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**VIA EMAIL ONLY**

January 31, 2019

Mr. Timothy Allen  
Retirement System Director and Chief Investment Officer  
Tacoma Employees' Retirement System  
3628 South 35th Street  
Tacoma , WA 98409

Re: July 2019 Cost-of-Living Adjustments

Dear Tim:

We have calculated the COLAs to be applied to member benefits in July 2019. The COLAs are summarized as follows.

<u>Date of Retirement</u>	<u>COLA</u>	<u>Percent of Original Purchasing Power*</u>
On or before July 1, 2018	2.125%	50.7% - 98.8%
After July 1, 2018	No COLA	100.0%

\* Loss of purchasing power is not measured until a full year has passed since retirement.

### Summary of CPI increases

The Seattle-Tacoma-Bremerton CPI-W experienced a 3.36% increase from 767.741 in 2017 to 793.554 in 2018. Therefore, all members who retired on or before July 1, 2018 are eligible for the full 2.125% COLA, based on TMC Section 1.30.665. Per Section 1.30.665A the CPI-W increase is rounded to the nearest 0.05 of one percent but not more than 2.125%. Two exhibits detailing the development of the COLA factors are enclosed with this letter.

Members with retirement dates on or before July 1, 1978 were included in the 50% restoration for 2009 and will have their benefits increased by 2.125%. Their resulting purchasing power will be slightly over 50% of their original purchasing power after the increase in July 2019.

### Calculations

The calculations were performed consistently with the interpretation of TMC Section 1.30.665 used in prior years. This letter provides the COLAs and describes their calculation. The letter is sent early to give the Board time to review the COLAs. In June or July, the System will calculate the increase in each member's retirement benefit using the appropriate COLA factor based on the date of the original member's retirement. We will be available to review those calculations and to answer any questions the System may have at that time.

This work product was prepared solely for Tacoma Employees' Retirement System for the purposes described herein and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

The COLAs are based on the Seattle-Tacoma-Bremerton Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W), as specified in the law. This letter covers a great amount of detail. Most of this detail is a restatement of explanations provided in past years. The description provides a thorough documentation of the COLA process.

### Examples

Example 1: member retired in June 2003. This member will be receiving his or her sixteenth COLA. The CPI increases have been 1.42%, 1.57%, 3.02%, 3.73%, 3.79%, 4.48%, 0.44%, 0.78%, 3.17%, 2.54%, 1.22%, 1.93%, 0.91%, 2.28%, 3.32%, and 3.36% respectively. The member has received COLAs of 1.400% in 2004, 1.600% in 2005 and 2.125% for each year from 2006 through 2018. The member will receive a 2.125% COLA in 2019.

Total COLA and CPI increases including 2019:

$$\begin{aligned} \text{CPI increases} &= 1.0142 \times 1.0157 \times 1.0302 \times 1.0373 \times 1.0379 \times 1.0448 \times 1.0044 \times 1.0078 \\ &\quad \times 1.0317 \times 1.0254 \times 1.0122 \times 1.0193 \times 1.0091 \times 1.0228 \times 1.0332 \times 1.0336 \\ &= 1.45379 \text{ (Column 5 of Exhibit 1)} \\ &= 793.554/545.850 \end{aligned}$$

$$\text{COLA increases} = 1.01400 \times 1.01600 \times 1.02125^{14} = 1.3829$$

Since the cumulative COLA increases including the 2.125% COLA in 2019 are less than the cumulative CPI increases, the member gets the entire 2.125% COLA.

Example 2: member retired in June 2018. This member will be receiving his or her first COLA. The CPI increase was 3.36%. Since the code states the COLA is the minimum of 2.125% and the CPI rounded to the nearest 0.05%, the member will receive a 2.125% COLA.

Example 3: member retired in June 2010.

$$\text{CPI increases} = 1.0078 \times 1.0317 \times 1.0254 \times 1.0122 \times 1.0193 \times 1.0091 \times 1.0228 \times 1.0332 \times 1.0336 = 1.21251 \text{ (Column 5 of Exhibit 1)}$$

$$\begin{aligned} \text{COLA increases} &= 1.15784 \text{ prior to 2019 adjustment (Column 8 of Exhibit 1). Including a} \\ &\quad 2.125\% \text{ increase for 2019 would result in a total of } 1.18244 = 1.15784 \times \\ &\quad 1.02125. \end{aligned}$$

Because the cumulative COLA increases including the 2.125% COLA in 2019 are less than the cumulative CPI increases (1.21251), the member will receive the entire 2.125% COLA.

### **Overview of COLAs**

Annual COLAs for TERS are granted in July to all members who retired on or before July 1 of the preceding year. The COLAs are based on the Seattle-Tacoma-Bellevue Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W) for the two years preceding the year in which the COLA is granted. Therefore, a member retiring in June of 2018 will receive the first COLA in July of 2019, and it will be based on the increase in CPI-W from 2017 to 2018. A member retiring in August of 2018 will receive the first COLA in July of 2020, and it will be based on the increase in CPI-W from 2018 to 2019.

The generalizations are:

- All COLAs are based on increases in the CPI for the period ending in the year preceding the COLA.
- The first COLA for members who retired on or before July 1 is based on increases in the CPI from the calendar year prior to retirement to the calendar year of retirement.
- The first COLA for members who retired after July 1 is based on increases in the CPI from the calendar year of retirement to the calendar year after retirement.

### **Calculation of Factors**

The enclosed Exhibit 1 “Factors Applied in Calculating the 2019 COLA Increases” uses 17 columns to calculate the COLA factors. Consistent with the previous discussion, the factors will be different for members who retired in the first or second half of the calendar year. A complete description of the columns follows:

1. The first three columns show the Seattle-Tacoma-Bellevue CPI-W. The average value given in Column 3 is the beginning point for the calculation.
2. Column 4 documents the annual increase in the CPI.
3. Columns 5 and 6 document the cumulative increase in the CPI to be used in calculating the 50% restoration benefits and maximum accumulated COLA. As an example, if a member retired in March of 1980, the member’s 2019 restoration COLA and maximum accumulated COLA would be based on increases in the CPI from 1979 (214.600) to 2018 (793.554). The corresponding factor is  $793.554 / 214.600 = 3.6978$ . This number is shown in Column 5.
4. Column 7 documents the general TERS COLA given in each year. Some retirees have received less than this amount, as benefits are limited to 100% of original purchasing power.

5. Columns 8 and 9 document the cumulative annual COLAs granted prior to the 2019 COLA. They ignore the effect of any restorations of purchasing power. As an example, members retiring in March of 1980 received the first COLA in July of 1981, and as of June 2019 have received sixteen 1.75% COLAs (1981 – 1996), four 2.00% COLAs (1997-2000), and eighteen 2.125% COLAs (2001-2018) for a cumulative increase of  $1.0175^{16} \times 1.02^4 \times 1.02125^{18} = 2.08607$ . This number is shown in Column 8. In 2003 to 2005, in 2010 to 2011, and in 2014 to 2016, some recent retirees were not eligible for the full 2.125% COLA due to inflation less than 2.125%. Exhibit 2 documents how these COLAs less than 2.125% combined to provide the cumulative COLAs shown in Columns 8 and 9.
6. Columns 10 and 11 document the maximum accumulated COLA which represents the magnitude of accumulated CPI-W increases over the cumulative TERS COLA increases. The maximum accumulated COLA would restore the member to 100% of original purchasing power. Note that these are rounded to the nearest 0.05%. This is used to determine whether or not the full 2.125% increase can be granted under Section 1.30.665C.
7. Columns 12 and 13 document the percent of original purchasing power which members have before the July 1, 2019 COLA based on the CPI measures used to calculate the 2019 COLA. As an example, if a member retired in March of 1980, the cumulative increase in the CPI (Column 5) has been 3.69783, while the member's cumulative COLA increases (Column 8) have been 2.08607. The combined effect is that the member's benefit now provides  $2.08607 / 3.69783 = 56.413\%$  of its original purchasing power. This number is shown in Column 12.

Prior restorations are included in these calculations. Members who were included in the prior 50% restoration are currently receiving 49.610% of their original purchasing power as seen in the bottom of Columns 12 and 13.

8. Columns 14 and 15 show the COLA factor to be applied to the portion of the current retirement benefit that is subject to escalation. Members retiring on or before July 1, 2018 will receive the 2.125% COLA.
9. Columns 16 and 17 show the Percent of Original Purchasing Power after the July 2019 COLA increases. All members have at least 50% of their original purchasing power. In some years, some members may be slightly above or below the 100% mark since the COLAs are rounded to the nearest 0.05%.

**Caveats and Certification**

Milliman's work product was prepared exclusively for the use or benefit of the Tacoma Employees' Retirement System for a specific and limited purpose. It is not for the use or benefit of any third party for any purpose. Any third party recipient of Milliman's work product who desires professional guidance should not rely upon Milliman's work product, but should engage qualified professionals for advice appropriate to its own specific needs. Any distribution of this letter must be in its entirety, unless prior written consent from Milliman is obtained.

The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuary is independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, I hereby certify that, to the best of my knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. I am a member of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

If you have any questions, feel free to contact me.

Sincerely,



Daniel R. Wade, FSA, EA, MAAA  
Consulting Actuary

DRW/sab

Enclosures

cc: Ms. Cathy Marx (w/ Enclosures)  
Mr. Mark Olleman (w/ Enclosures)

### Tacoma Employees' Retirement System Factors Applied in Calculating the 2019 COLA Increases

Ret Year	(1)		(2)	(3)	(4)	(5)		(6)	(7)	(8)	(9)		(10)	(11)	(12)		(13)	(14)		(15)	(16)		(17)		
	AVERAGE CPI-W			Annual CPI Increase	(Cumulative Increase in CPI at 2019 based on year w/ prior 6/30) CPI(2018)/CPI(T)				Tacoma COLA given on 7/1 of Year *	Cumulative Tacoma COLA @ 6/30/2019 *				Maximum Accumulated COLA **		Percent of Original Purchasing Power @ 6/30/2019 **		Total COLA Factor at 7/2019 with 50% Minimum ROPP		Percent of Original Purchasing Power @ 7/1/2019 **					
	URBAN WAGE, CLERICAL SEATTLE				DOR	DOR	DOR	DOR		DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR
	(All Items 1967 = 100)																								
1st Half	2nd Half	Avg																							
2019					1.00000	N/A	2.125%	1.00000	N/A	1.0000	N/A	100.000%	N/A	1.00000	N/A	1.00000	N/A	100.000%	N/A						
2018			793.554	3.36%	1.03362	1.00000	2.125%	1.00000	1.00000	1.00000	1.00000	96.747%	100.000%	1.02125	1.00000	98.803%	100.000%	1.02125	1.00000						
2017			767.741	3.32%	1.06797	1.03362	2.125%	1.02125	1.00000	1.0455	1.0335	95.626%	96.747%	1.02125	1.02125	97.658%	98.803%	1.02125	1.02125						
2016			743.051	2.28%	1.09234	1.06797	2.125%	1.04295	1.02125	1.0475	1.0455	95.478%	95.626%	1.02125	1.02125	97.507%	97.658%	1.02125	1.02125						
2015			726.470	0.91%	1.10225	1.09234	2.125%	1.05234	1.04295	1.0475	1.0475	95.472%	95.478%	1.02125	1.02125	97.501%	97.507%	1.02125	1.02125						
2014			719.942	1.93%	1.12355	1.10225	2.125%	1.07286	1.05234	1.0470	1.0475	95.488%	95.472%	1.02125	1.02125	97.517%	97.501%	1.02125	1.02125						
2013			706.291	1.22%	1.13725	1.12355	2.125%	1.08573	1.07286	1.0475	1.0470	95.470%	95.488%	1.02125	1.02125	97.499%	97.517%	1.02125	1.02125						
2012			697.784	2.54%	1.16613	1.13725	2.125%	1.11319	1.08573	1.0475	1.0475	95.460%	95.470%	1.02125	1.02125	97.489%	97.499%	1.02125	1.02125						
2011			680.504	3.17%	1.20310	1.16613	2.125%	1.14865	1.11319	1.0475	1.0475	95.474%	95.460%	1.02125	1.02125	97.503%	97.489%	1.02125	1.02125						
2010			659.589	0.78%	1.21251	1.20310	2.125%	1.15784	1.14865	1.0470	1.0475	95.491%	95.474%	1.02125	1.02125	97.520%	97.503%	1.02125	1.02125						
2009			654.472	0.44%	1.21784	1.21251	2.125%	1.16305	1.15784	1.0470	1.0470	95.501%	95.491%	1.02125	1.02125	97.520%	97.520%	1.02125	1.02125						
2008			651.608	4.48%	1.27243	1.21784	2.125%	1.21476	1.16305	1.0475	1.0470	95.467%	95.501%	1.02125	1.02125	97.496%	97.530%	1.02125	1.02125						
2007			623.650	3.79%	1.32061	1.27243	2.125%	1.26024	1.21476	1.0480	1.0475	95.429%	95.467%	1.02125	1.02125	97.456%	97.496%	1.02125	1.02125						
2006			600.900	3.73%	1.36985	1.32061	2.125%	1.28702	1.26024	1.0645	1.0480	93.953%	95.429%	1.02125	1.02125	95.950%	97.456%	1.02125	1.02125						
2005			579.300	3.02%	1.41126	1.36985	2.125%	1.31437	1.28702	1.0735	1.0645	93.134%	93.953%	1.02125	1.02125	95.113%	95.950%	1.02125	1.02125						
2004			562.300	1.57%	1.43344	1.41126	2.125%	1.33474	1.31437	1.0740	1.0735	93.114%	93.134%	1.02125	1.02125	95.093%	95.113%	1.02125	1.02125						
2003			553.600	1.42%	1.45379	1.43344	2.125%	1.35409	1.33474	1.0735	1.0740	93.142%	93.114%	1.02125	1.02125	95.121%	95.093%	1.02125	1.02125						
2002	543.2	548.5	545.850	1.80%	1.47996	1.45379	2.125%	1.37847	1.35409	1.0735	1.0735	93.142%	93.142%	1.02125	1.02125	95.122%	95.121%	1.02125	1.02125						
2001	532.8	539.6	536.200	3.54%	1.53240	1.47996	2.125%	1.42725	1.37847	1.0735	1.0735	93.138%	93.142%	1.02125	1.02125	95.117%	95.122%	1.02125	1.02125						
2000	512.4	523.3	517.850	3.77%	1.59013	1.53240	2.00%	1.46008	1.42725	1.0890	1.0735	91.822%	93.138%	1.02125	1.02125	93.773%	95.117%	1.02125	1.02125						
1999	495.3	502.8	499.050	3.10%	1.63941	1.59013	2.00%	1.48928	1.46008	1.1010	1.0890	90.843%	91.822%	1.02125	1.02125	92.773%	93.773%	1.02125	1.02125						
1998	480.7	487.4	484.050	2.61%	1.68215	1.63941	2.00%	1.51907	1.48928	1.1075	1.1010	90.305%	90.843%	1.02125	1.02125	92.224%	92.773%	1.02125	1.02125						
1997	469.1	474.4	471.750	3.10%	1.73435	1.68215	2.00%	1.54945	1.51907	1.1195	1.1075	89.339%	90.305%	1.02125	1.02125	91.237%	92.224%	1.02125	1.02125						
1996	452.7	462.4	457.550	3.31%	1.79172	1.73435	1.75%	1.58044	1.54945	1.1335	1.1195	88.208%	89.339%	1.02125	1.02125	90.082%	91.237%	1.02125	1.02125						
1995	439.8	446.0	442.900	2.90%	1.84376	1.79172	1.75%	1.60810	1.58044	1.1465	1.1335	87.218%	88.208%	1.02125	1.02125	89.072%	90.082%	1.02125	1.02125						
1994	426.2	434.6	430.400	3.65%	1.91103	1.84376	1.75%	1.63624	1.60810	1.1680	1.1465	85.621%	87.218%	1.02125	1.02125	87.440%	89.072%	1.02125	1.02125						
1993	411.9	418.6	415.250	2.99%	1.96814	1.91103	1.75%	1.66487	1.63624	1.1820	1.1680	84.591%	85.621%	1.02125	1.02125	86.389%	87.440%	1.02125	1.02125						
1992	399.6	406.8	403.200	3.53%	2.03763	1.96814	1.75%	1.69401	1.66487	1.2030	1.1820	83.136%	84.591%	1.02125	1.02125	84.903%	86.389%	1.02125	1.02125						
1991	386.1	392.8	389.450	5.54%	2.15055	2.03763	1.75%	1.72365	1.69401	1.2475	1.2030	80.149%	83.136%	1.02125	1.02125	81.853%	84.903%	1.02125	1.02125						
1990	361.8	376.2	369.000	7.13%	2.30383	2.15055	1.75%	1.75382	1.72365	1.3135	1.2475	76.126%	80.149%	1.02125	1.02125	77.744%	81.853%	1.02125	1.02125						
1989	340.3	348.6	344.450	4.66%	2.41129	2.30383	1.75%	1.78451	1.75382	1.3510	1.3135	74.007%	76.126%	1.02125	1.02125	75.579%	77.744%	1.02125	1.02125						
1988	326.1	332.1	329.100	3.30%	2.49075	2.41129	1.75%	1.81574	1.78451	1.3720	1.3510	72.899%	74.007%	1.02125	1.02125	74.448%	75.579%	1.02125	1.02125						
1987	315.6	321.6	318.600	2.35%	2.54916	2.49075	1.75%	1.84751	1.81574	1.3800	1.3720	72.475%	72.899%	1.02125	1.02125	74.015%	74.448%	1.02125	1.02125						
1986			311.300	0.71%	2.56731	2.54916	1.75%	1.87985	1.84751	1.3655	1.3800	73.223%	72.475%	1.02125	1.02125	74.778%	74.015%	1.02125	1.02125						
1985			309.100	2.08%	2.62072	2.56731	1.75%	1.91274	1.87985	1.3700	1.3655	72.985%	73.223%	1.02125	1.02125	74.536%	74.778%	1.02125	1.02125						
1984			302.800	3.27%	2.70653	2.62072	1.75%	1.94622	1.91274	1.3905	1.3700	71.908%	72.985%	1.02125	1.02125	73.436%	74.536%	1.02125	1.02125						
1983			293.200	-0.27%	2.69916	2.70653	1.75%	1.98027	1.94622	1.3630	1.3905	73.366%	71.908%	1.02125	1.02125	74.925%	73.436%	1.02125	1.02125						
1982			294.000	6.48%	2.87415	2.69916	1.75%	2.01493	1.98027	1.4265	1.3630	70.105%	73.366%	1.02125	1.02125	71.595%	74.925%	1.02125	1.02125						
1981			276.100	10.84%	3.18568	2.87415	1.75%	2.05019	2.01493	1.5540	1.4265	64.356%	70.105%	1.02125	1.02125	65.724%	71.595%	1.02125	1.02125						
1980			249.100	16.08%	3.69783	3.18568	1.75%	2.08607	2.05019	1.7725	1.5540	56.413%	64.356%	1.02125	1.02125	57.612%	65.724%	1.02125	1.02125						
1979			214.600	10.73%	4.09471	3.69783	1.75%	2.12257	2.08607	1.9290	1.7725	51.837%	56.413%	1.02125	1.02125	52.939%	57.612%	1.02125	1.02125						

\* See Exhibit 2 for detail. Amount shown is the maximum for the year, ignoring restoration of purchasing power COLAs, which are not included. Some retirees received less based on 100% of purchasing power maximum.

\*\* All members retiring on or before July 1, 1978 have had their benefits increased to at least 50% of original purchasing power. These increases are included.



This work product was prepared solely for Tacoma Employees' Retirement System for the purposes described herein and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

**Exhibit 1  
(continued)**

**Tacoma Employees' Retirement System  
Factors Applied in Calculating the 2019 COLA Increases**

Ret Year	(1) AVERAGE CPI-W URBAN WAGE, CLERICAL SEATTLE (All Items 1967 = 100)		(2)	(3)	(4) Annual CPI Increase		(5) DOR <= 7/1	(6) DOR >= 7/2	(7) Tacoma COLA given on 7/1 of Year *	(8) Cumulative Tacoma COLA @ 6/30/2019 *		(9)	(10) Maximum Accumulated COLA **		(11)	(12) Percent of Original Purchasing Power @ 6/30/2019 **		(13)	(14) Total COLA Factor at 7/2019 with 50% Minimum ROPP		(15)	(16) Percent of Original Purchasing Power @ 7/1/2019 **		(17)	
	1st Half	2nd Half	Avg	CPI	DOR	DOR	DOR	DOR	Year *	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	DOR	
1978			193.800	9.12%	4.46821	4.09471	1.75%	2.15972	2.12257	2.0157	1.9290	49.610%	51.837%	1.02125	1.02125	50.664%	52.939%								
1977			177.600	7.96%	4.82404	4.46821	1.75%	2.19752	2.15972	2.0157	2.0157	49.610%	49.610%	1.02125	1.02125	50.664%	50.664%								
1976			164.500	5.58%	5.09341	4.82404	1.75%	2.23597	2.19752	2.0157	2.0157	49.610%	49.610%	1.02125	1.02125	50.664%	50.664%								
1975			155.800	10.11%	5.60816	5.09341	1.75%	2.27510	2.23597	2.0157	2.0157	49.610%	49.610%	1.02125	1.02125	50.664%	50.664%								
1974			141.500	10.98%	6.22395	5.60816	1.75%	2.31492	2.27510	2.0157	2.0157	49.610%	49.610%	1.02125	1.02125	50.664%	50.664%								
1973			127.500	6.52%	6.62952	6.22395	6.00%	2.35543	2.31492	2.0157	2.0157	49.610%	49.610%	1.02125	1.02125	50.664%	50.664%								
1972			119.700	2.84%	6.81747	6.62952	1.50%	2.49675	2.35543	2.0157	2.0157	49.610%	49.610%	1.02125	1.02125	50.664%	50.664%								
1971			116.400	2.11%	6.96100	6.81747	7.50%	2.53420	2.49675	2.0157	2.0157	49.610%	49.610%	1.02125	1.02125	50.664%	50.664%								
1970			114.000	4.40%	7.26698	6.96100	1.50%	2.72427	2.53420	2.0157	2.0157	49.610%	49.610%	1.02125	1.02125	50.664%	50.664%								
1969			109.200	4.90%	7.62300	7.26698	9.50%	2.76513	2.72427	2.0157	2.0157	49.610%	49.610%	1.02125	1.02125	50.664%	50.664%								
1968			104.100	4.10%	7.93554	7.62300	1.00%	3.02782	2.76513	2.0157	2.0157	49.610%	49.610%	1.02125	1.02125	50.664%	50.664%								
1967			100.000	2.99%	8.17254	7.93554	0.00%	3.05810	3.02782	2.0157	2.0157	49.610%	49.610%	1.02125	1.02125	50.664%	50.664%								
1966			97.100	2.75%	8.39740	8.17254	0.00%	3.05810	3.05810	2.0157	2.0157	49.610%	49.610%	1.02125	1.02125	50.664%	50.664%								
1965			94.500	1.18%	8.49630	8.39740	0.00%	3.05810	3.05810	2.0157	2.0157	49.610%	49.610%	1.02125	1.02125	50.664%	50.664%								

\* See Exhibit 2 for detail. Amount shown is the maximum for the year, ignoring restoration of purchasing power COLAs, which are not included. Some retirees received less based on 100% of purchasing power maximum.

\*\* All members retiring on or before July 1, 1978 have had their benefits increased to at least 50% of original purchasing power. These increases are included.



This work product was prepared solely for Tacoma Employees' Retirement System for the purposes described herein and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

Documentation of Cumulative COLAs for Retirement Dates on or before 7/1 of Given Year

Ret Year	Tacoma COLA given on 7/1 of Year*	Cumulative COLA at 7/2008	7/2009 COLA	Cumulative COLA at 7/2009	7/2010 COLA	Cumulative COLA at 7/2010	7/2011 COLA	Cumulative COLA at 7/2011	7/2012 COLA	Cumulative COLA at 7/2012	7/2013 COLA	Cumulative COLA at 7/2013	7/2014 COLA	Cumulative COLA at 7/2014	7/2015 COLA	Cumulative COLA at 7/2015	7/2016 COLA	Cumulative COLA at 7/2016	7/2017 COLA	Cumulative COLA at 7/2017	7/2018 COLA	Cumulative COLA at 7/2018
2019																						
2018																						
2017																						
2016																						
2015																						
2014																						
2013																						
2012																						
2011																						
2010																						
2009																						
2008			2.1250%	1.02125	2.1250%	1.04295	2.1250%	1.06511	2.1250%	1.08775	2.1250%	1.11086	2.1250%	1.13447	2.1250%	1.15858	2.1250%	1.18320	2.1250%	1.20834	2.1250%	1.23402
2007	2.1250%	1.02125	2.1250%	1.04295	2.1250%	1.06511	2.1250%	1.08775	2.1250%	1.11086	2.1250%	1.13447	2.1250%	1.15858	2.1250%	1.18320	2.1250%	1.20834	2.1250%	1.23402	2.1250%	1.26024
2006	2.1250%	1.04295	2.1250%	1.06511	2.1250%	1.08775	2.1250%	1.11086	2.1250%	1.13447	2.1250%	1.15858	2.1250%	1.18320	2.1250%	1.20834	2.1250%	1.23402	2.1250%	1.26024	2.1250%	1.28702
2005	2.1250%	1.06511	2.1250%	1.08775	2.1250%	1.11086	2.1250%	1.13447	2.1250%	1.15858	2.1250%	1.18320	2.1250%	1.20834	2.1250%	1.23402	2.1250%	1.26024	2.1250%	1.28702	2.1250%	1.31437
2004	2.1250%	1.08162	2.1250%	1.10461	2.1250%	1.12808	2.1250%	1.15205	2.1250%	1.17653	2.1250%	1.20154	2.1250%	1.22707	2.1250%	1.25314	2.1250%	1.27977	2.1250%	1.30697	2.1250%	1.33474
2003	2.1250%	1.09731	2.1250%	1.12062	2.1250%	1.14444	2.1250%	1.16876	2.1250%	1.19359	2.1250%	1.21896	2.1250%	1.24486	2.1250%	1.27131	2.1250%	1.29833	2.1250%	1.32592	2.1250%	1.35409
2002	2.1250%	1.11706	2.1250%	1.14080	2.1250%	1.16504	2.1250%	1.18979	2.1250%	1.21508	2.1250%	1.24090	2.1250%	1.26727	2.1250%	1.29420	2.1250%	1.32170	2.1250%	1.34978	2.1250%	1.37847
2001	2.1250%	1.15659	2.1250%	1.18117	2.1250%	1.20627	2.1250%	1.23190	2.1250%	1.25808	2.1250%	1.28481	2.1250%	1.31212	2.1250%	1.34000	2.1250%	1.36847	2.1250%	1.39755	2.1250%	1.42725
2000	2.1250%	1.18320	2.1250%	1.20834	2.1250%	1.23402	2.1250%	1.26024	2.1250%	1.28702	2.1250%	1.31437	2.1250%	1.34230	2.1250%	1.37082	2.1250%	1.39995	2.1250%	1.42970	2.1250%	1.46008
1999	2.1250%	1.20686	2.1250%	1.23251	2.1250%	1.25870	2.1250%	1.28544	2.1250%	1.31276	2.1250%	1.34066	2.1250%	1.36914	2.1250%	1.39824	2.1250%	1.42795	2.1250%	1.45829	2.1250%	1.48928
1998	2.1250%	1.23100	2.1250%	1.25716	2.1250%	1.28387	2.1250%	1.31115	2.1250%	1.33901	2.1250%	1.36747	2.1250%	1.39653	2.1250%	1.42620	2.1250%	1.45651	2.1250%	1.48746	2.1250%	1.51907
1997	2.1250%	1.25562	2.1250%	1.28230	2.1250%	1.30955	2.1250%	1.33738	2.1250%	1.36579	2.1250%	1.39482	2.1250%	1.42446	2.1250%	1.45473	2.1250%	1.48564	2.1250%	1.51721	2.1250%	1.54945
1996	2.1250%	1.28073	2.1250%	1.30794	2.1250%	1.33574	2.1250%	1.36412	2.1250%	1.39311	2.1250%	1.42271	2.1250%	1.45295	2.1250%	1.48382	2.1250%	1.51535	2.1250%	1.54755	2.1250%	1.58044
1995	2.1250%	1.30314	2.1250%	1.33083	2.1250%	1.35911	2.1250%	1.38799	2.1250%	1.41749	2.1250%	1.44761	2.1250%	1.47837	2.1250%	1.50979	2.1250%	1.54187	2.1250%	1.57464	2.1250%	1.60810
1994	2.1250%	1.32595	2.1250%	1.35412	2.1250%	1.38290	2.1250%	1.41228	2.1250%	1.44230	2.1250%	1.47294	2.1250%	1.50424	2.1250%	1.53621	2.1250%	1.56885	2.1250%	1.60219	2.1250%	1.63624
1993	2.1250%	1.34915	2.1250%	1.37782	2.1250%	1.40710	2.1250%	1.43700	2.1250%	1.46754	2.1250%	1.49872	2.1250%	1.53057	2.1250%	1.56309	2.1250%	1.59631	2.1250%	1.63023	2.1250%	1.66487
1992	2.1250%	1.37276	2.1250%	1.40193	2.1250%	1.43172	2.1250%	1.46215	2.1250%	1.49322	2.1250%	1.52495	2.1250%	1.55735	2.1250%	1.59045	2.1250%	1.62424	2.1250%	1.65876	2.1250%	1.69401
1991	2.1250%	1.39678	2.1250%	1.42647	2.1250%	1.45678	2.1250%	1.48773	2.1250%	1.51935	2.1250%	1.55164	2.1250%	1.58461	2.1250%	1.61828	2.1250%	1.65267	2.1250%	1.68779	2.1250%	1.72365
1990	2.1250%	1.42123	2.1250%	1.45143	2.1250%	1.48227	2.1250%	1.51377	2.1250%	1.54594	2.1250%	1.57879	2.1250%	1.61234	2.1250%	1.64660	2.1250%	1.68159	2.1250%	1.71732	2.1250%	1.75382
1989	2.1250%	1.44610	2.1250%	1.47683	2.1250%	1.50821	2.1250%	1.54026	2.1250%	1.57299	2.1250%	1.60642	2.1250%	1.64055	2.1250%	1.67542	2.1250%	1.71102	2.1250%	1.74738	2.1250%	1.78451
1988	2.1250%	1.47141	2.1250%	1.50267	2.1250%	1.53461	2.1250%	1.56722	2.1250%	1.60052	2.1250%	1.63453	2.1250%	1.66926	2.1250%	1.70474	2.1250%	1.74096	2.1250%	1.77796	2.1250%	1.81574
1987	2.1250%	1.49716	2.1250%	1.52897	2.1250%	1.56146	2.1250%	1.59464	2.1250%	1.62853	2.1250%	1.66313	2.1250%	1.69848	2.1250%	1.73457	2.1250%	1.77143	2.1250%	1.80907	2.1250%	1.84751
1986	2.1250%	1.52336	2.1250%	1.55573	2.1250%	1.58879	2.1250%	1.62255	2.1250%	1.65703	2.1250%	1.69224	2.1250%	1.72820	2.1250%	1.76492	2.1250%	1.80243	2.1250%	1.84073	2.1250%	1.87985
1985	2.1250%	1.55001	2.1250%	1.58295	2.1250%	1.61659	2.1250%	1.65094	2.1250%	1.68603	2.1250%	1.72185	2.1250%	1.75844	2.1250%	1.79581	2.1250%	1.83397	2.1250%	1.87294	2.1250%	1.91274
1984	2.1250%	1.57714	2.1250%	1.61065	2.1250%	1.64488	2.1250%	1.67983	2.1250%	1.71553	2.1250%	1.75199	2.1250%	1.78922	2.1250%	1.82724	2.1250%	1.86607	2.1250%	1.90572	2.1250%	1.94622
1983	2.1250%	1.60474	2.1250%	1.63884	2.1250%	1.67367	2.1250%	1.70923	2.1250%	1.74555	2.1250%	1.78265	2.1250%	1.82053	2.1250%	1.85921	2.1250%	1.89872	2.1250%	1.93907	2.1250%	1.98027
1982	2.1250%	1.63282	2.1250%	1.66752	2.1250%	1.70296	2.1250%	1.73914	2.1250%	1.77610	2.1250%	1.81384	2.1250%	1.85239	2.1250%	1.89175	2.1250%	1.93195	2.1250%	1.97300	2.1250%	2.01493
1981	2.1250%	1.66140	2.1250%	1.69670	2.1250%	1.73276	2.1250%	1.76958	2.1250%	1.80718	2.1250%	1.84558	2.1250%	1.88480	2.1250%	1.92485	2.1250%	1.96576	2.1250%	2.00753	2.1250%	2.05019
1980	2.1250%	1.69047	2.1250%	1.72639	2.1250%	1.76308	2.1250%	1.80055	2.1250%	1.83881	2.1250%	1.87788	2.1250%	1.91779	2.1250%	1.95854	2.1250%	2.00016	2.1250%	2.04266	2.1250%	2.08607
1979	2.1250%	1.72006	2.1250%	1.75661	2.1250%	1.79393	2.1250%	1.83206	2.1250%	1.87099	2.1250%	1.91074	2.1250%	1.95135	2.1250%	1.99281	2.1250%	2.03516	2.1250%	2.07841	2.1250%	2.12257
1978	2.1250%	1.75016	2.1250%	1.78735	2.1250%	1.82533	2.1250%	1.86412	2.1250%	1.90373	2.1250%	1.94418	2.1250%	1.98550	2.1250%	2.02769	2.1250%	2.07078	2.1250%	2.11478	2.1250%	2.15972
1977	2.1250%	1.78078	2.1250%	1.81863	2.1250%	1.85727	2.1250%	1.89674	2.1250%	1.93704	2.1250%	1.97821	2.1250%	2.02024	2.1250%	2.06317	2.1250%	2.10702	2.1250%	2.15179	2.1250%	2.19752
1976	2.1250%	1.81195	2.1250%	1.85045	2.1250%	1.88977	2.1250%	1.92993	2.1250%	1.97094	2.1250%	2.01282	2.1250%	2.05560	2.1250%	2.09928	2.1250%	2.14389	2.1250%	2.18945	2.1250%	2.23597
1975	2.1250%	1.84366	2.1250%	1.88283	2.1250%	1.92284	2.1250%	1.96370	2.1250%	2.00543	2.1250%	2.04805	2.1250%	2.09157	2.1250%	2.13602	2.1250%	2.18141	2.1250%	2.22776	2.1250%	2.27510
1974	2.1250%	1.87592	2.1250%	1.91578	2.1250%	1.95649	2.1250%	1.99807	2.1250%	2.04053	2.1250%	2.08389	2.1250%	2.12817	2.1250%	2.17340	2.1250%	2.21958	2.1250%	2.26675	2.1250%	2.31492
1973	2.1250%	1.90875	2.1250%	1.94931	2.1250%	1.99073	2.1250%	2.03304	2.1250%	2.07624	2.1250%	2.12036	2.1250%	2.16542	2.1250%	2.21143	2.1250%	2.25842	2.1250%	2.30642	2.1250%	2.35543
1972	2.1250%	2.02327	2.1250%	2.06627	2.1250%	2.11018	2.1250%	2.15502	2.1250%	2.20081	2.1250%	2.24758	2.1250%	2.29534	2.1250%	2.34412	2.1250%	2.39393	2.1250%	2.44480	2.1250%	2.49675
1971	2.1250%	2.05362	2.1250%	2.09726	2.1250%	2.14183	2.1250%	2.18734	2.1250%	2.23382	2.1250%	2.28129	2.1250%	2.32977	2.1250%	2.37928	2.1250%	2.42984	2.1250%	2.48147	2.1250%	2.53420
1970	2.1250%	2.20264	2.1250%	2.25456	2.1250%	2.30247	2.1250%	2.35139	2.1250%	2.40136	2.1250%	2.45239	2.1250%	2.50450	2.1250%	2.55772	2.1250%	2.61208	2.1250%	2.66758	2.1250%	2.72427
1969	2.1250%	2.24076	2.1250%	2.28838	2.1250%	2.33700	2.1250%	2.38667	2.1250%	2.43738	2.1250%	2.48918	2.1250%	2.54207	2.1250%	2.59609	2.1250%	2.65126	2.1250%	2.70760	2.1250%	2.76513
1968	2.1250%	2.45363	2.1250%	2.50577	2.1250%	2.55902																