Actuarial Valuation as at July 1, 2021 for the University Pension Plan Ontario

Regulatory Registration Number: 1357243

March 2022

For Posting on UPP Website

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Executive Summary

Effective as of July 1, 2021, the assets and liabilities of the University of Toronto Pension Plan, the Revised Pension Plan of Queen's University, and the University of Guelph Pension Plans (Professional Plan, Retirement Plan and Non-Professional Plan) were transferred to the University Pension Plan Ontario (the "UPP") pursuant to the conversion of these single employer pensions plans (collectively the "SEPPs") under s. 80.4 of the *Pension Benefits Act* (Ontario) (the "*Act*"). The actual date of the transfer of the assets in-kind from the SEPPs was also July 1, 2021. Effective as of July 1, 2021, members of the SEPPs became members of the UPP and began accruing pension benefits under the provisions of the UPP in the case of active and disabled members and began receiving their pensions from the UPP in the case of pensioners and beneficiaries.

The July 1, 2021 actuarial valuation for the UPP has been prepared for purposes of establishing a funding regime in accordance with legislative requirements until the next actuarial valuation is performed. This actuarial valuation also constitutes the actuarial valuation of the UPP required under s.10(2) of Ontario Regulation 311/15. The next actuarial valuation for purposes of developing the funding requirements should be performed no later than July 1, 2024.

This section provides an overview of the important results and the key valuation assumptions which have had a bearing on the these results. For comparative purposes, the same information is provided as of January 1, 2020 for the effective date actuarial valuation of the UPP prepared for regulatory purposes for contingent members of the UPP who were members of the SEPPs and accruing benefits under the SEPPs as of January 1, 2020 and were expected to become members of the UPP if they remained in employment until July 1, 2021.

Summary of Principal Results

Financial Position (000's)

	July 1, 2021	January 1, 2020
Going Concern		
Assets	$ 11,230,192	$ 0
Liabilities	10,151,124	0
Funding excess/(shortfall)	$ 1,079,068	$ 0
Funded ratio	1.11	N/A
Solvency		
Assets[1]	$ 11,220,192	$ 0
Liabilities	12,168,872	0
Surplus/(deficiency)[2]	$ (948,680)	$ 0
Solvency ratio	0.92	N/A
Hypothetical Wind Up		
Assets[1]	$ 11,220,192	$ 0
Liabilities	15,284,518	0
Surplus/(deficiency)	$ (4,064,326)	$ 0
Transfer ratio	0.73	N/A

[1] Net of wind-up expenses
[2] Specified to be 0 pursuant to subsection 1.3.1(3) of the Regulations to the *Act*

Current Service Cost (000's)

	July 1, 2021	January 1, 2020
Total current service cost	$ 368,647	$ 337,751
As a % of capped pensionable earnings	19.62%	19.71%
Member and matching employer contributions	$ 381,476	$ 347,518
As a % of capped pensionable earnings	20.30%	20.28%
Capped pensionable earnings[1]	$ 1,878,949	$ 1,713,600

Membership Data

	July 1, 2021	January 1, 2020[2]
Active, leave and disabled members	19,818	18,418
Pensioners and beneficiaries	11,935	N/A
Deferred vested members	5,331	N/A
Other members	44	N/A
Total	**37,128**	**18,418**

[1] Pensionable earnings capped for contribution purposes at $181,700 in 2021; $173,200 in 2020

[2] January 1, 2020 actuarial valuation only determined current service cost, therefore member counts excluded members on leave of absence not accruing benefits and all pensioners and beneficiaries, deferred vested members and other members under the SEPPs

Key Assumptions

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

Going Concern	July 1, 2021	January 1, 2020
Discount rate	5.60% per year	Same
Inflation rate	2.00% per year	Same
Cost-of-living adjustment	1.50% per year (75% of CPI)	Same
YMPE and *ITA* maximum pension	2.75% per year	Same
Pensionable earnings	4.00% per year	Same
Mortality table	95% of 2014 Canadian Public Sector Pensioners' Mortality Table, with mortality improvement scale MI-2017 from 2014	Same
Retirement rates	Age-related table	Same

Section 1: Introduction

Purpose and Terms of Engagement

We have been engaged by the Board of Trustees (the "Board"), as legal administrator of the UPP, to conduct an actuarial valuation of the UPP as of the conversion date of July 1, 2021, hereafter referred to as the conversion date actuarial valuation. Specifically, the purposes of the valuation are to:

- Determine the funded position of the UPP as of the July 1, 2021 conversion date on a going concern, solvency and hypothetical wind up basis after the transfer of assets and liabilities from the five SEPPs;
- Measure the sufficiency of the member and participating employer contribution rates under Sections 5.01 through 5.04 of the UPP plan text;
- Satisfy the requirements in connection with s.10(2) of Regulation 311/15; and
- Provide the necessary actuarial certification required under the *Act* and the *Income Tax Act* (the *"ITA").*

The intended users of this report are the Board, the UPP Joint Sponsors, the Financial Services Regulatory Authority of Ontario ("FSRA") and the Canada Revenue Agency ("CRA")

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

The next required valuation will be the actuarial valuation as at July 1, 2024.

Board Information and Inputs

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

- The UPP qualifies as a jointly sponsored pension plan within the meaning of the *Act* and is listed under subsection 1.3.1(3) of Regulation 909 under the *Act*;
- A copy of the previous actuarial report of the UPP as at January 1, 2020, the effective date of the UPP;
- Member data provided by the actuaries for the SEPPs which were used for the preparation of the SEPP Transfer and Conversion Reports as of July 1, 2021, as well as data for new entrants as of July 1, 2021 provided by the administrators of the SEPPs;
- Asset data taken from the special purpose audited statements prepared by the SEPPs as of June 30, 2021;
- A copy of the UPP plan text filed for registration with the regulatory authorities;
- A copy of the Statement of the Investment Policies and Procedures of the UPP adopted as of July 1, 2021;

- A copy of the Funding Policy for the UPP adopted in December 2019 by the Joint Sponsors and filed with the regulatory authorities, which includes the actuarial assumptions and methods to be used for the conversion date actuarial valuation; and
- A copy of the Transfer Agreements entered into by each of the Universities with the Joint Sponsors of the UPP.

For the purposes of the solvency and hypothetical wind-up valuations, we have relied on the actuaries for the SEPPs to provide the liabilities as of July 1, 2021, using a common set of actuarial assumptions recommended to and adopted by the Board.

Subsequent Events

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

- Actual experience deviating from expected after July 1, 2021 will result in gains or losses which will be reflected in the next actuarial valuation report.
- Effective January 1, 2022, assets and liabilities of The Contributory Pension Plan for TUFA Employees of Trent University (the "TUFA Pension Plan") were transferred to the UPP and members of the TUFA Pension Plan began making contributions to and accruing benefits under the UPP. The impact of this conversion will be reflected in a subsequent cost certificate.
- The Canadian Institute of Actuaries has amended the Standards of Practice related to the computation of commuted values effective February 1, 2022. The amended Standards of Practice revise the methodology for determining commuted values for indexed pension plans by changing the determination of the rate of inflation. As this change is not retroactive, it does not impact the UPP as at July 1, 2021.
- To the best of our knowledge, the results contained in this report are based on the regulatory and legal environment in effect at the date of this report and do not take into consideration any potential changes that may be currently under review. To the extent that actual changes in the regulatory and legal environment transpire, any financial impact on the UPP as a result of such changes will be reflected in future valuations.

Section 2: Going Concern Valuation Results

Going Concern Valuation

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

The Funding Policy of the UPP sets out the going concern actuarial assumptions and methods to be used in the initial valuation of the UPP (both effective date and conversion date valuations) for purposes of determining the liabilities being transferred into the UPP and the current service cost for benefits being earned under the provisions of the UPP. The actuarial assumptions and methods, which are also subject to actuarial standards of practice and pension standards, are described in Appendix C of this report.

On the basis of the actuarial assumptions and methods, and the UPP provisions, membership data and asset information also described in the Appendices, the following sections show the initial going concern financial position of the Plan as at July 1, 2021, and the going concern current service cost and required member and matching employer contributions.

Going Concern Financial Position (000's)

July 1, 2021	**Pre-Conversion Date Benefits**	**Post-Conversion Date Benefits**	**Total**
Market Value of Assets (adjusted for receivables/payables)	**$ 11,230,192**	**$ 0**	**$ 11,230,192**
Going Concern Liabilities			
Active, leave and disabled members			
Defined benefit liabilities	$ 3,811,321	$ 0	$ 3,811,321
Money purchase liabilities	919,300	0	919,300
Deferred vested members			
Defined benefit liabilities	289,267	0	289,267
Money purchase liabilities	184,780	0	184,780
Pensioners and beneficiaries	4,945,950	0	4,945,950
Other members	506	0	506
Total Liabilities	**$ 10,151,124**	**$ 0**	**$ 10,151,124**
Funding Excess/(Shortfall)	**$ 1,079,068**	**$ 0**	**$ 1,079,068**

Going Concern Current Service Cost (000's)

Under Sections 5.01 through 5.04 of the UPP plan text, members and participating employers each contribute 9.20% of Pensionable Earnings up to the Year's Maximum Pensionable Earnings (YMPE) plus 11.50% of Pensionable Earnings above the YMPE up to the Maximum Pensionable Earnings for Contributions (capped pensionable earnings of $181,700 in 2021). The total current service cost and member and matching employer contributions shown below are for the year following the valuation date for active and disabled members and members on leave who are accruing benefits.

		July 1, 2021
Total current service cost	$	368,647
As a % of capped pensionable earnings		19.62%
Member and matching employer contributions	$	381,476
As a % of capped pensionable earnings		20.30%
Excess of contributions over total current service cost	$	12,829
As a % of capped pensionable earnings		0.68%
Capped pensionable earnings	$	1,878,949

Change in Financial Position

Since this is the initial actuarial valuation of the UPP with assets and liabilities transferred from the SEPPs, creating an initial funding excess/(shortfall), there is no analysis of the major components of the change in the funding excess/(shortfall). In future valuations, this section will present that analysis.

Going Concern Valuation Sensitivity Results

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

			Effect		
(000's)				**$**	**%**
Going concern liabilities	$	10,151,124			
Going concern liabilities (discount rate – 1%)	$	11,488,055	$	1,336,931	13.2%
Going concern liabilities (discount rate + 1%)	$	9,118,136	$	(1,032,988)	(10.2)%
Total current service cost	$	368,647			
Total current service cost (discount rate – 1%)	$	465,040	$	96,393	26.1%
Total current service cost (discount rate + 1%)	$	298,001	$	(70,646)	(19.2)%

Plausible Adverse Scenarios

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

Interest Rate Sensitivity

The table below presents the sensitivity of the going concern position of using interest rates 1% lower than the current level. In order to calculate the impact on the market value of assets, the decrease in interest rates only impacts fixed income assets (28% of total assets) and a duration of 8.4 years was considered.

(000's)		**Base Scenario**		**Adverse Scenario**		**Impact ($)**
Market value of assets	$	11,230,192	$	11,494,326	$	264,134
Going concern liabilities		10,151,124		11,488,055		1,336,931
Funding Excess/(Shortfall)	**$**	**1,079,068**	**$**	**6,271**	**$**	**(1,072,797)**
Total Current Service Cost						
Total current service cost	$	368,647	$	465,040	$	96,393

Deterioration in Asset Value

In assessing the risk related to the deterioration in asset value we have chosen an adverse scenario equal to a 15% reduction in the non-fixed income asset values and assume no change in future return expectations.

The table below presents the sensitivity of the going concern position of using the assets with a 15% reduction in non-fixed income asset values.

(000's)		**Base Scenario**		**Adverse Scenario**		**Impact ($)**
Market value of assets	$	11,230,192	$	10,017,331	$	(1,212,860)
Going concern liabilities		10,151,124		10,151,124		
Funding Excess/(Shortfall)	**$**	**1,079,068**	**$**	**(133,793)**	**$**	**(1,212,860)**
Total Current Service Cost						
Total current service cost	$	368,647	$	368,647	$	-

Mortality Sensitivity

The table below presents the sensitivity of the going concern position of the Plan to using a mortality assumption with a 10% improvement to the base mortality rates. For the purposes of this analysis, we have used 90% of the rates of the base table used in the going concern valuation.

(000's)	**Base Scenario**	**Adverse Scenario**	**Impact ($)**
Market value of assets	$ 11,230,192	$ 11,230,192	$
Going concern liabilities	10,151,124	10,346,603	195,479
Funding Excess/(Shortfall)	**$ 1,079,068**	**$ 883,589**	**$ (195,479)**
Total Current Service Cost			
Total current service cost	$ 368,647	$ 374,099	$ 5,452

Section 3: Solvency Valuation Results

Solvency Valuation

The solvency valuation is a financial assessment of the UPP that is required by the *Act* and is performed in accordance with requirements prescribed by that legislation. It is intended to provide an assessment of the UPP's financial position at the valuation date on the premise that certain obligations as prescribed by the *Act* are settled on the valuation date for all members. The liabilities must be calculated based on a postulated scenario that maximizes liabilities on wind up. Contingent benefits are included in the liabilities that would be payable under the postulated scenario, unless permitted to be omitted under the definition of solvency liabilities under the Regulations to the *Act.* The solvency valuation reflects that the Joint Sponsors have not made an election to exclude the UPP from the operation of Section 74 of the *Act.* All assumptions for the solvency valuation are listed in Appendix D.

On the basis of the UPP provisions, membership data, solvency assumptions and methods and asset information described in the Appendices, as well as the requirements of the *Act*, the solvency financial position of the Plan as at July 1, 2021 is shown in the following table.

Solvency Financial Position (000's)

		July 1, 2021
Assets		
Solvency assets	$	11,230,192
Estimated wind up expenses		(10,000)
Total Assets	**$**	**11,220,192**
Solvency Liabilities		
Active, leave and disabled members		
Defined benefit liabilities	$	5,141,177
Money purchase liabilities		919,300
Deferred vested members		
Defined benefit liabilities		375,788
Money purchase liabilities		184,780
Pensioners and beneficiaries		5,547,321
Other members		506
Total Liabilities	**$**	**12,168,872**
Solvency Surplus/(Deficiency)	**$**	**(948,680)**
Solvency Ratio[1]		**0.92**

As permitted under subsection 1.3.1(3) of the Regulations to the *Act,* the solvency deficiency may be specified to be a stated amount, not to be les than zero. Consequently, the solvency deficiency as at July 1, 2021 has been specified to be zero.

[1] Solvency Assets divided by Solvency Liabilities

Solvency Valuation Sensitivity Results

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

		Effect	
(000's)		**$**	**%**
Solvency liabilities	$ 12,168,872		
Solvency liabilities (discount rate – 1%)	$ 14,039,723	$ 1,870,851	15.4%

Incremental Cost on a Solvency Basis

The incremental cost on a solvency basis represents the present value at July 1, 2021 of the expected aggregate change in the solvency liabilities between July 1, 2021 and the next calculation date, that is July 1, 2024. Appendix D gives more details on the calculation methodology and on assumptions.

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

(000's)	**July 1, 2021 to June 30, 2024**
Incremental cost on a solvency basis	$ 2,032,747

Pension Benefits Guarantee Fund ("PBGF")

Under the Regulations to the *Act,* the UPP is not covered by the PBGF and is exempt from the annual assessment to the PBGF.

Section 4: Hypothetical Wind Up Valuation Results

Hypothetical Wind Up Valuation

A hypothetical wind up valuation is performed to determine the financial position of the UPP as at the valuation date on a wind up basis, reflecting market settlement rates as of the valuation date. Unlike the solvency valuation, all benefits are included that would be payable under the postulated scenario that would maximize benefits. The hypothetical wind up valuation is determined using benefit entitlements on the assumption that the UPP has neither a surplus nor a deficit. Contingent benefits are included in the liabilities that would be payable under the postulated scenario. Assets are set equal to market value net of estimated wind up expenses. The hypothetical wind up valuation reflects that the Joint Sponsors have not made an election to exclude the UPP from the operation of Section 74 of the *Act.* All assumptions for the hypothetical wind up valuation are listed in Appendix D.

On the basis of UPP provisions, membership data, hypothetical wind up assumptions and methods, and asset information described in the Appendices, as well as the requirements of the *Act*, the hypothetical wind up financial position of the Plan as at July 1, 2021 is shown in the following table.

Hypothetical Wind Up Financial Position (000's)

		July 1, 2021
Assets		
Hypothetical wind up assets	$	11,230,192
Estimated wind up expenses		(10,000)
Total Assets	**$**	**11,220,192**
Hypothetical Wind Up Liabilities		
Active, leave and disabled members		
Defined benefit liabilities	$	6,847,460
Money purchase liabilities		919,300
Deferred vested members		
Defined benefit liabilities		650,683
Money purchase liabilities		184,780
Pensioners and beneficiaries		6,681,789
Other members		506
Total Liabilities	**$**	**15,284,518**
Hypothetical Wind Up Surplus/(Deficiency)	**$**	**(4,064,326)**
Transfer Ratio[1]		**0.73**

[1] Hypothetical wind up assets divided by hypothetical wind up liabilities

Section 5: Contribution Requirements

Contribution Requirements in Respect of Current Service Cost

The annual going concern cost of benefits in respect of service accruing after the valuation date is known as the current service cost.

To meet the current service cost requirements, under Sections 5.01 through 5.04 of the UPP plan text, members and participating employers each contribute 9.20% of Pensionable Earnings up to the Year's Maximum Pensionable Earnings (YMPE) plus 11.50% of Pensionable Earnings above the YMPE up to the Maximum Pensionable Earnings for Contributions (capped pensionable earnings of $181,700 in 2021).

The following table shows as estimate of the total current and the member and matching employer contributions for the three years following the valuation date.

	For Year Following:		
(000's)	**July 1, 2021**	**July 1, 2022**	**July 1, 2023**
Total current service cost	$ 368,647	$ 383,393	$ 398,729
As a % of capped pensionable earnings	19.62%	19.62%	19.62%
Member and matching employer contributions	$ 381,476	$ 396,735	$ 412,604
As a % of capped pensionable earnings	20.30%	20.30%	20.30%
Capped pensionable earnings	$ 1,878,949	$ 1,954,107	$ 2,032,271

The member and matching employer contributions satisfy the current service contribution requirements under the *Act.*

Development of Special Payments

There are no Special Payments required under the *Act.*

Excess Surplus

Excess surplus is defined in Section 147.2(2)(d) of the *Income Tax Act*, as the portion of surplus (if any) that exceeds 25% of the going concern liabilities. Since there is a going concern funding excess of 11% of the going concern liabilities, there is no excess surplus and therefore it does not impact the development of the contribution requirements for the UPP.

Maximum Eligible Contributions

Paragraph 8503(4)(a) of the Regulations to the *Income Tax Act* set a limit on member contributions that can be made to a defined benefit provision of a registered pension: the lesser of (i) 9% of the member's compensation, and (ii) the sum of $1,000 plus 70% of the member's pension credit for the year. A waiver of this limit has been granted by the CRA to the UPP pursuant to subsection 8503(5) of the Regulations for the period from July 1, 2021 to December 31, 2023.

Under the *Income Tax Act,* the total contributions must not be more than the total current service cost plus the greater of any going concern funding shortfall and any hypothetical wind up deficiency. Given the UPP has a hypothetical wind up deficiency of $4,064,326,000, the total contributions to the UPP representing member and matching employer contributions are eligible contributions under the *Income Tax Act.*

Section 6: Actuarial Certificate

Actuarial Opinion, Advice and Certification for the University Pension Plan Ontario

Regulatory Registration Number: 1357243

Opinion

This actuarial certification forms an integral part of the actuarial valuation report for the UPP as at July 1, 2021. We confirm that we have prepared an actuarial valuation of the UPP as at July 1, 2021, for the purposes outlined in the Introduction section to this report and consequently:

Our advice on funding is the following:

- Member and participating employer contributions stipulated in Sections 5.01 through 5.04 of the UPP plan text, which are estimated to be 20.30% of Pensionable Earnings up to the Maximum Pensionable Earnings for Contributions, should be made starting July 1, 2021 to fund the benefits accruing under the UPP.
- The next actuarial valuation for the purpose of developing funding requirements should be performed no later than as at July 1, 2024.

We hereby certify that, in our opinion:

- The member and participating employer contributions stipulated in Sections 5.01 through 5.04 of the UPP plan text are sufficient to satisfy the funding requirements of the *Act* in respect of benefits set out in the UPP.
- The member and participating employer contributions stipulated in Sections 5.01 through 5.04 of the UPP plan text are eligible contributions under Section 147.2(2) of the *Income Tax Act*, subject to the requisite approvals from the Minister of National Revenue.
- The market value of assets exceed the accrued liabilities by $1,079,068,000 on a going concern basis.
- There is no excess surplus as defined under paragraph 147.2(2)(d) of the *Income Tax Act.*
- Pursuant to subsection 1.3.1(3) of the Regulations to the *Act,* the solvency deficiency as of July 1, 2021 has been specified to be zero.
- The transfer ratio as of July 1, 2021, as defined under the *Act,* is 0.73
- For the purposes of the valuation:
  - The data on which this valuation is based are sufficient and reliable;
  - The assumptions used are appropriate; and
  - The actuarial cost methods and asset valuation methods used are appropriate.

- This report and its associated work have been prepared, and our opinion is given, in accordance with accepted actuarial practice in Canada and in compliance with the requirements outlined in subparagraphs 147.2(2)(a)(iii) and (iv) of the *Income Tax Act*.
- Notwithstanding the above certifications, emerging experience differing from the assumptions will result in gains or losses that will be revealed in subsequent valuations.

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Appendix A: Assets

Asset Data

On July 1, 2021, the assets of the University of Toronto Pension Plan, the Revised Pension Plan of Queen's University and the University of Guelph Pension Plans (Professional Plan, Retirement Plan and Non-Professional Plan) were transferred in-kind to the UPP. In the case of the University of Guelph Non-Professional Pension Plan, the transfer of assets was limited to the wind up liabilities.

The market value of the assets transferred, adjusted for receivables and payables, was as follows:

Pension Plans		**(000's)**
University of Toronto	$	6,866,089
Queen's University		2,554,853
University of Guelph		1,809,250
Total	**$**	**11,230,192**

Asset Mix

The following is a summary of the composition of the transferred assets by asset type as reported by the Board as at July 1, 2021.

	July 1, 2021
Public equity	51.7%
Private equity	5.7%
Private debt	7.0%
Absolute return	7.0%
Fixed income	29.5%
Real estate	3.0%
Infrastructure	1.6%
Cash/funding	-5.5%
Total	**100.0%**

Target Asset Mix

The asset mix ranges for the UPP are contained in the Statement of Investment Policies and Procedures (SIP&P) approved on June 29, 2021, and are shown below. The SIP&P notes that a target asset mix is still being determined but the current levels may be used as interim proxy. The target asset mix below is based on the asset mix as of July 1, 2021 with some minor adjustments to reflect asset mix changes after the assets were received.

Asset Class	Minimum	Target (Current)	Maximum
Public equity	35%	52%	65%
Private equity	3%	6%	8%
Private debt	4%	7%	10%
Absolute return	2%	5%	6%
Fixed income	20%	30%	50%
Inflation sensitive bonds	0%	0%	10%
Real estate	2%	3%	8%
Infrastructure	1%	2%	8%
Cash/funding	-20%	-5%	10%
		100%	

Reconciliation of Changes in Market Value of Assets

In future actuarial valuations, this section will reconcile the change in the market value of assets from the prior actuarial valuation.

Development of Actuarial Value of Assets

The actuarial value of assets is equal to the market value of assets, adjusted for contributions, benefit payments, transfers and fees/expenses in-transit, as of the valuation date.

Appendix B: Membership Data

Source of Data

This valuation was based on member data provided by the actuaries of the SEPPs which were used for the preparation of the SEPP Transfer and Conversion Reports as of July 1, 2021, as well as data for new entrants to the UPP as of July 1, 2021 provided by the administrators of the SEPPs. We have relied on the tests performed by the SEPP actuaries for the sufficiency and reliability of the member data. On an ongoing basis, the following tests will be performed:

- A reconciliation of membership status against the membership status at the last valuation. This test is performed to ensure that all members were accounted for;
- A reconciliation of birth, hire, and participation dates against the corresponding dates provided for the last valuation to ensure consistency of data;
- A reconciliation of pensionable service against the corresponding amount provided for the last valuation to ensure the service accrued is as expected;
- A reconciliation of pensionable earnings against the corresponding amounts provided for the last valuation to identify any unusual increases or decreases;
- A reconciliation of accrued benefits against the corresponding amounts provided for the last valuation to identify any unusual benefit accruals;
- A reconciliation of any stated benefit payments since the last valuation (for retired, terminated, or deceased members) against the financial statements of the pension fund for confirmation of the payments; and
- A reconciliation of inactive member benefit amounts against the corresponding amounts provided for the last valuation to ensure consistency of data.

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

Membership Summary

In future actuarial valuations, this section will reconcile the number of members, by category of members, from the prior actuarial valuation.

Active, Leave and Disabled Members

	July 1, 2021	January 1, 2020
Number	19,818[1]	18,418[2]
Average Age	46.6	47.2
Average Age at Hire	35.0	35.2
Average Years of Pensionable Service	10.1	10.5
Average Pensionable Earnings (100% FTE)	$ 103,398	$ 99,326
Average Capped Pensionable Earnings (100% FTE)	$ 99,200	$ 95,157
Average Capped Pensionable Earnings (Actual % FTE)	$ 95,851[3]	$ 93,039

Pensioners and Beneficiaries

	July 1, 2021	January 1, 2020
Number	11,935	N/A
Average Age	75.9	N/A
Average Annual Benefit	$ 35,511[4]	N/A
Total Annual Pensions	$ 423,825,336	N/A

Deferred Vested Members

	July 1, 2021	January 1, 2020
Number	5,331	N/A
Average Age	52.5	N/A
Average Annual Benefit	$ 5,071	N/A
Average Money Purchase Balances[5]	$ 123,486	N/A

[1] July 1, 2021 data includes 798 leaves of absence who are not accruing pension benefit as of the valuation date
[2] January 1, 2020 data only includes leaves of absence accruing benefits under the SEPPs
[3] Average capped pensionable earnings (actual % FTE) for 19,020 members accruing benefits are $98,788
[4] Actual pension paid for Queen's University pensioners and beneficiaries; true pension with estimated indexation at September 1, 2021 used to value liabilities
[5] For pre-conversion date benefits for Queen's University members

Active/Disabled Membership Distribution

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

Age	< 5	5–10	10–15	15–20	20–25	25–30	>30	Total
< 30	1,177	158	13					1,348
	$ 63,738	$ 65,143	$ 59,042					$ 63,858
30–35	1,392	578	144	3				2,117
	$ 79,677	$ 77,391	$ 73,331	$ 49,437				$ 78,578
35–40	1,373	850	454	95				2,772
	$ 84,858	$ 94,231	$ 86,542	$ 74,289				$ 87,645
40–45	1,000	760	641	415	92			2,908
	$ 87,865	$ 99,938	$ 106,266	$ 94,627	$ 79,768			$ 95,785
45–50	606	549	649	534	281	23		2,642
	$ 88,350	$ 97,586	$ 114,275	$ 119,400	$ 99,113	$ 78,668		$ 103,974
50–55	430	384	476	647	443	144	96	2,620
	$ 77,902	$ 93,791	$ 103,796	$ 125,521	$ 118,177	$ 101,248	$ 81,042	$ 104,902
55–60	297	281	381	546	499	269	432	2,705
	$ 82,499	$ 87,977	$ 98,759	$ 112,863	$ 121,432	$ 120,567	$ 91,596	$ 103,908
60–65	149	178	255	332	301	229	527	1,971
	$ 73,304	$ 89,677	$ 87,329	$ 101,942	$ 117,541	$ 122,940	$ 108,108	$ 103,249
>65	30	69	92	89	102	75	276	735
	$ 58,031	$ 99,743	$ 104,942	$ 114,817	$ 128,271	$ 143,605	$ 141,478	$ 124,537
Total Count	**6,454**	**3,807**	**3,105**	**2,661**	**1,718**	**740**	**1,331**	**19,818**
Average Capped Pensionable Earnings	**$ 79,719**	**$ 91,471**	**$ 100,437**	**$ 111,663**	**$ 114,435**	**$ 118,575**	**$ 107,716**	**$ 95,851**

Pensioners and Beneficiaries Membership Distribution

The following table provides a detailed summary of the pensioners and beneficiaries at the valuation date by age group.

Age			**Pensioners and Beneficiaries[1]**
< 50	Count		36
	Average Annual Pension	$	17,386
50–54	Count		25
	Average Annual Pension	$	15,158
55–59	Count		173
	Average Annual Pension	$	21,071
60–64	Count		859
	Average Annual Pension	$	30,070
65–69	Count		2,258
	Average Annual Pension	$	32,581
70–74	Count		2,662
	Average Annual Pension	$	36,237
75–79	Count		2,189
	Average Annual Pension	$	41,516
80–84	Count		1,679
	Average Annual Pension	$	39,710
85–89	Count		1,160
	Average Annual Pension	$	35,000
90–94	Count		614
	Average Annual Pension	$	30,062
95+	Count		280
	Average Annual Pension	$	23,931
Total			
Count			11,935
Average Annual Pension		$	35,511

[1] Reflects actual pension paid for Queen's University pensioners and beneficiaries; true pension with estimated indexation at September 1, 2021 used to value liabilities

Appendix C: Going Concern Assumptions and Methods

Assumptions and Methods

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

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

This appendix summarizes the going concern assumptions and methods that have been used for the going concern valuation of the UPP at the valuation date. The going concern assumptions and methods to be used for the July 1, 2021 conversion date actuarial valuation and the January 1, 2020 effective date actuarial valuation are specified in the Funding Policy of the UPP. They were developed considering the economic and demographic assumptions used for the most recently filed valuation of the five SEPPs converted to the UPP.

The actuarial assumptions and methods are summarized below and described on the following pages.

	July 1, 2021	**January 1, 2020**
Economic Assumptions		
Discount rate	5.60% per year	Same
Increase in consumer price index (CPI)	2.00% per year	Same
Cost-of-living adjustment (75% of CPI)	1.50% per year[1]	Same
Increases in pensionable earnings		
Active and leave members	4.00% per year	Same
Disabled members[2]	2.00% per year	Same
Increases in YMPE	$61,600 in 2021; then 2.75% per year	$58,700 in 2020; then 2.75% per year
Increases in *ITA* maximum pension	$3,245.56 in 2021; then 2.75% per year	$3,092.22 in 2020; then 2.75% per year
Interest on member contributions	2.50% per year[3]	Same
Passive investment expenses	0.05% per year[4]	Same
Non-investment expenses	0.20% per year[4]	Same

[1] 0.6% per year (determined stochastically) for pre-conversion date benefits for University of Guelph members which are indexed at CPI-2%; 0% for pre-conversion date benefits for Queen's University members

[2] Members receiving (or deemed eligible to receive) disability income from an LTD plan

[3] Interest of 5.60% per year on money purchase account balances in respect of pre-conversion date benefits for Queen's University members

[4] Taken into account in discount rate assumption

	July 1, 2021	January 1, 2020
Demographic Assumptions		
Mortality table	95% of 2014 Canadian Public Sector Pensioners' Mortality Table, with mortality improvements scale MI-2017 from 2014 (sex-distinct rates)	Same
Retirement rates	Variable by age (Table A following)	Same
Termination rates	Variable by age (Table B following)	Same
Disability rates	None	Same
Proportion married		
Non-retired proportion with spouse	85% for male members and 75% for female members	Same
Non-retired spousal age differential	Male members with spouse four years younger and female members with spouse two years older	Same
Retired members	Actual marital status and ages are used	N/A
Termination-option election		
Lump-sum transfer	50%	Same
Lump-sum transfer value rate	1.97% per year[1]	Same
Other Assumptions[2]		
Non-reduction reserve	7.5% applied to money purchase accounts; cost of non-reduction for active members reflects that a non-reduction charge of 4.5% is actually applied 7.5% applied to liabilities for pensioners and beneficiaries, which have been determined using true pension (estimated with indexation at September 1, 2021) rather than actual pension	N/A
Deferred indexing reserve	Reflects expected indexation to true pensions based on fund returns to date and expected future returns	N/A

[1] Commuted value based on an increase in CPI of 2.00% per year, cost-of-living adjustment of 75% of CPI, and a nominal discount rate of 3.50% per year

[2] For pre-conversion date benefits for Queen's University members; non-reduction reserve based on stochastic modelling

	July 1, 2021	January 1, 2020
Methods		
Actuarial cost method	Projected unit credit	Same
Asset valuation method	Market value of assets adjusted to reflect contributions, benefit payments, transfers and fees/expenses in transit as of the valuation date	N/A

Table A—Retirement Rates

Faculty

- 2% from ages 55 through 59 inclusive
- 5% from ages 60 through 64 inclusive
- 30% from ages 65 through 68 inclusive
- 50% from ages 69 through 70 inclusive
- 100% at age 71
- Additional 5% at age 60 with 80 age-plus-service points

Staff

- 2% from age 55 through 59 inclusive
- 7% from ages 60 through 64 inclusive
- 50% from ages 65 through 67 inclusive
- 100% at age 68
- Additional 15% at age 60 with 80 age-plus-service points.

Table B—Termination Rates

Rates used in this valuation are shown as rates per 1,000 lives in the following table:

Present Age	Rates
20	150
21	150
22	150
23	150
24	150
25	150
26	135
27	120
28	107
29	95
30	84
31	75
32	68
33	60
34	54
35	48
36	45
37	42
38	39
39	36

Present Age	Rates
40	33
41	31
42	30
43	28
44	26
45	24
46	22
47	20
48	18
49	16
50	14
51	12
52	10
53	8
54	6

Justification of Actuarial Assumptions and Methods

Economic Assumptions

Discount Rate

For purposes of this initial valuation at the conversion date, the use of a 5.60% discount rate with an assumed inflation rate of 2.00% per year, as specified in the Funding Policy adopted by the Joint Sponsors, is supported by the target asset mix outlined on page 22 of this report.

The overall expected return was developed using best-estimate returns for each of the asset classes above. A Monte Carlo simulation is performed over 30 years where the portfolio returns are projected assuming annual rebalancing. The average of the 30-year geometric return is used to develop an overall best-estimate rate of return for the entire pension fund. Gains from rebalancing and diversification are implicit to this return.

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

Development of Discount Rate	
Overall expected return	5.84%
Passive investment expenses	(0.05)%
Non-investment expenses	(0.20)%
Additional returns due to active management (net of fees)	0.00%
Rounding	0.01%
Discount Rate	**5.60%**

There is no margin for adverse deviations in the 5.60% discount rate. On an ongoing basis, the Board will set the discount rate for the Plan, including the appropriate margin for adverse deviations taking into account the risk profile of the UPP.

Increase in Consumer Price Index

The CPI rate assumption reflects our best estimate of future long-term inflation and represents the mid-point of the Bank of Canada target inflation.

Increases in Pensionable Earnings

The assumption for increases in pensionable earnings for active members reflects the assumed rate of inflation, plus allowances for the effect of merit and promotion increases and grid step movement.

The assumption for increases in pensionable earnings for disabled members reflects the assumed rate of inflation.

Increases in YMPE

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

The assumed increase in the YMPE reflects the assumed rate of inflation plus the productivity increase assumption of 0.75% per year.

Increases in the Maximum Pension Limit

Pensions are limited to the maximum limits under the *Income Tax Act*. The *Income Tax Act* specifies both a dollar limit, and in addition pensions cannot exceed 2.00% of indexed highest average compensation per year of pensionable service. The assumed increase in the dollar limit reflects the assumed rate of inflation plus the productivity increase assumption of 0.75% per year.

Interest on Member Contributions

Interest is credited on member contributions with the rate credited by chartered banks on five-year personal fixed term deposits. The assumption for interest on member contributions reflects our long-term expectation of these rates.

Expenses

Since the discount rate has been established net of investment and administration expense, no explicit assumption is required.

Demographic Assumptions

Mortality

During 2014, the CIA completed a study of Canadian pensioner mortality levels and trends. The 2014 study published mortality rates split by sector and included Public, Private and Combined tables, as well as possible pension size adjustment factors. In 2017, a new mortality improvement scale (MI-2017) was developed and published by CIA to account for broader mortality improvements for the Canadian population. The continued use of this mortality table and projection scale are considered reasonable.

To address the specifics of the UPP demographics and recent experience under the SEPPs, we have used 95% of the 2014 Canadian Public Sector Pensioners' Mortality Table with mortality improvement scale MI-2017 from 2014.

Retirement

Different retirement rates are used for Faculty and Staff to reflect the different underlying experience. The retirement rates reflect recent experience under the SEPPs. A significant proportion of Faculty and Staff continue to work beyond age 65.

Termination of Employment

The rates of termination of employment before retirement represent a best estimate of termination rates for a plan of the size and workforce characteristics of the UPP membership, reflecting the recent experience under the SEPPs.

Option Elections on Termination

We have assumed that a portion of members will elect a deferred annuity, while others will elect a commuted value transfer or cash on termination. In recognition of the lower prevailing discount rates and to determine commuted values, we have employed a different discount rate basis used to calculate termination benefits for those that elect a lump-sum transfer value.

Disability

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

Proportion of Members with Spouses and Spousal Age Differential

These assumptions are relevant to the valuation of benefits since there is a subsidized joint and survivor benefit available for members with a spouse. The proportion of members who will have a spouse is based on recent experience under the SEPPs. The spousal age difference was based on observance of actual age differences in the group for members where the spouse age is known.

Other

Actuarial Cost Method

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

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

With respect to service after the valuation date, the expected value of benefits for service in the year following the valuation date (i.e., the current service cost) net of any required member contributions is expressed as a percentage of the expected value of participating payroll for that year.

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

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

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

Asset Valuation Method

Market value, adjusted by in-transit cash flows was used as the actuarial value of assets for this valuation. Asset-smoothing techniques are often used to reduce volatility in contribution requirements. However, since this is the initial valuation with the transferred assets, asset smoothing was not applicable.

Appendix D: Solvency and Hypothetical Wind Up Assumptions and Methods

Valuation Assumptions

	July 1, 2021	**January 1, 2020**
Economic Assumptions		
Discount rate (without indexation)		
Transfer value basis	1.80% per year for 10 years; 3.30% per year thereafter	N/A
Annuity purchase basis	2.95% per year	N/A
Discount rate (with indexation at 75% of CPI)		
Transfer value basis	1.00% per year for 10 years; 1.70% per year thereafter	N/A
Annuity purchase basis	0.45% per year	N/A
Discount rate (with indexation at CPI-2%)		
Transfer value basis	1.80% per year for 10 years; 2.80% per year thereafter	N/A
Annuity purchase basis	1.30% per year	N/A
Income Tax Act dollar limit	$3,245.56[1] per year	N/A
Duration used to set annuity purchase basis[2]	10.90	N/A

[1] For pre-conversion date benefits for Queen’s University members, increasing to $3,420.00 in 2022, at 2.09% per year thereafter for 9 years and 3.08% per year thereafter

[2] Based on liabilities assumed to be settled through the purchase of annuities

	July 1, 2021	January 1, 2020
Demographic Assumptions		
Mortality table	2014 Canadian Pensioners' Mortality Table (Combined), with mortality improvement scale CPM-B (sex-distinct rates); 90% of rates applied for annuity purchases	N/A
Termination rates	Not applicable	N/A
Retirement age		
Active, leave and disabled members		
Settled through annuity purchase	Age that produces highest actuarial value (including statutory grow-in rights if applicable)	N/A
Settled through transfer value	50% of the age that produces the highest actuarial value and 50% at the earliest unreduced commencement age (including statutory grow-in rights if applicable)	N/A
Deferred vested members	Earlier of unreduced early retirement date and normal retirement date	N/A
Retired members and beneficiaries	Not applicable	N/A
Termination of employment	Terminate with full vesting	N/A
Marital status		
Non-retired spousal proportion	85% for male members and 75% for female members	N/A
Non-retired spousal age differential	Male members with spouse four years younger and female members with spouse two years older	N/A
Retired members	Actual marital status and ages are used	N/A
Other		
Wind up expenses	$10,000,000	N/A
Actuarial cost method	Unit credit	N/A
Asset valuation method	Market value of assets adjusted to reflect contributions, benefit payments, transfers and fees/expenses in transit as of the valuation date	N/A
Incremental Cost		
The assumptions for the expected benefit payments and decrement probabilities, service accruals, and projected changes in benefits and/or pensionable earnings	Same as going concern	N/A

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

	Percent of Liability Assumed to be Settled By Purchase of Annuities	Percent of Liability Assumed to be Settled By Lump-Sum Transfer
Active Members		
Not retirement eligible	0%	100%
Retirement eligible	75%	25%
Active Members—Queen's Pre-Conversion Benefits		
Not retirement eligible	30%	70%
Retirement eligible	50%	50%
Deferred Vested Members		
Not retirement eligible	100%	0%
Retirement eligible	100%	0%
Retired Members and Beneficiaries	100%	0%

Postulated Scenario

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

Benefits Valued

	Solvency Valuation	Hypothetical Wind Up Valuation
Vesting	We have treated all accrued benefits as vested on Plan wind up.	We have treated all accrued benefits as vested on Plan wind up.
Grow-in Benefits	Active members with 55 age-plus-continuous service points as of the valuation date are assumed to grow into the enhanced early retirement reduction.	Active members with 55 age-plus-continuous service points as of the valuation date are assumed to grow into the enhanced early retirement reduction.
Indexing	In accordance with the *Pension Benefits Act* (Ontario), solvency liability excludes the value of future escalated adjustments (future indexation) for both the preretirement and postretirement period (if applicable).	Hypothetical Wind Up Valuation liabilities include the value of future escalated adjustments (future indexation) in the preretirement and postretirement period (if applicable).

Justification for Valuation Assumptions

We have set the aforementioned assumptions based on guidance prepared by the CIA Committee on Pension Plan Financial Reporting ("PPFRC") in Educational Note – Assumptions for Hypothetical Wind-Up and Solvency Valuations with Effective Dates between June 30, 2021 and December 30, 2021 ("CIA Guidance") released on July 26, 2021.

For benefit entitlements that are expected to be settled by lump-sum transfer, we based the assumptions on Section 3500 (Pension Commuted Values) of the CIA Standards of Practice, using rates corresponding to a valuation date of July 1, 2021.

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

Mortality Table

The use of 90% of the 2014 Canadian Pensioners' Mortality Table (Combined) with mortality improvement scale CPM-B reflects the expectation that annuity pricing for a university pension plan will reflect higher longevity.

Preretirement Mortality

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

Pensionable Earnings

To estimate active and disabled members' best average earnings, we have used actual historical member earnings.

Assumptions Not Needed

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

- Increases in pensionable earnings;
- Increases in YMPE;
- Increases in *ITA* maximum pension limit (unless otherwise noted); and
- Termination of employment rates.

Estimated Wind Up Expenses

Plan wind up expenses would normally include such items as fees related to preparation of the actuarial wind up report, fees imposed by a pension supervisory authority, legal fees, administration, custodial and investment management expenses. We calculated this as a flat $10,000,000.

Unisex Assumption

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

Actuarial Cost Methods

Unit credit (accrued benefit) cost method as prescribed.

Asset Valuation Method Considerations

Assets for solvency purposes have been determined using market value.

Incremental Cost

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

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

The calculation methodology can be summarized as follows:

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

  plus

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

  minus

- The liabilities at time 0.

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

- The assumptions for the expected benefit payments and decrement probabilities, service accruals, and projected changes in benefits and/or pensionable earnings would be consistent with the assumptions used in the pension plan's going concern valuation.
- The assumptions used to calculate the projected liability at time t are consistent with the assumptions for the liabilities at time 0, assuming that interest rates remain at the levels applicable at time 0, that the select period is reset at time t for interest rate assumptions that are select and ultimate and that the Standards of Practice for the calculation of commuted values and the guidance for estimated annuity purchase costs in effect at time 0 remain in effect at time t.
  - Active and inactive plan members as of time 0 are considered in calculating the incremental cost.

Appendix E: Summary of Plan Provisions

Provisions for UPP Service

The following is a summary of the main provisions of the UPP applicable to this valuation. These provisions apply to pension benefit entitlements earned on or after the July 1, 2021 conversion date (or such later conversion date for new participating employers). Different provisions apply to certain members of the UPP as set out in the UPP plan text. These provisions have not been incorporated into this summary on the basis that they are not material to the valuation.

Effective Date	January 1, 2020.
Conversion Date	July 1, 2021.
Eligibility	Full-time employees of a participating employer must become a member of the UPP on the first day of the month coincident with or immediately following the date of employment. Other than continuous full-time employees of a participating employer may elect to become a member on the first day of any month if the employee has either of the following in the two consecutive calendar years immediately prior to applying for membership in the UPP: (a) Earnings from an eligible class of employment of at least 35% of the YMPE with one or more participating employers; or (b) At least 700 hours from an eligible class of employment with one or more participating employers.
Normal Retirement	
Eligibility	Last day of the month coincident with or in which the member attains age 65.
Benefit	**For Pensionable Service on or after July 1, 2021 up to and including December 31, 2024** Annual benefit equal to (a) + (b) below for each year of Pensionable Service: (a) 1.6% of Best Average Earnings up to the Average YMPE. (b) 2.0% of Best Average Earnings in excess of the Average YMPE.

For Pensionable Service on or after January 1, 2025
Annual benefit equal to (a) + (b) below for each year of Pensionable Service:

(a) 1.6% of Best Average Earnings up to the Average YAMPE.
(b) 2.0% of Best Average Earnings in excess of the Average YAMPE.

Unreduced Early Retirement

Eligibility	Age 60 and age-plus-Eligibility Service totaling 80 or more.
Benefit	The benefit calculated under the normal retirement formula based on Best Average Earnings, Average YMPE/ Average YAMPE and Pensionable Service as of early retirement date, without reduction for early commencement. Grandparenting: For members at University of Toronto and University of Guelph who are within 3 years of attaining eligibility for reduced early retirement as a member of one of the Prior Plans as of July 1, 2021, the unreduced early retirement date determined under the Prior Plan will continue to apply to pension benefits earned for UPP service if it provides an earlier unreduced date than above (age 60 and 10 years of Pensionable Service or 15 years of Pensionable Service for certain University of Toronto members; age 55 and 85 age-plus-Pensionable Service points for certain University of Guelph members).

Reduced Early Retirement

Eligibility	Last day of the month coincident with or in which the member attains age 55 and not eligible for unreduced early retirement.
Benefit	The benefit calculated under the normal retirement formula based on Best Average Earnings, Average YMPE/ Average YAMPE and Pensionable Service as of early retirement date, reduced by 5% for each year that early retirement date precedes normal retirement date.

Postponed Retirement

Eligibility	Any age after normal retirement date that the member terminates employment, but for plan purposes, pension benefits must commence no later than December 1 of the year in which the member's 71st birthday occurs.
Benefits	The benefit calculated under the normal retirement formula based on Best Average Earnings, Average YMPE/ Average YAMPE and Pensionable Service as of postponed retirement date.

Disability Accrual

Eligibility	If eligible (or deemed eligible) to receive disability income from Long-Term Disability Plan of the participating employer.
Benefit	The benefit calculated under the normal retirement formula, payable at normal retirement date, based on Pensionable Service which continues to accrue during periods of disability and on Pensionable Earnings in effect immediately prior to the commencement of disability increased at the same rate and at the same time as any increase granted to the disability income from the Long-Term Disability Plan.

Termination of Service

Eligibility	Any age prior to eligibility for early retirement.
Benefit	A terminating member may choose one of the following options: (a) A benefit calculated under the normal retirement formula based on Best Average Earnings, Average YMPE/Average YAMPE and Pensionable Service at termination date, payable at normal retirement date (or actuarially reduced for early commencement). (b) A transfer of the commuted value of the accrued benefit to a new employer's pension plan, another prescribed retirement savings vehicle, or a life insurance company to purchase an annuity (provided the funds are transferred on a "locked-in" basis).

Death in Service

Eligibility	Any age.
Benefit	Lump-sum death benefit equal to the commuted value of the accrued benefit calculated under the normal retirement formula based on Best Average Earnings, Average YMPE/Average YAMPE and Pensionable Service at date of death. If the beneficiary is the spouse, the spouse shall receive an immediate pension unless he or she chooses a lump-sum cash payment, a transfer to an RRSP or RRIF, or a deferred pension. A beneficiary who is not a spouse, or an estate, will receive the benefit as a single lump-sum cash payment.

Minimum Employer Cost

On retirement, death, or termination, the required member contributions with interest, cannot provide more than 50% of the commuted value of the benefit. In the event that required member contributions provide for more than 50%, the excess will be refunded to the member or beneficiary, if applicable. The calculation of excess refunds is amalgamated for service under the Prior Plans and the UPP.

Normal Form of Pension

The normal form for members with a spouse at pension commencement date is a life annuity with 50% continuing thereafter to the surviving spouse for their lifetime. If the spouse is more than 10 years younger than the member, the pension will be actuarially reduced to reflect the number of years in excess of 10 that the spouse is younger than the member. Legislated 60% continuation to the spouse unless the right is waived pursuant to the legislation will be on an actuarially equivalent basis to the 50% continuation.

For members without a spouse at pension commencement, the normal form is a life annuity with a 10-year guarantee period.

Funded Conditional Indexation

Funded conditional indexation under which annual cost-of-living adjustments equal to 75% of the increase in CPI are made to pensions in payment each January 1st (prorated to reflect the number of months from pension commencement date to January 1st). The Joint Sponsors may, in accordance with the Funding Policy, decide that any prospective cost-of-living adjustment to pensions earned for pensionable service on and after the conversion date under the UPP provisions will be paid at a rate lower than 75% of the increase in CPI. Despite the previous sentence, the Joint Sponsors have agreed to grant adjustments at the 75% rate up to and including January 1, 2028.

Contribution Rates

Each member contributes each year an amount equal to 9.20% of Pensionable Earnings up to the YMPE (YAMPE starting in 2025) plus 11.50% of Pensionable Earnings in excess of the YMPE (YAMPE starting in 2025) and up to the Maximum Pensionable Earnings for Contributions.

Participating employers match the member contributions, and under certain types of leaves and programs may make part or all of the member’s contributions.

Definitions

Average YMPE	The average of the Year's Maximum Pensionable Earnings (YMPE) during the last consecutive 48 months of participation in the UPP and Prior Plan prior to retirement, termination of death.
Average YAMPE	The average of the Year's Additional Maximum Pensionable Earnings (YAMPE) during the last consecutive 48 months of participation in the UPP and the Prior Plan prior to retirement, termination or death. If the last 48 months of participation includes periods before and after January 1, 2025, the YAMPE before 2025 will be 114% of the YMPE for that period.
Best Average Earnings	The average of the highest 48 completed months (need not be consecutive) of Pensionable Earnings during participation in the UPP and the Prior Plan up to the date of retirement, termination or death. Best Average Earnings will be capped at the level at which the *Income Tax Act* maximum pension is reached at the date of determination.
Credited Interest	Minimum rate prescribed by the *Pension Benefits Act* (Ontario) and its Regulations.
Eligibility Service	Member's years and fraction of years of continuous service with a participating employer, plus any periods of employment that became recognized as pensionable service under a Prior Plan during such periods of continuous service, plus periods of employment with prior employers that becomes recognized as Pensionable Service under the UPP.
Maximum Pensionable Earnings for Contributions	$181,700 in 2021, increased each Plan Year after 2021 by the percentage increase in the *Income Tax Act* maximum pension, subject to adjustments to this increase based on the advice of the UPP actuary.
Pensionable Earnings	Basic or regular salary/wages excluding overtime, bonuses, and special payments; may include academic administrative stipends or acting salary at certain participating employers. Note: This is a generic description. The UPP contains specific provisions that govern Pensionable Earnings at each participating employer.
Pensionable Service	Member's years and fractions of years of continuous service with a participating employer on or after the conversion date during which the member contributes to the UPP, plus periods of employment with prior employers

	that becomes recognized as Pensionable Service under the UPP. For service of a member employed on a part-time basis, the period of service is multiplied by the percentage appointment.
Plan Year	The period of 12 consecutive months commencing on January 1.
Prior Plans	The single employer pension plan in which members participated in at Queen’s University, University of Guelph and University of Toronto, as applicable, and from which liabilities have been transferred to the UPP.

A copy of a letter from the Board of Trustees certifying the accuracy and completeness of the UPP provisions summarized in this report, including the benefit provisions for pre-conversion date service that follow in this section, is included in Appendix F of this report.

University of Toronto—Provisions for Pre-Conversion Date Service

The following is a summary of the main provisions that apply to pre-conversion date service for members accruing benefits under the University of Toronto Pension Plan as of June 30, 2021 and for whom pension benefit entitlements have been transferred to the UPP effective July 1, 2021. The provisions of the University of Toronto Pension Plan in effect on June 30, 2021 apply to the pension benefit entitlements for pensioners, beneficiaries and deferred vested members transferred to the UPP effective July 1, 2021.

Conversion Date	July 1, 2021
Normal Retirement	
Eligibility	Last day of the month coincident with or in which the member attains age 65 (June 30 coincident with or next following the attainment of age 65 for deferred vested members as of June 30, 2021)
Benefit	**For Full-Time Service, and Part-Time Service on or after July 1, 1987 up to and including June 30, 2021** Annual benefit equal to (a) + (b) below for each year of Pensionable Service up to and including June 30, 2021: ***Academic Staff, Librarians and Research Associates*** (a) 1.5% of Highest Average Salary up to the Average CPP Maximum Salary. (b) 2.0% of Highest Average Salary in excess of the Average CPP Maximum Salary. ***Administrative Staff, Unionized Administrative Staff and Unionized Staff*** (a) 1.6% of Highest Average Salary up to the Average CPP Maximum Salary. (b) 2.0% of Highest Average Salary in excess of the Average CPP Maximum Salary. **For Part-Time Service before July 1, 1987** Annual benefit equal to 2% of indexed salary for each year of participation, where indexed salary is the salary paid in the University Year in which the benefit is earned, indexed by the increases in the Average Industrial Wage from the end of the University Year to the beginning of the University Year in which the member retires, terminates, or dies in active service of the University, whichever occurs first.

Maximum Pension
The annual benefit for a member cannot exceed the lesser of:

- Defined benefit limit on such date times years of pensionable service; and
- 2.0% of the average of the best three consecutive years of salary times pensionable service.

Regulation 8504(6) imposes a lower maximum benefit limit in respect of any pre-1990 service that is granted after June 8, 1990.

Unreduced Early Retirement

Eligibility

Academic Staff and Librarians[1]
December 31 or June 30 following attainment of age 60 and 10 or more years of Pensionable Service

Administrative Staff—P/Ms 6 and Above
Age 60 and 15 or more years of Pensionable Service

Administrative Staff (Other Than Above), Unionized Administrative Staff, Unionized Staff and Research Associates
Age 60 and age-plus-continuous service (including transferred-in pensionable service) totaling 80 or more.

Benefit

The benefit calculated under the normal retirement formula based on Highest Average Salary, Average CPP Maximum Salary, and Pensionable Service as of early retirement date, without reduction for early commencement.

Reduced Early Retirement

Eligibility

Within 10 years of normal retirement date and not eligible for unreduced early retirement.

Benefit

The benefit calculated under the normal retirement formula based on Highest Average Salary, Average CPP Maximum Salary, and Pensionable Service as of early retirement date, reduced 5% for each year that actual retirement precedes the normal retirement date.

Postponed Retirement

Eligibility

Any age after normal retirement date, but for plan purposes pension benefits must commence no later than December 1 of the year in which the member's 71st birthday occurs.

[1] Only if retiring on December 31, on June 30

Benefit	The benefit calculated under the normal retirement formula based on Highest Average Salary, Average CPP Maximum Salary, and Pensionable Service as of postponed retirement date.

Disability

Eligibility	If eligible (or deemed eligible) to receive disability income from Long-Term Disability Plan.
Benefit	The benefit calculated under the normal retirement formula, payable at normal retirement date, based on Pensionable Service which continues to accrue during periods of disability and on salary which is increased during each year of disability by the lesser of: (a) 7%; and (b) The "across-the-board" economic increase granted to active employees during the preceding 12 months.

Termination of Service

Eligibility	Any age
Benefit	A terminating member may choose one of the following options: (a) A benefit calculated under the normal retirement formula based on Highest Average Salary, Average CPP Maximum Salary, and Pensionable Service at termination date, payable at normal retirement date (or actuarially reduced for early commencement). (b) A transfer of the commuted value of the accrued benefit to a new employer's pension plan, another prescribed retirement savings vehicle, or a life insurance company to purchase an annuity (provided the funds are transferred on a "locked-in" basis). For terminations after July 1, 2019 but prior to early retirement age, the minimum termination benefit will be two times the member's required contributions made prior to July 1, 2019 with interest.

Death in Service

Eligibility	Any age
Benefit	Lump-sum death benefit equal to the commuted value of the accrued benefit calculated under the normal retirement formula above based on Highest Average Salary, Average CPP Maximum Salary, and Pensionable Service at date of death. If the beneficiary is the spouse, the spouse shall receive an immediate pension unless he or she chooses a lump-sum cash payment, a transfer to an RRSP or RRIF, or a deferred pension. A beneficiary who is not a spouse, or an estate, shall receive the benefit as a single lump-sum cash payment.
Normal Form of Pension	The normal form for members with a spouse at pension commencement date is a life annuity with 60% continuing thereafter to the surviving spouse for his or her lifetime. If the spouse is more than 15 years younger than the member, the pension will be actuarially reduced to reflect the number of years in excess of 15 that the spouse is younger than the member. A survivor's pension is payable to a member's dependent children under certain circumstances. For members without a spouse at pension commencement date, the normal form is a life annuity with a five-year guarantee period. For members who terminated prior to July 1, 1996 and are entitled to a future pension under the Plan, the normal form will be determined based on the Plan provisions in effect at the time of termination.
Cost-of-Living Adjustments	Pensions in payment, and pensions in the deferral period for members who terminated service on or after July 1, 1982, will be increased on July 1 each year by the greater of (a) and (b) prorated to reflect the number of months from pension commencement date to the July 1: (a) The increase in the CPI for Canada for the previous calendar year minus 4.0%; or (b) 75% of the increase in the CPI for the previous calendar year to a maximum CPI increase of 8%, plus 60% of the increase in CPI in excess of 8%.

Definitions

Average CPP Maximum Salary	The average of the CPP Maximum Salary during the last 36 months of participation.
CPP Maximum Salary	The maximum salary taken into account for purposes of the Canada Pension Plan (i.e., the Year's Maximum Pensionable Earnings) as at the beginning of a University Year.
Credited Interest[1]	4% per annum up to June 30, 1981; after June 30, 1981, an annual rate equal to the increase in the CPI plus 2% subject to the minimum rate prescribed by the *Pension Benefits Act* (Ontario) and its Regulations; from July 1, 2012 onward, the increase in CPI plus 2% is removed.
Highest Average Salary	The highest average of the Salary received by a member during any 36 completed months of participation. Highest Average Salary is capped at the level at which the *Income Tax Act* maximum pension is reached in the month of retirement or earlier termination.
Pensionable Service	Member's years and completed months of continuous service with the University while a member of the University of Toronto Pension Plan up to and including June 30, 2021. For service of a member employed on a full-time basis or the service on or after July 1, 1987 of a member employed on a part-time basis, the period of service is multiplied by the percentage appointment.
Salary	Gross regular salary/wages including academic administrative stipends, but excluding all other payments.
University Year	The period of 12 consecutive months commencing on July 1.

[1] Applies to contribution balances up to and including June 30, 2021

Queen's University—Provisions for Pre-Conversion Date Service

The following is a summary of the main provisions that apply to pre-conversion date service for members accruing benefits under the Revised Pension Plan of Queen's University as of June 30, 2021 and for whom pension benefit entitlements have been transferred to the UPP effective July 1, 2021. The provisions of the Revised Pension Plan of Queen's University in effect on June 30, 2021 apply to the pension benefit entitlements for pensioners, beneficiaries and deferred vested members transferred to the UPP effective July 1, 2021.

Conversion Date	July 1, 2021
Normal Retirement	
Eligibility	Last day of the month coincident with or in which the member attains age 65.
Benefit	**Money Purchase Pension** Pension that can be provided by the member's Money Purchase Account balance (member and University money purchase contributions up to and including June 30, 2021, credited with Fund Interest to retirement date) based on actuarial tables in force on retirement date. Account balance is reduced by a charge to account for the cost of the non-reduction pension currently 4.50% of the total account balance. **Minimum Guarantee Pension** The excess, if any, of (a) over (b): (a) 1.40%[1] of Final Average Earnings up to Average YMPE plus 1.80% of Final Average Earnings in excess of Average YMPE multiplied by Credited Service up to and including June 30, 2021 (b) Money Purchase Pension
Unreduced Early Retirement	
Eligibility	Age 60 and age-plus-Eligibility Service[2] totaling 80 or more.
Benefit	Pension calculated under normal retirement formula based on Money Purchase Account balance at early retirement date and Minimum Guarantee Pension based on Final Average Earnings, Final Average YMPE and Credited Service at early retirement date, without reduction for early commencement.

[1] 1.35% for Credited Service before September 1, 1997
[2] Same definition as for benefits earned for post-conversion date service

Reduced Early Retirement

Eligibility

Any age and not eligible for unreduced early retirement.

Benefit

Pension calculated under normal retirement formula based on Money Purchase Account balance at early retirement date and Minimum Guarantee Pension based on Final Average Earnings, Final Average YMPE and Credited Service at early retirement, reduced as follows:

- For Minimum Guarantee Pension accrued as of September 1, 2012, 2% per year for the first five years prior to normal retirement date and 6% per year for each additional year prior to normal retirement date.
- For Minimum Guarantee Pension accrued on or after September 1, 2012, if early retirement date is within 10 years prior to normal retirement date, 3% per year for the first five years, prior to normal retirement date and 6% per year for each additional year prior to normal retirement date; otherwise 6% per year from normal retirement date.

Postponed Retirement

Eligibility

Any age after normal retirement date, but for plan purposes benefits must commence no later than December 1 of the year in which the member's 71st birthday occurs.

Grandparenting: A member who has attained normal retirement date as of July 1, 2021 and has elected to cease contributing at or after normal retirement date.

Benefit

Pension calculated under normal retirement formula based on Money Purchase Account balance at postponed retirement date and Minimum Guarantee Pension based on Final Average Earnings, Final Average YMPE and Credited Service at postponed retirement date.

Grandparenting: Minimum Guarantee Pension is calculated at contribution cessation date based on Final Average Earnings, Final Average YMPE and Credited Service at contribution cessation date, actuarially increased to postponed retirement date.

Termination of Service

Eligibility

Any age

Benefit

Member may elect to transfer the Money Purchase Account plus the excess, if any, of the commuted value of the Minimum Guarantee Pension determined based on Final Average Earnings, Final Average YMPE and Credited Service at termination date, over the Money Purchase Account, to a new employer's pension plan, another prescribed retirement savings vehicle or a life insurance company to purchase an annuity (provided the funds are transferred on a "locked-in" basis).

A terminating member is also entitled to a lump-sum refund of any voluntary or special lump-sum contributions, in cash or as a transfer to a retirement savings arrangement (on a "non-locked-in" basis).

Death in Service

Eligibility

Any age

Benefit

Lump-sum benefit equal to Money Purchase Account balance plus the excess, if any, of the commuted value of the Minimum Guarantee Pension based on Final Average Earnings, Final average YMPE and Credited Service after January 1, 1987 to date of death, over the Money Purchase Account balance in respect of service after January 1, 1987. Any voluntary or special lump-sum contributions would be refunded.

Maximum Benefit

The annual pension determined in accordance with the Minimum Guarantee Pension formula prior to the reduction for the Money Purchase Pension cannot exceed the lesser of (1) and (2) below.

(1) The defined benefit limit as defined under the *Income Tax Act* times Credited Service; and

(2) 2.0% of the average of the best three consecutive years' earnings times Credited Service.

For commencement of the pension after normal retirement date, the amount shall be increased on an actuarially equivalent basis in the manner permitted by the *Income Tax Act.*

For commencement of the pension prior to normal retirement date, for the maximum pension earned for Credited Service up to September 1, 2012, the early retirement reductions under the *Income Tax Act* will apply. For the maximum pension in respect of Credited Service on or after September 1, 2012, the maximum pension is applied to the normal retirement formula with the plan's early retirement reductions then applied.

Normal Form of Pension

The normal form of annuity is a life annuity with a 10-year guarantee. For members with a spouse at pension commencement date, legislated 60% survivor pension on an actuarially equivalent basis.

Excess Interest Indexation

For pensioners retiring prior to or on September 1, 2012:

- Pensions in payment will be adjusted each September 1 by the excess, if any, of the 4-year average of the Fund Interest over 6%. No reduction will be made even if the 4-year average of the Fund Interest is less than 6%.

For pensioners retiring after September 1, 2012:

- Pensions in payment from the Money Purchase Pension and the prorated portion of the Minimum Guarantee Pension in respect of Credited Service prior to September 1, 2012 will be adjusted each September 1 by the excess, if any, of the 6-year average Fund Interest in excess of 6%. For this purpose, the Fund Interest rate for periods prior to the retirement date will be set at 6%. The indexation will be adjusted either positively or negatively to reflect actual mortality gains or losses. No reduction will be made if the 6-year average of the Fund Interest combined with the mortality adjustments is less than 6%.

Definitions

Credited Service	Years and fraction of years during which the member contributes at the full rate based on contributory earnings for the year. For a part-time member, determined by taking the ratio of the member's actual contributions to the contributions that would normally be required if contributory earnings were adjusted to a full-time basis.
Earnings	Regular earnings from the University, excluding overtime, special supplements, summer school, extramural and similar payments.
Final Average Earnings	Average of the member's Earnings during 48 consecutive months of highest Earnings, or if less, total period service.
Final Average YMPE	Average of the Year's Maximum Pensionable Earnings under the Canada Pension Plan for the same 48 months as used for the Final Average Earnings.
Fund Interest	Interest at a rate calculated as of the close of each plan year based on the pension fund earnings including interest and dividends, capital gains and losses (both realized and unrealized), less administrative expense incurred in the operation of the pension fund.

University of Guelph—Provisions for Pre-Conversion Date Service

The following is a summary of the main provisions that apply to pre-conversion date service for members accruing benefits under the University of Guelph Pension Plans as of June 30, 2021 and for whom pension benefit entitlements have been transferred to the UPP effective July 1, 2021. The provisions of the University of Guelph Pension Plans as in effect on June 30, 2021 apply to the pension benefit entitlements for pensioners, beneficiaries and deferred vested members transferred to the UPP effective July 1, 2021.

Conversion Date — July 1, 2021

Normal Retirement

Eligibility — Last day of the month coincident with or in which the member attains age 65

Benefit — Annual benefit equal to (a) plus (b) below for each year of Credited Service up to and including June 30, 2021:

(a) 1.50%* of Best Average Earnings up to YMPE Average.

(b) 2.00% of Best Average Earnings in excess of YMPE Average.

*1.60% for USW, OSSTF, CUPE 1334 and Exempt

Maximum Pension

The annual benefit for a member cannot exceed the lesser of:

- Defined benefit limit on such date times years of Credited Service; and
- 2.00% of the average of the best three consecutive years of salary times Credited Service.

Regulation 8504(6) imposes a lower maximum benefit limit in respect of any pre-1990 service that is granted after June 8, 1990.

Unreduced Early Retirement

Eligibility — Multiple provisions depending on employee group based on age and age-plus-Credited Service points.

Age 55 and 85 points for:
USW, CUPE 1334, CUPE 1334 Unit 1, CUPE 3913 Unit 2, UGFSEA Unit 1, UGFSEA Unit 2, ONA

	Age 55 and 85 points for pension benefits earned for Credited Service prior to Earliest Unreduced Retirement Change Date, and the following for pension benefits earned for Credited Service after that date:
	Age 60 and 90 points with Change Date of September 1, 2011 for: UFGA Unit 2.
	Age 60 and 90 points with Change Date of May 1, 2013 for: Exempt, OPSEU, OSSTF and UNIFOR
	Age 60 and 90 points with Change Date of July 1, 2013 for: USW TESL and Non-Represented Members
	Age 60 and 85 points with Change Date of July 1, 2013 for: P&M
	Age 62 and 87 points with Change Date of July 1, 2013 for: UGFA, Executive.
Benefit	The benefit calculated under the normal retirement formula based on Best Average Earnings, YMPE Average and Credited Service as of early retirement date, without reduction for early commencement.

Reduced Early Retirement

Eligibility	Last day of the month coincident with or in which the member attains age 55, and not eligible for unreduced early retirement.
Benefit	The benefit calculated under the normal retirement formula based on Best Average Earnings, YMPE Average and Credited Service as of early retirement date, reduced 3% for each year that early retirement date precedes the earliest of: (a) normal retirement date; and (b) the earliest unreduced retirement date had the member remained in employment.

Postponed Retirement

Eligibility	Any age after normal retirement date that the member terminates employment, but for plan purposes, pension benefits must commence no later than December 1 of the year in which the member's 71st birthday occurs.
Benefit	The benefit calculated under the normal retirement formula based on Best Average Earnings, YMPE Average and Credited Service as of postponed retirement date.

Disability

Eligibility

If eligible (or deemed eligible) to receive disability income from Long-Term Disability Plan.

Benefit

The benefit calculated under the normal retirement formula, payable at normal retirement date, based on Credited Service that continues to accrue during periods of disability and on earnings which are increased annually to reflect the increase in the base salary level for the member's union, association, or group as applicable.

Termination of Service

Eligibility

Any age prior to eligibility for early retirement.

Benefit

A terminating member may choose one of the following options:

(a) A benefit calculated under the normal retirement formula above based on Best Average Earnings, YMPE Average, and Credited Service at termination date, payable at normal retirement date or as early as 10 years prior to normal retirement date reduced for early commencement as shown below.

(b) A transfer of the commuted value of the accrued benefit to a new employer's pension plan, another prescribed retirement savings vehicle, or a life insurance company to purchase an annuity (provided the funds are transferred on a "locked-in" basis).

For pension benefits in respect of Credited Service up to the Termination Benefit Change Date in the following table, the reduction for early commencement is 3% for each year that the pension commencement date precedes the earlier of the normal retirement date and the date on which the member would have attained the 85 age-plus-Credited Service points had they remained in employment.

Termination Benefit Change Dates:

Date	Employee Group
September 1, 2011	UGFA Unit 2
January 1, 2012	USW, UGFSEA Unit 2
May 1, 2012	UGFSEA Unit 1
June 1, 2012	ONA
July 1, 2012	UGFA, P&M
May 1, 2013	OPSEU, UNIFOR, OSSTF, Exempt
July 1, 2013	USW TESL, Non-Represented, Executive
April 30, 2016	CUPE 1334, CUPE 1334 Unit 1
September 1, 2016	CUPE 3913 Unit 2

For service up to the Termination Benefit Change Date, the minimum lump-sum transfer is two times the member's contributions with interest.

For pension benefit in respect of Credited Service after the Termination Benefit Change Date, on early commencement, an actuarial reduction from normal retirement date is applied.

Death in Service

Eligibility

Any age

Benefit

Lump-sum death benefit equal to the commuted value of the accrued benefit calculated under the normal retirement formula above based on Best Average Earnings, YMPE Average and Credited Service at date of death. If the beneficiary is the spouse, the spouse shall receive an immediate pension unless they choose a lump-sum cash payment, a transfer to an RRSP or RRIF, or a deferred pension. A beneficiary who is not a spouse, or an estate, shall receive the benefit as a single lump-sum cash payment.

Normal Form of Pension

The normal form for members with a spouse at pension commencement date is a life annuity with 60% continuing to the surviving spouse for their lifetime. If the spouse is more than five years younger than the member, the pension will be actuarially reduced to reflect the number of years in excess of five that the spouse is younger than the member. A survivor's pension is payable to a member's dependent children under certain circumstances.

For members without a spouse at pension commencement date, the normal form is a life annuity with a five-year guarantee period.

Cost-of-Living Adjustments

Pensions in payment will be increased on September 1 each year by (a) less (b) below, prorated to reflect the number of months from pension commencement date to the September 1:

(a) Increase in CPI up to a maximum of 8.00%.

(b) 2.00%

Increase in CPI is measured by the percentage by which the average of the CPI Canada over the 12-month period ending in April of the year in which the adjustment is occurring exceeds the average of the CPI Canada over the preceding 12-month period.

Definitions

Best Average Earnings	Annualized average of the member's 36 consecutive months of Earnings prior to date of retirement, termination, or death.
Credited Service	Continuous service with the University during which regular contributions are made. Proportionate Credited Service is granted for part-time members. Limited to 35 years for Credited Service up to and including June 30, 2021.
Earnings	Basic earnings annualized for part-time members, including deferred income, excluding bonuses, overtime payments and other payments. For benefits for Pensionable Service on or after July 1, 2021 under the UPP, the following payments are included: stipends for administrative appointments, administrative honorariums, team leader pay, acting pay and market adjustments.
Interest[1]	Minimum rate prescribed by the *Pension Benefits Act* (Ontario) and its Regulations.
YMPE Average	Average of the Year's Maximum Pensionable Earnings under the Canada Pension Plan for the 60 consecutive months immediately prior to retirement, termination or death.

[1] Applies to contribution balances up to and including June 30, 2021

Appendix F: Administrator Certification

With respect to the University Pension Plan Ontario, forming part of the actuarial report as at July 1, 2021, I hereby certify that, to the best of my knowledge and belief:

- The terms of engagement contained in Section 1 of this report are accurate and reflect the Board of Trustee's direction;
- The asset data provided or made available to the actuary are complete and accurate;
- The plan provisions provided or made available to the actuary are complete and accurate;
- The membership data made available to the actuary by the actuaries of the single employer pension plans that converted to the UPP on July 1, 2021 have been certified by the administrators of the single employer pension plans for purposes of the Transfer and Conversion Reports prepared for the pension plans as of July 1, 2021 as complete and accurate for all persons entitled to pensions benefits under the terms of those pension plans in respect of service up to the date of the valuation; and
- The actuary has been notified of all relevant events subsequent to the valuation measurement date.

Barbara Zvan

Barbara Zvan

Name (print) of Authorized Signatory

CEO and President

Title

Signature

March 14, 2022

Date

About Aon

Aon plc (NYSE:AON) is a leading global professional services firm providing a broad range of risk, retirement and health solutions. Our 50,000 colleagues in 120 countries empower results for clients by using proprietary data and analytics to deliver insights that reduce volatility and improve performance.