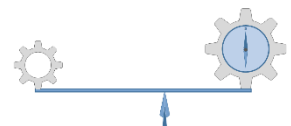


# Real-time Estimation Method for the Year's Maximum Pensionable Earnings (YMPE)

This Leading Indicator can Improve Payroll Budgeting and Canada Pension Plan (CPP) Calculations

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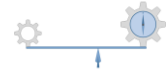
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The Year's Maximum Pensionable Earnings (YMPE) is an important figure that is used for determining contributions to the Canada Pension Plan (CPP), and for CPP retirement benefit calculations. YMPE is meant to represent the average national wage, and year-over-year changes in YMPE represent wage inflation.

We propose that a reasonable estimate for the Year's Maximum Pensionable Earnings (YMPE) can be made with a simple assumption, and that this Real-time YMPE Estimate can be made prior to the official release in November. Thus, Real-time YMPE Estimation is valuable for individuals who have an opportunity to make financial decisions earlier than November, and which take effect in January of the upcoming year. Two come to mind:

1. **Payroll budgeting** for the employer's portion of CPP contributions – a company expense
2. **CPP retirement pension amount calculations** – and the cost-benefit, trade-off calculations for when CPP should be started by retirees

Our companion papers examine applying Real-time YMPE Estimation for these cases.<sup>1,2</sup>

The purpose of this paper is to introduce Real-time YMPE Estimation. This paper describes the YMPE equation, and the data used when calculating YMPE. Then we present the results from a study that examines how well (accurate) Real-time YMPE Estimation has performed historically. It is our belief that Real-time YMPE Estimation can provide earlier and accurate estimates for the YMPE, and that using these YMPE estimates can be valuable.

## Calculation Methodology

The YMPE is defined in the CPP Act (Minster of Justice 2023a) and is expressed as an equation in The CPP & OAS Stats Book (Employment and Social Development Canada 2022). We repeat the YMPE equation from The CPP & OAS Stats Book as Equation 1.

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<sup>1</sup> Yee, J. "Improve Your Payroll Budgeting with Real-time Estimation for the Year's Maximum Pensionable Earnings (YMPE): Earlier and Accurate Estimates for Canada Pension Plan (CPP) Contributions." Saskatoon, Saskatchewan: FINEPOINT SOLUTIONS INC., 2023.

<sup>2</sup> Yee, J. "Improved Inflation Estimator can Help Avoid the Regret of not Getting Enough out of the Canada Pension Plan (CPP): Real-time Wage Inflation Estimation Improves Financial Planning Information for Lifetime Loss Calculations." Saskatoon, Saskatchewan: FINEPOINT SOLUTIONS INC., 2023.



## EQUATION 1:

$$YMPE_t = YMPE_{t-1}^* \times \frac{(Wage\ measure\ July_{t-2}\ to\ June_{t-1})/12}{(Wage\ measure\ July_{t-3}\ to\ June_{t-2})/12}$$

\*not rounded

We define Active Year as the most recent year where YMPE is known. The Active Year is denoted by the subscript “t-1” in Equation 1<sup>3</sup>. The Active Year is also the year when the “wage measure” data is most recent and is being released live by Statistics Canada. Equation 1 calculates YMPE for the upcoming year, year t.

Equation 1 states that YMPE for the upcoming year ( $YMPE_t$ ) is **calculated** by:

- **Multiplying** the (not rounded) known Active Year YMPE ( $YMPE_{t-1}$ ), by
  - The **ratio** calculated by dividing:
    - The **average** of the monthly wage measure for the 12-month period from July of the year preceding the Active Year ( $July_{t-2}$ ), to June of the Active Year ( $June_{t-1}$ ), by
    - The **average** of the monthly wage measure for the preceding 12-month period, from  $July_{t-3}$  to  $June_{t-2}$ .

Historically, YMPE is announced in November for the upcoming year.<sup>4</sup> The official value for YMPE is provided in even \$100-increments (Minster of Justice 2023a). The asterisk in Equation 1 which indicates “not rounded” is an important technical detail. The unrounded YMPE value will determine the timing – the year – when a new \$100-increment threshold has been crossed.<sup>5, 6</sup>

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<sup>3</sup> We have colour coded the subscripts in Equation 1 to indicate each respective calendar year: Green refers to the Active Year, black refers to the year following the Active Year, purple refers to the year prior to the Active Year and blue refers to two years prior to the Active Year. Year t (black), is also referred to as the upcoming year throughout this paper.

<sup>4</sup> Author’s review of recent press releases.

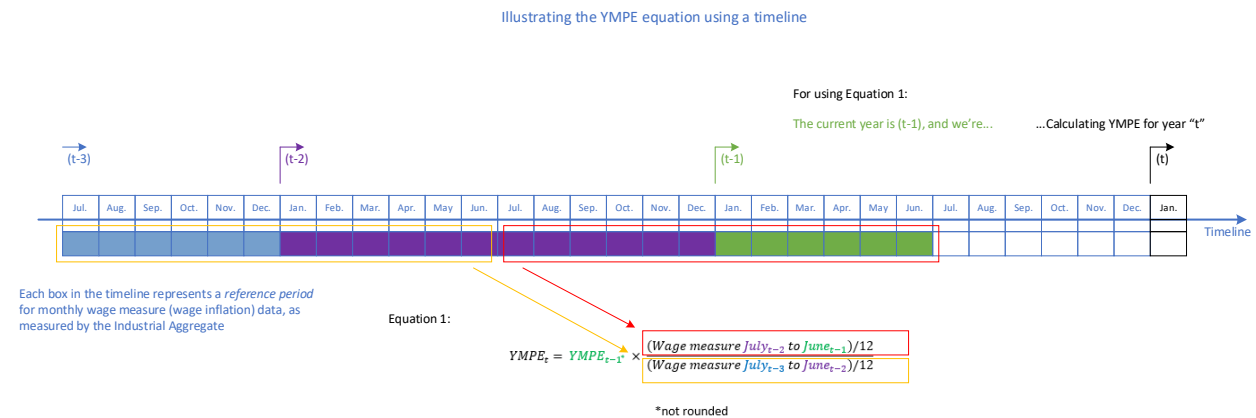
<sup>5</sup> YMPE estimates that do not use the appropriate unrounded value are uncertain because, even when all the other data for Equation 1 is known, such estimates may calculate a value for YMPE in the customary \$100-increments that differs from the official YMPE value.

<sup>6</sup> Unrounded YMPE figures obtained from Canada Revenue Agency. “Payroll Deductions Formulas – T4127.” Available at <https://www.canada.ca/en/revenue-agency/services/tax/businesses/topics/payroll/t4127-payroll-deductions-formulas-computer-programs.html>. Accessed 30 December 2022. *The author thanks Carlos da Roza for this reference.*



The source of data for the wage measure for a particular month (the reference period) is the average weekly earnings of the Industrial Aggregate in Canada. The Industrial Aggregate is published monthly by Statistics Canada (Statistics Canada 2023a, 2023c).

We illustrate the Equation 1 as a timeline in Figure 1.



**Figure 1.** The YMPE equation as a timeline for the source data.

Each box in the timeline represents the reference period for the monthly wage measure data. The red and orange boxes, in Figure 1, indicate which reference period months to use for each of the two respective 12-month averages in the ratio described above for Equation 1.<sup>7</sup>

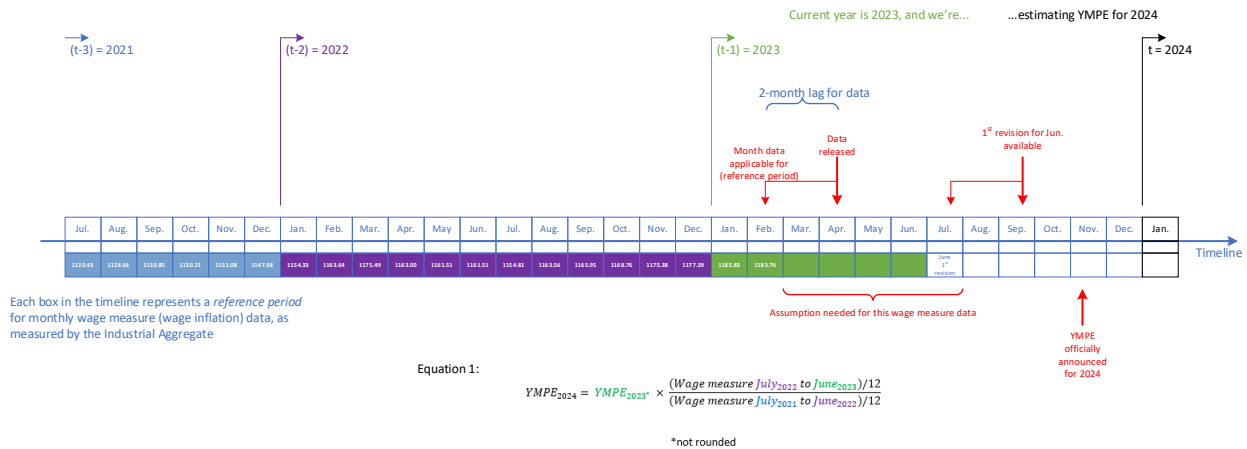
There is a two-month lag between a reference period and the time when that data becomes available to the public (the release date) (Statistics Canada 2023a). The time and manner of calculating YMPE can be found in the CPP Regulations, “The Year’s Maximum Pensionable Earnings for a year shall be calculated immediately following the date on which the first revision of the Industrial Aggregate in Canada for the month of June of the year preceding that year is published by Statistics Canada” (Minister of Justice 2023b). The first revision for June is the September release date. This is the earliest that YMPE for the upcoming year can be calculated with the final data that will be used.

In Figure 2, the timeline illustration is repeated and shows the example of adding wage measure data for February 2023, which was initially released in April 2023. At the time of writing, this is the most recent data.

<sup>7</sup> Red box reference period months are to be used in the top 12-month average for the ratio (the numerator); the orange box reference period months are to be used in the bottom 12-month average for the ratio (the denominator).



Illustrating the YMPE equation using a timeline – note the two month lag (release date) for when data is available for a specific month (reference date)  
 Example: Current year = 2023. Most recent wage measure data is for the February 2023 reference period, which was released in April 2023.



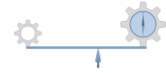
**Figure 2.** The YMPE equation as a timeline, showing the data required and indicating data availability.

Wage measure data for the remaining months in the YMPE calculation (for the March 2023 to July 2023 reference periods) are not yet available. Thus, if an estimate for the upcoming year’s YMPE will be made prior to the first revision for June’s wage measure data being available (in the September release date of the Active Year), an assumption must be made for all outstanding wage measure values in the Active Year.

We make the simple assumption that the wage measure value (Industrial Aggregate) will remain the same during the remaining months required for the calculation as it was provided on the last available reference date. We analyze this assumption in the historical study that follows.

## Historical Study

If you were to examine the currently available data for the Industrial Aggregate, you would find that the results of the YMPE calculation do not always match the historic progression of actual YMPE increases. For example, if you were to use Industrial Aggregate data from Table 14-10-0203-01 that was released in the fall of 2021 to calculate YMPE for 2019 using the YMPE equation, the result would not match the actual, historical YMPE (Statistics Canada 2023c). This is because statistical data is revised and adjusted on a regular basis. “Every time Statistics Canada revises data for a given time period, it replaces the existing data table information with the revised data. This ensures that users always have the most up-to-date statistics,” (Statistics Canada 2023b). This is just part of the process. However, it means that – for all but the current year – the values for the Industrial Aggregate are not the same values that were initially released for that particular month.



For our analysis, we need to know the Industrial Aggregate values for each year as they were released. Fortunately, Statistics Canada provides access, although limited, to historical data. A table or database that contains vintages of data is referred to as a real-time database. We use Table 14-10-0358-01, which is the real-time version of Table 14-10-0203-01, to construct a dataset for our study (Statistics Canada 2023c, 2023d).

We refer to this estimation method as Real-time YMPE Estimation because of the use of real-time data. We also refer to “real-time” as the live data as it is being released in the current year on a going-forward basis, thus, when making new YMPE estimates.

We use wage inflation projections from the triennial Actuarial Report on the CPP (in effect at the time of the respective Active Year), as a baseline for YMPE growth for our study.<sup>8</sup> Baseline YMPE growth is the expected value for the upcoming year’s YMPE in each respective Active Year. The baseline is used as a comparison value. A Real-time YMPE Estimate, or ultimate YMPE value, that differs significantly from the baseline is considered abnormal. For this study, we consider a difference of +/-1.5% from the baseline as abnormal.

The real-time dataset for the Industrial Aggregate was accessed to obtain data from the actual time of each release date of interest. Using the timeline format introduced in Figure 1, data was filtered and sorted to tabulate by release date for successive years. Table 1 shows the organized data. The grey shaded cells indicate the data is not yet available for that particular reference period. That is, the grey shaded cells apply our assumption – that the Industrial Aggregate will remain the same during the remaining months required for the calculation as it was provided on the last available reference period.

The Active Year is, as previously defined, the year when the Industrial Aggregate data release dates are considered live. We have a known YMPE in the Active Year, year (t-1) in Equation 1. We are estimating YMPE for the upcoming year, year (t). Table 2 shows results and comparisons to the specified baseline.

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<sup>8</sup> Consistent with the information available at the time, the 27<sup>th</sup> Actuarial Report on the CPP (released in September 2016) was used for baseline wage inflation for the years 2016 to 2018; we refer to this as CPP27. The 30<sup>th</sup> Actuarial Report on the CPP (released in September 2019) was used for the years 2019 to 2022. We refer to this as CPP30. The 31<sup>st</sup> Actuarial Report on the CPP (released in December 2022) was used from 2023 onward. We refer to this as CPP31.



**Table 1. Dataset organized in the timeline format.**

Release Date (Active Year = year of Release Date)	(t-3)							(t-2)												(t-1)						
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Mar-15	906.82	907.3	907.86	916.45	922.36	930.28	930.18	933.15	930.78	931.12	932.72	938.57	939.3	935.22	934.74	940.68	937.83	948.4	947.91	947.91	947.91	947.91	947.91	947.91	947.91	947.91
Apr-15	906.82	907.3	907.86	916.45	922.36	930.28	930.18	933.15	930.78	931.12	932.72	938.57	939.3	935.22	934.74	940.68	937.83	948.4	948.98	948.98	948.98	948.98	948.98	948.98	948.98	948.98
May-15	906.82	907.3	907.86	916.45	922.36	930.28	930.18	933.15	930.78	931.12	932.72	938.57	939.3	935.22	934.74	940.68	937.83	948.4	948.98	948.98	948.98	948.98	948.98	948.98	948.98	948.98
Jun-15	906.82	907.3	907.86	916.45	922.36	930.28	930.18	933.15	930.78	931.12	932.72	938.57	939.3	935.22	934.74	940.68	937.83	948.4	948.98	948.98	948.98	948.98	948.98	948.98	948.98	948.98
Jul-15	906.82	907.3	907.86	916.45	922.36	930.28	930.18	933.15	930.78	931.12	932.72	938.57	939.3	935.22	934.74	940.68	937.83	948.4	948.98	948.98	948.98	948.98	948.98	948.98	948.98	948.98
Aug-15	906.82	907.3	907.86	916.45	922.36	930.28	930.18	933.15	930.78	931.12	932.72	938.57	939.3	935.22	934.74	940.68	937.83	948.4	948.98	948.98	948.98	948.98	948.98	948.98	948.98	948.98
Sep-15	906.82	907.3	907.86	916.45	922.36	930.28	930.18	933.15	930.78	931.12	932.72	938.57	939.3	935.22	934.74	940.68	937.83	948.4	948.98	948.98	948.98	948.98	948.98	948.98	948.98	948.98
Mar-16	939.59	935.5	934.99	940.83	938.14	948.35	945.09	956.71	956.87	954.25	944.77	956.18	953.33	940.55	948.54	953.44	950.64	964.74	948.38	948.38	948.38	948.38	948.38	948.38	948.38	948.38
Apr-16	939.59	935.5	934.99	940.83	938.14	948.35	945.09	956.71	956.87	954.25	944.77	956.18	953.33	940.55	948.54	953.44	950.64	964.74	946.28	946.28	946.28	946.28	946.28	946.28	946.28	946.28
May-16	939.59	935.5	934.99	940.83	938.14	948.35	945.09	956.71	956.87	954.25	944.77	956.18	953.33	940.55	948.54	953.44	950.64	964.74	946.28	946.28	946.28	946.28	946.28	946.28	946.28	946.28
Jun-16	939.59	935.5	934.99	940.83	938.14	948.35	945.09	956.71	956.87	954.25	944.77	956.18	953.33	940.55	948.54	953.44	950.64	964.74	946.28	946.28	946.28	946.28	946.28	946.28	946.28	946.28
Jul-16	939.59	935.5	934.99	940.83	938.14	948.35	945.09	956.71	956.87	954.25	944.77	956.18	953.33	940.55	948.54	953.44	950.64	964.74	946.28	946.28	946.28	946.28	946.28	946.28	946.28	946.28
Aug-16	939.59	935.5	934.99	940.83	938.14	948.35	945.09	956.71	956.87	954.25	944.77	956.18	953.33	940.55	948.54	953.44	950.64	964.74	946.28	946.28	946.28	946.28	946.28	946.28	946.28	946.28
Sep-16	939.59	935.5	934.99	940.83	938.14	948.35	945.09	956.71	956.87	954.25	944.77	956.18	953.33	940.55	948.54	953.44	950.64	964.74	946.28	946.28	946.28	946.28	946.28	946.28	946.28	946.28
Mar-17	953.47	940.72	948.9	953.66	950.9	964.71	946.2	960.9	960.47	954.54	950.82	960.16	951.25	953.79	950.03	952.02	958.51	978.85	962.83	962.83	962.83	962.83	962.83	962.83	962.83	962.83
Apr-17	953.47	940.72	948.9	953.66	950.9	964.71	946.2	960.9	960.47	954.54	950.82	960.16	951.25	953.79	950.03	952.02	958.51	978.85	962.83	962.83	962.83	962.83	962.83	962.83	962.83	962.83
May-17	953.47	940.72	948.9	953.66	950.9	964.71	946.2	960.9	960.47	954.54	950.82	960.16	951.25	953.79	950.03	952.02	958.51	978.85	962.83	962.83	962.83	962.83	962.83	962.83	962.83	962.83
Jun-17	953.47	940.72	948.9	953.66	950.9	964.71	946.2	960.9	960.47	954.54	950.82	960.16	951.25	953.79	950.03	952.02	958.51	978.85	962.83	962.83	962.83	962.83	962.83	962.83	962.83	962.83
Jul-17	953.47	940.72	948.9	953.66	950.9	964.71	946.2	960.9	960.47	954.54	950.82	960.16	951.25	953.79	950.03	952.02	958.51	978.85	962.83	962.83	962.83	962.83	962.83	962.83	962.83	962.83
Aug-17	953.47	940.72	948.9	953.66	950.9	964.71	946.2	960.9	960.47	954.54	950.82	960.16	951.25	953.79	950.03	952.02	958.51	978.85	962.83	962.83	962.83	962.83	962.83	962.83	962.83	962.83
Sep-17	953.47	940.72	948.9	953.66	950.9	964.71	946.2	960.9	960.47	954.54	950.82	960.16	951.25	953.79	950.03	952.02	958.51	978.85	962.83	962.83	962.83	962.83	962.83	962.83	962.83	962.83
Mar-18	951.45	954.09	950.43	952.26	959.3	979.25	963.54	970.61	973.53	971.19	966.33	975.79	962.88	972.52	980.84	980.55	990.53	1003.82	994.62	994.62	994.62	994.62	994.62	994.62	994.62	994.62
Apr-18	951.45	954.09	950.43	952.26	959.3	979.25	963.54	970.61	973.53	971.19	966.33	975.79	962.88	972.52	980.84	980.55	990.53	1003.82	989.02	1004.42	1004.42	1004.42	1004.42	1004.42	1004.42	1004.42
May-18	951.45	954.09	950.43	952.26	959.3	979.25	963.54	970.61	973.53	971.19	966.33	975.79	962.88	972.52	980.84	980.55	990.53	1003.82	989.02	1004.85	1001.93	1001.93	1001.93	1001.93	1001.93	1001.93
Jun-18	951.45	954.09	950.43	952.26	959.3	979.25	963.54	970.61	973.53	971.19	966.33	975.79	962.88	972.52	980.84	980.55	990.53	1003.82	989.02	1004.85	996.06	996.06	996.06	996.06	996.06	996.06
Jul-18	951.45	954.09	950.43	952.26	959.3	979.25	963.54	970.61	973.53	971.19	966.33	975.79	962.88	972.52	980.84	980.55	990.53	1003.82	989.02	1004.85	1003.59	993.83	993.83	993.83	993.83	993.83
Aug-18	951.45	954.09	950.43	952.26	959.3	979.25	963.54	970.61	973.53	971.19	966.33	975.79	962.88	972.52	980.84	980.55	990.53	1003.82	989.02	1004.85	994.97	992.16	992.16	992.16	992.16	992.16
Sep-18	951.45	954.09	950.43	952.26	959.3	979.25	963.54	970.61	973.53	971.19	966.33	975.79	962.88	972.52	980.84	980.55	990.53	1003.82	989.02	1004.85	1003.59	994.97	992.16	992.16	992.16	992.16
Mar-19	962.58	972.18	980.49	980.21	990.23	1003.61	988.76	1004.64	1003.36	994.73	991.77	1004.86	990.97	1001.39	995.85	1004.28	1011.13	1021.33	1008.82	1008.82	1008.82	1008.82	1008.82	1008.82	1008.82	1008.82
Apr-19	962.58	972.18	980.49	980.21	990.23	1003.61	988.76	1004.64	1003.36	994.73	991.77	1004.86	990.97	1001.39	995.85	1004.28	1011.13	1021.33	1008.24	1014.42	1014.42	1014.42	1014.42	1014.42	1014.42	1014.42
May-19	962.58	972.18	980.49	980.21	990.23	1003.61	988.76	1004.64	1003.36	994.73	991.77	1004.86	990.97	1001.39	995.85	1004.28	1011.13	1021.33	1008.24	1015.16	1025.44	1025.44	1025.44	1025.44	1025.44	1025.44
Jun-19	962.58	972.18	980.49	980.21	990.23	1003.61	988.76	1004.64	1003.36	994.73	991.77	1004.86	990.97	1001.39	995.85	1004.28	1011.13	1021.33	1008.24	1015.16	1022.8	1023.19	1023.19	1023.19	1023.19	1023.19
Jul-19	962.58	972.18	980.49	980.21	990.23	1003.61	988.76	1004.64	1003.36	994.73	991.77	1004.86	990.97	1001.39	995.85	1004.28	1011.13	1021.33	1008.24	1015.16	1022.8	1017.83	1028.33	1028.33	1028.33	1028.33
Aug-19	962.58	972.18	980.49	980.21	990.23	1003.61	988.76	1004.64	1003.36	994.73	991.77	1004.86	990.97	1001.39	995.85	1004.28	1011.13	1021.33	1008.24	1015.16	1022.8	1017.83	1028.33	1028.33	1028.33	1028.33
Sep-19	962.58	972.18	980.49	980.21	990.23	1003.61	988.76	1004.64	1003.36	994.73	991.77	1004.86	990.97	1001.39	995.85	1004.28	1011.13	1021.33	1008.24	1015.16	1022.8	1017.83	1028.33	1028.33	1028.33	1028.33
Mar-20	991.09	1001.53	996.02	1004.29	1011.13	1021.37	1008.07	1015.1	1022.75	1017.78	1028.73	1024.76	1018.6	1027.84	1034.23											





**Table 2. Real-time YMPE Estimation results for our historical study.**

Release Date (Active Year = year of Release Date)	Data Availability		Estimating next year's YMPE			Actual YMPE	Difference with Actual		Wage Inflation	
	# Months out of 12, Data avail.	% Data avail. For trailing year	Year estimating YMPE for (t):	Estimated YMPE (t) on Release Date (unrounded)	Estimated YMPE (t) (rounded)		Estimate %- Diff. w Actual	Diff. w Actual in Increments of YMPE	Wage Inflation %-increase in YMPE (yoy)	Selected Baseline
	26	27	28	29	30	31	32	33	34	35
			Starting YMPE (t-1)* = \$53,604.63							
Mar-15	7	58%	2016	\$54,783.93	\$54,700		-0.4%	-2	2.1%	
Apr-15	8	67%	2016	\$55,051.96	\$55,000		0.2%	1	2.6%	
May-15	9	75%	2016	\$54,998.35	\$54,900		0.0%	0	2.4%	
Jun-15	10	83%	2016	\$54,944.75	\$54,900		0.0%	0	2.4%	
Jul-15	11	92%	2016	\$54,891.14	\$54,800		-0.2%	-1	2.2%	
Aug-15	12	100%	2016	\$54,944.75	\$54,900		0.0%	0	2.4%	
Sep-15	12	100%	2016	\$54,944.75	\$54,900	\$54,900	0.0%	0	2.4%	
Mar-16	7	58%	2017	\$55,164.53	\$55,100		-0.4%	-2	0.4%	
Apr-16	8	67%	2017	\$55,439.25	\$55,400		0.2%	1	0.9%	
May-16	9	75%	2017	\$55,494.20	\$55,400		0.2%	1	0.9%	
Jun-16	10	83%	2017	\$55,439.25	\$55,400		0.2%	1	0.9%	
Jul-16	11	92%	2017	\$55,384.31	\$55,300		0.0%	0	0.7%	
Aug-16	12	100%	2017	\$55,384.31	\$55,300		0.0%	0	0.7%	
Sep-16	12	100%	2017	\$55,384.31	\$55,300	\$55,300	0.0%	0	0.7%	1.1%
Mar-17	7	58%	2018	\$55,772.00	\$55,700		-0.4%	-2	0.7%	
Apr-17	8	67%	2018	\$56,048.92	\$56,000		0.2%	1	1.3%	
May-17	9	75%	2018	\$55,993.54	\$55,900		0.0%	0	1.1%	
Jun-17	10	83%	2018	\$55,993.54	\$55,900		0.0%	0	1.1%	
Jul-17	11	92%	2018	\$55,938.15	\$55,900		0.0%	0	1.1%	
Aug-17	12	100%	2018	\$55,938.15	\$55,900		0.0%	0	1.1%	
Sep-17	12	100%	2018	\$55,938.15	\$55,900	\$55,900	0.0%	0	1.1%	2.6%
Mar-18	7	58%	2019	\$57,336.60	\$57,300		-0.2%	-1	2.5%	
Apr-18	8	67%	2019	\$57,560.36	\$57,500		0.2%	1	2.9%	
May-18	9	75%	2019	\$57,504.42	\$57,500		0.2%	1	2.9%	
Jun-18	10	83%	2019	\$57,448.48	\$57,400		0.0%	0	2.7%	
Jul-18	11	92%	2019	\$57,392.54	\$57,300		-0.2%	-1	2.5%	
Aug-18	12	100%	2019	\$57,448.48	\$57,400		0.0%	0	2.7%	
Sep-18	12	100%	2019	\$57,448.48	\$57,400	\$57,400	0.0%	0	2.7%	2.7%
Mar-19	7	58%	2020	\$58,425.10	\$58,400		-0.5%	-3	1.7%	
Apr-19	8	67%	2020	\$58,540.00	\$58,500		-0.3%	-2	1.9%	
May-19	9	75%	2020	\$58,769.80	\$58,700		0.0%	0	2.3%	
Jun-19	10	83%	2020	\$58,712.35	\$58,700		0.0%	0	2.3%	
Jul-19	11	92%	2020	\$58,769.80	\$58,700		0.0%	0	2.3%	
Aug-19	12	100%	2020	\$58,769.80	\$58,700		0.0%	0	2.3%	
Sep-19	12	100%	2020	\$58,712.35	\$58,700	\$58,700	0.0%	0	2.3%	2.3%
Mar-20	7	58%	2021	\$60,532.43	\$60,500		-1.8%	-11	3.1%	
Apr-20	8	67%	2021	\$60,591.15	\$60,500		-1.8%	-11	3.1%	
May-20	9	75%	2021	\$60,767.28	\$60,700		-1.5%	-9	3.4%	
Jun-20	10	83%	2021	\$61,413.12	\$61,400		-0.3%	-2	4.6%	
Jul-20	11	92%	2021	\$61,706.68	\$61,700		0.2%	1	5.1%	
Aug-20	12	100%	2021	\$61,647.97	\$61,600		0.0%	0	4.9%	
Sep-20	12	100%	2021	\$61,647.97	\$61,600	\$61,600	0.0%	0	4.9%	2.5%
Mar-21	7	58%	2022	\$65,100.26	\$65,100		0.3%	2	5.7%	
Apr-21	8	67%	2022	\$65,408.50	\$65,400		0.8%	5	6.2%	
May-21	9	75%	2022	\$65,100.26	\$65,100		0.3%	2	5.7%	
Jun-21	10	83%	2022	\$64,976.96	\$64,900		0.0%	0	5.4%	
Jul-21	11	92%	2022	\$65,038.61	\$65,000		0.2%	1	5.5%	
Aug-21	12	100%	2022	\$65,038.61	\$65,000		0.2%	1	5.5%	
Sep-21	12	100%	2022	\$64,976.96	\$64,900	\$64,900	0.0%	0	5.4%	2.6%
Mar-22	7	58%	2023	\$66,471.43	\$66,400		-0.3%	-2	2.3%	
Apr-22	8	67%	2023	\$66,666.36	\$66,600		0.0%	0	2.6%	
May-22	9	75%	2023	\$66,796.31	\$66,700		0.2%	1	2.8%	
Jun-22	10	83%	2023	\$66,731.34	\$66,700		0.2%	1	2.8%	
Jul-22	11	92%	2023	\$66,601.38	\$66,600		0.0%	0	2.6%	
Aug-22	12	100%	2023	\$66,601.38	\$66,600		0.0%	0	2.6%	
Sep-22	12	100%	2023	\$66,601.38	\$66,600	\$66,600	0.0%	0	2.6%	2.7%
Mar-23	7	58%	2024	\$68,399.62	\$68,300				2.6%	
Apr-23	8	67%	2024	\$68,266.41	\$68,200				2.4%	
May-23	9	75%	2024							
Jun-23	10	83%	2024							
Jul-23	11	92%	2024							
Aug-23	12	100%	2024							
Sep-23	12	100%	2024						?	2.9%

← Abnormally high compared to baseline.

← Abnormally high compared to baseline.

Source: Table 14-10-0358 (real-time table for 14-10-0203-01), Table 14-10-0203-01 (formerly CANSIM 281-0026), 27th, 30th & 31st Actuarial Report on the CPP, and author's calculations.  
 \* Unrounded YMPE obtained from Canada Revenue Agency: "Payroll Deductions Formulas - T4127 (various years).



We considered only seven release dates for each Active Year, with March established as the earliest month for testing Real-time YMPE Estimation accuracy. The March release date means that 7 out of 12 months of data for the trailing year are available for the YMPE estimate.<sup>9</sup> September is the last release date considered because it provides the first revision for the June reference period, and as noted above, this ends the official data for the YMPE calculation for a given year.

The real-time dataset only provides data going back to 2015 in the format required for our study. This means we have eight years of data (2015 to 2022) that we can examine ex post and for which we have the final, official YMPE. We analyze each of these years as if it were the Active Year.

For each release date under consideration, we estimate YMPE for the upcoming year. There are a total of 56 observations. Where referenced, we also show the available data for the current year (2023). The resulting Real-time YMPE Estimates are compared to YMPE growth projections for our specified baseline.

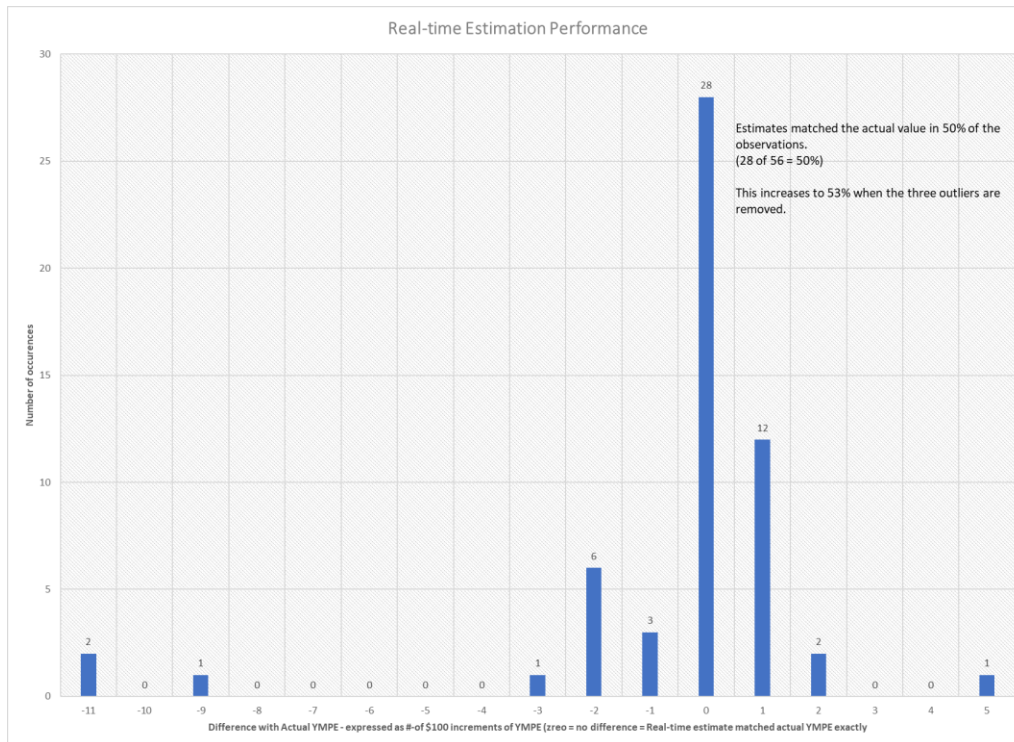
Noting that YMPE changes occur in round \$100-increments, we also convert the difference between the estimates and the actual YMPE to a \$100-increment basis to simplify the analysis. A zero difference in \$100-increments means the Real-time YMPE Estimate matched the ultimate value for YMPE exactly. A negative value means our estimate was an underestimate; a positive number means it was an overestimate.

As expected, Table 2 shows that each estimate using data from the September release date matches the actual historic progression of YMPE increases.

The chart in Figure 3 shows that half the Real-time YMPE Estimates (28 of 56 = 50%) matched the ultimate value for YMPE. Estimates within one \$100-increment of the ultimate value occurred 76% of the time.

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<sup>9</sup> This means that only 58% of the trailing year data is available, and we simply believed that any less would not be reasonable. In Table 2, data availability is shown in columns 26 and 27 for, respectfully, number of months and percent.



**Figure 3.** Real-time Estimation Performance as a Histogram.

The outliers, with a staggering underestimation of wage inflation (and therefore YMPE), for the 2020 Active Year occurred during the March through May 2020 release dates, which reflect the January through March 2020 reference periods. This was arguably the height of uncertainty during the Covid-19 pandemic. When these three outliers are removed, over half (28 of 53 = 53%) of the Real-time YMPE Estimates matched the ultimate value for YMPE, and occurrences of estimates within one \$100-increment jumped to 82%.

It is worth mentioning the abnormally high wage inflation estimated for 2020 and 2021 compared to our selected baseline (Table 2). In these years, estimates using the Real-time YMPE Estimation method that we propose in this paper are notably higher than the baseline. This presents an opportunity for individuals who make financial decisions where YMPE is an input for their calculations. Two come to mind:

1. **Payroll budgeting** for the employer’s portion of CPP contributions – a company expense
2. **CPP retirement pension amount calculations** – and the cost-benefit, trade-off calculations for when CPP should be started by retirees

For some applications, we consider one \$100-increment from zero to be a reasonable range to determine that a Real-time YMPE Estimate was successful. Under this condition successful Real-time YMPE Estimates occurred 76% of the time or 82% of the time with the outliers removed.



We counted the number of Real-time YMPE Estimation matches by release-month. For example, how many March release date estimates matched the ultimate value for YMPE perfectly? This information is organized in Table 3 (Panel A), which shows that Real-time YMPE Estimation began to match perfectly in April release-months (meaning with February reference date data). However, prior to 2022, there were no exact Real-time YMPE Estimation matches with the ultimate YMPE value, before the May release month.<sup>10</sup>

**Table 3.** How often Real-time YMPE Estimates matched by release-month.

Release Month	Exact matches by Release Month		Release Month	Matched within one \$100 increment of YMPE	
	#	%		#	%
March	0	0%	March	1	13%
April	1	13%	April	5	63%
May	3	38%	May	6	75%
June	5	63%	June	7	88%
July	4	50%	July	8	100%
August	7	88%	August	8	100%
September	8	100%	September	8	100%

(A)

(B)

Source: Author's calculations.

We also counted the matches that were within one \$100-increment of the ultimate YMPE value. This information is provided in Table 3 (Panel B). Real-time YMPE Estimates made in April matched within one \$100-increment for 63% of the years in our study; Real-time YMPE Estimates in May matched within one \$100-increment for 75% of the years.

At the time of writing, the most recent data available is from the April 2023 release date (Statistics Canada 2023c). Using the April 2023 release date data, the estimate for wage inflation as measured by the Industrial Aggregate is 2.4%. For comparison, our baseline projects YMPE growth for 2023 at 2.9% (Office of the Chief Actuary 2022). Recent YMPE growth is summarized with the YMPE projections from our selected baseline in Table 4.

<sup>10</sup> Recall from column 26 in Table 3 that the April release contains 67% of the data available for the trailing year in the YMPE equation; the May release month contains 75% of available trailing year data.



**Table 4.** Recent YMPE growth compared to our selected baseline.

Active Year	Actual YMPE Growth (yoy)	Baseline YMPE Growth (yoy)
2019	2.3%	2.3%
2020	4.9%	2.5%
2021	5.4%	2.6%
2022	2.6%	2.7%
2023	?	2.9%

← Abnormally high compared to baseline.

← Abnormally high compared to baseline.



Current estimate with data available on the April 2023 release date is 2.4%

Source: CPP30, CPP31, and author's calculations.

In our judgement, Real-time YMPE Estimation using data from – as early as – the May release date can be used for financial calculations and decisions.

However, Individuals who require more certainty are advised to determine their own timeframe for when to apply Real-time YMPE Estimation, according to their own specific circumstances, using Table 3 as a guideline.

You can find our most recent Real-time YMPE Estimate at the following website:<sup>11</sup>

[ympe.ca](http://ympe.ca)

<sup>11</sup> Real-time YMPE Estimates are provided beginning in May for an upcoming year's YMPE.



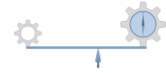
## Conclusion

In our judgement, this method results in sufficient occurrences of successful YMPE estimates to justify using Real-time YMPE Estimation for each upcoming year. However, we caution that the May release date should be the earliest used for making Real-time YMPE Estimates for an upcoming year.

Real-time YMPE Estimation can detect an abnormally high level of wage inflation for a current Active Year. Use of Real-time YMPE Estimates for the YMPE assumption in financial calculations will thus provide results that may be significantly different than when a more customary, and perhaps stale, YMPE assumption is used.

Real-time YMPE Estimation can also detect an abnormally low level of wage inflation for the current Active Year. This is also useful information. Whether the Real-time YMPE Estimate is abnormally high, or abnormally low, it is important that the estimate be as accurate as possible if it will be used for financial calculations.

Real-time YMPE Estimation provides wage inflation information five months before the official release of the upcoming year's YMPE and over six months before the wage inflation adjustment takes effect. This knowledge provides more flexibility and control by offering more time to make decisions; you don't need to wait for the official release to know, with reasonable accuracy, what next year's YMPE will be.



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## Canada Pension Plan Reference Symbols








Prior to 1 January 2019, the CPP consisted of only the **base CPP**. Recent changes have added what is referred to as the additional CPP (sometimes called enhanced CPP). The additional CPP is further subdivided into:

- the **first additional CPP**, and
- the **second additional CPP**.

The first additional CPP, and the second additional CPP, each have their own respective rules, calculations, effective dates and phase-in periods.

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	Content, or parts of content, with this symbol applies to: <ul style="list-style-type: none"> <li>• the base CPP, <i>and</i></li> <li>• the first additional CPP, <i>and</i></li> <li>• the second additional CPP.</li> </ul>





## About the Author



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Jason Yee is the principal investment analyst and financial planner at FINEPOINT SOLUTIONS INC., an advice-only, fee-for-service financial planning provider.

Jason is a thorough collaborator who offers a diverse mix of multi-disciplinary knowledge when getting things done. His personal mission is to deliver thorough work that is actionable and has impact.

After completing the CFA Program, the focus of Jason's work became investment analysis and financial planning for individuals.

Prior to this role, Jason had a 16-year career as a Professional Engineer, where he held a number of technical and leadership roles managing operations at a variety of industrial facilities.