



500 Dallas Street
Suite 2550
Houston, TX 77002
USA

Tel +1 713 658 8451
Fax +1 713 658 9656

milliman.com

July 28, 2020

Sent via email

Mr. Tim Finley
Chief Financial Officer
Port of Houston Authority
Post Office Box 2562
Houston, Texas 77252-2562

Re: Experience Study – Port of Houston Authority Restated Retirement Plan

Dear Tim:

As requested, we have performed an actuarial experience study of the Port of Houston Authority Restated Retirement Plan (Plan). The enclosed report includes a summary of recommended changes to the withdrawal (turnover) and retirement rate assumptions, the mortality assumption, the inflation assumption, and the administration expense load to the normal cost assumption. We have also summarized the impact of the recommended changes on the 2019 contribution requirements to the Plan. In addition, the report also estimates the impact on fiscal year ending (FYE) 2020 GASB 67 / 68 liabilities for the Plan. For this study, we reviewed actual experience from August 1, 2014 through August 1, 2019. Thus, the experience studied was based on census data beginning with the August 1, 2014 funding valuation and ending with the August 1, 2019 funding valuation.

The rate of return (interest rate) assumption decreased from 6.75% to 6.50% effective August 1, 2019. Based on your current asset allocation, Milliman's Capital Market assumptions (including an inflation assumption of 2.20%), and a 30-year investment horizon, we find that a range of reasonable returns for the investment rate of return assumption for each of the pension plans as of July 31, 2019 could be as high as the current assumption of 6.50% and as low as 5.50%. Although our best estimate based on our analysis would be 5.50%, we find the current assumption of 6.50% to be within the range of reasonable returns. We have also shown the impact of changing the interest rate assumption lowering to 6.25%.

Mortality was also reviewed as part of the experience study. The size of your plan does not lend itself to the development of a custom mortality table, so plan sponsors typically adopt the most current mortality table and projection scales published. Please recall that in the last experience study, the Port of Houston Authority elected to use the RP-2014 Mortality Table adjusted backward to 2006 with MP-2014 and projected with Scale MP-2015, and the MP-2015 Projection Scale (with annual updates to the improvement scale; the 2019 valuation and FYE 2019 GASB 67/68 reports used Scale MP-2018, published October 2018 by the Society of Actuaries). The results shown use the newly published Pri-2012 Private Retirement Plans Mortality Tables projected with Mortality Improvement Scale MP-2019 on a generational basis, with sex-distinct employee rates before commencement and healthy annuitant rates after commencement (separate table for contingent survivors). We expect to continue to make annual updates to the improvement scale as the Society of Actuaries releases these tables.

Please contact us at your earliest convenience to discuss the recommended assumption changes in more detail. We seek your approval for the proposed actuarial assumption changes to be reflected in your next



actuarial valuations to be performed as of August 1, 2020. In the meantime, please let us know if you have any questions or if we may be of additional help concerning any other matter regarding the operation of the plans.

Sincerely,

A handwritten signature in black ink that reads "Jake Pringle".

Jake Pringle, EA, MAAA
Consulting Actuary

A handwritten signature in black ink that reads "Katherine Pitzinger".

Katherine Pitzinger, ASA, MAAA
Actuarial Associate

Enclosures



Port of Houston Authority Restated Retirement Plan

As requested, we have performed an actuarial experience study of the Plan including experience from calendar years 2014 through 2019. Note that the results of the experience study will also apply to the Port of Houston Authority Post-Retirement Medical Plan (where assumptions are applicable). This experience was included in our actuarial valuations performed from August 1, 2014 through August 1, 2019. Our findings are shown in the enclosed Exhibits and indicate that some intermediate adjustments are recommended. Furthermore, as expected with intermediate adjustments, the impact of the proposed assumption changes is within a moderate range.

Exhibit A

Exhibit A shows the impact on the 2019 actuarial accrued liability, unfunded actuarial accrued liability, and the actuarially determined contribution if the assumption changes were implemented for the 2019 Plan valuation. Exhibit A also estimates the impact of the proposed assumption changes to the FYE2020 GASB 67/68 Total Pension Liability.

We have shown these consolidated impacts at both the current 6.50% rate of return (interest rate) assumption and 25 basis points lower (6.25%) for sensitivity.

Exhibits B1 – B2

Exhibits B1 – B2 display the proposed assumption changes for retirement rates, withdrawal rates, mortality assumption, inflation assumption, and administrative expense load on the normal cost assumption for the Plan. Our study of actual experience over the recent past indicates the following:

- Retirement rates should be decreased and the retirement assumption should also be dependent on service earned (shown in Exhibit B1).
- Withdrawal rates should be decreased overall based on years of service rather than age (shown in Exhibit B1).
- No adjustment is suggested for disability rates due to limited experience (stated in Exhibit B2).
- The mortality assumption should be updated to the most recently published table available. In the last couple of years, new public-sector tables (Pub-2010 Mortality Tables) and new private-sector tables (Pri-2012 Private Retirement Plans Mortality Tables) have been released. Comparing these two sets of tables to the actual experience of the plan, the new private sector mortality table more in line for retiree population and appears to be the best fit for the Plan.
The mortality assumption will continue to use the White-Collar / Blue-Collar tables for participants based on salaried / hourly status and will receive annual improvement scale updates as the Society of Actuaries releases these tables. Tables are male / female distinct with separate tables for employees, retirees, disabled participants, and beneficiaries (shown in Exhibit B2).
- No adjustment is suggested for the salary scale assumption since overall salaries for participants lined up with the current assumption (stated in Exhibit B2).
- The inflation rate should be decreased to 2.20% based on current long-term expectations (shown in Exhibit B2).
- The administrative expense load for the normal cost should be decreased to \$500,000 based on historical administrative expense amounts in past years (shown in Exhibit B2).



Exhibit C

Exhibit C shows details of our current economic model developed with the Actuarial Standards of Practice number 27 (ASOP 27), along with your asset allocation policy, which supports both of the rate of return assumptions shown in Exhibit A.

Exhibits D1 – D7

Exhibits D1 – D7 contain documentation on each of the assumptions we reviewed as part of the experience study to comply with the ASOPs. This documentation includes a summary of the relevant data used to propose each assumption and our rationale for making the proposed assumption.

The experience study was performed using information (some verbally and some in writing) as of the valuation dates, furnished by the Port of Houston Authority. This information includes, but is not limited to, plan documents and provisions, employee data, and financial information. This data was relied upon as submitted. We have reviewed the data for reasonableness and consistency. Since the results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations might need to be revised.

The results contained in this report are based on the actuarial methods, actuarial assumptions (except as listed otherwise), principal plan provisions, and risk disclosures contained in the appendices of the most recent actuarial funding valuation report dated November 6, 2019.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the principles prescribed by the Actuarial Standards Board and the Code of Professional Conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

We further certify that all costs, liabilities, rates of interest, and other factors (except when determination is mandated directly by the Internal Revenue Code and its regulations) under the Plan have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the Plan and reasonable expectations) and which, in combination, offer our best estimate of anticipated experience under the Plan. Nevertheless, the emerging costs will vary from those presented in this report to the extent that actual experience differs from that projected by the actuarial assumptions.

Actuarial computations presented in this report are for purposes of determining the minimum funding requirements and of fulfilling annual financial accounting requirements. Actuarial computations presented in this report are for purposes of satisfying the funding policy. The calculations in the enclosed report have been made on a basis consistent with our understanding of the Authority's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the Plan's funding goals. Determinations for the purposes other than meeting those requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

This work product was prepared solely for the Port of Houston Authority 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.



This report has been prepared for the internal use of and is only to be relied upon by the Port of Houston Authority and its auditors. No portion of this report may be disclosed to any other party without Milliman's prior written consent. In the event such consent is given, the report must be provided in its entirety, unless prior written consent is obtained from Milliman.

We respectfully submit the following report, and we look forward to discussing it with you.

Respectfully submitted,

A handwritten signature in black ink that reads "Jake Pringle".

Jake Pringle, EA, MAAA
Consulting Actuary

A handwritten signature in black ink that reads "Katherine Pitzinger".

Katherine Pitzinger, ASA, MAAA
Actuarial Associate



Exhibit A

Port of Houston Authority Retirement Plan
(in millions)

	Current Assumptions	Proposed Assumptions		Proposed - Current		
		6.50% IR	6.25% IR	6.50% IR	6.25% IR	
<u>2019 Funding Results</u>						
Actuarial Accrued Liability	\$ 198.41	\$ 193.40	\$ 198.74			
Actuarial Value of Assets	<u>184.41</u>	<u>184.41</u>	<u>184.41</u>			
Unfunded Actuarial Accrued Liability	\$ 14.00	\$ 8.99	\$ 14.33	\$ (5.01)	\$ 0.33	
Funded Status	92.94%	95.35%	92.79%			
Present Value of Benefits	\$ 222.25	\$ 222.10	\$ 229.85	\$ (0.15)	\$ 7.60	
Normal Cost	\$ 4.17	\$ 3.87	\$ 4.08	\$ (0.30)	\$ (0.09)	
Funding Policy Contribution	\$ 5.37	\$ 4.69	\$ 5.27	\$ (0.68)	\$ (0.10)	
<u>FYE2020 GASB 67/68 Estimate</u>						
Total Pension Liability	\$ 203.69	\$ 198.51	\$ 203.93	\$ (5.18)	\$ 0.24	

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Exhibit B1

Port of Houston Authority Retirement Plan
Plan-Specific Decrement Assumptions

Current			Proposed			Proposed	
Age	Withdrawal	Retirement	Age	Retirement		Service	Withdrawal
				Service			
				<30	30+		
<20	N/A	N/A	<20	N/A	N/A	< 0	N/A
20-24	5.00%	N/A	20-24	N/A	N/A	0	10.00%
25	12.00%	N/A	25	N/A	N/A	1	10.00%
26	11.50%	N/A	26	N/A	N/A	2	10.00%
27	10.50%	N/A	27	N/A	N/A	3	7.50%
28	9.00%	N/A	28	N/A	N/A	4	5.00%
29	8.00%	N/A	29	N/A	N/A	5	5.00%
30	6.80%	N/A	30	N/A	N/A	6	5.00%
31	6.60%	N/A	31	N/A	N/A	7	5.00%
32	6.30%	N/A	32	N/A	N/A	8	5.00%
33	6.10%	N/A	33	N/A	N/A	9	2.00%
34	5.90%	N/A	34	N/A	N/A	10	2.00%
35	5.60%	N/A	35	N/A	N/A	11	2.00%
36	5.40%	N/A	36	N/A	N/A	12	2.00%
37	5.20%	N/A	37	N/A	N/A	13	2.00%
38	5.00%	N/A	38	N/A	N/A	14	2.00%
39	4.80%	N/A	39	N/A	N/A	15	4.00%
40	4.50%	N/A	40	N/A	N/A	16	4.00%
41-43	4.40%	N/A	41-43	N/A	N/A	17	2.00%
44	4.30%	N/A	44	N/A	N/A	18	2.00%
45	4.20%	0.00%	45	0.00%	0.00%	19	1.00%
46	3.80%	0.00%	46	0.00%	0.00%	20	1.00%
47	3.40%	0.00%	47	0.00%	0.00%	21	1.00%
48	3.00%	0.00%	48	0.00%	0.00%	22	2.00%
49	2.60%	0.00%	49	0.00%	0.00%	23	3.00%
50	2.20%	0.00%	50	0.00%	0.00%	24	4.50%
51-54	3.60%	0.00%	51-54	0.00%	0.00%	25	4.00%
55	3.60%	10.00%	55	0.00%	30.00%	26	4.00%
56	3.10%	10.00%	56	0.00%	5.00%	27	4.00%
57	2.60%	15.00%	57	0.00%	5.00%	28	2.00%
58	2.10%	15.00%	58	0.00%	5.00%	29	1.00%
59	1.60%	20.00%	59	0.00%	10.00%	30+	0.00%
60	1.10%	20.00%	60	0.00%	20.00%		
61	0.00%	25.00%	61	0.00%	20.00%		
62	0.00%	25.00%	62	10.00%	25.00%		
63	0.00%	25.00%	63	5.00%	25.00%		
64	0.00%	25.00%	64	5.00%	25.00%		
65-69	0.00%	50.00%	65-69	30.00%	30.00%		
70+	0.00%	100.00%	70+	100.00%	100.00%		

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Exhibit B2

Port of Houston Authority Retirement Plan
Other Assumptions

Admin Expense Load

Current	Proposed
\$750,000	\$500,000

Inflation

Current	Proposed
2.50%	2.20%

Mortality

Current	Proposed
Salaried: White Collar RP-2014 / MP-2018 Hourly: Blue Collar RP-2014 / MP-2018 Male/Female, Employee / Retiree / Disability Tables Update Improvement Scales Annually (Base Table 2006)	Salaried: White-Collar Pri-2012 / MP-2019 Hourly: Blue-Collar Pri-2012 / MP-2019 Male/Female, Employee / Retiree / Disability / Beneficiary Tables Update Improvement Scales Annually (Base Table 2012)

Salary Scale

no change proposed

Disability

no change proposed

30-Year Milliman 30-Year Investment Assumptions at July 1, 2019

Policy Alloc %	Asset Class	Representative Index	Expected	Expected	Expected	Expected	Expected	
			Nominal Annual Return: Arithmetic Mean	Nominal Annualized Return: 30-Yr Geom Mean	Nominal Standard Deviation of Annual Return	Real Annual Return: Arithmetic Mean	Real Annualized Return: 30-Yr Geom Mean	
	US Inflation	CPI-U	2.21%	2.20%	1.65%			
1		US Cash	BAML 3-Mon Tbill	2.93%	2.92%	1.20%	0.71%	0.71%
2		US Core Fixed Income	Bloomberg Barclays Aggregate	4.04%	3.97%	3.90%	1.83%	1.73%
3		US Core Bonds	Bloomberg Barclays Gvt/Credit	4.03%	3.94%	4.50%	1.82%	1.70%
4		US Short Bonds	Bloomberg Barclays 1-3 Yr Gvt/Credit	3.39%	3.37%	2.10%	1.18%	1.14%
5		US Interm Bonds	Bloomberg Barclays IT Gvt/Credit	3.72%	3.66%	3.45%	1.50%	1.43%
6	20.00%	US Long Bonds	Bloomberg Barclays LT Gvt/Credit	4.84%	4.50%	8.65%	2.63%	2.25%
7	20.00%	US Gvt Bonds	Bloomberg Barclays Gvt	3.55%	3.45%	4.75%	1.34%	1.22%
8		US Credit Bonds	Bloomberg Barclays Credit	4.91%	4.79%	5.05%	2.70%	2.54%
9		US Long Gvt Bonds	Bloomberg Barclays Long Gvt	4.08%	3.55%	10.70%	1.87%	1.32%
10		US Long Credit Bonds	Bloomberg Barclays Long Credit	5.68%	5.40%	7.90%	3.47%	3.13%
11		US Mortgages	Bloomberg Barclays MBS	4.02%	3.98%	3.15%	1.81%	1.74%
12		US Municipal Bonds	Bloomberg Barclays Muni	3.73%	3.66%	4.00%	1.52%	1.42%
13		US Bank / Leveraged Loans	Credit Suisse Leveraged Loan	5.18%	4.96%	6.90%	2.97%	2.70%
14		US Inflation-Indexed Bonds	Bloomberg Barclays US TIPs	3.17%	3.08%	4.40%	0.96%	0.86%
15		US High Yield Bonds	BofAML High Yield	6.22%	5.82%	9.40%	4.00%	3.54%
16		Global Bonds	FTSE WGBI	2.69%	2.42%	7.60%	0.48%	0.22%
17		Non-US Bonds	JPM GBI Global xUS	2.42%	1.99%	9.65%	0.21%	-0.21%
18	5.00%	Emerging Markets Bonds	JPM EMBI Plus	5.72%	4.95%	13.10%	3.51%	2.69%
19	15.00%	US Large Caps	S&P 500	6.65%	5.60%	15.35%	4.44%	3.33%
20	7.50%	US Large & Mid Caps	Russell 1000	6.80%	5.70%	15.70%	4.59%	3.42%
21		US Equity Market	Russell 3000	6.92%	5.80%	15.90%	4.71%	3.52%
22	10.00%	US Small Caps	Russell 2000	7.97%	6.20%	20.15%	5.76%	3.91%
23		US Micro Caps	Russell MicroCap	8.58%	6.40%	22.50%	6.37%	4.11%
24		US Small & Mid Caps	Russell 2500	7.70%	6.10%	19.10%	5.49%	3.82%
25		US Mid Caps	Russell MidCap	7.02%	5.65%	17.60%	4.81%	3.38%
26		US Large Growth	Russell 1000 Growth	7.18%	5.75%	18.00%	4.97%	3.47%
27		US Large Value	Russell 1000 Value	6.68%	5.65%	15.15%	4.47%	3.38%
28		US Small Growth	Russell 2000 Growth	8.64%	6.30%	23.35%	6.43%	4.01%
29		US Small Value	Russell 2000 Value	7.66%	6.10%	18.85%	5.45%	3.82%
30		US Growth	Russell 3000 Growth	7.31%	5.85%	18.20%	5.10%	3.57%
31		US Value	Russell 3000 Value	6.79%	5.75%	15.25%	4.57%	3.47%
32		US MidCap Growth	Russell MidCap Growth	7.80%	5.70%	22.00%	5.59%	3.42%
33		US MidCap Value	Russell MidCap Value	6.83%	5.60%	16.65%	4.62%	3.33%
34		Global Equity	MSCI ACWI NR	7.59%	6.40%	16.45%	5.38%	4.11%
35		Non-US Equity	MSCI ACWI xUS NR	8.46%	7.00%	18.30%	6.25%	4.70%
36	7.50%	Foreign Developed Equity	MSCI EAFE NR	8.27%	6.85%	18.05%	6.06%	4.55%
37		Emerging Markets Equity	MSCI EM NR	10.44%	7.75%	25.30%	8.23%	5.43%
38		Non-US Small Cap	MSCI EAFE Small Cap NR	8.86%	7.25%	19.30%	6.65%	4.94%
39	5.00%	US REITs	FTSE NAREIT Equity REIT	7.26%	5.70%	18.85%	5.05%	3.42%
40		Global REITs	FTSE EPRA/NAREIT Developed	7.82%	6.20%	19.25%	5.61%	3.91%
41		Non-US REITs	FTSE EPRA/NAREIT Developed ex-US	8.40%	6.50%	20.95%	6.19%	4.21%
42		Private Real Estate Property *	NCREIF Property	6.15%	5.50%	12.00%	3.94%	3.23%
43		Timber *	NCREIF Timber	6.36%	5.60%	13.00%	4.15%	3.33%
44		Farmland *	NCREIF Farmland	6.86%	6.10%	13.00%	4.64%	3.82%
45		Infrastructure	S&P Global Infrastructure	7.11%	6.25%	13.85%	4.89%	3.96%
46		Private Equity **	Cambridge Private Equity	11.68%	8.00%	30.00%	9.47%	5.68%
47		Commodities	Bloomberg Commodity	5.17%	3.60%	18.70%	2.96%	1.37%
48	10.00%	Master Limited Partnerships	Alerian MLP	6.18%	5.00%	16.25%	3.97%	2.74%
49		Hedge FOF Diversified	HFRI FOF Diversified	4.22%	4.00%	6.95%	2.01%	1.76%
50		Hedge FOF Conservative	HFRI FOF Conservative	3.97%	3.85%	5.00%	1.75%	1.61%
51		Hedge FOF Strategic	HFRI FOF Strategic	5.19%	4.75%	9.85%	2.98%	2.50%
52		Hedge Funds - MultiStrategy	HFRI:Fund Wtd Composite	5.60%	5.30%	8.15%	3.39%	3.03%
53		Hedge Funds - Event-Driven	HFRI Event-Driven	5.80%	5.50%	8.15%	3.59%	3.23%
54		Hedge Funds - Equity Hedge	HFRI Equity Hedge	6.16%	5.65%	10.60%	3.95%	3.38%
55		Hedge Funds - Relative Value	HFRI Relative Value	4.40%	4.25%	5.60%	2.18%	2.01%
56		Hedge Funds - Macro	HFRI Macro	5.30%	5.00%	8.05%	3.08%	2.74%
57		Hedge Funds - Distressed	HFRI Distressed	5.62%	5.25%	8.95%	3.40%	2.98%
100.00%		Total Portfolio		5.87%	5.56%	8.32%	3.66%	3.28%

Percentiles of the Annualized Return Distribution:

95%	8.06%
75%	6.57%
50%	5.55%
25%	4.53%
5%	3.09%



Exhibit D1

Port of Houston Authority Retirement Plan

Active Decrements - Retirement Probabilities

Service	Near age	Actual Exposed	Actual Retirements	Expected Retirements	Actual q's	Expected q's	Ratio: Actual over Expected
<30	<55	-	-	-	0.00%	0.00%	
	55	-	-	-	0.00%	0.00%	
	56	2	-	0.20	0.00%	9.94%	
	57	1	-	0.15	0.00%	14.88%	
	58	5	-	0.74	0.00%	14.85%	
	59	5	1	0.99	20.00%	19.77%	1.012
	60	5	-	0.99	0.00%	19.77%	
	61	3	2	0.74	66.67%	24.71%	2.698
	62	47	4	11.63	8.51%	24.74%	0.344
	63	46	1	11.38	2.17%	24.74%	0.088
	64	40	1	9.89	2.50%	24.74%	0.101
	65	34	9	16.82	26.47%	49.46%	0.535
	66	24	8	11.87	33.33%	49.45%	0.674
	67	11	3	5.44	27.27%	49.43%	0.552
	68	8	2	3.95	25.00%	49.38%	0.506
	69	3	2	1.48	66.67%	49.40%	1.350
70+	10	2	10.00	20.00%	100.00%	0.200	
<Total>	244	35	86.27	14.34%	35.36%	0.406	

Service	Near age	Actual Exposed	Actual Retirements	Expected Retirements	Actual q's	Expected q's	Ratio: Actual over Expected
30+	<55	19	-	-	0.00%	0.00%	
	55	9	4	0.89	44.44%	9.92%	4.478
	56	6	-	0.60	0.00%	9.92%	
	57	9	-	1.34	0.00%	14.88%	
	58	11	-	1.64	0.00%	14.87%	
	59	12	1	2.38	8.33%	19.80%	0.421
	60	10	2	1.98	20.00%	19.79%	1.011
	61	7	1	1.73	14.29%	24.73%	0.578
	62	4	1	0.99	25.00%	24.74%	1.010
	63	4	1	0.99	25.00%	24.73%	1.011
	64	1	-	0.25	0.00%	24.73%	
	65	1	-	0.49	0.00%	49.44%	
	66	-	-	-	0.00%	0.00%	
	67	-	-	-	0.00%	0.00%	
	68	-	-	-	0.00%	0.00%	
	69	-	-	-	0.00%	0.00%	
	70+	-	-	-	0.00%	0.00%	
<Total>	93	10	13.27	10.75%	14.27%	0.754	

This work product was prepared solely for the Port of Houston Authority 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.

Exhibit D2

Port of Houston Authority Retirement Plan

Active Decrements - Termination Probabilities

Service	Exposed	Actual Terminations	Expected Terminations	Actual q's	Expected q's	Ratio: Actual over Expected
< 0	-	-	-	0.00%	0.00%	
0	-	-	-	0.00%	0.00%	
1	-	-	-	0.00%	0.00%	
2	21	4	1.06	19.05%	5.04%	3.776
3	47	-	2.21	0.00%	4.70%	
4	73	3	3.05	4.11%	4.18%	0.982
5	88	2	3.76	2.27%	4.27%	0.532
6	105	5	4.44	4.76%	4.23%	1.125
7	111	8	4.60	7.21%	4.15%	1.739
8	110	6	4.34	5.45%	3.94%	1.383
9	112	2	4.45	1.79%	3.97%	0.449
10	106	1	4.17	0.94%	3.93%	0.240
11	97	-	3.55	0.00%	3.66%	
12	78	2	2.87	2.56%	3.68%	0.697
13	66	1	2.36	1.52%	3.58%	0.423
14	52	1	1.90	1.92%	3.65%	0.527
15	51	2	1.69	3.92%	3.31%	1.184
16	51	2	1.68	3.92%	3.29%	1.191
17	52	1	1.69	1.92%	3.25%	0.592
18	47	-	1.52	0.00%	3.23%	
19	45	-	1.43	0.00%	3.19%	
20	47	-	1.49	0.00%	3.17%	
21	51	-	1.59	0.00%	3.11%	
22	41	-	1.22	0.00%	2.98%	
23	34	-	1.03	0.00%	3.02%	
24	39	2	1.25	5.13%	3.21%	1.598
25	30	1	0.98	3.33%	3.26%	1.021
26	23	1	0.69	4.35%	3.02%	1.441
27	17	1	0.54	5.88%	3.15%	1.868
28	13	-	0.41	0.00%	3.17%	
29	4	1	0.12	25.00%	3.11%	8.042
30+	-	-	-	0.00%	0.00%	
<Total>	1,611	46	60.10	2.86%	3.73%	0.765

Exhibit D3

Port of Houston Authority Retirement Plan
Active Decrements - Disability Probabilities (Male)

Near age	Exposed	Actual Disabilities	Expected Disabilities	Actual q's	Expected q's	Ratio: Actual over Expected
<25	-	-	-	0.00%	0.00%	
26	2	-	-	0.00%	0.11%	
27	3	-	-	0.00%	0.11%	
28	4	-	-	0.00%	0.11%	
29	9	-	0.01	0.00%	0.11%	
30	12	-	0.01	0.00%	0.11%	
31	16	-	0.02	0.00%	0.12%	
32	21	-	0.03	0.00%	0.12%	
33	25	-	0.03	0.00%	0.12%	
34	24	-	0.03	0.00%	0.13%	
35	26	-	0.03	0.00%	0.13%	
36	25	-	0.03	0.00%	0.13%	
37	21	-	0.03	0.00%	0.14%	
38	25	-	0.04	0.00%	0.14%	
39	27	-	0.04	0.00%	0.15%	
40	32	1	0.05	3.13%	0.16%	20.114
41	35	-	0.06	0.00%	0.17%	
42	41	-	0.08	0.00%	0.19%	
43	40	-	0.08	0.00%	0.21%	
44	46	-	0.10	0.00%	0.23%	
45	47	-	0.12	0.00%	0.25%	
46	46	-	0.13	0.00%	0.29%	
47	49	-	0.16	0.00%	0.33%	
48	54	-	0.20	0.00%	0.38%	
49	45	-	0.19	0.00%	0.42%	
50	51	-	0.24	0.00%	0.46%	
51	52	-	0.29	0.00%	0.55%	
52	50	-	0.32	0.00%	0.65%	
53	49	1	0.36	2.04%	0.74%	2.768
54	51	-	0.42	0.00%	0.83%	
55	45	-	0.41	0.00%	0.92%	
56	41	-	0.41	0.00%	1.01%	
57	43	-	0.47	0.00%	1.09%	
58	38	1	0.45	2.63%	1.17%	2.246
59	40	-	0.50	0.00%	1.26%	
60	47	1	0.63	2.13%	1.35%	1.580
61	43	1	0.56	2.33%	1.30%	1.789
62	40	-	0.44	0.00%	1.11%	
63	38	-	0.40	0.00%	1.06%	
64	28	1	0.28	3.57%	1.01%	3.543
65	21	-	0.17	0.00%	0.82%	
66	12	-	0.10	0.00%	0.82%	
67	6	-	0.05	0.00%	0.82%	
68	5	-	0.04	0.00%	0.82%	
69	2	-	0.02	0.00%	0.82%	
70+	5	-	-	0.00%	0.00%	
<Total>	1,382	6	8.06	0.43%	0.58%	0.744

This work product was prepared solely for the Port of Houston Authority 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.

Exhibit D4

Port of Houston Authority Retirement Plan
Active Decrements - Disability Probabilities (Female)

Near age	Exposed	Actual Disabilities	Expected Disabilities	Actual q's	Expected q's	Ratio: Actual over Expected
<30	-	-	-	0.00%	0.00%	0.00%
30	1	-	-	0.00%	0.00%	0.18%
31	3	-	0.01	0.00%	0.00%	0.19%
32	8	-	0.02	0.00%	0.00%	0.19%
33	9	-	0.02	0.00%	0.00%	0.20%
34	11	-	0.02	0.00%	0.00%	0.20%
35	11	-	0.02	0.00%	0.00%	0.20%
36	12	-	0.03	0.00%	0.00%	0.21%
37	8	-	0.02	0.00%	0.00%	0.22%
38	9	-	0.02	0.00%	0.00%	0.23%
39	13	-	0.03	0.00%	0.00%	0.24%
40	14	-	0.03	0.00%	0.00%	0.25%
41	17	-	0.05	0.00%	0.00%	0.28%
42	15	-	0.05	0.00%	0.00%	0.30%
43	18	-	0.06	0.00%	0.00%	0.33%
44	15	-	0.05	0.00%	0.00%	0.36%
45	17	-	0.06	0.00%	0.00%	0.38%
46	20	-	0.09	0.00%	0.00%	0.46%
47	21	-	0.11	0.00%	0.00%	0.53%
48	19	-	0.12	0.00%	0.00%	0.61%
49	21	-	0.14	0.00%	0.00%	0.68%
50	19	-	0.14	0.00%	0.00%	0.76%
51	19	-	0.17	0.00%	0.00%	0.89%
52	19	-	0.20	0.00%	0.00%	1.03%
53	16	-	0.19	0.00%	0.00%	1.16%
54	15	-	0.20	0.00%	0.00%	1.30%
55	19	-	0.27	0.00%	0.00%	1.41%
56	19	-	0.30	0.00%	0.00%	1.58%
57	21	-	0.36	0.00%	0.00%	1.73%
58	22	-	0.41	0.00%	0.00%	1.86%
59	25	-	0.50	0.00%	0.00%	1.99%
60	20	-	0.43	0.00%	0.00%	2.16%
61	14	-	0.29	0.00%	0.00%	2.10%
62	11	-	0.20	0.00%	0.00%	1.85%
63	12	-	0.22	0.00%	0.00%	1.80%
64	13	-	0.23	0.00%	0.00%	1.75%
65	14	-	0.20	0.00%	0.00%	1.46%
66	12	-	0.17	0.00%	0.00%	1.46%
67	5	-	0.07	0.00%	0.00%	1.46%
68	3	-	0.04	0.00%	0.00%	1.45%
69	1	-	0.01	0.00%	0.00%	1.46%
70+	5	-	-	0.00%	0.00%	0.00%
<Total>	566	-	5.56	0.00%	0.00%	0.98%

Exhibit D5

Port of Houston Authority Retirement Plan
Active Decrements - Mortality Probabilities (RP-2014, MP-2019)

Sex	Near age	Exposed	Actual Deaths	Expected Deaths	Actual q's	Expected q's	Ratio: Actual over Expected
Male	<20	-	-	-	0.0000%	0.0000%	
	20-24	-	-	-	0.0000%	0.0000%	
	25-29	18	-	0.01	0.0000%	0.0518%	
	30-34	98	-	0.06	0.0000%	0.0588%	
	35-39	124	-	0.09	0.0000%	0.0715%	
	40-44	194	1	0.17	0.5155%	0.0877%	5.881
	45-49	241	-	0.35	0.0000%	0.1438%	
	50-54	253	-	0.58	0.0000%	0.2279%	
	55-59	207	-	0.79	0.0000%	0.3797%	
	60-64	196	-	1.24	0.0000%	0.6326%	
	65+	51	-	0.34	0.0000%	0.6682%	
	<Total>	1,382	1	3.62	0.0724%	0.2616%	0.277

Sex	Near age	Exposed	Actual Deaths	Expected Deaths	Actual q's	Expected q's	Ratio: Actual over Expected
Female	<20	-	-	-	0.0000%	0.0000%	
	20-24	-	-	-	0.0000%	0.0000%	
	25-29	-	-	-	0.0000%	0.0000%	
	30-34	32	-	0.01	0.0000%	0.0261%	
	35-39	53	-	0.02	0.0000%	0.0369%	
	40-44	79	-	0.04	0.0000%	0.0548%	
	45-49	98	-	0.08	0.0000%	0.0839%	
	50-54	88	-	0.11	0.0000%	0.1296%	
	55-59	106	-	0.21	0.0000%	0.1958%	
	60-64	70	-	0.19	0.0000%	0.2720%	
	65+	40	-	0.12	0.0000%	0.2916%	
	<Total>	566	-	0.78	0.0000%	0.1382%	

Exhibit D6

Port of Houston Authority Retirement Plan
Inactive Mortality - Retired Members (RP-2014, MP-2019)

Sex	Near age	Exposed	Actual Deaths	Expected Deaths	Actual q's	Expected q's	Ratio: Actual over Expected
Male	<55	1	-	-	0.0000%	0.3834%	
	55-59	33	-	0.20	0.0000%	0.6041%	
	60-64	141	3	1.11	2.1277%	0.7900%	2.693
	65-69	336	9	4.23	2.6786%	1.2595%	2.127
	70-74	352	14	7.22	3.9773%	2.0511%	1.939
	75-79	305	13	10.18	4.2623%	3.3371%	1.277
	80-84	130	11	7.30	8.4615%	5.6177%	1.506
	85-89	76	8	7.33	10.5263%	9.6438%	1.092
	90-94	47	8	7.79	17.0213%	16.5805%	1.027
	95-99	15	3	3.67	20.0000%	24.4485%	0.818
	100+	-	-	-	0.0000%	0.0000%	
<Total>	1,436	69	49.04	4.8050%	3.4150%	1.407	

Sex	Near age	Exposed	Actual Deaths	Expected Deaths	Actual q's	Expected q's	Ratio: Actual over Expected
Female	<55	-	-	-	0.0000%	0.0000%	
	55-59	34	-	0.13	0.0000%	0.3791%	
	60-64	80	-	0.46	0.0000%	0.5727%	
	65-69	183	1	1.64	0.5464%	0.8953%	0.610
	70-74	123	2	1.74	1.6260%	1.4164%	1.148
	75-79	81	3	1.90	3.7037%	2.3417%	1.582
	80-84	42	1	1.71	2.3810%	4.0603%	0.586
	85-89	25	2	1.95	8.0000%	7.8083%	1.025
	90-94	14	4	1.91	28.5714%	13.6785%	2.089
	95-99	1	-	0.19	0.0000%	18.8560%	
	100+	-	-	-	0.0000%	0.0000%	
<Total>	583	13	11.63	2.2298%	1.9941%	1.118	

Exhibit D7

Port of Houston Authority Retirement Plan
Continuing Active Salary Growth - Total Salary Increases

Near age	Exposed	Prior Year Salaries	Actual Salaries	Expected Salaries	Actual Increase	Expected Increase	Ratio: Actual over Expected
<25	-	-	-	-	0.00%	0.00%	
26	1	57,970	59,708	62,143	103.00%	107.20%	0.961
27	3	199,076	209,094	213,211	105.03%	107.10%	0.981
28	4	283,769	293,089	303,633	103.28%	107.00%	0.965
29	9	585,043	612,902	625,411	104.76%	106.90%	0.980
30	13	889,801	926,667	950,308	104.14%	106.80%	0.975
31	16	1,139,507	1,195,338	1,213,575	104.90%	106.50%	0.985
32	29	1,961,500	2,136,493	2,083,113	108.92%	106.20%	1.026
33	34	2,466,840	2,597,404	2,612,383	105.29%	105.90%	0.994
34	33	2,490,445	2,599,669	2,627,419	104.39%	105.50%	0.989
35	36	2,589,446	2,732,423	2,724,098	105.52%	105.20%	1.003
36	36	2,615,189	2,789,384	2,745,949	106.66%	105.00%	1.016
37	29	1,970,739	2,056,476	2,065,335	104.35%	104.80%	0.996
38	30	1,901,321	1,984,973	1,988,782	104.40%	104.60%	0.998
39	40	2,423,912	2,545,168	2,530,564	105.00%	104.40%	1.006
40	44	2,782,838	2,893,178	2,899,717	103.97%	104.20%	0.998
41	50	3,223,582	3,331,489	3,362,196	103.35%	104.30%	0.991
42	53	3,470,171	3,572,602	3,619,388	102.95%	104.30%	0.987
43	56	3,781,856	3,979,670	3,948,258	105.23%	104.40%	1.008
44	59	4,042,431	4,192,770	4,220,298	103.72%	104.40%	0.993
45	63	4,204,843	4,366,631	4,394,061	103.85%	104.50%	0.994
46	63	4,239,017	4,384,676	4,429,772	103.44%	104.50%	0.990
47	68	4,773,263	4,976,571	4,988,060	104.26%	104.50%	0.998
48	71	4,992,024	5,178,716	5,216,665	103.74%	104.50%	0.993
49	66	4,731,808	4,876,671	4,944,740	103.06%	104.50%	0.986
50	70	5,483,757	5,709,179	5,730,526	104.11%	104.50%	0.996
51	67	5,539,828	5,701,594	5,778,041	102.92%	104.30%	0.987
52	68	5,464,819	5,637,240	5,688,877	103.16%	104.10%	0.991
53	63	5,421,390	5,668,792	5,632,824	104.56%	103.90%	1.006
54	66	5,842,571	6,089,315	6,058,746	104.22%	103.70%	1.005
55	57	5,001,955	5,216,575	5,187,028	104.29%	103.70%	1.006
56	59	5,181,697	5,356,272	5,373,420	103.37%	103.70%	0.997
57	62	5,565,744	5,817,363	5,771,677	104.52%	103.70%	1.008
58	59	5,150,706	5,290,281	5,341,282	102.71%	103.70%	0.990
59	60	4,815,842	5,018,323	4,994,028	104.20%	103.70%	1.005
60	64	4,819,636	4,981,481	4,997,963	103.36%	103.70%	0.997
61	51	4,121,314	4,235,316	4,265,560	102.77%	103.50%	0.993
62	46	3,635,657	3,781,856	3,755,634	104.02%	103.30%	1.007
63	48	4,135,090	4,256,545	4,263,278	102.94%	103.10%	0.998
64	39	3,369,268	3,462,963	3,466,977	102.78%	102.90%	0.999
65	26	2,512,054	2,583,072	2,579,879	102.83%	102.70%	1.001
66	16	1,394,665	1,452,336	1,429,531	104.14%	102.50%	1.016
67	8	599,816	615,421	614,811	102.60%	102.50%	1.001
68	6	494,475	503,935	506,837	101.91%	102.50%	0.994
69	1	174,480	181,895	178,842	104.25%	102.50%	1.017
70+	8	534,284	556,828	547,641	104.22%	102.50%	1.017
<Total>	1,850	141,075,443	146,608,344	146,932,483	103.92%	104.15%	0.998