
Solvency Liabilities	Liabilities determined as if the plan had been wound up on the valuation date, including liabilities for plant closure benefits or permanent layoff benefits that would be immediately payable if the employer's business were discontinued on the valuation date of the report, but, if elected by the plan sponsor, excluding liabilities for,	$79,778,700
	(a) any escalated adjustment,	
	(b) excluded plant closure benefits,	
	(c) excluded permanent layoff benefits,	
	(d) special allowances other than funded special allowances,	
	(e) consent benefits other than funded consent benefits,	
	(f) prospective benefit increases,	
	(g) potential early retirement window benefit values, and	
	(h) pension benefits and ancillary benefits payable under a qualifying annuity contract.	
Solvency Liability Adjustment	The amount by which Solvency Liabilities are adjusted as a result of using a solvency valuation interest rate that is the average of market interest rates calculated over the period of time used in the determination of the smoothed value of assets.	$0
Solvency Deficiency	The amount, if any, by which the sum of:	
	(a) the Solvency Liabilities	$79,778,700
	(b) the Solvency Liability Adjustment	$0
	(c) the Prior Year Credit Balance	$0
		$79,778,700
	Exceeds the sum of	
	(d) the Solvency Assets net of estimated termination expenses[12]	$211,486,200
	(e) the Solvency Asset Adjustment	$0
		$211,486,200
		$0

[12] In accordance with accepted actuarial practice, for purposes of determining the financial position, the market value of plan assets was reduced by a provision for estimated termination expenses payable from the Plan's assets that may reasonably be expected to be incurred in terminating the Plan and to be charged to the Plan.

Defined Term	Description	Result
Reduced Solvency Deficiency / (Solvency Excess)	The sum of:	
	(a) 85% of the Solvency Liabilities	$67,811,900
	(b) 85% of the Solvency Liability Adjustment	$0
	(c) the Prior Year Credit Balance	$0
		$67,811,900
	minus the sum of:	
	(d) the Solvency Assets net of estimated termination expenses	$211,486,200
	(e) the Solvency Asset Adjustment	$0
		$211,486,200
		($143,674,300)

Provision for Adverse Deviations

The provision for adverse deviations has been established in accordance with regulations taking into account the following parameters:

<table>
<tr><th colspan="2">Defined Amount</th><th>Results</th></tr>
<tr><td>Fixed Income Component
(L)</td><td>The sum of the Plan’s target allocation of assets (excluding those allocated to annuity contracts and meeting the minimum rating requirement) as described in the regulations according to the investment policy applicable at the valuation date:

<table><tr><th>Investment</th><th>Target</th></tr><tr><td>Canadian Bonds and debentures</td><td>34.0%</td></tr><tr><td>Demand deposits and cash on hand</td><td>1.0%</td></tr></table></td><td>35.0%</td></tr>
<tr><td>Alternative Investment Component
(M)</td><td>The sum of the Plan’s target allocation of assets (excluding those allocated to annuity contracts) meeting requirements as described in the regulations according to the investment policy applicable at the valuation date:

<table><tr><th>Investment</th><th>Target</th></tr><tr><td>Infrastructure</td><td>10.0%</td></tr></table></td><td>10.0%</td></tr>
<tr><td>Investment Component
(N)</td><td>Plan’s target asset allocation for mutual, pooled or segregated funds</td><td>0.0%</td></tr>
<tr><td>Investment Component Fixed Income %
(P)</td><td>Portion of Investment Component (N) that is allocated to investment categories accounted for in Fixed Income Component (L)</td><td>0.0%</td></tr>
<tr><td>Investment Component Alternative Investment %
(Q)</td><td>Portion of Investment Component (N) that is allocated to investment categories accounted for in Alternative Income Component (M)</td><td>0.0%</td></tr>
<tr><td>Annuity Contract Allocation
(R)</td><td>Annuity contracts that have been purchased from an insurance company and excluded from the Fixed Income Component (L) and Alternative Investment Component (M)</td><td>0.0%</td></tr>
</table>

Combined Target Asset Allocation for Fixed Income Assets (J)			
Sum of			
• Fixed Income Component (L)	35.00%		
• 0.5 × Alternative Investment Component (0.5 × M)	5.00%		
• Investment Component × Investment Component Fixed Income % (N × P)	0.00%		
• 0.5 × Investment Component × Investment Component Alternative Investment % (0.5 x N × Q)	0.00%		
		40.00%	
Divided by			
• 100% - Annuity Contract Allocation (100% - R)		100.00%	
Combined Target Asset Allocation for Fixed Income Assets			**40.00%**

Combined Target Asset Allocation for Non-Fixed Income Assets (K)	
100% – Combined **Target** Asset Allocation for Fixed Income Assets (100% - J)	**60.00%**

Duration of going concern liabilities at valuation date		
=	(F - G) / (G × 0.01)	**48.81**
where,		
G =	going concern liabilities excluding liabilities in respect of escalated adjustments at valuation date established using the discount rate determined for this valuation	$170,784,100
F =	going concern liabilities excluding liabilities in respect of escalated adjustments established using the discount rate minus 1%	$254,152,000

Benchmark Discount Rate (E)	
Base rate	0.50%
Effective yield from CANSIM Series V39056 (H)	1.84%
1.5% x Combined **Target** Asset Allocation for Fixed Income Assets (1.5% × J)	0.60%
5.0% x Combined **Target** Asset Allocation for Non-Fixed Income Assets (5.0% × K)	3.00%
Benchmark Discount Rate	**5.94%**

Provision for Adverse Deviations			
i.	5.0% for a closed plan and 4.0% for a Plan that is not a closed plan		4.00%
ii.	Provision based on Combined Target Asset Allocation for Non-Fixed Income Assets		4.00%
iii.	Greater of zero and the		
	• Duration of going concern liabilities at valuation date	48.81	
	Multiplied by:		
	– Going concern valuation gross discount rate net of active investment management fees (D), less	5.57%	
	– Benchmark Discount Rate (E)	5.94%	0.00%
Provision for Adverse Deviations (A + B + C)			**8.00%**

The Provision for Adverse Deviations of 8.0% has been applied to the going concern liabilities and current service cost in respect of the supplemental benefits required to provide a total pension equal to the Minimum Guaranteed Benefit. The Provision for Adverse Deviations is not applied to benefits payable under the Money Purchase Account, Additional Voluntary Contribution Account, Past Service Account, Special Transfer Fund and Variable Annuity Fund.

The available actuarial surplus that may be used according to the Act is established as follows:

Available actuarial surplus			
Excess of			
• Assets determined on basis of going concern valuation including accrued and receivable income but excluding the value of any letters of credit		$211,936,200	
Over			
• Going concern liabilities	$170,784,100		
• Provision for adverse deviations in respect of the going concern liabilities	$6,475,700		
• Prior Year Credit Balance	$0		
		$177,259,800	
		$34,676,400	(a)
Excess of			
• Solvency assets excluding the value of any letters of credits and lesser of Prior Year Credit Balance and minimum required employer contributions, including the provision for adverse deviations until the next required valuation		$211,936,200	
Over			
• Wind-up liabilities × 105%		$357,740,000	
		$0	(b)
The available actuarial surplus = the lesser of a) and b) above		**$0**	

Timing of Next Required Valuation

In accordance with the Act the next valuation of the Plan would be required at an effective date within one year of the current valuation date if:

- The ratio of solvency assets to solvency liabilities is less than 85%.
- The University elected to exclude plant closure or permanent lay-off benefits under Section 5(18) of the regulations, and has not rescinded that election.

Otherwise, the next valuation of the Plan would be required at an effective date no later than three years after the current valuation date.

Accordingly, the next valuation of the Plan will be required as of July 1, 2024.

Special Payments

The present values as at July 1, 2021 of the monthly special payments determined in the previous valuation are as follows:

Present Value of Monthly Special Payments
Determined as at January 1, 2020

				Present Value of Remaining Payments as at July 1, 2021	
Type of Deficit	Start Date	Monthly Special Payment	End date	Going Concern Basis[13]	Solvency Basis[14]
Going concern	January 1, 2020	$531,050	December 31, 2020	$0	$0
Going concern	January 1, 2021	$190,075	December 31, 2030	$17,017,400	$10,673,400
Total				$17,017,400	$10,673,400

As the Plan has a funding excess, going concern special payments revealed in the previous valuation are no longer required.

Pension Benefits Guarantee Fund (PBGF) Assessment

A PBGF assessment is required to be paid under Section 37 of the Act. The PBGF assessment base is derived as follows:

Solvency assets	$689,562,500	(a)
PBGF liabilities	$557,405,000	(b)
Solvency liabilities	$557,405,000	(c)
Ontario asset ratio	100%	(d) = (b) ÷ (c)
Ontario portion of the fund	$689,562,500	(e) = (a) × (d)
PBGF assessment base	$0	(f) = max(0, (b) – (e))
Amount of additional liability for plant closure and/or permanent layoff benefits which is not funded and subject to the 2% (3% for years after 2018) assessment pursuant to s.37(4)	$0	(g)

[13] Calculation only considers going concern special payments and is based on a going concern discount rate.

[14] Calculation considers both solvency and going concern special payments (six years only) and is based on the average solvency discount rate.

Appendix B
Plan Assets

The pension fund is held by Northern Trust Company. In preparing this report, we have relied upon fund statements prepared by Northern Trust Company without further audit. Customarily, this information would not be verified by a plan's actuary. We have reviewed the information for internal consistency and we have no reason to doubt its substantial accuracy.

Reconciliation of Market Value of Plan Assets

The pension fund transactions since the last valuation are summarized in the following table:

	2020	2021
January 1	$590,796,909	$658,189,093
PLUS		
Members' contributions	$8,338,989	$4,352,959
University's MPC contributions	$5,559,326	$2,901,972
University's MGP contributions	$5,931,848	$3,045,116
University's special funding payments	$6,372,600	$1,140,450
Investment income	$17,998,755	$9,740,347
Net capital gains (losses)	$55,681,791	$27,077,840
	$99,883,309	$48,258,684
LESS		
Pensions paid	$27,351,932	$13,668,088
Lump-sums paid	$2,218,150	$1,453,962
Investment fees	$2,190,012	$1,402,242
Professional fees	$290,591	$108,291
Administration fees	$440,440	$138,983
	$32,491,125	$16,771,566
December 31	$658,189,093	
June 30		$689,676,211
Gross rate of return[15]	12.54%	5.62%
Rate of return net of expenses[16]	12.01%	5.36%

[15] Assuming mid-period cash flows.

[16] Assuming mid-period cash flows.

The market value of assets shown in the above table is adjusted to reflect in-transit amounts as follows:

	Current Valuation	Previous Valuation
Market value of invested assets	$689,676,211	$590,796,909
In-transit amounts		
• Benefit payments	($113,695)	($68,098)
Market value of assets adjusted for in-transit amounts	$689,562,516	$590,728,811

We have tested the pensions paid, the lump-sums paid, and the contributions for consistency with the membership data for the Plan members who have received benefits or made contributions. The results of these tests were satisfactory.

Investment Policy

The plan administrator has adopted a statement of investment policy and procedures. This policy is intended to provide guidelines for the manager(s) as to the level of risk that is consistent with the Plan's investment objectives. A significant component of this investment policy is the asset mix.

The University amended its Statement of Investment Policies and Procedures document effective November 24, 2020.

The plan administrator is solely responsible for selecting the plan's investment policies, asset allocations, and individual investments. The constraints on the asset mix and the actual asset mix at the valuation date are provided for information purposes:

	Investment Policy			Actual asset Mix as at July 1, 2021
	Minimum	Target	Maximum	
Canadian Equities	5%	15%	25%	19.1%
Global Equities	20%	30%	40%	38.1%
Private Equity	0%	10%	20%	3.0%
Canadian Long Bonds	14%	24%	34%	22.0%
Canadian Provincial Bond Overlay	0%	10%	20%	7.6%
Infrastructure	5%	10%	20%	9.6%
Cash and cash equivalents	0%	1%	20%	0.6%
		100%		100%

Because the Plan's assets (which are invested in accordance with the above investment policy) are not matched to the Plan's liabilities (which tend to behave like long bonds), the Plan's financial position will fluctuate over time. These fluctuations could be significant and could cause the Plan to become underfunded or overfunded even if the University contributes to the Plan based on the funding requirements presented in this report.

Individual Accounts

Each year the investment income in addition to realised gains and losses is allocated to the various sub-funds. The balances in the sub-funds as at July 1, 2021 are as follows:

	Market Value
Money Purchase Component Account	$269,293,244
Additional Voluntary Contribution Account	$221,947
Special Transfer Fund	$1,088,901
Variable Annuity Fund	$207,022,175
Past Service Account	$0
Minimum Guarantee Fund	$211,936,249
	$689,562,516

A detailed description of each fund follows:

Money Purchase Component Account

The Money Purchase Component Account consists of the Members' required contributions, the University's required Money Purchase Component contributions, and interest based on fund experience, including realised and unrealised gains and losses, net of expenses. At retirement the accumulated amounts will be transferred to the Variable Annuity Fund and will provide a Money Purchase Pension.

The Money Purchase Component Account balance as at July 1, 2021 is $269,293,244 ($251,895,856 in respect of active members and $17,397,388 in respect of deferred vested members).

Additional Voluntary Contribution Fund

This fund is composed of additional voluntary contributions. A Member may elect to contribute additional contributions up to the maximum allowable under the Income Tax Act, and all voluntary contributions will be accumulated with Credited Interest and used at retirement to provide such additional amount of pension as can be provided therewith based on actuarial tables in force for Plan purposes at that time.

The market value of the Additional Voluntary Contribution Fund was $221,947 as at July 1, 2021.

Special Transferred Contribution Fund

This fund includes lump sums transferred in from other plans. These amounts will be accumulated with Credited Interest and used at retirement to provide such additional amounts of pension as can be provided based on actuarial tables in force for Plan purposes at that time.

The market value of the Special Transferred Contribution Fund was $1,088,901 as at July 1, 2021.

Variable Annuity Fund

This fund provides variable annuities to members who retired on and after July 1, 1972. The accumulated Money Purchase Component Account of each member is transferred to this fund at retirement.

The market value of the Variable Annuity Fund was $207,022,175 as at July 1, 2021. There were 495 persons in receipt of pension benefits as at this date.

Past Service Account

This fund includes amounts that members have transferred into the Plan in respect of past service purchased. The market value of this fund was $0 as at July 1, 2021.

Minimum Guarantee Fund

This fund was created to support the minimum final earnings-related guarantee based on length of service and linked to cost of living. If after retirement, the pension in any one year payable to a Member from the Variable Annuity Fund falls below the minimum guarantee applicable to that year, the difference will be paid from the Minimum Guarantee Fund.

In addition, this fund provides benefits to pensioners and terminated members with vested benefits, who retired or vested prior to July 1, 1972.

As at July 1, 2021, this fund has assets at market value of $211,936,249.

Appendix C

Methods and Assumptions – Going Concern

Valuation of Assets

For this valuation, we have used the market value of assets.

Going Concern Funding Target

Over time, the real cost to the employer of a pension plan is the excess of benefits and expenses over member contributions and investment earnings. The actuarial cost method allocates this cost to annual time periods.

For purposes of the going concern valuation, we have continued to use the projected unit credit actuarial cost method. Under this method, we determine the present value of benefit cash flows expected to be paid in respect of service accrued prior to the valuation date, including ancillary benefits as follows:

- We project the money purchase pension and the minimum guarantee pension that each active Member will receive during retirement based on projected service, earnings, and the money purchase account balance (including future contributions).

- We compare the money purchase pension with the minimum guarantee benefit at each year after retirement.

- The present value of any supplementary pension, representing the excess of the minimum guarantee over the money purchase pension, is allocated to accrued and future liabilities proportionately by service.

- The present value of the accrued supplementary pension benefit is compared to the value of the Minimum Guarantee Fund at the valuation date to determine any funding excess or funding shortfall under the Plan.

- The present value of any supplementary pension, representing the excess of the minimum guarantee over the money purchase pension, is allocated to the year following the valuation date proportionately by service to determine the current service cost rate.

This is referred to as the funding target.

The funding excess or funding shortfall, as the case may be, is the difference between the market or smoothed value of assets and the funding target. A funding excess on a market value basis indicates that the current market value of assets and expected investment earnings are expected to be sufficient to meet the cash flows in respect of benefits accrued to the valuation date as well as expected expenses – assuming the plan is maintained indefinitely. A funding shortfall on a market value basis indicates the opposite – that the current market value of the assets is not expected to be sufficient to meet the plan's cash flow requirements in respect of accrued benefits, absent additional contributions.

As required under the Act, a funding shortfall (including the prior year credit balance)> and the provision for adverse deviations must be amortized over no more than 10 years through special payments beginning one year after the valuation date. A funding excess may, from an actuarial standpoint, be applied immediately to reduce required employer current service contributions unless precluded by the terms of the plan or by legislation.

The actuarial cost method used for the purposes of this valuation produces a reasonable matching of contributions with accruing benefits. Because benefits are recognized as they accrue, the actuarial cost method provides an effective funding target for a plan that is maintained indefinitely.

Current Service Cost

The current service cost is the present value of projected benefits to be paid under the plan with respect to service expected to accrue in each year during the period until the next valuation.

The University's current service cost is the total current service cost reduced by the members' required contributions.

The University's current service cost has been expressed as a percentage of the members' pensionable earnings to provide an automatic adjustment in the event of fluctuations in membership and/or pensionable earnings.

Under the projected unit credit actuarial cost method, the current service cost for an individual member will increase each year as the member approaches retirement. However, the current service cost of the entire group, expressed as a percentage of the members' pensionable earnings, can be expected to remain stable as long as the average age distribution of the group remains constant.

Actuarial Assumptions – Going Concern Basis

The present value of future benefit payment cash flows is based on economic and demographic assumptions. At each valuation we determine whether, in our opinion, the actuarial assumptions are still appropriate for the purposes of the valuation, and we revise them, if necessary. Emerging experience will result in gains or losses that will be revealed and considered in future actuarial valuations.

The table below shows the various assumptions used in the current valuation in comparison with those used in the previous valuation.

Assumption	Current valuation	Previous valuation
Discount rate:	5.40%	5.25%
Inflation:	2.00%	2.00%
ITA limit / YMPE increases:	3.00%	3.00%
Pensionable earnings increases:	3.00% for 3 years and 5.00% thereafter	2.00% for 3 years and 5.00% thereafter
Post retirement minimum guaranteed pension increases:	2.00%	2.00%
Post retirement money purchase pension increases:	(0.60%)	(0.75%)
Interest on Money Purchase Component Account balances:	5.40%	5.25%
Retirement rates:	Same age related table	Same age related table
Termination rates:	Same age related table	Same age related table
Mortality rates:	90% of the rates of the 2014 Public Sector Canadian Pensioners Mortality Table (CPM2014Publ)	95% of the rates of the 2014 Public Sector Canadian Pensioners Mortality Table (CPM2014Publ)
Mortality improvements:	Fully generational using CPM Improvement Scale B (CPM-B)	Fully generational using CPM Improvement Scale B (CPM-B)
Disability rates:	None	None
Form of benefit for pre-retirement termination:	50% of non-retirement eligible members elect a lump sum transfer	50% of non-retirement eligible members elect a lump sum transfer
Discount rate for termination benefits assumed to be settled through a lump sum:	3.05%	2.55%
Mortality rates and improvements for termination benefits assumed to be settled through a lump sum:	100% of the rates of the 2014 Canadian Pensioners Mortality Table (CPM2014) with fully generational mortality improvements using Scale B (CPM-B)	100% of the rates of the 2014 Canadian Pensioners Mortality Table (CPM2014) with fully generational mortality improvements using Scale B (CPM-B)
Eligible spouse before retirement:	85%	85%
Spousal age difference:	Males 3 years older	Males 3 years older

The assumptions are best-estimates and do not include a margin for adverse deviations.

Age Related Tables

Sample rates from the age-related tables are summarized in the following table:

Age	Termination	Retirement
20	4.0%	0.0%
25	4.0%	0.0%
30	4.0%	0.0%
35	4.0%	0.0%
40	4.0%	0.0%
45	4.0%	0.0%
50	4.0%	0.0%
55	0.0%	2.0%
56	0.0%	2.0%
57	0.0%	2.0%
58	0.0%	2.0%
59	0.0%	2.0%
60	0.0%	2.0%
61	0.0%	5.0%
62	0.0%	5.0%
63	0.0%	5.0%
64	0.0%	5.0%
65	0.0%	20.0%
66	0.0%	20.0%
67	0.0%	20.0%
68	0.0%	20.0%
69	0.0%	20.0%
70	0.0%	20.0%
71	0.0%	100.0%

Pensionable Earnings

The benefits ultimately paid will depend on each member's final average earnings. To calculate the pension benefits payable upon retirement, death, or termination of employment, we have taken the rate of pay on July 1, 2021 and assumed that such pensionable earnings will increase at the assumed rate.

Rationale for Assumptions

A rationale for each of the assumptions used in the current valuation is provided below.

Discount Rate

We have discounted the expected benefit payment cash flows using the expected investment return on the market value of the fund net of fees. Other bases for discounting the expected benefit payment cash flows may be appropriate, particularly for purposes other than those specifically identified in this valuation report.

The discount rate is comprised of the following:

- An **assumed investment return** based on estimated return for each major asset class that are consistent with market conditions on the valuation date modified to include a provision for increases in market interest rates to a level higher than current historically low levels, on the expected time horizon over which benefits are expected to be paid, and on the target asset mix specified in the Plan's investment policy.
- An **active investment management expense provision**. We have assumed that these fees would be offset by an equivalent additional return resulting from active management.
- An **assumed passive investment management expense provision** which represents the hypothetical fees for passive investment management of assets based on estimated fees charged by index managers for balanced mandates.
- An **implicit non-investment management expense provision** determined as the average rate of non-investment expenses paid from the fund over the last 3 years. These would include all fees payable from the fund (administration, custodial, audit, consulting, etc.) except those payable to investment managers, to the extent that these fees are not covered in an explicit provision for expenses added to the current service cost

The discount rate was developed as follows:

Assumed investment return	5.57%
Additional returns for active investment management offset by active investment management fees	0.00%
Assumed passive investment management expense provision	(0.05%)
Implicit non-investment management expense provision	(0.14%)
Rounding	0.02%
Net discount rate	5.40%

Inflation

The inflation assumption is based on the mid-point of the Bank of Canada's inflation target range of between 1% and 3%.

Income Tax Act Pension Limit and Year's Maximum Pensionable Earnings

The assumption is based on historical real economic growth and the underlying inflation assumption.

Pensionable Earnings

The assumption is based on general wage growth assumptions increased by our best estimate of future merit and promotional increases over general wage growth considering current economic and financial market conditions, applicable collective agreement provisions, and University expectations.

Post-Retirement Pension Increases

The assumption is based on the Plan formula and inflation assumption above.

Post retirement money purchase pension increases

The assumption is based on the difference between the discount rate and annuity conversion basis interest rate.

Retirement Rates

The assumption is based on experience over the years 2008/2009 to 2016/2017 and expectations of future experience based on Plan terms and employment standards law.

Termination Rates

The assumption is based on experience from 2008/2009 to 2013/2014. Subsequent experience has been consistent with these rates.

Interest on Money Purchase Account Balance

The assumption is based on Plan terms and the underlying investment return assumption.

Mortality Rates

The assumption for the mortality rates is based on the Canadian Pensioners' Mortality (CPM) study published by the Canadian Institute of Actuaries in February 2014.

The mortality rates selected reflect plan-specific experience over the years 2007 to 2021. However, due to the size of the Plan, this mortality experience is not fully credible. The CPM mortality rates from the public sector have been adjusted after considering the plan-specific experience and member and plan-specific characteristics through the Mercer Mortality Model, with those characteristics including pension amount, lifestyle information extracted from postal codes, and broad classification of type of work. Mercer has compiled detailed mortality experience data from a diverse set of large and mid-sized Canadian pension plans and analyzed the experience across a number of those key characteristics. This has led to the creation of numerous mortality tables varying according to the different characteristics, and forms the Mercer Mortality Model.

There is broad consensus among actuaries and other longevity experts that mortality improvement will continue in the future, but the degree of future mortality improvement is uncertain. Two mortality improvement scales were recently published by the Canadian Institute of Actuaries (CIA) and may apply to Canadian pension valuations:

- The Canadian Pensioners Mortality (CPM) study published in February 2014 included CPM Improvement Scale B (CPM-B).
- A report released by the Task Force on Mortality Improvement on September 20, 2017 includes an analysis of the rate of mortality improvement for the Canadian population and provides for mortality improvement scale MI-2017 to be considered for the purpose of reflecting future mortality improvement in Canadian actuarial work, while acknowledging that it might be appropriate to use alternative mortality improvement assumptions to reflect the nature of the work.

The CIA Committee on Pension Plan Financial Reporting published a revised version of the Educational Note on the Selection of Mortality Assumptions for Pension Plan Valuations on December 21, 2017. The Educational Note indicates that given the recent publication of the CPM-B and MI-2017 improvement scales and the similar data sets used in their development, it may be appropriate to use either scale in the absence of credible information to the contrary, such as the publication of a successor scale by the CIA.

For the present valuation, we have continued to use the CPM-B scale without adjustment, which is a reasonable outlook for future mortality improvement.

Based on the assumption used, the life expectancy of a member age 65 at the valuation date is 23.9 years for males and 25.7 years for females.

Money Purchase Account Conversion

Based on the current administrative practice, all members who participate in the Variable Annuity Fund receive pensions from their Money Purchase Account balances determined using an interest rate of 6% per annum and the following mortality rates:

- Pre-July 1, 2004 retirements - 1983 Group Annuity Mortality Table;
- Post-July 1, 2004 retirements - 1994 Uninsured Pensioners Mortality Table Fully generational using Scale AA
- The current administration practice of Money Purchase Account conversion is under review. For the purposes of this valuation we have assumed that the mortality assumption will be changed to 90% of the rates of the public sector mortality table (CPM2014Publ) and CPM-B mortality improvement scale.

Money Purchase Pension Adjustment for New Mortality Table

The change to the public sector mortality table (CPM2014Publ) and CPM-B mortality improvement scale is to be assumed to be accompanied by a decrease in money purchase pensions so that the Variable Annuity Fund is unchanged (i.e. entire cost is charged to pensioners). This means all Money Purchase Pensions at July 1, 2021 are assumed to decrease by the following factors relative to their previous level:

- Pre July 1, 2004 Retirements: (GAM83 / CPM2014Publ);
- Post July 1, 2004 Retirements: (UP94 / CPM2014Publ).

Disability Rates

Use of a different assumption would not have a material impact on the valuation.

Eligible Spouse

The assumption is based on an industry standard for non-retired members (actual status used for retirees).

Spousal Age Difference

The assumption is based on an industry standard showing males are typically 3 years older than their spouse.

Appendix D

Methods and Assumptions – Hypothetical Wind-Up and Solvency

Hypothetical Wind-up Basis

The Canadian Institute of Actuaries requires actuaries to report the financial position of a pension plan on the assumption that the plan is wound up on the effective date of the valuation, with benefits determined on the assumption that the pension plan has neither a surplus nor a deficit.

To determine the actuarial liability on the hypothetical wind-up basis, we have valued those benefits that would have been paid had the Plan been wound up on the valuation date, with all members fully vested in their accrued benefits.

The circumstances in which the plan wind-up is assumed to have taken place are as follows:

- The University's is discontinued on the valuation date

No benefits payable on plan wind-up under the above postulated scenario were excluded from our calculations.

Upon plan wind-up, members are given options for the method of settling their benefit entitlements. The options vary by eligibility and by province of employment, but in general, involve either a lump sum transfer or an immediate or deferred pension.

The value of benefits assumed to be settled through a lump sum transfer is based on the assumptions described in Section 3500 – *Pension Commuted Values* of the Canadian Institute of Actuaries' Standards of Practice applicable for July 1, 2021.

Benefits provided as an immediate or deferred pension are assumed to be settled through the purchase of annuities based on an estimate of the cost of purchasing annuities.

However, there is limited data available to provide credible guidance on the cost of a purchase of indexed annuities in Canada. In accordance with the *Canadian Institute of Actuaries Educational Note: Assumptions for Hypothetical Wind-up and Solvency Valuations with Effective Dates Between December 31, 2020 and December 30, 2021 (the "Educational Note")*, we have used an annuity proxy to estimate the cost of purchasing annuities.

The Educational Note provides guidance on estimating the cost of annuity purchases assuming a typical group of annuitants. That is, no adjustments for sub- or super-standard mortality are considered. However, it is expected that insurers will consider plan experience and certain plan-specific characteristics when determining the mortality basis for a particular group. The Educational Note states that the actuary would be expected to make an adjustment to the regular annuity purchase assumptions where there is demonstrated substandard or super-standard mortality or where an insurer might be expected to assume so. In such cases, the actuary would be expected to make an adjustment to the mortality assumption in a manner consistent with the underlying annuity purchase basis. Given the uncertainty surrounding the actual mortality basis that would be typical of a group annuity purchase, it is reasonable to assume that there is a range of bases that can be expected not to be materially different from the actual mortality basis. Therefore, an adjustment to the regular annuity purchase assumptions would be warranted when the plan's assumed basis falls outside that range.

In this context, we have determined that an adjustment to the mortality rates used in the regular annuity purchase assumptions is required.

We have not included a margin for adverse deviation in the solvency and hypothetical wind-up valuations.

The assumptions are as follows:

Form of Benefit Settlement Elected by Member	
Lump sum:	70% of active members and deferred pensioners under age 55, and 50% of active members and deferred pensioners over age 55, elect to receive their benefit entitlement in a lump sum
Annuity purchase:	All remaining members are assumed to elect to receive their benefit entitlement in the form of a deferred or immediate pension. These benefits are assumed to be settled through the purchase of deferred or immediate annuities from a life insurance company.
Basis for Benefits Assumed to be Settled through a Lump Sum	
Mortality rates:	100% of the rates of the 2014 Canadian Pensioners Mortality Table (CPM2014) with fully generational improvements using CPM Scale B
Interest rate:	1.80% per year for 10 years, 3.30% per year thereafter
Inflation rate:	1.09% per year for 10 years, 2.08% per year thereafter
Basis for Benefits Assumed to be Settled through the Purchase of an Annuity	
Mortality rates:	100% of the rates of the 2014 Canadian Pensioners Mortality Table (CPM2014) with fully generational improvements using CPM Scale B
Adjustment to mortality rates:	Above mortality rates reduced by 10% to reflect super-standard mortality
Interest rate:	2.97% per year based on a duration of 11.3 years determined for the liabilities assumed to be settled through the purchase of an annuity.
Inflation rate:	3.38% per year (representing the risk-adjusted inflation rate reflected in the purchase price of indexed annuities)

Retirement Age	
Benefits assumed to be payable through a lump sum:	Members are assumed to retire with a 50% probability at the age that maximizes the value of their entitlement from the Plan and a 50% probability at the member's earliest unreduced age in accordance with applicable legislation and based on the eligibility requirements that have been met at the valuation date
Benefits assumed to be settled through the purchase of an annuity:	Members are assumed to retire at the age that maximizes the value of their entitlement from the Plan, based on the eligibility requirements that have been met at the valuation date
Grow-in:	The benefit entitlement and assumed retirement age of Ontario members whose age plus service equals at least 55 at the valuation date reflect their entitlement to grow into early retirement subsidies
Post retirement pension increases[17]	
Minimum guarantee pension:	0.89% per year for 10 years, 2.08% per year thereafter for lump sum transfers 2.00% per year for annuity purchases
Money purchase pension:	(4.20%) per year for 10 years, (2.70%) per year thereafter for lump sum transfers (3.03%) per year for annuity purchases
Other Assumptions	
Final average earnings:	Based on actual pensionable earnings over the averaging period
Family composition:	Same as for going concern valuation
Maximum pension limit:	$3,245.56 per year
Termination expenses:	$450,000

For solvency and wind-up valuation purposes, we have assumed that, for active members, the annuity conversion basis used at the time of their ultimate pension commencement will be the conversion basis used to value the supplementary benefits for funding purposes.

To determine the hypothetical wind-up position of the Plan, a provision has been made for estimated termination expenses payable from the Plan's assets in respect of actuarial and administration expenses that may reasonably be expected to be incurred in terminating the Plan and to be charged to the Plan.

In addition, termination expenses also include a provision for transaction fees related to the liquidation of the Plan's assets and for expenses that may reasonably be expected to be paid by the pension fund under the postulated scenario between the wind-up date and the settlement date. It was assumed for this purpose that the

[17] Excluded from solvency liabilities.

termination process would extend over a two-year period. Because the settlement of all benefits on wind-up is assumed to occur on the valuation date and is assumed to be uncontested, the provision for termination expenses does not include custodial, investment management, auditing, consulting, and legal expenses that would be incurred between the wind-up date and the settlement date or due to the terms of a wind-up being contested.

Expenses associated with the distribution of any surplus assets that might arise on an actual wind-up are also not included in the estimated termination expense provisions.

In determining the provision for termination expenses payable from the Plan's assets, we have assumed that the plan sponsor would be solvent on the wind-up date. We have also assumed, without analysis, that the Plan's terms as well as applicable legislation and court decisions would permit the relevant expenses to be paid from the Plan.

Although the termination expense assumption is a best estimate, actual fees incurred on an actual plan wind-up may differ materially from the estimates disclosed in this report.

Incremental Cost

In order to determine the incremental cost, we estimate the hypothetical wind-up liabilities at the next valuation date. We have assumed that the cost of settling benefits by way of a lump sum or purchasing annuities remains consistent with the assumptions described above. Since the projected hypothetical wind-up liabilities will depend on the membership in the Plan at the next valuation date, we must make assumptions about how the Plan membership will evolve over the period until the next valuation.

We have assumed that the Plan membership will evolve in a manner consistent with the going concern assumptions as follows:

- Members terminate, retire and die consistent with the termination, retirement and mortality rates used for the going concern valuation.
- Pensionable earnings, money purchase accounts, the Income Tax Act pension limit, and the Year's Maximum Pensionable Earnings increase in accordance with the related going concern assumptions.
- Active members accrue pensionable service in accordance with the terms of the Plan.
- Cost of living adjustments are consistent with the inflation assumption used for the going concern valuation.

Solvency Basis

In determining the financial position of the Plan on the solvency basis, we have used the same assumptions and methodology as were used for determining the financial position of the Plan on the hypothetical wind-up basis with the exception that we have excluded post retirement indexing.

The solvency position is determined in accordance with the requirements of the Act.

Appendix E

Membership Data

Analysis of Membership Data

The actuarial valuation is based on membership data as at July 1, 2021, provided by the University.

We have applied tests for internal consistency, as well as for consistency with the data used for the previous valuation. These tests were applied to membership reconciliation, basic information (date of birth, date of hire, date of membership, gender, etc.), pensionable earnings, credited service, contributions accumulated with interest, and pensions to retirees and other members entitled to a deferred pension. Contributions, lump sum payments, and pensions to retirees were compared with corresponding amounts reported in financial statements. The results of these tests were satisfactory.

If the data supplied are not sufficient and reliable for its intended purpose, the results of our calculation may differ significantly from the results that would be obtained with such data. Although Mercer has reviewed the suitability of the data for its intended use in accordance with accepted actuarial practice in Canada, Mercer has not verified or audited any of the data or information provided.

Plan membership data are summarized below. For comparison, we have also summarized corresponding data from the previous valuation.

	07.01.2021	01.01.2020
Active Members		
Number	727	726
Total annualized pensionable earnings (2021/2022; 2020)	$106,773,733	$101,321,717
Average annualized pensionable earnings (2021/2022; 2020)	$146,869	$139,562
Average years of pensionable service	11.6 years	11.1 years
Average age	51.8	51.3
Accumulated Money Purchase Component Account Balance	$250,393,737	$208,320,959
Disabled Members		
Number	4	5
Total pensionable earnings (2021/2022; 2020)	$549,677	$632,135
Average pensionable earnings (2021/2022; 2020)	$137,419	$126,427
Average years of pensionable service	14.5 years	13.6 years
Average age	54.9	51.9
Accumulated Money Purchase Component Account Balance	$1,502,119	$1,624,591
Deferred Pensioners		
Number	149	151
Average age	54.5	53.9
Accumulated Money Purchase Component Account Balance	$17,397,388	$14,926,678
Pensioners and Survivors		
Number	495	486
Average Monthly Money Purchase Pension	$4,021	$3,690
Average Monthly Minimum Guaranteed Benefit	$4,434	$4,388
Average age	77.8	77.5

The membership movement for all categories of membership since the previous actuarial valuation is as follows:

	Actives	Disabled members	Deferred Pensioners	Pensioners and Survivors	Total
Total at 01.01.2020	726	5	151	486	1,368
New entrants	52				52
Terminations:					
• transfers/lump sums	(11)		(9)		(20)
• deferred pensions	(14)	(1)	15		
Deaths	(1)			(32)	(33)
Beneficiaries				11	11
Retirements	(25)		(7)	32	
Benefit expiry				(1)	(1)
Record consolidation			(1)	(1)	(2)
Total at 07.01.2021	**727**	**4**	**149**	**495**	**1,375**

The distribution of the active members by age and pensionable service as at the valuation date is summarized as follows:

	Years of Pensionable Service							
Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30 +**	**Total**
25 - 29	5							5
30 - 34	21	3						24
35 - 39	50	17	3					70
40 - 44	46	22	13	3				84
45 - 49	43	20	39	23	4			129
50 - 54	26	16	30	31	13	1		117
55 - 59	31	16	17	51	19	4	2	140
60 - 64	9	5	19	25	16	15	8	97
65 +	6	7	7	12	5	6	18	61
Total	**237**	**106**	**128**	**145**	**57**	**26**	**28**	**727**

The distribution of the deferred pensioners by age as at the valuation date is summarized as follows:

Age	Deferred Pensioners at 07.01.2021		
	Number	Average Annual Minimum Guarantee Pension at Age 65	Average Money Purchase Account Balance
< 40	16	$3,118	$37,913
40 – 44	3	$2,407	$27,536
45 – 49	20	$5,683	$88,565
50 – 54	30	$9,339	$131,760
55 – 59	44	$6,658	$143,977
60 – 64	22	$6,084	$142,173
65 +	14	$4,106	$108,665
Total	**149**	**$6,277**	**$116,760**

The distribution of the pensioners and survivors by age as at the valuation date is summarized as follows:

Age	Number	Pensioners and survivors at 07.01.2021		
		Average Annual Minimum Guarantee Pension (A)	Average Annual Money Purchase Pension (B)	Maximum of (A) and (B)
< 60	8	$18,771	$21,828	$24,563
60 – 64	9	$17,172	$22,712	$22,730
65 – 69	65	$40,701	$42,182	$44,521
70 – 74	114	$54,375	$54,923	$59,460
75 – 79	103	$67,565	$67,144	$74,370
80 – 84	104	$54,042	$43,723	$55,440
85 – 89	62	$52,124	$36,143	$52,338
90 – 94	22	$47,229	$27,694	$47,733
95 +	8	$42,550	$23,912	$44,992
Total	**495**	**$53,212**	**$48,256**	**$56,877**

Appendix F

Summary of Plan Provisions

Mercer has used and relied on the plan documents, including amendments and interpretations of plan provisions, supplied by the University. If any plan provisions supplied are not accurate and complete, the results of any calculation may differ significantly from the results that would be obtained with accurate and complete information. Moreover, plan documents may be susceptible to different interpretations, each of which could be reasonable, and the results of estimates under each of the different interpretations could vary.

This valuation is based on the plan provisions in effect on July 1, 2021. Since the previous valuation, the Plan has not been amended.

The following is a summary of the main provisions of the Plan in effect on July 1, 2021. This summary is not intended as a complete description of the Plan.

Background

The University of Windsor Employees' Retirement Plan was established on September 1, 1955. As of January 1, 1970, the Employees' Retirement Plan was amended to provide benefits to Faculty and Certain Employees under the provisions of the University of Windsor Retirement Plan for Faculty and Certain Employees which was established as of that date.

The Retirement Plan for Faculty and Certain Employees was amended effective July 1, 1985 to provide an increase in the Minimum Guaranteed Benefit level.

This Plan was again amended and restated as at January 1, 1988 to incorporate the new provisions of the Pension Benefits Act of Ontario, 1987, as well as amended effective May 1, 1989 to provide additional early retirement benefits.

The Plan was further amended effective July 1, 1990 to provide for the temporary non-reduction of Money Purchase Pensions and to introduce a new indexing formula to be applied to Minimum Guaranteed Benefits. The non-reduction of Money Purchase Pension was to be applied until July 1, 1995.

The Plan was amended and restated with effect from January 1, 1995 to incorporate the new provisions required by the Income Tax Act.

The Plan was amended effective July 1, 1993 to incorporate the following negotiated benefit improvements by the Faculty Association:

- increased Minimum Guaranteed Benefit formula (to 1.30/2.00% level)
- change Best Average Earnings from 5 year average to 4 year average
- change in the Canada Customs and Revenue Agency maximum pension test
- change in the post retirement indexation formula for the Minimum Guaranteed Benefit
- extension of the Voluntary Early Retirement (VER) program to August 31, 1996
- an ad hoc CPI related increase to the Minimum Guaranteed Benefit as at July 1, 1993, capped at 5%

The Plan was amended effective September 1, 1996 to incorporate the following negotiated improvements by the Faculty Association:

- increase Minimum Guaranteed Benefit formula (to 1.35%/2.00% level)
- change Best Average Earnings to allow non-consecutive years

Background *(continued)*	• allow a past service buyback for certain members • allow a temporary suspension of contributions by both Members and the University • extension of the Voluntary Early Retirement (VER) program to August 31, 1998 The Plan was amended effective September 1, 1998 to improve benefits as follows: • increase Minimum Guaranteed Benefit formula to (1.45/2% level), • increase the Minimum Guaranteed Benefit pension for those retired members as at July 1, 2001 to the level they would have received had they been given full CPI increases since pension commencement, • allow a temporary suspension of contributions by both Members and the University, • extension of the Voluntary Early Retirement (VER) program to August 31, 2001. The Plan was amended effective July 1, 2001 to improve benefits as follows: • increase Minimum Guaranteed Benefit formula to (1.5/2% level), • increase the contributions by both Members and the University to a flat 6% of pensionable earnings, • further extend the contribution holidays for both members and the University. The Plan was amended effective July 1, 2012 to increase the member Money Purchase contribution from 6% of Pensionable Earnings to 8% of Pensionable Earnings. Effective July 1, 2016, member contribution rates to the Money Purchase component increased from 8% of earnings to 9% of earnings. Effective July 1, 2016, the post retirement option to cease contributing to the Plan is no longer available. Members who remain actively employed beyond their normal retirement age continue to participate in the Plan.
Eligibility for membership	Permanent full-time members of the faculty and certain administrative staff who cannot be included in the bargaining unit and other designated employees are eligible to participate. Each new employee who is eligible, and joins the University on or after July 1, 1971 will be required to join the Plan on the January 1st or July 1st coincident with or following their date of appointment or attainment of age 25, whichever is later. An employee who is employed on a less than full-time basis is eligible to become a Member on the first day of the month coincident with or following the completion of 24 months of Continuous Service, provided that the employee has either earned at least 35% of the Year's Maximum Pensionable Earnings, or worked at least 700 hours in each of the 2 immediately preceding consecutive calendar years.
Pensionable Service	The pensionable service is contributory service under the Plan.

Contributions	Members are required to contribute to the Money Purchase Component Account an amount equal to 6% of Pensionable Earnings until December 31, 2011; 8% of Pensionable Earnings from January 1, 2012 to June 30, 2016; and 9% of Pensionable Earnings on and after July 1, 2016. The University is required to contribute 6% of Member Pensionable Earnings. On retirement, the Money Purchase Component Account for a disabled Member will include contributions deemed to be made by the Member, plus University contributions deemed to be made on behalf of the Member during the period of disability. The University pays the whole of the balance required to provide the supplemental benefits under the Plan.
Contributions Suspension	Effective September 1, 1998, contributions by Members and the University to the Money Purchase Component were temporarily suspended until such time as the total amount of the suspended contributions reached $14,720,000. Also effective September 1, 1998, the University's contributions to the Minimum Guarantee component of the plan were temporarily being suspended until such time as the total amount of the suspended University contributions reached $2,230,000. As part of the negotiated benefit improvements effective July 1, 2001, the contribution holidays were extended for both the University and the Members. The amount of additional contribution holiday was equal to the amount of funding excess as at July 1, 2001 in excess of $2,600,000. This additional contribution holiday of $3,484,992 was attributed one-third to the members and two-thirds to the University. The members were on a half contribution holiday once the contribution holiday established September 1, 1998 expired (February 16, 2005). During that time the members contributed half of the required contributions (i.e. 3% of pensionable earnings). During the contribution holiday, money was transferred from the funding excess to each Member's "Money Purchase Component Account" equal to the contributions the Member would have otherwise been required to make, plus the amount of contributions the University would have made on behalf of the Member.

Retirement Benefits

Money Purchase Pension

Each Member who retires from active service with the University at their Normal Retirement Date will receive a pension, commencing on such date and payable for life in monthly instalments but guaranteed in any event for 60 months, in such amount as can be provided from the total balance in the Money Purchase Component Account to the Member's credit, based on the actuarial tables in force for Plan purposes at that time. Such basic pension will be in the form of a variable benefit which will remain constant during each Plan Year but may vary from year to year depending upon the experience of that portion of the Pension Fund relating to retired Members during the preceding Plan Year, as determined by the Actuary.

Supplementary Pension

In addition, each Member who retires from active service with the University at their Normal Retirement Date will receive such amount of Supplementary Pension, payable for life but guaranteed in any event for 60 months, from the Minimum Guarantee Fund as may be required to provide a total pension during each Plan Year equal to the Minimum Guaranteed Benefit for that year.

The amount of the Minimum Guaranteed Benefit payable at the Normal Retirement Date will be calculated as follows:

(a) 1.50% of the Member's Best Average Earnings not in excess of the Average Canada Pension Plan Base, plus

(b) 2.00% of the Member's Best Average Earnings in excess of the Average Canada Pension Plan Base;

multiplied by the Member's Pensionable Service.

The Minimum Guaranteed Benefit is indexed according to the following formula:

% CPI Increase	% Increases In Minimum Guaranteed Pension
0% to 2%	100% of CPI increase
2% to 4%	2%
4% to 8%	50% of CPI increase
greater than 8%	4%

Early Retirement

Upon early retirement, the Money Purchase Pension and Minimum Guaranteed Benefits are calculated as the actuarial equivalent of the pensions payable at Normal Retirement.

Postponed Retirement

A Member who continues participation after Normal Retirement has the option of either continuing to contribute to the Money Purchase Component and continuing to accrue Minimum Guarantee service or ceasing contributions to the Money Purchase Component and receiving an actuarially increased pension at time of retirement.

Effective July 1, 2016, the option to cease contributing to the Plan is no longer available to Members who remain actively employed beyond their Normal Retirement Date. These Members will continue to participate in the Plan, and will continue making contributions to their Money Purchase Component Accounts and will continue accruing credited service under the Minimum Guarantee plan formula.

Maximum Minimum Guaranteed Benefit

The Minimum Guaranteed Benefit shall not exceed the years of the Member's Pensionable Service multiplied by the lesser of:

(a) $3,245.56 for 2021 or such greater benefit as may be permitted under the Income Tax Act; and

(b) 2% of the average of the Member's best three consecutive years' remuneration from the University,

reduced, if the pension commencement date precedes the earlier of the day on which:

(a) the Member attains age 60;

(b) the Member's age plus Continuous Service is equal to 80; and

(c) the Member completes 30 years of Continuous Service,

by 1/4 of 1% for each month by which the pension commencement date precedes that day, provided that no reduction shall apply in the case of a pension payable as a result of a Total and Permanent Disability.

For Service prior to January 1, 1995, Service is capped at 35 years when determining the maximum supplementary pension. Also for service prior to January 1, 1995, the value of the pension benefit provided upon early retirement cannot exceed the above maximum pension payable to age 60 in the form of a single life annuity guaranteed for 10 years.

The Canada Customs and Revenue Agency maximum pension test is to be applied to the form of pension selected, rather than the normal form of pension.

There is no limit on the amount of the pension that the member can purchase from the funds accumulated in the Money Purchase Account.

Death benefits

Pre-retirement:

In the event of death of a member while in the employment of the University, there will be payable to his/her named beneficiary or, if none, to his/her estate, a lump sum payment equal to the sum of the following:

(a) the balance of his/her Money Purchase Component Account at January 1, 1987 with Credited Interest to the date of death;

(b) the greater of:

- (i) employee and University contributions made on and after January 1, 1987 with Credited Interest to the date of death; and
- (ii) the Commuted Value of the deferred pension accrued after December 31, 1986;

(c) the total of his/her additional voluntary and special lump sum contributions including those amounts transferred under special agreement with a former University with Credited Interest to date of death.

Post retirement:

The normal form of payment is a lifetime pension guaranteed for five years. If the member has a spouse, an actuarially equivalent retirement option, such that the death benefit is a spousal pension of at least 60% of the retirement income which was payable during the member's lifetime, must be provided unless the member's spouse waives his or her right to such spousal pension. In that case, or if the member does not have a spouse, other optional retirement income forms are available.

Termination Benefits

A Member who terminates employment is entitled to a locked-in deferred pension. Such terminating Member may elect to transfer the greater of:

(i) his/her Money Purchase Component Account balance; and

(ii) the Commuted Value of his/her deferred pension,

to another registered pension plan or a locked-in registered retirement savings plan.

A Member who terminates employment is entitled to either leave the balance of his/her additional voluntary contributions, if any, under the Plan to provide an additional pension or receive a lump sum refund of his/her additional voluntary contributions with Credited Interest.

Disability Accrual

During any period of Total Disability, the Member shall continue to accrue benefits as though he were still actively employed. Also, the Member shall be deemed to have received Earnings during the disability period based on his/her level of Earnings prior to disability. The Year's Maximum Pensionable Earnings shall remain constant during the disability period at the level in effect in the year of disability.

For the purpose of determining all benefits under the Plan, except death benefits, the Member's Money Purchase Component Account shall include all deemed contributions the Member would have been required to make had he not been disabled, using the Member's Earnings and the Year's Maximum Pensionable Earnings in effect in the month prior to disability, along with the amount of deemed contributions the University would have made on behalf of the Member.

Appendix G

Plausible Adverse Scenarios

In this Appendix, the financial impact on the Plan’s going concern results (i.e., going concern financial position at the valuation date and current service cost from the valuation date to the next valuation date), on the Plan’s hypothetical wind-up and solvency financial positions at the valuation date and on the special payments of plausible adverse scenarios that would pose threats to the Plan’s future financial condition is illustrated for the following risks:

- Interest rate risk, the potential that interest rates will be lower than expected;
- Deterioration of asset values; and
- Longevity risk, the potential that pension plan members will live longer than expected.

The following tables summarize the going concern results, where we assumed for:

- Interest rate risk, an immediate parallel decrease in market interest rates of 100 basis points,
- Deterioration of asset values, an immediate decrease of 10% in the market value of non-fixed income assets; and
- Longevity risk, that life expectancy from the valuation date at age 65 for a male and a female would increase by 1.4 years and 1.3 years, respectively.

Excluding Money Purchase Component (All figures in $000's)	GOING CONCERN VALUATION RESULTS AS at 07.01.2021	PLAUSIBLE ADVERSE SCENARIO RESULTS AS AT 07.01.2021		
		INTEREST RATE RISK	DETERIORATION OF ASSET VALUES	LONGEVITY RISK
Market value of assets	$211,936	$226,772	$199,220	$211,936
Going concern funding target	$170,784	$182,295	$189,715	$181,849
Provision for Adverse Deviation	$6,476	$7,596	$8,474	$6,759
Funding excess (shortfall)	$34,676	$36,881	$1,031	$23,328
Estimated University's Current Service Cost for supplemental benefits, including Provision for Adverse Deviation				
July 1, 2021	$5,358	$6,203	$5,727	$5,416
July 1, 2022	$5,519	$6,389	$5,899	$5,578
July 1, 2023	$5,685	$6,581	$6,076	$5,745

Excluding Money Purchase Component (All figures in $000's)	HYPOTHETICAL WIND-UP AND SOLVENCY POSITION AS AT 07.01.2021	PLAUSIBLE ADVERSE SCENARIO RESULTS AS AT 07.01.2021		
		INTEREST RATE RISK	DETERIORATION OF ASSET VALUES	LONGEVITY RISK
Hypothetical Wind-up Financial Position				
Market value of assets	$211,936	$226,772	$199,220	$211,936
Termination expense provision	($450)	($450)	($450)	($450)
Wind-up assets	$211,486	$226,322	$198,770	$211,486
Wind-up liabilities	$340,705	$470,469	$364,235	$360,998
Wind-up excess (shortfall)	($129,219)	($244,147)	($165,465)	($149,512)
Solvency Financial Position				
Reduction in wind-up liabilities due to difference in circumstances of assumed wind-up and excluded benefits	($260,926)	($371,031)	($259,800)	($278,798)
Surplus excess (shortfall)	$131,707	$126,884	$94,335	$129,286
Solvency ratio	265%	228%	190%	257%
Transfer ratio	62%	48%	55%	59%

Excluding Money Purchase Component (All figures in $000's)	MINIMUM ANNUAL SPECIAL PAYMENTS AS AT 07.01.2021[18]	PLAUSIBLE ADVERSE SCENARIO RESULTS AS AT 07.01.2021		
		INTEREST RATE RISK	DETERIORATION OF ASSET VALUES	LONGEVITY RISK
July 1, 2021	$0	$0	$0	$0

If the University sponsoring the Plan became insolvent and unable to continue making contributions to meet the minimum funding requirements described in the report, the Plan would likely be wound up. The impact of this adverse scenario, as measured at July 1, 2021, would be a shortfall in the Plan of $129,219,000

The balance of this Appendix provides details of the plausible adverse scenarios selected and the determination of the impact on the going concern results.

Interest Rate Risk

The purpose of this scenario is to illustrate the sensitivity of the Plan's valuation results to the potential that interest rates will be lower than expected. For this purpose, we have assumed an immediate parallel decrease in market interest rates underlying fixed income investments, where fixed income investments are as shown in the investment policy summarized in Appendix B.

Using a methodology consistent with the one used to determine the going concern discount rate, we have determined that a parallel decrease in market interest rates of 100 basis points would have a non-trivial probability (between 1 in 10 and 1 in 20) of occurring within the year following the valuation date. For purpose of this scenario, we have assumed that such a decrease in market interest rates would occur immediately on the valuation date and would have the following impact on the value of assets and going concern assumptions:

Defined Term	Description
Market value of assets & Money Purchase Component	The decrease in market interest rates has been assumed to affect only the market value of the fixed income investments. The increase to assets and Money Purchase Component benefits is assumed to have occurred immediately on the valuation date.

[18] A new special payment is assumed to start 1 year have the valuation date.

Defined Term	Description
Discount rate assumption	**Going concern:** It was assumed that the decrease in market interest rates affects only the expected return on assets for the fixed income portion of assets. The discount rate assumption was therefore decreased from 5.40% to 5.00%. **Hypothetical wind-up and Solvency:** The interest rates used in the valuation were reduced by 100 basis points
Post retirement money purchase pension increases	**Going concern:** The post retirement money purchase pension assumption decreased by 35 basis points. **Hypothetical wind-up and Solvency:** The post retirement money purchase pension assumption decreased by 100 basis points.
Other assumptions	Except as mentioned above, all assumptions used were the same as those used for this valuation. In particular, the discount rate used to value benefits assumed to be settled through a lump sum was not changed.
Provision for Adverse Deviations	The above changes would not affect the calculation of the Provision for Adverse Deviations

Deterioration of Asset Values

The purpose of this scenario is to illustrate the sensitivity of the Plan's valuation results to a deterioration of asset values. For this purpose, we assumed an immediate reduction in the market value of the Plan's non-fixed income assets, where non-fixed income investments are as shown in the investment policy summarized in Appendix B.

Using a methodology consistent with the one used to determine the going concern discount rate, we have determined that a decrease of 10% in the market value of value of non-fixed income assets would have a non-trivial probability (between 1 in 10 and 1 in 20) of occurring within the year following the valuation date. For purpose of this scenario, we have assumed that such a decrease would occur immediately on the valuation date and would have the following impact on the value of assets and going concern assumptions:

Defined Term	Description
Market value of assets & Money Purchase Component	The decrease in the market value of the non-fixed income portion of assets, together with Money Purchase Component benefits, is assumed to have occurred immediately on the valuation date.
Going concern assumptions	This scenario is assumed to have no impact on the assumptions used for this valuation.
Wind-up & solvency assumptions	This scenario is assumed to have no impact on the assumptions used for this valuation.

Longevity Risk

The purpose of this scenario is to illustrate the sensitivity of the Plan's valuation results to the potential that pension plan members will live longer than expected. For this purpose, we have determined that a plausible adverse scenario would be to assume that future mortality improvements[19] will be in line with the average improvements experienced by the Canadian population over the most recent 15-year period available, with uniform improvement rates for all future years but varying by age[20] and gender.

The table below summarizes the improvement rates under the plausible adverse scenario compared to those currently assumed under the CPM-B scale and is based on Canadian population experience from the Human Mortality Database (HMD) from 2002 to 2016.

[19] i.e. starting one year after the valuation in this context

[20] improvement rates below age 45 are set to those at age 45

	Males				Females			
	CPM-B			Adverse Scenario	CPM-B			Adverse Scenario
Age	2020	2025	2030+		2020	2025	2030+	
20	1.59%	1.20%	0.80%	1.68%	0.98%	0.89%	0.80%	1.47%
30	1.88%	1.34%	0.80%	1.68%	0.98%	0.89%	0.80%	1.47%
40	1.80%	1.30%	0.80%	1.68%	1.17%	0.98%	0.80%	1.47%
50	1.17%	0.98%	0.80%	1.76%	0.98%	0.89%	0.80%	1.34%
55	1.47%	1.13%	0.80%	1.67%	1.11%	0.96%	0.80%	1.14%
60	1.77%	1.28%	0.80%	1.75%	1.24%	1.02%	0.80%	1.34%
65	2.06%	1.43%	0.80%	2.11%	1.36%	1.08%	0.80%	1.65%
70	2.06%	1.43%	0.80%	2.48%	1.36%	1.08%	0.80%	1.77%
75	2.01%	1.41%	0.80%	2.66%	1.36%	1.08%	0.80%	1.93%
80	1.96%	1.38%	0.80%	2.63%	1.36%	1.08%	0.80%	2.03%
85	1.38%	1.03%	0.68%	2.32%	1.31%	0.99%	0.68%	1.98%
90	0.75%	0.62%	0.48%	1.68%	0.75%	0.62%	0.48%	1.60%
95	0.16%	0.25%	0.34%	1.04%	0.16%	0.25%	0.34%	1.12%
100	0.14%	0.22%	0.30%	0.64%	0.14%	0.22%	0.30%	0.80%
105	0.14%	0.22%	0.30%	0.38%	0.14%	0.22%	0.30%	0.55%

Appendix H

University Certification

With respect to the Report on the Actuarial Valuation for Funding Purposes as at July 1, 2021, of the University of Windsor Retirement Plan for Faculty and Certain Employees, I hereby certify that, to the best of my knowledge and belief:

- The valuation reflects the terms of the University's engagement with the actuary described in Section 2 of this report, particularly the requirement to not reflect a margin for adverse deviations in the going concern valuation in excess of the provision for adverse deviation prescribed by the Act and the University's decisions in regards to determining the going concern and solvency funding requirements.
- A copy of the official plan documents and of all amendments made up to July 1, 2021 was provided to the actuary and is reflected appropriately in the summary of plan provisions contained herein.
- The asset information summarized in Appendix B is reflective of the Plan's assets.
- The membership data provided to the actuary included a complete and accurate description of every person who is entitled to benefits under the terms of the Plan for service up to July 1, 2021.
- All events subsequent to July 1, 2021 that may have an impact on the Plan have been communicated to the actuary.

March 28, 2022

Date

Signed

Gillian Heisz

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