



Preliminary Actuarial Valuation Results as of January 1, 2016

University of Waterloo
Pension and Benefits Committee Meeting on March 11, 2016

Prepared by Aon Hewitt

Presentation to University of Waterloo

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Preparation of this Actuarial Valuation

Aon Hewitt has been retained by the University of Waterloo Pension and Benefits Committee to prepare an actuarial valuation of the University of Waterloo Pension Plan (the “Plan”) as of January 1, 2016 for Plan management purposes.

In conducting the valuation, we have used member data provided by the University of Waterloo as of January 1, 2016, the unaudited financial statements of the Plan provided by CIBC Mellon as of January 1, 2016, and the actuarial assumptions and methods described in this document.

For the purposes of this valuation, it is our opinion that:

- The membership and asset data upon which the valuation is based are sufficient and reliable;
- The assumptions used are appropriate; emerging experience differing from the assumptions will result in gains or losses which will be revealed in future valuations;
- The actuarial methods used are appropriate for purposes of the valuation and are consistent with the applicable regulatory requirements.

Allan H. Shapira
Fellow of the Canadian Institute of Actuaries

Linda M. Byron
Fellow of the Canadian Institute of Actuaries

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Understanding the Actuarial Process

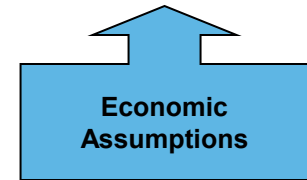
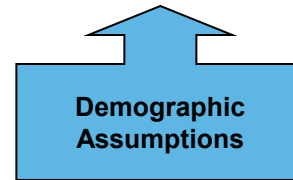
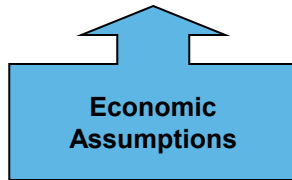
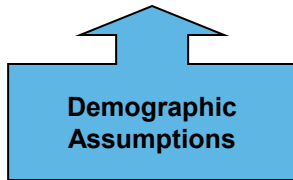
- Ultimate cost of Pension Plan equals the sum of benefits paid
- Cost is funded by University and member contributions and investment earnings, net of expenses
- Actuarial process from a funding perspective:
 - Using actuarial estimates to make periodic funding contributions in a systematic manner to meet the ultimate cost

Understanding the Actuarial Process (continued)

- Elements of an actuarial valuation:
 - Pension Plan: Contractually promises to pay benefits defined by the plan formula(s) on retirement, death, disability and termination
 - Plan Members: Current employees, retirees and beneficiaries in this group will be or are entitled to the benefits promised by the plan. Specific data is gathered and validated for all members
 - Actuarial Assumptions: Actuary uses these to estimate who will receive a benefit, what the amount of benefit will be, when the benefit will start, and how long it will be paid
 - Actuarial Cost Method: Used to allocate the cost of the estimated benefits (determined using the member data and actuarial assumptions) to various time periods

Actuarial Assumptions for Going Concern Valuation

Assumptions to Estimate:			
When Pension Benefits Are Payable	Amount of Pension Benefits Payable	How Long Pension Benefits Are Payable	How Much Money to Set Aside
<ul style="list-style-type: none"> Termination Rates Disability Rates Preretirement Mortality Rates Retirement Ages 	<ul style="list-style-type: none"> Increases in CPP Wage Base Increases in ITA Maximum Pension Increases in Salaries Inflation 	<ul style="list-style-type: none"> Postretirement Mortality Rates 	<ul style="list-style-type: none"> Investment Return on Pension Fund



Pension Liability/Asset Relationship

Growth in Liabilities From Year to Year

Liabilities at beginning of year
(representing discounted present value of
pension benefits earned in respect of service
up to the valuation date)

Plus

Interest on liabilities at rate used to
discount the liabilities

Plus

New liability for benefits earned by
members in the year (current service)
and increase/(decrease) in liability from
experience losses/(gains)

Less

Pension payments and lump-sum transfers

Growth in Assets From Year to Year

Value of pension fund assets at
beginning of year

Plus

Rate of return on pension fund assets

Plus

Contributions made by members
and University

Less

Pension payments, lump-sum transfers,
fees and expenses

Highlights of January 1, 2016 Valuation Results

- This material includes the going concern valuation results for the Registered Pension Plan (RPP) and the Payroll Pension Plan (PPP) as at January 1, 2016
- The January 1, 2016 actuarial valuation of the RPP is not required to be filed with the pension regulators
- The next required valuation to be filed with the pension regulators must have an effective date no later than January 1, 2017
- The going concern results have been determined using the alternate set of economic assumptions discussed with the Pension and Benefits Committee on January 15, 2016

Plan Members—Demographics

January 1, 2015

January 1, 2016

Active Members (Including Leaves)

Number	3,940	4,169
Average age	47.8	47.5
Average years of credited service	10.7	10.4
Average pensionable earnings ¹	\$ 92,918	\$ 94,753
Total pensionable earnings ¹	\$ 366,096,682	\$ 395,023,466

LTD Members

Number	86	84
Average age	57.4	57.2
Average years of credited service	18.4	18.2
Average pensionable earnings ¹	\$ 52,263	\$ 59,106
Total pensionable earnings ¹	\$ 4,494,583	\$ 4,964,947

Suspended Members

Number	12	10
Average age	32.0	32.6
Average years of credited service	1.4	2.3

¹ Year following valuation date

Plan Members—Demographics (continued)

	January 1, 2015	January 1, 2016
Pensioners and Survivors		
Number	1,673	1,745
Average age	74.2	74.4
Average annual pension	\$ 29,184	\$ 29,831
Total annual pension	\$ 48,823,996 ¹	\$ 52,054,523 ¹
Total bridge benefit	\$ 77,006	\$ 83,395
Deferred Pensions: Subject to COLA		
Number	481	493
Average age	49.7	50.0
Average annual pension	\$ 6,328	\$ 6,268
Deferred Pensions: Others		
Number	9	8
Average age	65.5	66.6
Average annual pension	\$ 872	\$ 980

¹ Does not reflect increase as of May 1, 2015 or May 1, 2016, as applicable

Actuarial Assumptions for Going Concern Valuation— Economic Assumptions

Economic Assumptions	January 1, 2014 (Last Filed Valuation)	January 1, 2015	January 1, 2016
Increase in Consumer Price Index (CPI)	2.25% per year	2.00% per year	No change
Increase in Year's Maximum Pensionable Earnings under Canada pension plan	3.00% per year (CPI + 0.75%)	2.75% per year (CPI + 0.75%)	No change
Increase in <i>Income Tax Act</i> maximum pension	\$2,770.00 in 2014; increased at 3.00% per year up to \$3,200	\$2,818.89 in 2015; increased at 2.75% per year up to \$3,200	\$2,890.00 in 2016; increased at 2.75% per year up to \$3,200 ¹
Increase in salaries ²	5.00% per year for 1 year; 4.25% per year thereafter (CPI + 2.00%)	4.00% per year (CPI + 2.00%)	No change
Increase in salaries (disabled)	2.25% per year (CPI + 0.00%)	2.00% per year	No change
Interest rate used to discount liabilities	6.00% per year (CPI + 3.75%)	5.75% per year (CPI + 3.75%)	5.70% per year (CPI + 3.70%)
Interest rate used to discount cash flow from real return bonds	3.75% per year	Not applicable	Not applicable
Interest rate used to calculate 50% rule	1.70% per year for 10 years; 2.30% per year thereafter	1.30% ³ per year for 10 years; 1.60% per year thereafter	1.20% ³ per year for 10 years; 1.70% per year thereafter
Interest rate for crediting on required member contributions	3.00% per year	No change	No change
Loading for administrative expenses	Reflected in discount rate	No change	No change

¹ PPP limit of \$3,309 in 2016 increased at 2.75% per year up to \$3,400

² Across the board increases plus grid steps / merit / promotion

³ 1.60% / 2.10% for 75% indexed benefits in 2015; 1.40% / 2.20% for 75% indexed benefits in 2016

Actuarial Assumptions for Going Concern Valuation— Demographic Assumptions

Demographic Assumptions	January 1, 2014 (Last Filed Valuation)	January 1, 2015	January 1, 2016																		
Retirement age	Age 64, but no earlier than one year after valuation date	No change	No change																		
Mortality rates	2014 Canadian Pensioners Combined Table (“CPM2014 Combined”) with Improvements under Scale CPM-B	No change	No change																		
Termination rates	<table border="1"> <thead> <tr> <th>Age</th> <th>Rates Per 100</th> </tr> </thead> <tbody> <tr> <td>20</td> <td>10.0</td> </tr> <tr> <td>25</td> <td>10.0</td> </tr> <tr> <td>30</td> <td>5.6</td> </tr> <tr> <td>35</td> <td>3.2</td> </tr> <tr> <td>40</td> <td>2.2</td> </tr> <tr> <td>45</td> <td>1.7</td> </tr> <tr> <td>50</td> <td>1.2</td> </tr> <tr> <td>55</td> <td>0.7</td> </tr> </tbody> </table>	Age	Rates Per 100	20	10.0	25	10.0	30	5.6	35	3.2	40	2.2	45	1.7	50	1.2	55	0.7	No change	No change
Age	Rates Per 100																				
20	10.0																				
25	10.0																				
30	5.6																				
35	3.2																				
40	2.2																				
45	1.7																				
50	1.2																				
55	0.7																				

Reconciliation of Plan Assets (Market Value)

	Total
Market Value of Assets, January 1, 2015	\$ 1,316,509,737
Plus	
Member contributions	\$ 27,586,988
University contributions	45,002,974
Flex contributions	0
Transfers in from other plans	1,655,420
Investment income	70,629,072
Net transfers from other accounts	<u>0</u>
	\$ 144,874,454
Less	
Pensions and lump-sum refunds paid	\$ 57,283,148
Expenses and fees	<u>1,349,912</u>
	\$ 58,633,060
Market Value of Assets, December 31, 2015*	\$ 1,402,751,131
Rate of return (net of expenses and fees)	5.23%

* The actual December 31, 2015 Market Value of Assets will be adjusted based on the audited financial statements

Development of Actuarial Value of Assets

- At the last filed valuation, the Actuarial Value of Assets for assets other than real return bonds, was set equal to the Market Value of Assets
- The actuarial value of the real return bonds was determined by discounting the projected cash flow at the real rate of return of 3.75% per year
- The real return bonds were sold in October 2014 at a MVA of \$216,935,034, compared to an AVA of \$172,569,989
- The difference between the MVA and the AVA of the real return bonds at the date of sale of \$44,365,045 will be held as a reserve
- The Actuarial Value of Assets as of January 1, 2016 is equal to the Market Value of Assets at that date, net of adjustments for amounts payable/receivable, less the above-mentioned reserve

Pension Fund Asset Mix as of December 31, 2015

Asset Class	Current Asset Mix	Target Asset Mix
Cash and short term	27%	2%
Fixed-income	27%	33%
Equities	38%	55%
Infrastructure	5%	5%
Real estate	<u>3%</u>	<u>5%</u>
Total	100%	100%

Going Concern Valuation Results as of January 1, 2016 Registered Pension Plan—Past Service

	January 1, 2014 (Last Filed Valuation)	January 1, 2015	January 1, 2016
Past Service			
Actuarial value of assets	\$ 1,156,065,428	\$ 1,272,144,692	\$ 1,357,813,943
Less: Accrued liability			
Active members	\$ 702,327,498	\$ 736,872,546	\$ 786,498,866
Disabled and suspended members	17,175,900	15,077,329	16,539,864
Pensioners and beneficiaries	551,387,278	588,096,584	620,925,745
Deferred vested members	27,199,975 ¹	30,323,422 ²	30,824,645 ³
Additional voluntary contribution balances	959,189	1,002,779	778,457
Members flex contribution balances	1,251,748	1,395,950	1,210,788
Cost of living increase effective May 1	<u>5,268,871</u>	<u>11,447,153</u>	<u>7,150,875</u>
Total	\$ 1,305,570,459	\$ 1,384,215,763	\$ 1,463,929,240
Funding excess/(unfunded liability)	\$ (149,505,031)	\$ (112,071,071)	\$ (106,115,297)
Deferred asset gain/(loss)—funding reserve on sale of real return bonds	<u>N/A</u>	<u>44,365,045</u>	<u>44,365,045</u>
Funding excess/(unfunded liability) on market value basis without funding reserve	\$ (149,505,031)	\$ (67,706,026)	\$ (61,750,252)
Market value of assets	\$ 1,194,775,607	\$ 1,316,509,737	\$ 1,402,178,988 ⁴

¹ Reflects actual indexation as of May 1, 2014 of 0.94%, and expected indexation in following two years

² Reflects actual indexation as of May 1, 2015 of 1.91% (1.43% for 75% indexed benefits), and expected indexation in following two years

³ Reflects actual indexation as of May 1, 2016 of 1.13% (0.84% for 75% indexed benefits), and expected indexation in following two years

⁴ Adjusted for \$572,143 of in-transit payments

Going Concern Valuation Results as of January 1, 2016 Registered Pension Plan—Current Service

	January 1, 2014 to December 31, 2014		January 1, 2015 to December 31, 2015	
	\$ Amount	% of Pensionable Earnings	\$ Amount	% of Pensionable Earnings
Current Service				
Total current service cost	\$ 53,202,405	14.97%	\$ 56,590,121	15.27%
Less: Members' required contributions	<u>(25,986,716)</u>	<u>(7.31%)</u>	<u>(27,239,514)</u>	<u>(7.35%)</u>
University current service cost	\$ 27,215,689	7.66%	\$ 29,350,607	7.92%
As a % of members' required contributions	104.7%		107.8%	
Pensionable earnings	\$ 355,351,815		\$ 370,580,275	
	January 1, 2016 to December 31, 2016			
	\$ Amount	% of Pensionable Earnings		
Current Service				
Total current service cost	\$ 61,199,016	15.30%		
Less: Members' required contributions	<u>(29,371,798)</u>	<u>(7.34%)</u>		
University current service cost	\$ 31,827,218	7.96%		
As a % of members' required contributions	108.4%			
Pensionable earnings	\$ 399,988,413			

Analysis of Experience

	In \$ Millions
Funding excess/(unfunded liability) as of January 1, 2015	\$ (112.1)
Plus: University contributions	45.0
Member contributions	27.6
Less: Total current service cost	(56.5)
Plus: Interest at 5.75% per year	<u>(6.0)</u>
Equals: Expected funding excess/(unfunded liability) as of January 1, 2016	\$ (102.0)
Plus: Gains (losses) due to:	
Return on actuarial value of assets	(4.4)
COLA adjustment lower than assumed	5.5
Change in assumed interest rate for 50% rule	0.0
Salary increases lower than assumed	1.6
Change in ITA maximum pension/YMPE lower than assumed	0.6
Mortality experience	(1.8)
Retirement experience	5.0
Termination experience	0.1
Additional deferred year of COLA	(0.5)
Data adjustments / Article 12 Transfers	0.6
Miscellaneous experience	<u>(0.5)</u>
Equals: Funding excess/(unfunded liability) as of January 1, 2016	\$ (95.8)
Plus: Impact of change in assumptions	<u>(10.3)</u>
Equals: Funding excess / unfunded liability as of January 1, 2016	(106.1)

Going Concern Valuation Results as of January 1, 2016

Payroll Pension Plan

	January 1, 2015 ¹	January 1, 2016 ²
Past Service		
Market value of assets	\$ 33,993,532	\$ 33,737,828
Less: Accrued liability		
Active members	\$ 19,391,943	\$ 21,380,969
Pensioners and beneficiaries	<u>12,100,172</u>	<u>13,574,700</u>
Total	\$ 31,492,115	\$ 34,955,669
Funding excess/(unfunded liability)	\$ 2,501,417	\$ (1,217,841)
Current Service		
University current service cost	\$ 1,616,071	\$ 1,582,372
As a % of pensionable earnings	0.44%	0.40%

¹ Reflects maximum benefit in 2015 of \$3,228 per year of credited service, indexed at 2.75% per year up to \$3,400

² Reflects maximum benefit in 2016 of \$3,309 per year of credited service, indexed at 2.75% per year up to \$3,400

Going Concern Results at January 1, 2016 – Sensitivity to 0.10% Lower Discount Rate

	Registered Pension Plan	Payroll Pension Plan	Increase
Past Service			
Accrued liability	\$ 1,484,837,678	\$ 35,457,537	\$ 21,410,306 (+1.4%)
Current Service			
Total current service cost	\$ 62,534,619	\$ 1,617,665	\$ 1,370,896 (+2.2%)

Total Current Service Cost for 2016

	RPP		PPP		Total	
	\$ Amount	% of Pensionable Earnings	\$ Amount	% of Pensionable Earnings	\$ Amount	% of Pensionable Earnings
Total current service cost	\$ 61,199,016	15.30%	\$ 1,582,372	0.40%	\$ 62,781,388	15.70%
Less: Members' required contributions	<u>(29,371,798)</u>	<u>(7.34%)</u>	<u>-</u>	<u>-</u>	<u>(29,371,798)</u>	<u>(7.34%)</u>
University current service cost	\$ 31,827,218	7.96%	\$ 1,582,372	0.40%	\$ 33,409,590	8.36% ¹

¹ Total University contributions shown on following page

Contributions for 2016—Based on Filed Valuation

Member contributions:	\$ 29,371,798	7.34% of pensionable earnings
University contributions:	1.63 x \$ 29,371,798 = \$ 47,876,031	11.97% of pensionable earnings
	\$ 30,639,112	Allocated to pay University current service cost under RPP in 2016 (based on January 1, 2014 actuarial valuation—7.66% of pensionable earnings)
	14,985,678	Allocated to pay University special payments to amortize unfunded liability (based on January 1, 2014 actuarial valuation)
	<u>2,251,241</u>	Additional contributions allocated to fund the unfunded liability
	\$ 47,876,031	Total University contributions

- Assumes no contribution to Payroll Pension Plan

Contributions for 2016—Based on January 1, 2016 Valuation

Member contributions:	\$ 29,371,798	7.34% of pensionable earnings
University contributions:	1.63 x \$ 29,371,798 = \$ 47,876,031	11.97% of pensionable earnings
	\$ 31,827,218	Allocated to pay University current service cost under RPP in 2016 (7.96% of pensionable earnings)
	11,480,695	Allocated to pay University special payments to amortize unfunded liability of \$106,115,297 over remaining 13 years of amortization period
	<u>4,568,118</u>	Additional contributions allocated to fund the unfunded liability
	\$ 47,876,031	Total University contributions

- Assumes no contribution to Payroll Pension Plan

Solvency and Wind Up Valuations

- The solvency and wind up valuations are performed at January 1, 2016 using assumptions that are prescribed by legislation and actuarial standards
- The solvency ratio has declined since January 1, 2015 due to a decrease in nominal government bond yields and the adoption of a new mortality table, which was only partially offset by the asset gains during the year
- The transfer ratio increased slightly as yields on inflation linked bonds dropped and this was more than offset by asset gains during the year
- The solvency and wind up valuations are both performed assuming the plan were to wind up on the valuation date and all benefits are settled either through an annuity purchase or the payment of lump-sum (commuted) values to members
- The solvency valuation excludes the value of indexation from the liabilities; solvency deficit is subject to funding requirements
- The wind up valuation represents the estimated liability of all benefits to be settled; wind-up deficit is calculated for reporting purposes but is not required to be funded
- The wind up valuation is based on the premise that a market for fully-indexed annuities exists, which may not be practical for a pension plan of this size

Actuarial Assumptions For Solvency and Wind-Up Valuations

Assumptions	January 1, 2014 (Last Filed Valuation)	January 1, 2015	January 1, 2016
Retirement Ages	Age between 55 and 65 that produces highest value	No change	No change
Mortality Rates	1994 Uninsured Pensioner Mortality Table With Generational Mortality Improvements Under Scale AA	No change	CPM2014 Combined with Generational Improvements Under Scale CPM-B
Interest Rates— Solvency Valuation (Per Year)			
Active Members Age 55 and Over, Pensioners and Deferred Pensioners ¹	3.83%	2.54%	3.04% ^{3 4}
Active Members Under Age 55 ²	3.10% for 10 years; 4.60% thereafter	2.40% for 10 years; 3.70% thereafter	1.90% for 10 years; 3.60% thereafter
Interest Rates— Wind-Up Valuation (Per Year)			
Active Members Age 55 and Over, Pensioners and Deferred Pensioners ¹	0.15%	-0.58% (100% indexed) 0.20% (75% indexed)	-0.05% ^{3 4} (100% indexed) 0.72% ^{3 4} (75% indexed)
Active Members Under Age 55 ²	1.70% for 10 years; 2.30% thereafter	1.30% for 10 years; 1.60% thereafter (100% indexed) 1.60% for 10 years; 2.10% thereafter (75% indexed)	1.20% for 10 years; 1.70% thereafter (100% indexed) 1.40% for 10 years; 2.20% thereafter (75% indexed)

¹ Settled through annuity purchase

² Settled through commuted value

³ Based on guidance released by Canadian Institute of Actuaries for January 1, 2016 actuarial valuations

⁴ Under prior guidance in combination with UP1994, solvency rate would be 2.37% and wind up rate would be – 0.55% / 0.18%

Solvency and Wind Up Valuation Results as of January 1, 2016

	January 1, 2015		January 1, 2016	
	Solvency Valuation	Wind Up Valuation	Solvency Valuation	Wind Up Valuation
Market Value of Assets	\$ 1,316,509,737	\$ 1,316,509,737	\$ 1,402,178,988	\$ 1,402,178,988
Less: Wind up expenses	<u>(500,000)</u>	<u>(500,000)</u>	<u>(500,000)</u>	<u>(500,000)</u>
Solvency/wind up assets	\$ 1,316,009,737	\$ 1,316,009,737	\$ 1,401,678,988	\$ 1,401,678,988
Solvency/Wind Up Liabilities				
Active members	\$ 839,011,700	\$ 1,293,640,077	\$ 954,556,678	\$ 1,348,691,828
Disabled and suspended members	18,656,805	28,495,639	20,883,902	29,067,814
Pensioners and beneficiaries	620,592,040	845,931,438	672,727,068	844,785,390
Deferred vested members	40,654,070	80,505,465	39,842,193	65,271,033
Voluntary contribution balances	1,002,779	1,002,779	778,457	778,457
Member flex contribution balances	<u>1,395,950</u>	<u>1,395,950</u>	<u>1,210,788</u>	<u>1,210,788</u>
Total	\$ 1,521,313,344	\$ 2,250,971,348	\$ 1,689,999,086	\$ 2,289,805,310
Solvency Excess/(Deficiency)	\$ (205,303,607)	\$ (934,961,611)	\$ (288,320,098)	\$ (888,126,322)
Transfer ratio (market value of assets/wind up liabilities)	N/A	0.58	N/A	0.61
Solvency ratio (market value of assets/solvency liabilities)	0.87	N/A	0.83	N/A

Note:

Difference between Solvency and Wind Up Valuation is that Wind Up Valuation includes indexation under plan, whereas Solvency Valuation excludes the indexation.



Protocol Calculations

Protocol Calculations—Background

- The *Income Tax Act* (ITA) places a dollar limit cap on the benefits that may be paid to members from the RPP. This dollar limit is indexed each year by the increase in average industrial wage
- Both the RPP and PPP have annual indexed caps and maximum caps on the pension benefit payable from the Plans:
 - Caps essentially limit final average earnings that will be recognized under the defined benefit formula
- The current caps and maximum caps under the ITA, RPP and PPP are as follows:

	2016 Cap	Indexed Up To	Maximum Cap
ITA	\$ 2,890.00		None
RPP	\$ 2,890.00		\$ 3,200.00
PPP	\$ 3,309.00		\$ 3,400.00

- Pension caps help manage funding risk but at the same time Pension and Benefits Committee wanted to ensure that the defined benefit formula will apply to the full final average earnings of the majority of Plan members
- Cap Protocol requires the tracking of funding required to meet the defined benefit formula without maximum caps:
 - Ensures there are no “hidden liabilities” and as funding resources become available, increase in maximum caps will be one of the priorities

Translation of Flat Dollar Maximums Into Salary Levels

- The following shows how the flat dollar amounts translate into salary levels at which the maximums are reached if the caps are not projected beyond the current hard dollar caps:

Final Average Salary at Which ITA Maximum Pension (\$2,890.00) is Reached Under RPP in 2016:	\$159,800
Final Average Salary at Which \$3,200 Maximum Will Be Reached Under RPP (estimated):	\$175,300
Final Average Salary at Which UW Maximum Pension (\$3,309.00) is Reached Under PPP in 2016:	\$180,800
Final Average Salary at Which \$3,400 Maximum Will Be Reached Under PPP (estimated):	\$185,300
Salary at Which Maximum Member Contribution is Reached Under RPP in 2016:	\$214,700

Past Service Liabilities With Indexed Caps But Without \$3,200/\$3,400 Maximum Caps

- The chart below shows the increase in Accrued Liability at January 1, 2016 if the current caps are indexed in the future, without being subject to a maximum cap:

Provisions	As of January 1, 2016
Active, disabled and suspended accrued liability under RPP (current \$2,890.00 cap indexed annually subject to \$3,200.00 maximum cap)	\$ 803,038,730
Active accrued liability under PPP (current \$3,309.00 cap, indexed annually subject to \$3,400.00 maximum cap)	\$ 21,380,969
Increase in accrued liability under RPP (current \$2,890.00 cap indexed annually, no maximum cap)	\$ 51,109,174
Increase in accrued liability under PPP (current \$3,309.00 cap indexed annually, no maximum cap)	\$ 6,585,663

Current Service Cost With Indexed Caps But Without \$3,200/\$3,400 Maximum Caps

- The chart below shows the increase in University Current Service Cost at January 1, 2016 if the current caps are indexed in the future, without being subject to a maximum cap:

As of January 1, 2016

University current service cost (RPP + PPP) (current \$2,890.00/\$3,309.00 cap indexed annually, subject to \$3,200.00/\$3,400.00 maximum cap) As a % of pensionable earnings	\$ 33,409,590 8.36%
Increase in University current service cost (RPP + PPP) (\$2,890.00/\$3,309.00 cap indexed annually with no maximum cap) As a % of pensionable earnings	\$ 6,049,369 1.51%

Projection of Members With Benefits In Excess of Indexed Caps

- To assess the long-term impact of the caps on pension benefits, for active members in the January 1, 2016 actuarial valuation, pension benefits have been projected to retirement age under two scenarios (assumed retirement at age 65): Scenario A) with a fixed \$3,400.00 cap on the indexed caps, and Scenario B) with no fixed dollar caps on the indexed caps
- Following assumptions have been used for projections:
 - Increase in salaries of 4.00% per year
 - Indexation of caps at 2.75% per year
- As of December 31, 2015 there were 70 members impacted by the current cap of \$3,309.00 on the combined RPP and PPP:
 - University of Waterloo is one of the few universities with a plan (PPP) providing pension benefits in excess of the ITA maximum pension under the RPP

Projection of Members With Benefits in Excess of Indexed Caps (Subject to \$3,400 Maximum Cap)

Number of Members As of January 1, 2016

Pension Benefit With Cap as a % of Formula Benefit ¹	Number of Members As of January 1, 2016			Total
	Less Than Age 45	Ages 45 to 54	Ages 55 and Over	
Less than 50%	68	8	1	77
50% but less than 55%	91	9	0	100
55% but less than 60%	93	29	2	124
60% but less than 65%	101	50	5	156
65% but less than 70%	97	65	7	169
70% but less than 75%	86	63	20	169
75% but less than 80%	95	50	23	168
80% but less than 85%	79	42	37	158
85% but less than 90%	119	33	41	193
90% but less than 95%	79	23	45	147
95% but less than 100%	83	21	54	158
Total	991 (57%)	393 (30%)	235 (19%)	1,619 (38%)

Note:

Figures in parenthesis are percentage of total participants in the applicable category.

¹ Formula benefit is defined as the calculation of the pension applying the pension formula (based on final five-year average earnings) to all pensionable earnings without applying any caps; the projection of pension benefits is based on the salary increase assumption of 4.00% per year used in the actuarial valuation (2.00% per year for disabled members).

Projection of Members With Benefits in Excess of Indexed Caps (Without \$3,400 Maximum Cap)

Pension Benefit as a % of Formula Benefit ¹	Number of Members As of January 1, 2016			Total
	Less Than Age 45	Ages 45 to 54	Ages 55 and Over	
Less than 80%	3	15	13	31
80% but less than 85%	11	23	12	46
85% but less than 90%	21	25	27	73
90% but less than 95%	32	50	38	120
95% but less than 100%	37	47	53	137
Total	104 (6%)	160 (13%)	143 (12%)	407 (10%)

Note:

Figures in parenthesis are percentage of total participants in the applicable category.

¹ Formula benefit is defined as the calculation of the pension applying the pension formula (based on final five-year average earnings) to all pensionable earnings without applying any caps; the projection of pension benefits is based on the salary increase assumption of 4.00% per year used in the actuarial valuation (2.00% per year for members on disability).



Appendix

Definition of Terms

Accrued liability	The actuarial present value of the benefits earned by members in respect of their service prior to the valuation date. For active and disabled members, the accrued benefits reflect anticipated future salary increases. For pensioners, the accrued liability reflects the actuarial present value of future benefit payments.
Actuarial value of assets	Since neither book value nor market value is necessarily an ideal measure, other methods are often used to reduce volatility in year-to-year valuation results. The method for this valuation assumes the market value of assets less a reserve equal to the gain on the real return bond sale which will be recognized over time.
Funding excess/(unfunded liability)	Amount by which the actuarial value of assets exceeds/ (is less than) the accrued liability.
Funding reserve	The amount by which the market value of assets exceeds/ (is less than) the actuarial value of assets.
Members' pensionable earnings	The covered earnings (see definition under "Plan Provisions") for active and disabled members accruing service at the valuation date.

Definition of Terms (continued)

Current service cost	The actuarial present value of the benefits expected to be earned by active and disabled members in respect of service during the year following the valuation date. The required member contributions are subtracted from the total current service cost to derive the University current service cost. For funding purposes, the University current service cost is expressed as a percentage of the required member contributions. This amount is also shown as a percentage of members' pensionable earnings.
Solvency liability	The actuarial present value of benefits earned for service prior to the valuation date, determined as if the Pension Plan were terminated on the valuation date. The solvency liability excludes liabilities for future escalated adjustments (indexation).
Wind up liability	Equal to the solvency liability, but including liabilities for future escalated adjustments.
Transfer ratio	The ratio of market value of assets to the wind up liability.

Definition of Terms (continued)

Personnel Data

Active members

Members contributing to the Pension Plan as of the valuation date. Includes both full-time and part-time members and members on a paid or unpaid leave of absence who have elected to pay their required member contributions.

Disabled members

Members who are certified to be totally disabled by a medical doctor and in receipt of disability income under the University's long-term disability income plan. Such members continue to accrue benefits but do not make the required member contributions.

Pensioners and surviving beneficiaries

Members who have retired as of the valuation date, or surviving beneficiaries of such members, and are in receipt of a pension from the trust fund.

Deferred vested members

Members who have terminated employment as of the valuation date and who are entitled to a monthly pension commencing at normal retirement date.

Suspended members

Members who have previously joined the Plan but elected to cease making further contributions to the Plan until age 35.

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