
Government of Guam Retirement Fund

Actuarial Valuation as of September 30, 2018

Prepared by:

Richard A. Wright
FSA, MAAA

Milliman, Inc.
650 California Street
21st Floor
San Francisco, CA 94108
USA

Tel +1 415 403 1333
Fax +1 415 403 1334

milliman.com

April 4, 2019



650 California Street
21st Floor
San Francisco, CA 94108-2702
USA

Tel +1 415 403 1333
Fax +1 415 403 1334

milliman.com

April 4, 2019

Government of Guam Retirement Fund
424 Route 8
Maite, Guam 96910

**Government of Guam Retirement Fund –
Actuarial Valuation as of September 30, 2018**

As part of our engagement with the Board of Trustees, we performed an actuarial valuation of the Government of Guam Retirement Fund as of September 30, 2018. The purpose of this valuation is to determine the required contribution under the provisions of GCA Section 8137.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the Fund's staff. This information includes, but is not limited to, financial information, member census data, and plan provisions. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete the results may be different and the calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the Fund 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 affecting the Fund. The assumptions have been adopted by the Board of Trustees and are based on the 2011-2015 actuarial experience study.

This valuation report is only an estimate of the Fund's financial condition as of a single date. It can neither predict the Fund's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of Fund benefits, only the timing of Fund contributions. While the valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. Determining results using alternative assumptions is outside the scope of our engagement.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the Fund's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements. The Board of Trustees has the final decision regarding the appropriateness of the assumptions and actuarial cost methods.

Actuarial computations presented in this report are for the purposes of determining the recommended funding amounts for the Fund. The calculations in this report have been made on a basis consistent with our understanding of the Fund's funding requirements and goals. Determinations for other purposes may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

Milliman's work is prepared solely for the use and benefit of the Government of Guam Retirement Fund. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exception(s):

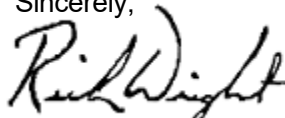
- (a) GGRF may provide a copy of Milliman's work, in its entirety, to its professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit GGRF.
- (b) GGRF may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs. 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, 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. The undersigned is a member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Sincerely,

A handwritten signature in black ink that reads "Richard A. Wright".

Richard A. Wright, FSA, MAAA
Principal and Consulting Actuary

RAW:jh
gua2018v_e (final)

TABLE OF CONTENTS

Section	Page
I VALUATION SUMMARY	
Introduction	1
Highlights	2
Results of Valuation	3
5-Year Historical Summary	4
Actuarial Assumptions	5
Funding Method	7
II FUND ASSETS	
Exhibit 1. Summary of DB Plan Assets	8
Exhibit 2. DB Plan Asset Allocation	9
Exhibit 3. Changes in DB Plan Assets	10
Exhibit 4. Actuarial Value of Assets	11
Exhibit 5. Historical Returns on DB Plan Assets	12
III MEMBERSHIP DATA	
Exhibit 6. Active Employees	13-14
Exhibit 7. Active Employees by Agency	15
Exhibit 8. Retired Employees	16-17
Exhibit 9. Terminated and Inactive Members	18
Exhibit 10. Reconciliation of Membership Data	19-20
IV VALUATION EXHIBITS	
Exhibit 11. Actuarial Accrued Liability	21-22
Exhibit 12. Calculation of Unfunded Actuarial Accrued Liability	23
Exhibit 13. Calculation of Actuarial Gain/Loss	24
Exhibit 14. Normal Cost	25
Exhibit 15. Amortization of Unfunded Actuarial Accrued Liability	26
Exhibit 16. Actuarially Determined Contribution	27
Exhibit 17. Projection of Contribution Rate	28-29
Exhibit 18. Projection of Security Ratio	30-31
V APPENDICES	
Appendix A. Summary of Pension Plan	32-36
Appendix B. Actuarial Cost Method and Assumptions	37-39
Appendix C. Summary of Participant Data	40-47
Appendix D. Glossary of Key Terms	48

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION I. VALUATION SUMMARY**INTRODUCTION**

Milliman, Inc. has been retained by the Government of Guam Retirement Fund to provide an actuarial valuation of the retirement fund. In our valuation we:

- Summarize the membership data.
- Calculate the actuarial accrued liability and normal cost.
- Determine the contribution requirements.
- Project the fund balance and security ratio forward 40 years.

This actuarial valuation as well as the prior year's actuarial valuation reflect the plan changes made by P.L. 33-186, which were effective January 1, 2018. P.L. 33-186 provides for the following:

1. Increases the contribution rates to the existing Defined Contribution Retirement System ("DC Plan") from 5.0% to 6.2% effective January 1, 2018.
2. Establishes a new Defined Benefit 1.75 Retirement System ("DB 1.75 Plan", formerly known as the "Hybrid Plan") and provides an opportunity for current employees in the DC Plan to transfer to the DB 1.75 Plan or the Government of Guam Retirement Security Plan (see item 3) effective January 1, 2018. The DB 1.75 Plan is closed to new employees on and after January 1, 2018.
3. Establishes a new cash balance retirement plan known as the Government of Guam Retirement Security Plan (GRSP) which will be the default retirement plan for new employees hired on and after January 1, 2018. Current employees in the DC Plan may transfer to the GRSP effective January 1, 2018.
4. Extends the period used to amortize the unfunded actuarial accrued liability (UAAL) of the Government of Guam Retirement Fund by two years from an end date of May 1, 2031 to an end date of May 1, 2033, effective January 1, 2018.
5. Provides that if the Government of Guam is authorized to extend Social Security coverage to government of Guam employees on a prospective basis, then all employees hired on or after the effective date shall be enrolled into Social Security and will not be eligible for the DB 1.75 Plan or the GRSP.

The results contained in this report represent our best estimates. However, it is likely that actual experience will vary from these estimates. To the extent that actual experience differs from the anticipated experience, actual plan costs will vary as well.

SECTION I. VALUATION SUMMARY

HIGHLIGHTS

- The required contribution under GCA Section 8137 is **26.28%** of payroll. Of this amount, 20.70% is for the unfunded actuarial accrued liability of the defined benefit plans (Old DB Plan and DB 1.75 Plan), 2.39% is for the normal cost of the DB plans, and 3.19% is for contributions and expenses for the defined contribution (DC) plan.

The primary reason for the decrease in the contribution rate was the net recognition of investment gains and losses over the last three years, and some actuarial gains due to demographic experience that differed from the actuarial assumptions. These decreases were partially offset by a lower than expected increase in total payroll.

Contribution rate from 9/30/17 actuarial valuation	26.56%
2015-16 investment gain (final 1/3 rd recognition) *	(0.23%)
2016-17 investment gain (second 1/3 rd recognition) *	(0.47%)
2017-18 investment loss (first 1/3 rd recognition) *	0.14%
Actual payroll increase for 2017-18 of 1.09% (vs. assumption of 2.75%)	0.32%
Other factors, including demographic changes	<u>(0.04%)</u>
Contribution rate in 9/30/18 actuarial valuation	26.28%

* Investment returns that differ from the actuarial assumption of 7% are recognized over a 3 year period.

- Public Law 28-150 provided that the current employer contribution rate would increase over a 5-year period starting in the 2006-07 fiscal year until it reached the actuarial contribution rate, which is the rate specified in the Fund's actuarial valuation report. The employer contribution rate for the 2018-19 fiscal year is 26.56%.
- The defined benefit (Old DB) payroll for the 2017-18 fiscal year was \$122.2 million compared with \$131.5 million for the 2016-17 fiscal year. The defined benefit (DB 1.75) payroll for the 2017-18 fiscal year was \$127.2 million for the 9 month period starting January 1, 2018 to the end of the fiscal year. The total defined benefit and defined contribution payroll for the 2017-18 fiscal year, was \$513.9 million compared with \$508.3 million for the 2016-17 fiscal year, an increase of 1.09%. The long term assumption is a 2.75% annual growth in total payroll. If total payroll had increased by 2.75%, the required contribution rate would have been 25.96%.
- Based on the audited financial statements, we calculated an investment return on the total market value of assets of 5.7% for the fiscal year ending September 30, 2018. The average annual return on the market value of assets for the last 5 fiscal years has been 7.5%. The investment return on the actuarial value of assets, which recognizes investment gains and losses over a 3 year period, was 9.0% for the fiscal year ending September 30, 2018.
- The unfunded actuarial accrued liability decreased from \$1.267 billion as of September 30, 2017, to \$1.176 billion as of September 30, 2018. The payment required to amortize the unfunded actuarial accrued liability under GCA Section 8137 has decreased from \$111.2 million to \$108.2 million. The payment as a percentage of payroll has decreased from 21.29% to 20.70%.

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION I. VALUATION SUMMARY

RESULTS OF VALUATION

	9/30/2018		9/30/2017		
Participant Counts					
Active Old DB	Non-Uniformed	1,697		1,859	
	Uniformed	<u>173</u>		<u>199</u>	
	Total	1,870		2,058	
Active DB 1.75 Participants		3,318		3,353	
Active DC Participants		<u>5,921</u>		<u>5,674</u>	
Total Active Participants (Old DB, DB 1.75, DC)		11,109		11,085	
Retired (Old DB)		7,247		7,279	
Retired (DB 1.75)		26		0	
Inactive and Terminated Members (Old DB)					
	Assumed to withdraw contributions	3,041		4,161	
	<u>Not</u> assumed to withdraw contributions	129		128	
Total DB Participants (Old DB and DB 1.75)		15,631		16,979	
		(\$millions)		(\$millions)	
Actual Payroll for Prior Fiscal Year					
Defined benefit (Old DB) payroll		\$122.2		\$131.5	
Defined benefit (DB 1.75) payroll		127.2		0.0	
Defined contribution (DC) payroll		<u>264.5</u>		<u>376.8</u>	
Total payroll (DB and DC)		\$513.9		\$508.3	
Expected Payroll for Next Fiscal Year					
Defined benefit (Old DB) payroll		\$116.3		\$126.7	
Defined benefit (DB 1.75) payroll		171.7		171.5	
Defined contribution (DC) payroll		<u>234.9</u>		<u>224.1</u>	
Total payroll (DB and DC)		\$522.9		\$522.3	
Financial Status					
Actuarial accrued liability		\$3,197.1		\$3,183.2	
Actuarial value of assets		<u>2,021.9</u>		<u>1,916.4</u>	
Unfunded actuarial accrued liability (UAAL)		\$1,175.2		\$1,266.8	
Security ratio		63.24%		60.20%	
		% of DB Payroll		% of DB Payroll	
Normal Cost					
Total normal cost ¹		\$ 39.9	13.86%	\$ 40.4	13.54%
Estimated employee contributions		<u>(27.4)</u>	<u>(9.52%)</u>	<u>(28.4)</u>	<u>(9.52%)</u>
Government normal cost		\$ 12.5	4.34%	\$ 12.0	4.02%
		% of Total Payroll		% of Total Payroll	
Required Contribution per GCA §8137					
Unfunded actuarial accrued liability cost		\$ 108.2	20.70%	\$ 111.2	21.29%
Government DB normal cost		12.5	2.39%	12.0	2.29%
Expected government DC contributions ¹		<u>16.7</u>	<u>3.19%</u>	<u>15.5</u>	<u>2.98%</u>
Total DB and DC contribution		\$ 137.4	26.28%	\$ 138.7	26.56%

¹ Includes budgeted administrative expenses.

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION I. VALUATION SUMMARY

5-YEAR HISTORICAL SUMMARY

The following table summarizes the principal valuation results over the last 5 years.

	9/30/2018	9/30/2017	9/30/2016	9/30/2015	9/30/2014
Participant Counts					
Active (Old DB)	1,870	2,058	2,208	2,460	2,692
Active (DB 1.75)	3,318	3,353	n/a	n/a	n/a
Retired (Old DB)	7,247	7,279	7,298	7,197	7,226
Retired (DB 1.75)	26	n/a	n/a	n/a	n/a
Inactives (Old DB)	3,162	4,289	4,463	4,701	4,941
Inactives (DB 1.75)	<u>8</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
Total (DB)	15,631	16,979	13,969	14,358	14,859
Active (DC)	5,921	5,674	8,858	8,697	8,181
Actual Payroll					
DB payroll (Old DB)	\$122.2	\$131.5	\$141.3	\$155.5	\$169.9
DB payroll (DB 1.75)	127.2	n/a	n/a	n/a	n/a
DC payroll	<u>264.5</u>	<u>376.8</u>	<u>365.1</u>	<u>355.9</u>	<u>335.0</u>
Total payroll	\$513.9	\$508.3	\$506.3	\$511.4	\$504.9
Financial Status					
Accrued liability	\$3,197.1	\$3,183.2	\$2,904.9	\$2,927.7	\$2,931.7
Actuarial assets	<u>2,021.9</u>	<u>1,916.4</u>	<u>1,655.6</u>	<u>1,629.4</u>	<u>1,562.5</u>
UAAL	\$1,175.2	\$1,266.8	\$1,249.3	\$1,298.3	\$1,369.2
Security ratio	63.24%	60.20%	56.99%	55.66%	53.30%
Contribution Rate					
DB Normal Cost (as % of DB payroll)	4.34%	4.02%	6.42%	6.71%	6.32%
% of Total Payroll					
UAAL Rate	20.70%	21.29%	22.12%	21.60%	22.42%
DB Normal Cost	2.39%	2.29%	1.60%	1.87%	1.94%
DC Contribution	<u>3.19%</u>	<u>2.98%</u>	<u>4.11%</u>	<u>3.94%</u>	<u>3.80%</u>
Actuarial Rate ¹	26.28%	26.56%	27.83 %	27.41%	28.16%
Budget Rate ²	**	26.56%	27.83 %	27.41%	28.16%
Investment Yield (Market Value)	5.7%	12.0%	9.5%	0.6%	10.0%

¹ "Actuarial Rate" is the contribution rate determined in the actuarial valuation. Contribution rates apply to the fiscal year beginning one year after the valuation date.

² "Budget Rate" is the contribution rate set by the legislature. The budget rate for 2019-20 has not yet been determined.

SECTION I. VALUATION SUMMARY

ACTUARIAL ASSUMPTIONS

The following are the major assumptions used in the actuarial valuation. The assumptions are based upon the actuarial experience study for the period October 1, 2011, through September 30, 2015. The rationale for each significant assumption is provided in that experience study and in the discussion below. To the extent that actual experience differs from the assumptions below, future pension costs will differ.

Interest Rate: The interest rate used to discount future benefit payments to the present was 7.0% as of September 30, 2018. This assumption is unchanged from the prior valuation. Milliman's expected returns on various asset classes over the next 30 years are shown below, assuming inflation averages 2.75% over the next 30 years. The target asset allocation is the expected long-term asset allocation and is based on the Fund's investment policy.

Asset Class	(a) Target Asset Allocation	(b) Expected Nominal Return	(a) x (b) Component Return
U.S. Equities (large cap)	29.0%	7.47%	2.17%
U.S. Equities (small cap)	7.0%	8.73%	0.61%
Non-U.S. Equities	16.5%	9.27%	1.53%
Non-U.S. Equities (emerging markets)	2.0%	11.09%	0.22%
U.S. Fixed Income (aggregate)	21.5%	4.67%	1.00%
Risk Parity	8.0%	6.50%	0.52%
High Yield Bonds	8.0%	6.59%	0.53%
Global Real Estate (REITs)	5.0%	8.60%	0.43%
Master Limited Partnerships	3.0%	6.56%	0.20%
Expected average return for one year			7.21%
Expected geometric mean (30 years)			6.69%

The discount rate assumption of 7.0% is expected to be between the arithmetic and geometric returns over 30 years. Note that if investments fail to achieve the assumed interest rate, future pension costs will increase.

Mortality. The mortality table used as of September 30, 2018, is the RP-2000 combined mortality table, set forward by 3 years for males and 2 years for females. The mortality table used for disabled lives is the RP-2000 disability mortality table, set forward by 6 years for males and 4 years for females. Mortality improvement is assumed to be 30% of Scale BB, projected generationally from 2016. This is the same table used for the prior actuarial valuation.

Salary Increases. Salaries are assumed to increase 7.5% per year for employees in their first 5 years of service, 6.0% for service between 6 and 10 years, 5.0% for service between 11 and 15 years, and 4.0% for service after 15 years. These are the same rates used in the prior actuarial valuation.

Total Payroll Growth. The total payroll for defined benefit and defined contribution members is assumed to increase 1.75% for FY 2019 and then increase 2.75% per year thereafter.

SECTION I. VALUATION SUMMARY

Retirement Age. We have assumed 50% of employees will retire when first eligible for unreduced retirement. Thereafter, 20% of employees will retire at each year until age 75, at which time all remaining employees are assumed to retire. This is the same assumption used in the prior actuarial valuation.

Return of Contributions. We have assumed that any current Old DB Plan employees who terminate employment prior to retirement and who have less than 20 years of service will elect a return of contributions in lieu of a deferred benefit. Old DB Plan employees with at least 20 years of service who terminate employment are assumed to retire upon eligibility for unreduced benefits. Old DB Plan employees with between 20 and 24 years of service who terminate employment and are ineligible for the service retirement benefit and DB 1.75 Plan employees who terminate employment with less than 25 years of service are assumed to retire at age 60 with an unreduced benefit with no survivor benefits.

Current terminated or inactive members with at least 5 years of service and a contributions balance that exceeds \$10,000 who have not withdrawn their contributions and for whom sufficient earnings data are available to value their retirement benefits are assumed to retire upon eligibility for unreduced benefits. All other terminated and inactive members are assumed to elect to withdraw their contributions. These assumptions are unchanged from the prior actuarial valuation.

Administrative Expenses. Total administrative expenses are assumed to be \$6,860,000, which is the amount budgeted for the year ending September 30, 2019. Of this amount, \$4,733,400 is allocated to the defined benefit plan and \$2,126,600 to the defined contribution plan. In addition, we have assumed that expenses related to the DB 1.75 Plan will be 5% of the normal cost of that plan.

Rates of Withdrawal. The assumed rates of withdrawal are shown in Appendix B. The withdrawal rates are unchanged from the prior actuarial valuation.

Rates of Disability. The assumed rates of disability are shown in Appendix B. These rates are based on the 1974-78 Society of Actuaries Long Term Disability Non-Jumbo table, with rates reduced by 50% for males and 75% for females. The disability rates are unchanged from the prior actuarial valuation.

Probability of Marriage. We have assumed that 75% of retirees will be married at retirement. This assumption is unchanged from the prior actuarial valuation.

Leave Adjustments. We have assumed that unused leave increases a member's service by 1.5 years. For Old DB Plan members, we have assumed that unused leave increases average earnings by 5% at retirement. These assumptions are unchanged from the prior actuarial valuation.

Survivor Benefit – Minor Children. We have assumed there to be an average of 0.2 eligible child survivors at the time of a retiree's death, with payments to the child survivor continuing for 6 years. These assumptions are unchanged from the prior actuarial valuation.

SECTION I. VALUATION SUMMARY

Asset Valuation Method. Investment gains/losses relative to the assumed investment return are phased in over a period of 3 years. Certain receivables and liabilities whose payments are deducted from employer contributions to the Fund are excluded from the actuarial value of assets. This valuation method is unchanged from the prior valuation.

A complete summary of actuarial assumptions is in Appendix B.

FUNDING METHOD

GCA Section 8137 required a contribution sufficient to fully fund the unfunded actuarial accrued liability by 2031 (within 80 years from May 1, 1951). P.L. 33-186 extended this period by 2 years to 2033. The required contribution shown in this report includes a payment for the normal cost of active members of the Fund, and amortizes the unfunded actuarial accrued liability over the remaining 14.58 years as a level percentage of total payroll (including both defined benefit and defined contribution members).

Exhibits 17 and 18 project the employer and employee contributions, fund balance, actuarial accrued liability and security ratio forward 40 years based upon the current funding method.

SECTION II. FUND ASSETS

EXHIBIT 1. SUMMARY OF DB PLAN ASSETS

Listed below are the assets reported for the defined benefit (DB) pension plan in the Fund's financial statements, excluding certain receivables and liabilities whose payments are deducted from employer contributions to the Fund.

	9/30/2018	9/30/2017
Investments		
Common stocks	\$ 1,363,025,724	\$ 1,110,502,896
U.S. government securities	207,209,221	232,829,593
Corporate bonds and notes	341,684,213	303,153,981
Money market funds	26,130,425	23,864,447
Mutual funds	<u>73,297,212</u>	<u>76,530,912</u>
Total investments	2,011,346,795	1,746,881,829
Receivables		
Employer contributions, net	4,777,413	2,192,359
Employer contributions, unfunded liability	2,831,437	4,401,290
Member contributions	1,699,660	851,023
Interest and penalties on contributions	202,039	293,978
Supplemental/insurance benefits advanced	1,996,097	2,000,350
Notes receivable ERIP	0	0
Notes receivable for service credits	3,185,369	481,712
Accrued investment income	5,882,874	4,664,261
Other receivables	626,228	637,754
Due from brokers for unsettled trades	4,096,366	2,693,741
Due from DC plan	<u>726,713</u>	<u>778,118</u>
Total receivables	26,024,196	18,994,586
Cash and cash equivalents	4,803,854	2,865,211
Prepaid expenses	6,415	12,116
Property and equipment	<u>651,708</u>	<u>728,973</u>
Total assets	\$ 2,042,832,968	\$ 1,769,482,715
Liabilities		
Accounts payable and accrued expenses	\$ 3,579,149	\$ 2,856,690
Due to brokers for unsettled trades	<u>6,908,827</u>	<u>7,436,345</u>
Total liabilities	\$ 10,487,976	\$ 10,293,035
Valuation Assets	<u>\$ 2,032,344,992</u>	<u>\$ 1,759,189,680</u>
Excluded Assets ¹		
Supplemental/COLA benefits receivable	\$ 20,456,178	\$ 26,450,176
Deferred revenue for service credits	<u>(3,444,429)</u>	<u>(660,577)</u>
Total excluded assets	\$ 17,011,749	\$ 25,789,599

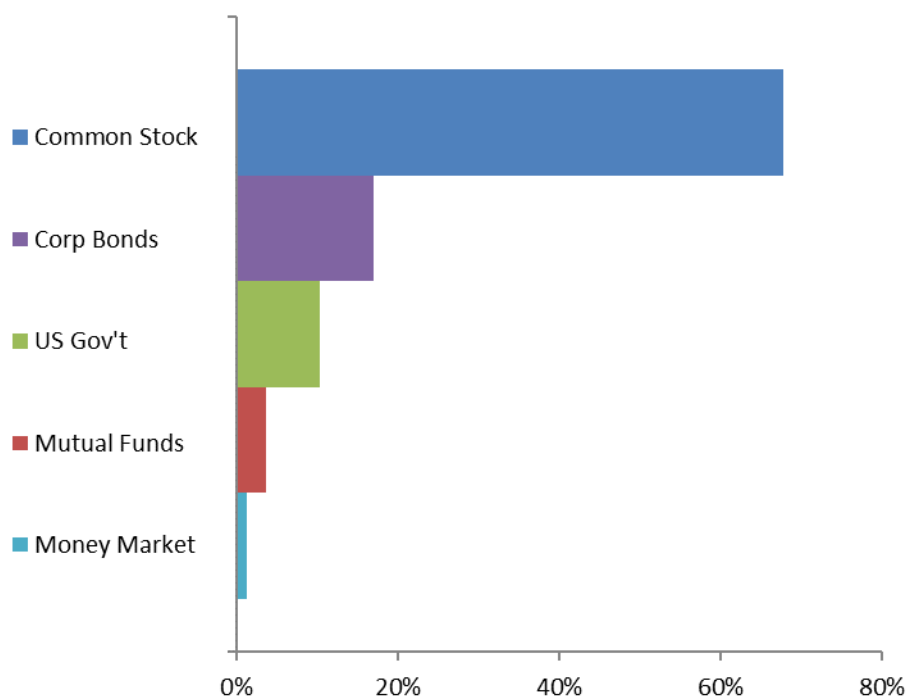
¹ Excluded because payments towards these receivables are deducted from employer contributions.

SECTION II. FUND ASSETS

EXHIBIT 2. DB PLAN ASSET ALLOCATION

The allocation of assets among various investment classes is an important determinant of expected future investment returns.

DB ASSET ALLOCATION		
	9/30/2018	9/30/2017
Common stocks	67.8%	63.5%
Corporate bonds and notes	17.0%	17.4%
U.S. government securities	10.3%	13.3%
Mutual funds	3.6%	4.4%
Money market funds	<u>1.3%</u>	<u>1.4%</u>
Total	100.0%	100.0%



This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION II. FUND ASSETS

EXHIBIT 3. CHANGES IN DB PLAN ASSETS

Assets increase or decrease each year due to employer contributions, investment income, benefit payments to retiring participants, plan expenses paid by the trust fund, and any realized and unrealized gains and losses from investments.

	FISCAL YEAR ENDING	
	9/30/2018	9/30/2017
Beginning Balance	\$ 1,759,189,680	\$ 1,647,181,257
Contributions		
Employer contributions	127,072,864	119,211,434
Member contributions	28,895,275	13,476,517
Decrease/(increase) in excluded assets	<u>8,777,850</u>	<u>6,063,292</u>
Total contributions	164,745,989	138,751,243
Investment Income		
Net appreciation in fair value	70,558,548	161,667,955
Interest	24,644,319	22,858,704
Dividends	14,442,841	12,862,678
Other investment income	410,460	283,806
Investment expenses	<u>(5,574,493)</u>	<u>(4,907,570)</u>
Total investment income	104,481,675	192,765,573
Benefit Payments		
Age and service annuities	184,232,873	179,682,483
Disability annuities	5,348,959	5,625,697
Survivor annuities	29,461,972	28,437,070
Refunds to separated employees	1,793,906	1,113,513
Interest on refunded contributions	516,037	831,859
Balances transferred to DC plan	<u>0</u>	<u>0</u>
Total benefit payments	221,353,747	215,690,622
Administrative Expenses	3,794,742	3,817,771
Transfer from DC (for DB 1.75 Plan)	229,076,137	n/a
Ending Balance	\$ 2,032,344,992	\$ 1,759,189,680

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION II. FUND ASSETS

EXHIBIT 4. ACTUARIAL VALUE OF ASSETS

The actuarial value of assets is equal to the market value of DB plan assets adjusted to phase in gains and losses relative to the assumed rate of return over a 3-year period, and to exclude certain receivables and liabilities whose payments are deducted from employer contributions to the Fund.

	9/30/2018	9/30/2017
Valuation assets at market value	\$ 2,032,344,992	\$ 1,759,189,680
(Gains)/Losses excluded from actuarial value (see below)	<u>(10,436,973)</u>	<u>(66,321,803)</u>
Actuarial value of assets	\$ 2,021,908,019	\$ 1,692,867,877
Actuarial value as % of market value	99.5%	96.2%

3-Year Phase-in of Gains and (Losses)

Year	Expected Return ¹	Actual Return	Gain/(Loss)	Percent Excluded	Excluded From Market Value
2017/2018	\$128,947,007	\$104,481,675	\$ (24,465,332)	66.67%	\$ (16,310,221)
2016/2017	112,523,992	192,765,573	80,241,581	33.33%	26,747,194
2015/2016	107,752,783	146,235,031	38,482,248	0.00%	<u>0</u>
Total					\$ 10,436,973

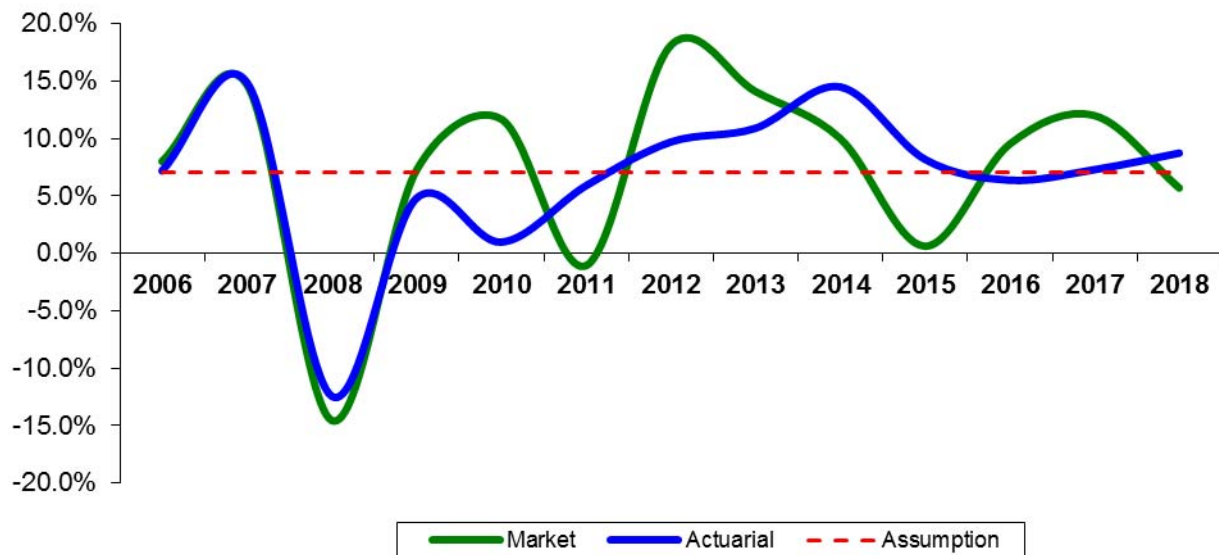
¹ Expected return is based on the assumed investment return, which is 7.0%.

SECTION II. FUND ASSETS

EXHIBIT 5. HISTORICAL RETURNS ON DB PLAN ASSETS

The following table shows the historical return on DB plan assets over the last 15 years. The assumed actuarial valuation rate is 7.0%.

Fiscal Year Ending 9/30	Return on Market Value	Return on Actuarial Value
2018	5.7%	9.0%
2017	12.0%	7.3%
2016	9.5%	6.4%
2015	0.6%	8.2%
2014	10.0%	14.5%
2013	14.1%	10.9%
2012	18.1%	9.7%
2011	(1.1)%	5.9%
2010	11.7%	1.0%
2009	7.2%	4.8%
2008	(14.6)%	(12.4)%
2007	14.7%	14.9%
2006	8.0%	7.2%
2005	9.7%	10.7%
2004	9.3%	10.4%
Average of last 5 years	7.5%	9.0%
Average of last 10 years	8.6%	7.7%
Average of last 15 years	7.4%	7.0%



This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION III. MEMBERSHIP DATA

EXHIBIT 6a. ACTIVE EMPLOYEES (Old DB Plan)

	9/30/2018	9/30/2017
Reconciliation of Old DB Census		
Members reported in raw data	5,046	6,416
Number excluded due to:		
Reported as inactive	2,939	4,053
Reported as terminated	211	222
Zero earnings	12	4
Refund of contributions	0	0
Duplicate inactive records	0	66
Included as retirees or deceased	<u>14</u>	<u>13</u>
Total exclusions	3,176	4,358
Active employees (Old DB Plan) in valuation	1,870	2,058
Active Employees – Non-Uniformed		
Number vested	1,677	1,834
Number not vested	<u>20</u>	<u>25</u>
Total	1,697	1,859
Average age	55.1	54.5
Average service	26.9	26.2
Average earnings	\$ 61,419	\$ 60,187
Average accumulated contributions	\$ 178,336	\$ 166,398
Active Employees – Uniformed		
Number vested	172	199
Number not vested	<u>1</u>	<u>0</u>
Total	173	199
Average age	51.6	50.9
Average service	27.7	27.2
Average earnings	\$ 98,105	\$ 95,272
Average accumulated contributions	\$ 234,524	\$ 225,401
Active Employees – Total Old DB Plan		
Number vested	1,849	2,023
Number not vested	<u>21</u>	<u>25</u>
Total	1,870	2,058
Average age	54.8	54.1
Average service	27.0	26.3
Average earnings	\$ 64,813	\$ 63,580
Average accumulated contributions	\$ 183,534	\$ 172,103

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION III. MEMBERSHIP DATA

EXHIBIT 6b. ACTIVE EMPLOYEES (DB 1.75 Plan)

	9/30/2018	9/30/2017
Reconciliation of DB 1.75 Census		
Members reported in raw data	3,329	3,353
Number excluded due to:		
Reported as inactive	8	0
Reported as terminated	0	0
Zero earnings	0	0
Refund of contributions	0	0
Duplicate inactive records	0	0
Included as retirees or deceased	<u>3</u>	<u>0</u>
Total exclusions	11	0
Active employees in valuation	3,318	3,353
Active Employees – DB 1.75 Plan		
Number vested	2,315	2,201
Number not vested	<u>1,003</u>	<u>1,152</u>
Total	3,318	3,353
Average age	44.6	43.8
Average service	11.3	10.4
Average earnings	\$ 52,709	\$ 52,121
Average accumulated contributions	\$ 37,837	\$ 32,932
Active Employees – Total Old DB and DB 1.75		
Number vested	4,164	4,234
Number not vested	<u>1,024</u>	<u>1,177</u>
Total	5,188	5,411
Average age	48.3	47.7
Average service	16.9	16.4
Average earnings	\$ 57,071	\$ 56,479
Average accumulated contributions	\$ 90,353	\$ 85,864

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION III. MEMBERSHIP DATA

EXHIBIT 7. ACTIVE EMPLOYEES BY AGENCY

	9/30/18 DC	9/30/18 DB 1.75	9/30/18 Old DB	9/30/17 DC Less DB 1.75	1/1/18 DB 1.75	9/30/17 Old DB
Bureau of Budget & Management Research	2	12	5	1	12	5
Bureau of Statistics and Plans	15	9	9	17	10	8
Chief Medical Examiner	3	0	0	3	0	0
Customs & Quarantine	62	30	29	63	30	34
Dept of Administration ¹	50	60	41	43	64	45
Dept of Agriculture	40	17	22	42	17	23
Dept of Corrections	84	98	21	100	103	26
Dept of Labor ²	34	22	11	34	23	16
Dept of Land Management	21	7	26	24	7	27
Dept of Law	101	75	31	104	75	33
Dept of Mental Health & Substance Abuse	124	53	27	115	54	29
Dept of Military Affairs	22	13	6	12	15	6
Dept of Parks and Recreation	23	16	11	18	17	13
Dept of Public Health & Social Services	200	145	76	173	149	86
Dept of Public Works	170	75	83	165	74	94
Dept of Revenue and Taxation	85	56	34	79	55	40
Dept of Youth Affairs	36	29	15	33	29	15
D.I.S.I.D.	9	5	3	9	5	3
Governor's Office	92	16	4	94	16	3
Guam Energy Office	4	1	1	2	0	1
Guam Environmental Protection Agency	18	26	8	18	26	8
Guam Fire Dept	49	150	65	18	144	80
Guam Legislature	18	21	5	22	21	6
Guam Police Dept	140	136	61	132	143	69
Judiciary Of Guam	213	136	64	208	134	73
KGTF	2	1	4	2	1	5
Lt. Governor's Office	15	1	1	17	1	0
Mayor's Council	257	23	14	190	23	13
Public Auditors	11	7	0	10	7	0
Public Defender	33	16	12	34	17	13
General Fund Total	1,933	1,256	689	1,782	1,272	774
Dept of Chamorro Affairs ³	27	4	6	30	4	9
Dept of Education	2,135	908	611	2,243	911	665
Government of Guam Retirement Fund	15	20	12	12	20	14
Guam Airport Authority	90	95	60	74	99	63
Guam Community College	104	100	45	97	101	50
Guam Economic Development Agency	14	10	5	15	11	6
Guam Housing & Urban Renewal Agency	36	42	18	33	44	18
Guam Housing Corporation	10	11	4	6	12	6
Guam Memorial Hospital Authority	629	238	111	639	243	118
Guam Power Authority	165	194	109	166	191	116
Guam Visitors Bureau	14	20	4	13	19	4
Guam Waterworks Authority	218	110	29	179	111	34
Port Authority Of Guam	157	138	57	148	141	63
University Of Guam	374	172	110	237	174	118
Others Total	3,988	2,062	1,181	3,892	2,081	1,284
GRAND TOTAL	5,921	3,318	1,870	5,674	3,353	2,058

¹ Department of Administration includes Civil Service Commission and Guam Election

² Department of Labor includes AHRD

³ Department of Chamorro Affairs' includes Guam CAHA, Guam Public Library, and Chamorro Land Trust

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION III. MEMBERSHIP DATA

EXHIBIT 8a. RETIRED EMPLOYEES (Old DB Plan)

	9/30/2018	9/30/2017
Service Retirees		
Count	5,186	5,197
Average age	70.1	69.8
Average benefit	\$35,813	\$34,978
Median benefit	\$32,293	\$31,626
Disabled Retirees		
Count	231	242
Average age	68.8	68.1
Average benefit	\$22,912	\$22,840
Median benefit	\$21,187	\$20,734
Survivors		
Count	1,678	1,670
Average age	72.1	72.0
Average benefit	\$17,423	\$17,064
Median benefit	\$15,179	\$14,729
Child Pensioners		
Count	152	170
Average age	16.2	15.6
Average benefit	\$2,880	\$2,880
Median benefit	\$2,880	\$2,880
Total Retirees and Survivors		
Count	7,095	7,279
Average age ¹	70.5	70.2
Average benefit ¹	\$31,043	\$30,357
Median benefit ¹	\$27,338	\$26,733

¹ Excludes child pensioners.

SECTION III. MEMBERSHIP DATA

EXHIBIT 8b. RETIRED EMPLOYEES (DB 1.75 Plan)

	9/30/2018	9/30/2017
Service Retirees		
Count	26	n/a
Average age	64.1	n/a
Average benefit	\$17,499	n/a
Median benefit	\$17,177	n/a
Disabled Retirees		
Count	n/a	n/a
Average age	n/a	n/a
Average benefit	n/a	n/a
Median benefit	n/a	n/a
Survivors		
Count	n/a	n/a
Average age	n/a	n/a
Average benefit	n/a	n/a
Median benefit	n/a	n/a
Child Pensioners		
Count	n/a	n/a
Average age	n/a	n/a
Average benefit	n/a	n/a
Median benefit	n/a	n/a
Total Retirees and Survivors		
Count	26	n/a
Average age ¹	64.1	n/a
Average benefit ¹	\$17,499	n/a
Median benefit ¹	\$17,177	n/a

¹ Excludes child pensioners.

SECTION III. MEMBERSHIP DATA

EXHIBIT 9. TERMINATED AND INACTIVE MEMBERS (DB)

	9/30/2018	9/30/2017
Reported as Inactive		
Count	2,933	4,053
Accumulated contributions	\$ 9,450,438	\$ 10,611,768
Reported as Terminated		
Count	211	222
Accumulated contributions	\$ 534,596	\$ 536,563
Zero Earnings		
Count	26	14
Accumulated contributions	\$ 2,034,073	\$ 1,240,002
Refund of Contributions		
Count	0	0
Accumulated contributions	\$ 0	\$ 0
Total Terminateds and Inactives		
Count	3,170	4,289
Accumulated contributions	\$ 12,019,107	\$ 12,388,333
Assumed to Withdraw Contributions		
Count	3,041	4,161
Accumulated contributions	\$ 2,246,142	\$ 3,294,346
Not Assumed to Withdraw Contributions		
Count	129	128
Average age	56.4	55.4
Average benefit	\$ 14,460	\$ 13,897
Accumulated contributions	\$ 9,772,965	\$ 9,093,987

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION III. MEMBERSHIP DATA

EXHIBIT 10a. RECONCILIATION OF MEMBERSHIP DATA (Old DB Plan)

	Act	Assumed to Withdraw Contributions				No With'd	Ret	Surv	Disab	Child	Total
		Inact	Term	Zero	Refund						
9/30/2017	2,058	3,935	222	4	0	128	5,197	1,670	242	170	13,626
Additions from:											
Actives				4		9	172	4	3		192
Inactives	6			3			6	11			26
Terminations							1				1
Zero earnings	1										1
Refunds											
Inactives no w/d	2			2			2				6
Retiree								1			1
Survivor											
Disability								1			1
Child											
Other adds ¹	1						20	78		22	121
Subtotal	10	0	0	9	0	9	201	95	3	22	349
Subtractions due to:											
Actives		-6		-1		-2					-9
Inactives											
Terminations											
Zero earnings	-4	-3				-2					-9
Refunds											
Inactives no w/d	-9										-9
Retiree	-172	-6	-1			-2					-181
Survivor	-4	-11					-1		-1		-17
Disability	-3										-3
Child											0
Other drops ²	-6	-1,099	-10			-2	-211	-87	-13	-40	-1,468
Subtotal	-198	-1,125	-11	-1	0	-8	-212	-87	-14	-40	-1,696
9/30/2018	1,870	2,810	211	12	0	129	5,186	1,678	231	152	12,279

¹ Other additions indicate members or beneficiaries who were reported this year but who were not included in the prior year's valuation (e.g. a new beneficiary, etc.).

² Other drops indicate members or beneficiaries who were in the prior year's valuation but who were not reported in this year's census data (e.g. members who received a complete refund, retirees or beneficiaries who are now deceased, children who have reached the maximum age, etc.).

SECTION III. MEMBERSHIP DATA

EXHIBIT 10b. RECONCILIATION OF MEMBERSHIP DATA (DB 1.75 Plan)

	Act	Assumed to Withdraw Contributions				No With'd	Ret	Surv	Disab	Child	Total
		Inact	Term	Zero	Refund						
9/30/2017	3,353	0	0	0	0	0	0	0	0	0	3,353
Additions from:											
Actives		3					24				27
Inactives											
Terminations											
Zero earnings											
Refunds											
Inactives no w/d											
Retiree											
Survivor											
Disability											
Child											
Other adds ¹	30	5					2				37
Subtotal	30	8	0	0	0	0	26	0	0	0	64
Subtractions due to:											
Actives											
Inactives	-3										-3
Terminations											
Zero earnings											
Refunds											
Inactives no w/d											
Retiree	-24										-24
Survivor											
Disability											
Child											
Other drops ²	-38										-38
Subtotal	-65	0	0	0	0	0	0	0	0	0	-65
9/30/2018	3,318	8	0	0	0	0	26	0	0	0	3,352

¹ Other additions indicate members or beneficiaries who were reported this year but who were not included in the prior year's valuation (e.g. a new beneficiary, etc.).
² Other drops indicate members or beneficiaries who were in the prior year's valuation but who were not reported in this year's census data (e.g. members who received a complete refund, retirees or beneficiaries who are now deceased, children who have reached the maximum age, etc.).

SECTION IV. VALUATION EXHIBITS

EXHIBIT 11a. ACTUARIAL ACCRUED LIABILITY (Old DB Plan)

The actuarial accrued liability has been calculated using the Entry Age Normal actuarial cost method, and is equal to the present value of benefits for all Old DB Plan members less the present value of future normal costs for active Old DB Plan employees.

	Old DB Plan 9/30/2018	Old DB Plan 9/30/2017
Present Value of Benefits		
Active employees –		
Retirement	\$ 805,543,094	\$ 852,448,699
Disability	11,233,551	12,920,482
Death	14,209,438	15,636,841
Withdrawal	<u>22,554,220</u>	<u>27,807,424</u>
Total active PVB	853,540,303	908,813,446
Retirees and Survivors		
Retirees	1,803,108,871	1,770,345,913
Disabled retirees	43,934,606	46,694,397
Survivors	<u>255,442,526</u>	<u>250,172,724</u>
Total retirees and survivors	2,102,486,003	2,067,213,034
Terminated and inactive members		
Assumed to retire	15,737,970	14,432,835
Assumed to elect return of contributions	<u>2,246,142</u>	<u>3,294,346</u>
Total terminated and inactive members	17,984,112	17,727,181
Total PVB	\$ 2,974,010,418	\$ 2,993,753,661
Present Value of Future Normal Cost		
Active employees –		
Retirement	\$ 58,502,274	\$ 65,415,106
Disability	3,663,064	4,153,300
Death	3,396,358	3,843,584
Withdrawal	<u>12,641,955</u>	<u>14,311,397</u>
Total active PVFNC	\$ 78,203,651	\$ 87,723,387
Actuarial Accrued Liability		
Active members	\$ 775,336,652	\$ 821,090,059
Retirees and survivors	2,102,486,003	2,067,213,034
Terminations and inactives	<u>17,984,112</u>	<u>17,727,181</u>
Total accrued liability	\$ 2,895,806,767	\$ 2,906,030,274

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION IV. VALUATION EXHIBITS

EXHIBIT 11b. ACTUARIAL ACCRUED LIABILITY (DB 1.75 Plan)

The actuarial accrued liability has been calculated using the Entry Age Normal actuarial cost method, and is equal to the present value of benefits for all DB 1.75 Plan members less the present value of future normal costs for active DB 1.75 Plan employees.

	DB 1.75 Plan 9/30/2018	DB 1.75 Plan 9/30/2017
Present Value of Benefits		
Active employees –		
Retirement	\$ 351,845,173	\$ 330,850,805
Disability	18,746,673	18,278,333
Death	17,465,130	16,718,260
Withdrawal	<u>79,084,133</u>	<u>78,268,618</u>
Total active PVB	467,141,109	444,116,016
Retirees and Survivors		
Retirees	4,870,668	0
Disabled retirees	0	0
Survivors	<u>0</u>	<u>0</u>
Total retirees and survivors	4,870,668	0
Terminated and inactive members		
Assumed to retire	0	0
Assumed to elect return of contributions	<u>0</u>	<u>0</u>
Total terminated and inactive members	0	0
Total PVB	\$ 472,011,777	\$ 444,116,016
Present Value of Future Normal Cost		
Active employees –		
Retirement	\$ 93,712,177	\$ 94,092,595
Disability	8,410,883	8,207,905
Death	7,569,954	7,200,717
Withdrawal	<u>61,024,027</u>	<u>57,473,493</u>
Total active PVFNC	\$ 170,717,041	\$ 166,974,710
Actuarial Accrued Liability		
Active members	\$ 296,424,068	\$ 277,141,306
Retirees and survivors	4,870,668	0
Terminations and inactives	<u>0</u>	<u>0</u>
Total accrued liability	\$ 301,294,736	\$ 277,141,306

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION IV. VALUATION EXHIBITS

EXHIBIT 12. CALCULATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY

The unfunded actuarial accrued liability is used to determine the funding requirements. The unfunded actuarial accrued liability equals the actuarial accrued liability less the valuation assets.

	9/30/2018	9/30/2017
OLD DB PLAN		
Actuarial Accrued Liability		
Active members	\$ 775,336,652	\$ 821,090,059
Retirees and survivors	2,102,486,003	2,067,213,034
Terminations and inactives	<u>17,984,112</u>	<u>17,727,181</u>
Total accrued liability	\$ 2,895,806,767	\$ 2,906,030,274
DB 1.75 PLAN		
Actuarial Accrued Liability		
Active members	\$ 296,424,068	\$ 277,141,306
Retirees and survivors	4,870,668	0
Terminations and inactives	<u>0</u>	<u>0</u>
Total accrued liability	\$ 301,294,736	\$ 277,141,306
TOTAL (Old DB Plan plus DB 1.75 Plan)		
Actuarial Accrued Liability		
Active members	\$ 1,071,760,720	\$ 1,098,231,365
Retirees and survivors	2,107,356,671	2,067,213,034
Terminations and inactives	<u>17,9984,112</u>	<u>17,727,181</u>
Total accrued liability	\$ 3,197,101,503	\$ 3,183,171,580
Actuarial Value of Assets	<u>2,021,908,019</u>	<u>1,916,407,224</u>
Unfunded Actuarial Accrued Liability	\$ 1,175,193,484	\$ 1,266,764,356
Security Ratio = (Assets/AAL)	63.24%	60.20%

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION IV. VALUATION EXHIBITS

EXHIBIT 13. CALCULATION OF ACTUARIAL GAIN/LOSS

	Year Ending 9/30/2018	Year Ending 9/30/2017
Unfunded Actuarial Accrued Liability, beginning of year	\$ 1,266,764,356	\$ 1,249,316,487
Additions:		
Normal cost	8,640,161	8,072,162
Interest to end of year	<u>89,278,316</u>	<u>88,017,205</u>
Total additions	97,918,477	96,089,367
Deductions:		
Employer contributions for year	135,850,714	125,274,726
Interest on contributions	<u>4,674,357</u>	<u>4,310,458</u>
Total deductions	140,525,071	129,585,184
Other Changes:		
Plan amendments	0	53,601,959
Changes in assumptions and methods	<u>0</u>	<u>0</u>
Net other changes	0	53,601,959
Expected UAAL, end of year	\$ 1,224,157,762	\$ 1,269,422,629
Actual UAAL, end of year	<u>1,175,193,484</u>	<u>1,266,764,356</u>
Actuarial Gain/(Loss)	\$ 48,964,278	\$ 2,658,273
Components of Actuarial Gain/(Loss):		
Investment gain/(loss) on actuarial value of assets	\$ 36,062,024	\$ 4,919,877
Other gains/(losses)	<u>12,902,254</u>	<u>(2,261,604)</u>
Total actuarial gain/(loss)	\$ 48,964,278	\$ 2,658,273

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION IV. VALUATION EXHIBITS

EXHIBIT 14. NORMAL COST

The normal cost has been calculated using the Entry Age Normal actuarial cost method.

	9/30/2018		9/30/2017	
OLD DB Plan				
Expected payroll for next fiscal year	\$ 116,308,382		\$ 126,728,423	
Normal cost ¹		<i>% of Old DB Payroll</i>		<i>% of Old DB Payroll</i>
Retirement	\$ 11,468,981	9.86%	\$ 12,044,495	9.50%
Disability	701,622	0.60%	753,000	0.59%
Withdrawal	2,414,399	2.08%	2,573,371	2.03%
Death	<u>657,483</u>	<u>0.57%</u>	<u>705,820</u>	<u>0.56%</u>
Total active normal cost	\$ 15,242,485	13.11%	\$ 16,076,686	12.69%
Assumed DB administrative expenses	<u>4,733,400</u>	<u>4.07%</u>	<u>4,957,000</u>	<u>3.91%</u>
Total normal cost and expenses	\$ 19,975,885	17.18%	\$ 21,033,686	16.60%
Expected member contributions	<u>(11,095,274)</u>	<u>(9.54%)</u>	<u>(12,096,234)</u>	<u>(9.55%)</u>
Government portion of normal cost	\$ 8,880,611	7.64%	\$ 8,937,452	7.05%
DB 1.75 Plan				
Expected payroll for next fiscal year	\$ 171,690,091		\$ 171,450,950	
Normal cost ¹		<i>% of DB 1.75 Payroll</i>		<i>% of DB 1.75 Payroll</i>
Retirement	\$ 10,629,848	6.19%	\$ 10,559,525	6.16%
Disability	917,001	0.53%	883,745	0.52%
Withdrawal	6,610,460	3.85%	6,192,797	3.61%
Death	<u>855,071</u>	<u>0.50%</u>	<u>801,292</u>	<u>0.47%</u>
Total active normal cost	\$ 19,012,380	11.07%	\$ 18,437,359	10.75%
Assumed DB administrative expenses	<u>918,998</u>	<u>0.54%</u>	<u>891,203</u>	<u>0.52%</u>
Total normal cost and expenses	\$ 19,931,378	11.61%	\$ 19,328,562	11.27%
Expected member contributions	<u>(16,310,559)</u>	<u>(9.50%)</u>	<u>(16,287,840)</u>	<u>(9.50%)</u>
Government portion of normal cost	\$ 3,620,819	2.11%	\$ 3,040,722	1.77%
TOTAL DB Plans				
Expected payroll for next fiscal year	\$ 287,998,473		\$ 298,179,373	
Total active normal cost ¹	\$ 34,254,865	11.89%	\$ 34,514,045	11.57%
Assumed DB administrative expenses	<u>5,652,398</u>	<u>1.96%</u>	<u>5,848,203</u>	<u>1.96%</u>
Total normal cost and expenses	\$ 39,907,263	13.86%	\$ 40,362,248	13.54%
Expected member contributions	<u>(27,405,833)</u>	<u>(9.52%)</u>	<u>(28,384,074)</u>	<u>(9.52%)</u>
Government portion of normal cost	\$ 12,501,430	4.34%	\$ 11,978,174	4.02%

¹ Includes interest to mid-year.

SECTION IV. VALUATION EXHIBITS

EXHIBIT 15. AMORTIZATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY

Pursuant to GCA Section 8137, as modified by P.L. 33-186, the unfunded liabilities of the Government of Guam Retirement Fund are to be completely funded within 82 years from May 1, 1951. As of September 30, 2018, there are 14.58 years remaining in the funding period. The amortization of the unfunded actuarial accrued liability is calculated as a constant percentage of total payroll, which is assumed to grow at 2.75% per year.

	9/30/2018	9/30/2017
Total payroll (DB and DC) for fiscal year following	\$ 522,859,136	\$ 522,278,746
Unfunded actuarial accrued liability	1,175,193,484	1,266,764,356
Remaining funding period	14.58 years	15.58 years
Annual amortization	\$ 108,215,652	\$ 111,167,185
As % of total payroll (DB and DC)	20.70%	21.29%

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION IV. VALUATION EXHIBITS

EXHIBIT 16. ACTUARIALLY DETERMINED CONTRIBUTION

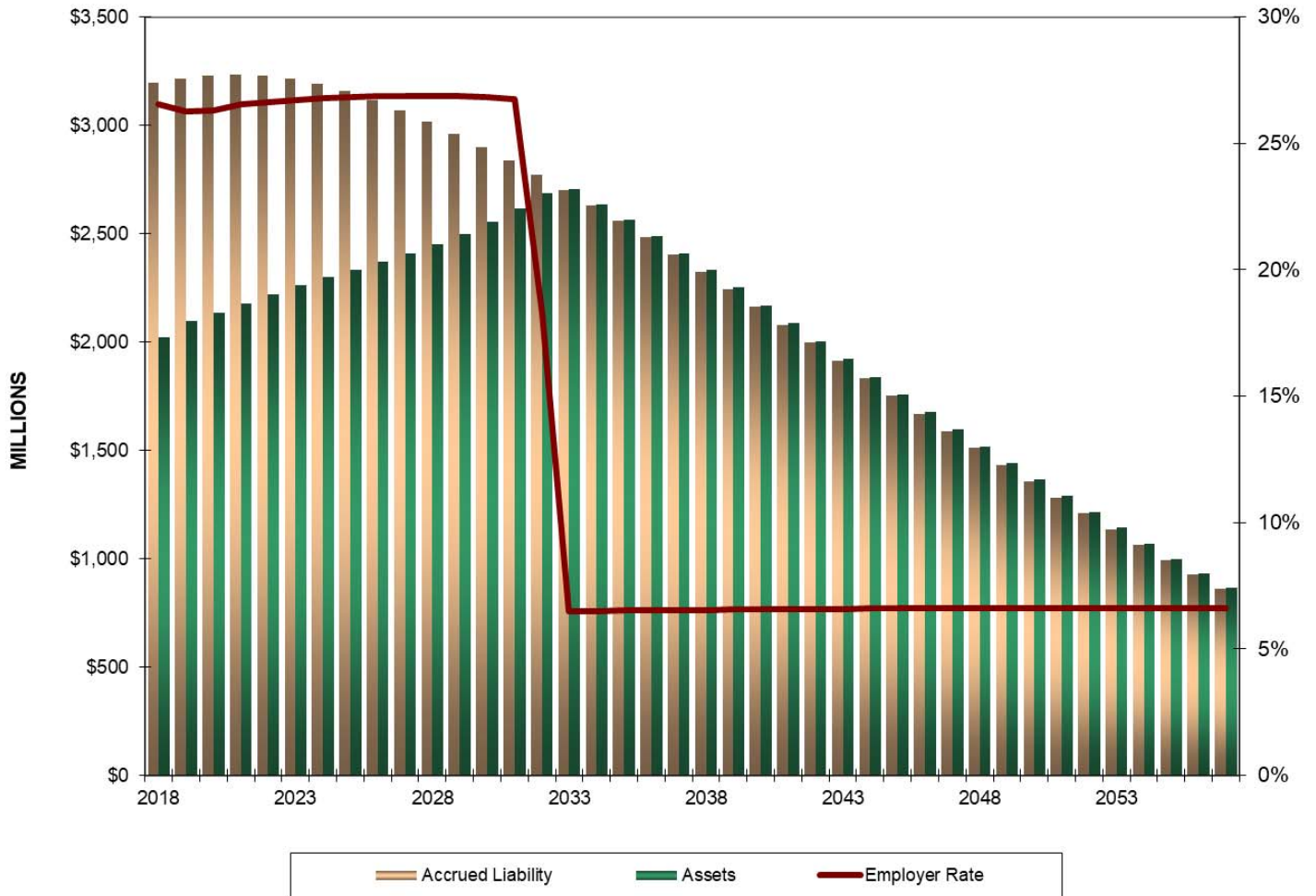
The Actuarially Determined Contribution (ADC) is equal to the sum of (1) the government normal costs for the defined benefit plans (Old DB and DB 1.75), (2) the amortization payment towards the unfunded actuarial accrued liability of the defined benefit plans (Old DB and DB 1.75), and (3) the expected government contributions to the defined contribution (DC) plan. The required contribution is then divided by the sum of the DB and DC payroll to determine the contribution rate as a percentage of payroll.

	9/30/2018	9/30/2017
Expected payroll for next fiscal year		
Old defined benefit (Old DB)	\$ 116,308,382	\$ 126,728,423
Defined Benefit 1.75 (DB 1.75)	171,690,091	171,450,950
Defined contribution (DC)	<u>234,860,663</u>	<u>224,099,373</u>
Total payroll (DB and DC)	\$ 522,859,136	\$ 522,278,746
Government normal cost including expenses (DB)	\$ 12,501,430	\$ 11,978,174
As % of DB payroll	4.34%	4.02%
As % of total payroll (DB and DC)	2.39%	2.29%
Amortization of UAAL (DB)	\$ 108,215,652	\$ 111,167,185
As % of total payroll (DB and DC)	20.70%	21.29%
Government DC contributions	\$ 16,687,961	\$ 15,570,962
As % of DC payroll	7.11%	6.95%
As % of total payroll (DB and DC)	3.19%	2.98%
Total DB and DC contributions	\$ 137,405,043	\$ 138,716,321
% of total payroll (DB and DC)	26.28%	26.56%

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION IV. VALUATION EXHIBITS

EXHIBIT 17. PROJECTION OF CONTRIBUTION RATE¹



¹ The contribution rate is the combined employer rate for the DB and DC plans.

SECTION IV. VALUATION EXHIBITS

EXHIBIT 17. PROJECTION OF CONTRIBUTION RATE (values)

Year Ending	PAYROLL ¹		CONTRIB RATE		CONTRIBUTIONS			Invest Gain ³	Benefits/ Expenses	DB Fund Actuarial
	DB	DC	DB	DC ²	DB	DC ²	EE			
2018										\$2,021.91
2019	\$288.00	\$234.86	26.56%	19.95%	\$76.49	\$46.86	\$27.41	\$138.28	\$(232.94)	2,095.43
2020	272.29	255.79	26.28%	19.67%	71.56	50.32	25.87	141.71	(241.03)	2,134.61
2021	256.83	285.78	26.32%	19.72%	67.59	56.34	24.40	144.79	(247.49)	2,179.27
2022	241.27	316.27	26.56%	19.96%	64.07	63.14	22.92	147.71	(254.27)	2,221.96
2023	225.56	347.30	26.65%	20.07%	60.11	69.69	21.43	150.48	(260.95)	2,261.91
2024	209.93	378.69	26.72%	20.15%	56.09	76.30	19.94	153.07	(267.30)	2,299.29
2025	195.67	409.14	26.78%	20.22%	52.41	82.74	18.59	155.52	(272.85)	2,335.04
2026	182.98	438.45	26.84%	20.28%	49.10	88.93	17.38	157.92	(276.98)	2,370.80
2027	171.89	466.64	26.87%	20.33%	46.19	94.86	16.33	160.40	(279.37)	2,408.68
2028	162.56	493.53	26.89%	20.36%	43.71	100.46	15.44	163.09	(280.34)	2,450.56
2029	154.29	519.84	26.89%	20.37%	41.49	105.87	14.66	166.11	(280.23)	2,498.01
2030	146.63	546.04	26.87%	20.36%	39.40	111.16	13.93	169.56	(279.09)	2,552.57
2031	139.46	572.25	26.84%	20.33%	37.42	116.33	13.25	173.54	(277.33)	2,615.41
2032	132.85	598.44	26.77%	20.27%	35.56	121.29	12.62	178.11	(274.99)	2,687.65
2033	126.57	624.83	18.27%	11.78%	23.13	73.62	12.02	181.19	(272.12)	2,705.19
2034	119.52	652.54	6.49%	0.01%	7.76	0.07	11.35	179.48	(268.49)	2,635.09
2035	112.24	681.05	6.51%	0.03%	7.30	0.21	10.66	174.67	(265.20)	2,562.49
2036	105.53	709.58	6.52%	0.05%	6.88	0.36	10.03	169.70	(261.72)	2,487.51
2037	99.00	738.52	6.53%	0.07%	6.46	0.51	9.41	164.58	(257.71)	2,410.55
2038	92.45	768.11	6.54%	0.09%	6.05	0.66	8.78	159.33	(253.38)	2,331.82
2039	85.96	798.26	6.55%	0.10%	5.63	0.83	8.17	153.97	(248.83)	2,251.44
2040	79.92	828.62	6.56%	0.12%	5.24	1.01	7.59	148.51	(243.84)	2,169.81
2041	74.11	859.41	6.57%	0.14%	4.87	1.18	7.04	142.99	(238.23)	2,087.55
2042	68.60	890.59	6.58%	0.15%	4.51	1.35	6.52	137.44	(232.40)	2,004.87
2043	63.36	922.21	6.59%	0.16%	4.17	1.52	6.02	131.87	(226.17)	1,922.20
2044	58.34	954.34	6.59%	0.18%	3.85	1.68	5.54	126.32	(219.74)	1,839.78
2045	53.52	987.01	6.60%	0.19%	3.53	1.85	5.08	120.79	(213.05)	1,757.92
2046	49.01	1,020.12	6.60%	0.20%	3.24	2.01	4.66	115.31	(206.27)	1,676.82
2047	44.81	1,053.73	6.60%	0.21%	2.96	2.17	4.26	109.89	(199.31)	1,596.75
2048	40.46	1,088.29	6.61%	0.21%	2.67	2.32	3.84	104.55	(192.11)	1,518.00
2049	36.31	1,123.48	6.61%	0.22%	2.40	2.48	3.45	99.29	(185.26)	1,440.34
2050	32.33	1,159.35	6.61%	0.23%	2.14	2.64	3.07	94.11	(178.24)	1,364.05
2051	28.29	1,196.17	6.61%	0.23%	1.87	2.79	2.69	89.02	(171.41)	1,289.02
2052	24.33	1,233.80	6.61%	0.24%	1.61	2.96	2.31	84.01	(164.81)	1,215.11
2053	20.31	1,272.42	6.61%	0.25%	1.34	3.12	1.93	79.08	(158.27)	1,142.34
2054	16.54	1,311.73	6.62%	0.25%	1.09	3.29	1.57	74.22	(151.96)	1,070.58
2055	13.31	1,351.50	6.62%	0.26%	0.88	3.45	1.26	69.44	(145.50)	1,000.15
2056	10.64	1,391.70	6.61%	0.26%	0.70	3.59	1.01	64.76	(138.82)	931.44
2057	8.49	1,432.41	6.61%	0.26%	0.56	3.71	0.81	60.22	(131.87)	864.90

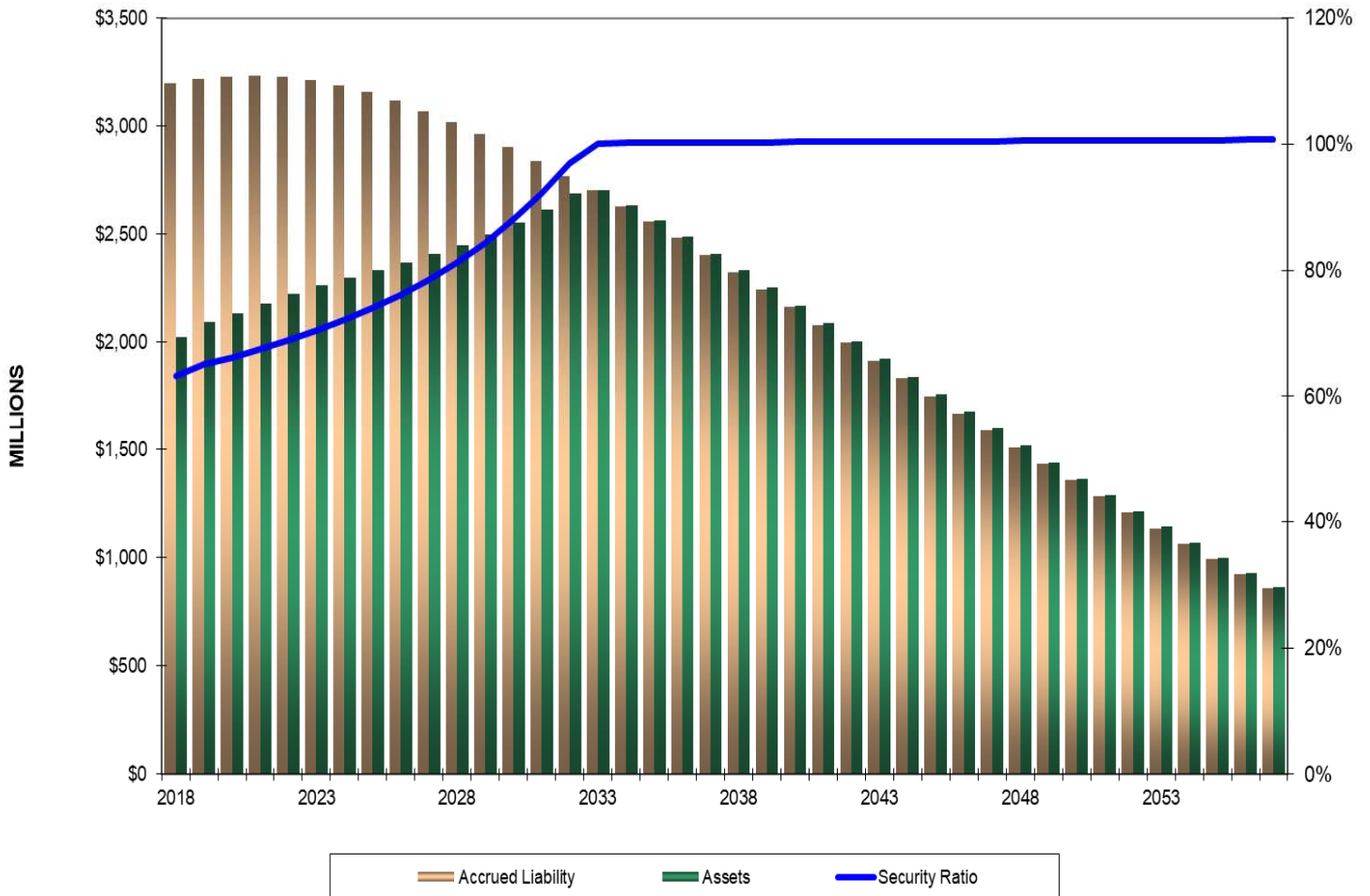
¹ Payroll is assumed to increase 1.75% for FY 2019, 1.0% for FY 2020, and 2.75% thereafter.

² DC rate and contributions are those for payment towards UAAL and plan expenses only.

³ Investment earnings are assumed to be 7.0% per year on the market value of assets.

SECTION IV. VALUATION EXHIBITS

EXHIBIT 18. PROJECTION OF SECURITY RATIO



This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION IV. VALUATION EXHIBITS

EXHIBIT 18. PROJECTION OF SECURITY RATIO (values)

Year Ending	EMPLOYER CONTRIBUTIONS					Security Ratio
	Payroll ¹	DB Rate	Contribs DB Plan	DB Fund AVA ²	Accrued Liability	
2018				\$2,021.91	\$3,197.10	63.24%
2019	\$522.86	26.56%	122.18	2,095.43	3,217.35	65.13%
2020	528.09	26.28%	120.79	2,134.61	3,228.75	66.11%
2021	542.61	26.32%	122.96	2,179.27	3,232.47	67.42%
2022	557.53	26.56%	126.32	2,221.96	3,227.60	68.84%
2023	572.86	26.65%	128.99	2,261.91	3,213.65	70.38%
2024	588.62	26.72%	131.67	2,299.29	3,190.34	72.07%
2025	604.80	26.78%	134.50	2,335.04	3,157.98	73.94%
2026	621.44	26.84%	137.45	2,370.80	3,117.60	76.05%
2027	638.53	26.87%	140.52	2,408.68	3,070.65	78.44%
2028	656.09	26.89%	143.69	2,450.56	3,018.32	81.19%
2029	674.13	26.89%	146.91	2,498.01	2,961.49	84.35%
2030	692.67	26.87%	150.15	2,552.57	2,900.98	87.99%
2031	711.72	26.84%	153.38	2,615.41	2,837.23	92.18%
2032	731.29	26.77%	156.51	2,687.65	2,770.67	97.00%
2033	751.40	18.27%	96.44	2,705.19	2,701.70	100.13%
2034	772.06	6.49%	7.56	2,635.09	2,630.85	100.16%
2035	793.29	6.51%	7.26	2,562.49	2,557.60	100.19%
2036	815.11	6.52%	7.02	2,487.51	2,482.06	100.22%
2037	837.52	6.53%	6.78	2,410.55	2,404.62	100.25%
2038	860.56	6.54%	6.53	2,331.82	2,325.49	100.27%
2039	884.22	6.55%	6.31	2,251.44	2,244.79	100.30%
2040	908.54	6.56%	6.12	2,169.81	2,162.91	100.32%
2041	933.52	6.57%	5.93	2,087.55	2,080.43	100.34%
2042	959.19	6.58%	5.76	2,004.87	1,997.60	100.36%
2043	985.57	6.59%	5.61	1,922.20	1,914.82	100.39%
2044	1,012.67	6.59%	5.46	1,839.78	1,832.32	100.41%
2045	1,040.52	6.60%	5.32	1,757.92	1,750.44	100.43%
2046	1,069.14	6.60%	5.20	1,676.82	1,669.33	100.45%
2047	1,098.54	6.60%	5.09	1,596.75	1,589.28	100.47%
2048	1,128.75	6.61%	4.97	1,518.00	1,510.60	100.49%
2049	1,159.79	6.61%	4.87	1,440.34	1,433.03	100.51%
2050	1,191.68	6.61%	4.77	1,364.05	1,356.85	100.53%
2051	1,224.45	6.61%	4.67	1,289.02	1,281.96	100.55%
2052	1,258.13	6.61%	4.58	1,215.11	1,208.21	100.57%
2053	1,292.73	6.61%	4.49	1,142.34	1,135.63	100.59%
2054	1,328.28	6.62%	4.41	1,070.58	1,064.08	100.61%
2055	1,364.80	6.62%	4.36	1,000.15	993.85	100.63%
2056	1,402.34	6.61%	4.33	931.44	925.33	100.66%
2057	1,440.90	6.61%	4.31	864.90	858.97	100.69%

¹ Payroll is assumed to increase 1.75% for FY 2019, 1.0% for FY 2020, and 2.75% thereafter.

² Actuarial Value of Assets. Investment earnings are assumed to be 7.0% per year on the market value of assets.

APPENDIX A. SUMMARY OF PLAN PROVISIONS

The following description is only a brief summary of the more important provisions of the retirement plan. Actual plan provisions are contained in Chapter 8 of the Guam Code, as modified by Public Law 33-186.

Membership Conditions and Exclusions (Old DB Plan): All employees of the Government of Guam hired on or before September 30, 1995 are required to participate as a condition of employment, except:

- a) Persons who are compensated on a fee basis;
- b) Independent contractors;
- c) Persons employed for a specific project;
- d) Persons employed in the Senior Citizens' Community Employment Program; and
- e) Persons with less than 20 years of service prior to September 30, 1995 who elect to transfer to the Government of Guam Defined Contribution Fund. Participants have an annual opportunity to transfer.

Membership is optional for:

- a) Temporary, seasonal, intermittent and part-time employees;
- b) Persons employed for a specific period of time and not domiciled in Guam; and
- c) Employees of a public corporation of the Government of Guam.

Membership is also applicable to members of the Legislature with special provisions for:

- a) The determination of average annual salary for pension computation purposes; and
- b) Contributions.

Membership Conditions and Exclusions (DB 1.75 Plan): All employees of the Government of Guam who were in the Defined Contribution Plan and were still employed had the option to transfer to the Defined Benefit 1.75 Plan effective January 1, 2018. Employees hired on or after January 1, 2018 are not eligible for the Old DB or DB 1.75 plans.

Pension Credits: Employees are entitled to pension credit for:

- a) Service rendered to the Government prior to May 1, 1951 when the Fund began operations.
- b) Service on or after May 1, 1951 for which contributions are required to be made by the employees.
- c) Casual or part-time employment under prescribed conditions for which contributions must be made.
- d) Unused and accumulated sick and annual (vacation) leaves with 12 days of service counted as a full month; 6 to 11 days, ½ month; and less than 6 days disregarded.
- e) For employees hired before June 1, 1989, pension credit is granted up to a maximum of 5 years for Federal service, provided the employee terminates membership in the Federal Civil Service Retirement Fund and makes a contribution to the Government of Guam Retirement Fund equal to the amount contributed by the member and his employer during the period which is equal in length to the period for which service credit is requested, and which ends on the member's

SECTION V. APPENDICES

termination date of such employment with interest from the date of such termination to the date of payment.

- f) For employees hired before June 1, 1989, educational leave time or periods of termination for educational training purposes, if contributions are made to the Fund with interest. Members who first joined the fund prior to January 31, 1987, may receive credit for up to the normal period of time required to complete degree without having been employed by the government prior to the period during which the degree was earned.
- g) Military service prior to May 1, 1951, if not considered for any Federal Government Pension other than for disability. If entry into military service occurred after May 1, 1951, total pension credit is limited to 5 years in the aggregate, provided the employee was in the service of the Government of Guam at date of entry into military service and returned to the Government of Guam service within one year following discharge from military service under conditions other than dishonorable, or within 6 months after completion of education under the various education benefits programs for veterans; otherwise the total credit is limited to three years.

Schedule for Computing Service: The following schedule shall govern the computation of pension credit: 12 days or more during any month constitutes a month of service; 6 to 11 days, ½ month; less than 6 days is disregarded. Nine months or more during any year constitutes a year of service.

Vesting of Pension Credit: Vesting occurs after at least 5 years of service.

Upon separation from service, an employee may optionally leave the contribution credits in the Fund and qualify for a deferred retirement annuity, based upon the total pension credit. If the pension credit is 25 years or more, no refund of contributions is payable and the employee must accept a deferred retirement annuity.

Conditions for Service Retirement: With respect to any employee who originally became a member of the Fund prior to October 1, 1981:

- a) Such member may retire on a service retirement annuity at age 60 or over, or at age 55 in the case of a member of the uniformed personnel after at least 10 years of service. Upon retirement, a member of the uniformed personnel shall be considered one grade above that held at date of retirement.
- b) A member with at least 25 years of service may retire at any age on an unreduced retirement annuity.
- c) Any retired employee with at least 25 years of credit service shall be entitled to the full retirement annuity on and after September 30, 1981.
- d) Any member, active or inactive, may retire after 20 years of service, regardless of age. In such case, the retirement annuity shall be reduced ¼ of 1% for each month that the age of the member is less than 60 years (3% per year).

With respect to an employee who became a member of the Fund on or after October 1, 1981, and prior to August 22, 1984, the following provisions shall govern:

- a) Such member may retire on a service retirement annuity at age 60 or over, or at age 55 if a member of the uniformed personnel after at least 15 years of service and upon retirement shall be considered one rank grade above that held at such date.
- b) A member with at least 30 years of service shall be eligible for service retirement, regardless of age, without reduction for early retirement.

SECTION V. APPENDICES

- c) Any member, whether in an active or inactive status, may retire after 25 years of service, at any age, on an annuity reduced $\frac{1}{4}$ of 1% per month (3% per year) for each month member's age is less than 60.

With respect to any employee becoming a member of the Fund on or after August 22, 1984, and a member of the Old DB Plan:

- a) Such member may retire on a service retirement annuity at age 65 or over, or at age 60 in the case of a member of the uniformed personnel after at least 15 years of service. Upon retirement, a member of the uniformed personnel shall be considered one grade above that held at date of retirement.
- b) A member with at least 30 years of service may retire at any age on an unreduced retirement annuity.
- c) Any member, active or inactive, may retire after 25 years of service, regardless of age. In such case, the retirement annuity shall be reduced $\frac{1}{4}$ of 1% for each month that the age of the member is less than 65 years (3% per year).

With respect to any employee in the DB 1.75 Plan:

- a) Such member may retire on a service retirement annuity at age 62 or over.
- b) Any member, active or inactive, may retire after the attainment of age 55 with 25 years of service. In such case, the retirement annuity shall be reduced $\frac{1}{2}$ of 1% for each month that the age of the member is less than 62 years (6% per year).

Amount of Service Retirement Annuity (Old DB Plan): A basic annuity of 2.00% of "average annual salary" for each of the first 10 years of credited service; and 2.5% of "average annual salary" for each full year of pension credit above 10 years, plus twenty dollars (\$20.00) multiplied by years of credited service reduced by an amount equal to one hundredth of one percent (.01%) of said amount for each one dollar (\$1.00) that a member's average annual salary exceeds the amount of six thousand dollars (\$6,000).

The minimum amount of service retirement annuity payable by the Fund is \$1,200 per year. The maximum retirement annuity is 85% of "average annual salary."

Amount of Service Retirement Annuity (DB 1.75): A basic annuity of 1.75% of "average annual salary" for each year of credited service. The minimum amount of service retirement annuity payable by the Fund is \$1,200 per year. The maximum retirement annuity is 85% of "average annual salary."

Average Annual Salary: Average of three highest annual salaries received by a member during the entire period of pension credit. A minimum of \$6,000 applies to Old DB Plan members.

The annual salary of the member shall include the basic rate of salary on which contributions were made by the member and any salary on which the member made contributions as required under GCA, Section 8136(a). Effective October 1, 1986, salary can include payment for unused annual leave upon retirement for Old DB Plan members.

In case of members of the Legislature, the average annual salary is the salary of the Director of Administration at the member's date of retirement, or the average of the three highest annual salaries received by the member during the period of membership credit, whichever is greater.

SECTION V. APPENDICES

Automatic Increase in Annuity: Effective July 1, 1984, any member retiring from service and entitled to benefits after September 1, 1972, is to receive each year, on the anniversary date of retirement, an increment of \$600 if the annual annuity is \$3,500 or less; \$400 if the annuity is between \$3,500 and \$6,300 per year; \$300 if the annuity is between \$6,300 and \$10,100; and \$200 if the annuity exceeds \$10,100 per year.

Disability Retirement: Upon total and permanent disability due to physical or mental causes, an employee under age 65 is entitled to a disability retirement annuity. For employees hired prior to August 22, 1984, the amount of the disability retirement annuity will be 66-2/3% of the employee's salary in effect on the date of disability. Subsequent employees will have an annuity amount based on 66-2/3% (50% for DB 1.75 Plan members) of the average of the highest three years of salary. If the disability was not due to occupational causes, the employee must have Government of Guam service credit of at least six years, or five years in the case of terminal illness, in order to qualify, except that new members since May 28, 1985, may not retire if a disability arises from impairment or conditions existing prior to employment.

A disability retirement annuitant must submit to a medical examination at least once a year during the first five years of disability, and at least once every three years thereafter, by a physician or physicians designated by the Board in order to establish continuing disability and entitlement to benefits. Should a disability annuitant resume gainful employment in a position other than the particular job in which he was engaged when declared disabled, the disability retirement benefit shall continue as initially determined.

A member receiving disability retirement benefits since December 1, 1972, is entitled to receive on the anniversary date of retirement, an annual increase of \$300 if the benefit is \$3,000 per year or less; \$250 per year where the annuity is between \$3,000 and \$6,000 per year; \$200 per year where the annuity is between \$6,000 and \$10,000 per year; and \$100 if the annuity exceeds \$10,000 per year.

Re-entry Into Service: A member on retirement who re-enters services as an employee eligible for membership shall have the annuity suspended during the period of employment without losing rights to automatic increases in the retirement annuity during the period of re-employment. This provision does not apply to Department of Education employees who occupy positions dealing with the Chamorro Language and Culture Program in Guam schools, persons employed as classroom teachers, guidance or health counselors when critical need arises, nor elected officials.

Benefits to Survivors: Benefits are payable to a surviving spouse and children under age 21, upon the death of a member while in service after at least three years of service, or occurring while on retirement. The benefit to children of an annuitant or member whose death occurs while in service after at least three years of service is payable until age 25 if they are full-time students in an accredited educational institution, or payable regardless of age if disabled and disability occurred before age 18.

If only a spouse survives the active or retired member, the annuity payable is 60% of the service or disability retirement annuity earned by the member, subject to a minimum of \$1,200 per year.

The annuity to a child is \$2,880 per year, subject to a maximum payment to five or more minor children of \$14,400 per year. The term "child" or "children" includes any natural child or adopted

SECTION V. APPENDICES

child under age 21, or any permanently disabled child whose incapacity began before the child attained age 21.

A survivor annuitant is entitled to an automatic increase in annuity each year on the anniversary date of the annuity of \$600 if the annuity is \$3,500 per year or less; \$400 if the annuity is between \$3,500 and \$6,300 per year; \$300 if the annuity is between \$6,300 and \$10,100; and \$200 if the annuity is more than \$10,100 per year.

A surviving spouse or minor child surviving the member is entitled, in addition to the above, a death benefit of \$1,000 payable in a lump sum.

A survivor's annuity terminates upon death or re-marriage under the age of 40, attainment of age 21 of the child, or the termination of the incapacity of a disabled child.

Optional Privilege at Retirement: Upon retirement from service, any unmarried employee, if in good health as determined by medical examination, may elect to receive, on an actuarial equivalent basis in lieu of the full retirement annuity, a reduced retirement annuity payable during the annuitant's lifetime, plus an annuity to a designated beneficiary to become payable at death of the annuitant. The annuity to the beneficiary is to be paid at the same rate and under the same conditions that apply to a survivor of a married member whose death occurs while in service.

Death Benefit – Active and Retired Members Without Survivors: Upon death of a member while in service, leaving no survivors eligible for annuities, the designated beneficiary or estate is entitled to a refund of the contribution credits, plus interest, together with a death benefit of \$1,000 payable in a lump sum.

Upon death of a retired member, if no survivors' annuities are payable, the death benefit to a designated beneficiary or the estate of the member consists of the excess, if any, of: (1) the total contribution credits of the member at retirement, plus interest, over (2) the total amount of annuity payments made to the retired member, plus the sum of \$1,000.

Death Benefit – Inactive Members: Upon the death of an inactive member with at least 20 years of pension credit, and survived by a spouse or minor children, the following benefit options are provided: (a) the surviving spouse of children, as the case may be, may elect to receive the annuities prescribed if the death of a member occurs while in service; or (b) a refund of the deceased member's total contribution credits, plus interest.

Refund of Members' Contributions: Upon complete separation from service, or transfer to the Government of Guam Defined Contribution Fund, a member with less than 25 years of pension credit may receive a refund of the total contributions, plus interest (except that no interest is payable if the total pension credit is less than one year).

Contributions by Members: Each Old DB Plan member shall contribute to the Fund 9½% of salary earned and accruing after October 1, 1997; and at the member's option, 10½% of non-base pay subsequent to October 1, 1997. Each DB 1.75 Plan member shall contribute to the Fund 9½% of salary earned and accruing after January 1, 2018.

SECTION V. APPENDICES

APPENDIX B. ACTUARIAL COST METHOD AND ASSUMPTIONS

	September 30, 2018		September 30, 2017	
Actuarial Cost Method	Entry Age Normal		Entry Age Normal	
Interest Rate	7.00%		7.00%	
Long-term Expected Rate of Return on Plan Assets	7.00%		7.00%	
Salary Increases	<u>Service</u>	<u>% Increase</u>	<u>Service</u>	<u>% Increase</u>
	0 – 5	7.5%	0 – 5	7.5%
	6 – 10	6.0%	6 – 10	6.0%
	11 – 15	5.0%	11 – 15	5.0%
	16 – 20	4.0%	16 – 20	4.0%
	Over 20	4.0%	Over 20	4.0%
Total Payroll Growth (DB and DC)	2.75%		2.75%	
Cost of Living Adjustment	Specified in Plan		Specified in Plan	
Mortality	RP-2000 Combined Healthy table +3 for males +2 for females projected generationally using 30% of Scale BB		RP-2000 Combined Healthy table +3 for males +2 for females projected generationally using 30% of Scale BB	
Disability Incidence	1974-78 SOA LTD Non-Jumbo, with rates reduced by 50% for males and 75% for females		1974-78 SOA LTD Non-Jumbo, with rates reduced by 50% for males and 75% for females	
Post-disability mortality	RP-2000 Disabled table +6 for males +4 for females projected generationally using 30% of Scale BB		RP-2000 Disabled table +6 for males +4 for females projected generationally using 30% of Scale BB	
Withdrawal Rates	Service-based rates (see attached)		Service-based rates (see attached)	
Retirement Age	50% assumed to retire at earliest eligibility for unreduced benefits.		50% assumed to retire at earliest eligibility for unreduced benefits.	
	20% per year thereafter until age 75		20% per year thereafter until age 75	
	100% at age 75		100% at age 75	

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION V. APPENDICES

	September 30, 2018	September 30, 2017
Return of Contributions	<p>100% of current Old DB Plan employees who withdraw before retirement and who have less than 20 years of service are assumed to elect a return of contributions</p> <p>Terminated or inactive members with at least 5 years of service and an account balance of at least \$10,000 and who have not withdrawn their contributions are assumed to retire upon eligibility for unreduced benefits. All other employees who have previously withdrawn are assumed to elect a return of contributions.</p> <p>Contributions earn 4.5% interest</p>	<p>100% of current employees who withdraw before retirement and who have less than 20 years of service are assumed to elect a return of contributions</p> <p>Terminated or inactive members with at least 5 years of service and an account balance of at least \$10,000 and who have not withdrawn their contributions are assumed to retire upon eligibility for unreduced benefits. All other employees who have previously withdrawn are assumed to elect a return of contributions.</p> <p>Contributions earn 4.5% interest</p>
Marital Status	<p>Retiree data included spouse information. For active employees, 75% are assumed to have spouses at retirement. The assumed age difference is 3 years (+3 for a male spouse; -3 for a female spouse).</p>	<p>Retiree data included spouse information. For active employees, 75% are assumed to have spouses at retirement. The assumed age difference is 3 years (+3 for a male spouse; -3 for a female spouse).</p>
Leave Adjustments	<p>Assumed to add 1.5 years of service (Old DB and DB 1.75) and increase average earnings (Old DB only) by 5% at retirement</p>	<p>Assumed to add 1.5 years of service (Old DB and DB 1.75) and increase average earnings (Old DB only) by 5% at retirement</p>
Administrative Expenses	<p>\$6,860,000 per year (equal to budgeted expense for year ending 9/30/18), allocated 69% to DB and 31% to DC. In addition, the normal cost for DB 1.75 Plan members is increased by 5% to account for additional expenses.</p>	<p>\$7,082,000 per year (equal to budgeted expense for year ending 9/30/18), allocated 70% to DB and 30% to DC. In addition, the normal cost for DB 1.75 Plan members is increased by 5% to account for additional expenses.</p>
Survivor Benefit – Minor Children	<p>Assumed to be 0.2 eligible child survivors at time of retiree death, with payments to minor child continuing for 6 years</p>	<p>Assumed to be 0.2 eligible child survivors at time of retiree death, with payments to minor child continuing for 6 years</p>
Asset Valuation Method	<p>3-year phase-in of gains/losses relative to interest rate assumption</p>	<p>3-year phase-in of gains/losses relative to interest rate assumption</p>
Data Inconsistencies	<p>None</p>	<p>None</p>

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION V. APPENDICES

Probabilities of Separation from Active Service
(per 100 working at each age)

MALE					FEMALE				
Age	Death	Disability	Service	Withdrawal	Age	Death	Disability	Service	Withdrawal
20	0.04	0.05	0	15.0	20	0.02	0.03	0	15.0
21	0.04	0.05	1	14.0	21	0.02	0.03	1	14.0
22	0.04	0.05	2	13.0	22	0.02	0.03	2	13.0
23	0.04	0.05	3	12.0	23	0.02	0.03	3	12.0
24	0.04	0.05	4	11.0	24	0.02	0.03	4	11.0
25	0.04	0.05	5	10.0	25	0.02	0.03	5	10.0
26	0.04	0.05	6	9.0	26	0.02	0.03	6	9.0
27	0.04	0.05	7	8.0	27	0.02	0.03	7	8.0
28	0.05	0.05	8	7.0	28	0.03	0.03	8	7.0
29	0.06	0.05	9	6.0	29	0.03	0.03	9	6.0
30	0.06	0.05	10	5.0	30	0.04	0.03	10	5.0
31	0.07	0.05	11	4.5	31	0.04	0.03	11	4.5
32	0.08	0.05	12	4.0	32	0.04	0.03	12	4.0
33	0.08	0.05	13	3.5	33	0.05	0.03	13	3.5
34	0.09	0.05	14	3.0	34	0.05	0.03	14	3.0
35	0.10	0.05	15	2.5	35	0.06	0.03	15	2.5
36	0.10	0.05	16	2.0	36	0.06	0.03	16	2.0
37	0.11	0.05	17	2.0	37	0.06	0.03	17	2.0
38	0.11	0.05	18	2.0	38	0.07	0.03	18	2.0
39	0.12	0.05	19	2.0	39	0.08	0.03	19	2.0
40	0.13	0.10	20 & over	2.0	40	0.09	0.05	20 & over	2.0
41	0.14	0.10			41	0.09	0.05		
42	0.15	0.10			42	0.10	0.05		
43	0.16	0.10			43	0.11	0.05		
44	0.17	0.10			44	0.12	0.05		
45	0.19	0.18			45	0.13	0.09		
46	0.20	0.18			46	0.14	0.09		
47	0.21	0.18			47	0.16	0.09		
48	0.24	0.18			48	0.17	0.09		
49	0.27	0.18			49	0.19	0.09		
50	0.29	0.32			50	0.20	0.16		
51	0.32	0.32			51	0.22	0.16		
52	0.36	0.32			52	0.24	0.16		
53	0.42	0.32			53	0.27	0.16		
54	0.47	0.32			54	0.31	0.16		
55	0.53	0.53			55	0.35	0.27		
56	0.59	0.53			56	0.39	0.27		
57	0.67	0.53			57	0.44	0.27		
58	0.77	0.53			58	0.51	0.27		
59	0.88	0.53			59	0.58	0.27		
60	1.00	0.76			60	0.67	0.38		
61	1.13	0.76			61	0.76	0.38		
62	1.27	0.76			62	0.86	0.38		
63	1.44	0.76			63	0.97	0.38		
64	1.61	0.76			64	1.10	0.38		

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION V. APPENDICES

APPENDIX C. SUMMARY OF PARTICIPANT DATA

Active Non-Uniformed – Old DB Plan

Age	COUNT			ANNUAL SALARIES		
	Males	Females	Total	Males	Females	Total
Under 20	-	-	-	-	-	-
20 – 24	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-
40 – 44	25	23	48	\$ 1,284,014	\$ 1,311,672	\$ 2,595,686
45 – 49	134	176	310	7,335,645	9,902,406	17,238,051
50 – 54	219	281	500	12,756,668	16,623,338	29,380,006
55 – 59	195	248	443	11,138,629	14,949,480	26,088,109
60 – 64	99	144	243	6,477,786	8,108,298	14,586,084
65 – 69	31	70	101	2,402,480	4,401,998	6,804,478
70 & Over	<u>22</u>	<u>30</u>	<u>52</u>	<u>1,613,965</u>	<u>1,837,242</u>	<u>3,451,207</u>
Total	725	972	1,697	\$43,009,187	\$57,134,434	\$100,143,621

* Not shown if less than 20 members.

Age	SERVICE									Total
	0 - 4	5 - 9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
Under 20	-	-	-	-	-	-	-	-	-	-
20 – 24	-	-	-	-	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-	-	-	-	-
40 – 44	4	2	4	5	24	9	-	-	-	48
45 – 49	2	6	7	11	106	173	5	-	-	310
50 – 54	5	5	13	12	65	288	106	6	-	500
55 – 59	5	9	10	15	52	196	110	40	6	443
60 – 64	3	2	6	7	35	112	54	15	9	243
65 – 69	1	1	1	2	18	39	22	8	9	101
70 & Over	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>10</u>	<u>21</u>	<u>11</u>	<u>4</u>	<u>6</u>	<u>52</u>
Total	20	25	41	52	310	838	308	73	30	1,697

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION V. APPENDICES

Active Uniformed – Old DB Plan

Age	COUNT			ANNUAL SALARIES		
	Males	Females	Total	Males	Females	Total
Under 20	-	-	-	-	-	-
20 – 24	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-
40 – 44	7	-	7	*	*	*
45 – 49	50	2	52	\$ 4,412,362	*	\$ 4,412,362
50 – 54	66	1	67	6,468,404	*	6,468,404
55 – 59	39	2	41	3,414,260	*	3,414,260
60 – 64	3	1	4	*	*	*
65 – 69	1	-	1	*	-	*
70 & Over	<u>1</u>	<u>-</u>	<u>1</u>	<u>*</u>	<u>-</u>	<u>*</u>
Total	167	6	173	\$ 14,295,026	*	\$ 14,295,026

* Not shown if less than 20 members. The totals only sum the cells that are displayed.

Age	SERVICE									Total
	0 – 4	5 – 9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
Under 20	-	-	-	-	-	-	-	-	-	-
20 – 24	-	-	-	-	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-	-	-	-	-
40 – 44	-	-	-	-	6	1	-	-	-	7
45 – 49	-	-	-	2	13	35	2	-	-	52
50 – 54	-	-	-	-	5	44	17	1	-	67
55 – 59	-	-	-	-	7	17	14	3	-	41
60 – 64	1	-	-	-	-	-	-	3	-	4
65 – 69	-	-	-	-	-	1	-	-	-	1
70 & Over	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>1</u>	<u>-</u>	<u>1</u>
Total	1	-	-	2	31	98	33	8	-	173

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION V. APPENDICES

Active Total – Old DB Plan

Age	COUNT			ANNUAL SALARIES		
	Males	Females	Total	Males	Females	Total
Under 20	-	-	-	-	-	-
20 – 24	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-
40 – 44	32	23	55	\$ 1,736,293	\$ 1,311,672	\$ 3,047,965
45 – 49	184	178	362	11,748,007	10,031,403	21,779,410
50 – 54	285	282	567	19,225,072	16,691,108	35,916,180
55 – 59	234	250	484	14,552,889	15,098,006	29,650,895
60 – 64	102	145	247	7,446,107	8,210,368	15,656,475
65 – 69	32	70	102	2,454,762	4,401,998	6,856,760
70 & Over	<u>23</u>	<u>30</u>	<u>53</u>	<u>1,691,445</u>	<u>1,837,242</u>	<u>3,528,687</u>
Total	892	978	1,870	\$58,854,575	\$57,581,797	\$116,436,372

* Not shown if less than 20 members.

Age	SERVICE									Total
	0 - 4	5 – 9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
Under 20	-	-	-	-	-	-	-	-	-	-
20 – 24	-	-	-	-	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-	-	-	-	-
40 – 44	4	2	4	5	30	10	-	-	-	55
45 – 49	2	6	7	13	119	208	7	-	-	362
50 – 54	5	5	13	12	70	332	123	7	-	567
55 – 59	5	9	10	15	59	213	124	43	6	484
60 – 64	4	2	6	7	35	112	54	18	9	247
65 – 69	1	1	1	2	18	40	22	8	9	102
70 & Over	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>10</u>	<u>21</u>	<u>11</u>	<u>5</u>	<u>6</u>	<u>53</u>
Total	21	25	41	54	341	936	341	81	30	1,870

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION V. APPENDICES

Active – DB 1.75 Plan

Age	COUNT			ANNUAL SALARIES		
	Males	Females	Total	Males	Females	Total
Under 20	-	2	2	*	*	*
20 – 24	35	23	58	\$ 889,548	\$ 518,077	\$ 1,407,624
25 – 29	150	185	335	5,037,327	6,255,623	11,292,949
30 – 34	176	188	364	7,237,168	7,524,002	14,761,170
35 – 39	182	210	392	8,163,432	9,118,898	17,282,331
40 – 44	230	263	493	12,075,505	12,817,466	24,892,970
45 – 49	263	260	523	15,123,301	13,953,611	29,076,912
50 – 54	230	197	427	14,216,233	10,120,205	24,336,438
55 – 59	170	177	347	10,401,945	9,474,824	19,876,768
60 – 64	111	134	245	7,127,503	7,226,280	14,353,783
65 – 69	43	49	92	3,161,135	2,859,241	6,020,377
70 & Over	<u>26</u>	<u>14</u>	<u>40</u>	<u>1,586,647</u>	<u>*</u>	<u>1,586,647</u>
Total	1,616	1,702	3,318	\$85,019,744	\$79,868,227	\$164,887,969

* Not shown if less than 20 members. The totals only sum the cells that are displayed.

Age	SERVICE									Total
	0 - 4	5 – 9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
Under 20	2	-	-	-	-	-	-	-	-	2
20 – 24	55	2	1	-	-	-	-	-	-	58
25 – 29	266	68	1	-	-	-	-	-	-	335
30 – 34	196	128	40	-	-	-	-	-	-	364
35 – 39	133	107	118	33	-	1	-	-	-	392
40 – 44	116	94	100	103	79	1	-	-	-	493
45 – 49	98	85	105	74	136	25	-	-	-	523
50 – 54	74	71	90	45	95	40	12	-	-	427
55 – 59	33	49	85	46	84	38	11	1	-	347
60 – 64	26	37	53	43	55	24	6	1	-	245
65 – 69	4	11	27	19	19	8	4	-	-	92
70 & Over	<u>-</u>	<u>3</u>	<u>8</u>	<u>10</u>	<u>16</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>-</u>	<u>40</u>
Total	1,003	655	628	373	484	138	34	3	-	3,318

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION V. APPENDICES

Service Retirees

Age	COUNT			ANNUAL BENEFITS**		
	Males	Females	Total	Males	Females	Total
Under 25	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-
40 – 44	-	-	-	-	-	-
45 – 49	6	2	8	*	*	*
50 – 54	104	47	151	\$ 5,445,949	\$ 2,123,055	\$ 7,569,004
55 – 59	288	192	480	14,085,757	7,722,746	21,808,503
60 – 64	432	412	844	18,650,691	15,364,623	34,015,314
65 – 69	567	628	1,195	21,677,084	20,701,666	42,378,750
70 – 74	450	531	981	16,483,272	16,925,613	33,408,885
75 – 79	311	383	694	11,433,531	11,374,506	22,808,036
80 – 84	210	262	472	6,533,387	7,014,638	13,548,025
85 – 89	100	157	257	2,869,073	3,995,586	6,864,659
90 & Over	<u>43</u>	<u>87</u>	<u>130</u>	<u>1,228,195</u>	<u>1,935,450</u>	<u>3,163,645</u>
Total	2,511	2,701	5,212	\$98,406,939	\$87,157,883	\$185,564,822

* Not shown if less than 20 members. The totals only sum the cells that are displayed. Payees receiving benefits under Qualified Domestic Relations Orders (QDROs) are included with service retirees.

** Annual benefits shown do not include ad hoc COLAs or Supplemental Annuity Payments.

Age	ANNUAL BENEFIT LEVEL									Total
	<\$5k	\$5-10k	\$10-15k	\$15-20k	\$20-25k	\$25-30k	\$30-40k	\$40-50k	\$50k+	
Under 40	-	-	-	-	-	-	-	-	-	-
40 – 44	-	-	-	-	-	-	-	-	-	-
45 – 49	-	1	-	-	1	1	-	-	5	8
50 – 54	1	1	3	12	7	13	34	28	52	151
55 – 59	2	5	14	21	33	46	99	102	158	480
60 – 64	6	8	21	41	76	110	209	163	210	844
65 – 69	4	13	54	69	132	196	344	219	164	1,195
70 – 74	1	14	52	84	132	158	260	154	126	981
75 – 79	1	7	52	85	104	109	157	93	86	694
80 – 84	-	9	59	81	74	73	106	34	36	472
85 – 89	-	2	45	61	44	25	40	21	19	257
90 & Over	<u>-</u>	<u>-</u>	<u>30</u>	<u>37</u>	<u>17</u>	<u>15</u>	<u>19</u>	<u>4</u>	<u>8</u>	<u>130</u>
Total	15	60	330	491	620	746	1,268	818	864	5,212

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION V. APPENDICES

Disabled Retirees

Age	COUNT			ANNUAL BENEFITS**		
	Males	Females	Total	Males	Females	Total
Under 25	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-
40 – 44	1	-	1	*	-	*
45 – 49	2	4	6	*	*	*
50 – 54	10	4	14	*	*	*
55 – 59	11	6	17	*	*	*
60 – 64	20	17	37	\$ 507,445	*	\$ 507,445
65 – 69	26	22	48	697,793	\$ 440,114	1,137,908
70 – 74	13	25	38	*	575,222	575,222
75 – 79	19	22	41	*	430,978	430,978
80 – 84	8	11	19	*	*	*
85 – 89	2	4	6	*	*	*
90 & Over	<u>1</u>	<u>3</u>	<u>4</u>	<u>-</u>	<u>*</u>	<u>*</u>
Total	113	118	231	\$1,205,238	\$1,446,314	\$2,651,553

* Not shown if less than 20 members. The totals only sum the cells that are displayed.

** Annual benefits shown do not include ad hoc COLAs or Supplemental Annuity Payments.

Age	ANNUAL BENEFIT LEVEL									Total
	<\$5k	\$5-10k	\$10-15k	\$15-20k	\$20-25k	\$25-30k	\$30-40k	\$40-50k	\$50k+	
Under 40	-	-	-	-	-	-	-	-	-	-
40 – 44	-	-	-	1	-	-	-	-	-	1
45 – 49	-	-	-	4	1	-	1	-	-	6
50 – 54	-	-	-	2	2	4	4	2	-	14
55 – 59	-	-	1	4	6	4	-	-	2	17
60 – 64	-	-	2	14	9	5	5	1	1	37
65 – 69	-	-	5	15	9	11	6	2	-	48
70 – 74	-	-	5	10	7	8	7	1	-	38
75 – 79	-	-	4	19	14	1	2	-	1	41
80 – 84	-	-	4	6	3	4	2	-	-	19
85 – 89	-	-	5	1	-	-	-	-	-	6
90 & Over	<u>-</u>	<u>-</u>	<u>3</u>	<u>1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>4</u>
Total	-	-	29	77	51	37	27	6	4	231

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION V. APPENDICES

Surviving Spouses and Child Pensioners

Age	COUNT			ANNUAL BENEFITS**		
	Males	Females	Total	Males	Females	Total
Under 25	71	81	152	\$ 204,480	\$ 233,280	\$ 437,760
25 – 29	-	-	-	-	-	-
30 – 34	-	1	1	-	*	*
35 – 39	-	3	3	-	*	*
40 – 44	-	9	9	-	*	*
45 – 49	1	36	37	*	598,639	598,639
50 – 54	6	58	64	*	973,352	973,352
55 – 59	11	110	121	*	2,020,833	2,020,833
60 – 64	22	168	190	356,167	3,403,274	3,759,441
65 – 69	38	229	267	581,805	4,361,282	4,943,088
70 – 74	43	235	278	823,454	4,201,199	5,024,653
75 – 79	60	171	231	956,430	3,017,229	3,973,659
80 – 84	40	173	213	625,268	2,887,577	3,512,844
85 – 89	33	125	158	541,599	1,874,366	2,415,965
90 & Over	<u>19</u>	<u>87</u>	<u>106</u>	<u>*</u>	<u>1,268,846</u>	<u>1,268,846</u>
Total	344	1,486	1,830	\$4,089,203	\$24,839,877	\$28,929,080

* Not shown if less than 20 members. The totals only sum the cells that are displayed.

** Annual benefits shown do not include ad hoc COLAs or Supplemental Annuity Payments.

Surviving Spouses Only

Age	ANNUAL BENEFIT LEVEL									Total
	<\$5k	\$5-10k	\$10-15k	\$15-20k	\$20-25k	\$25-30k	\$30-40k	\$40-50k	\$50k+	
Under 40	-	-	2	2	-	-	-	-	-	4
40 – 44	-	3	3	1	1	-	1	-	-	9
45 – 49	1	5	13	10	2	4	2	-	-	37
50 – 54	1	6	24	21	6	2	3	1	-	64
55 – 59	-	12	40	27	19	15	6	1	1	121
60 – 64	1	7	57	55	37	9	14	7	3	190
65 – 69	-	13	100	63	44	24	20	1	2	267
70 – 74	-	18	110	65	46	16	18	4	1	278
75 – 79	-	14	100	58	30	15	9	4	1	231
80 – 84	-	21	92	52	24	14	10	-	-	213
85 – 89	-	15	84	34	13	8	2	2	-	158
90 & Over	<u>-</u>	<u>7</u>	<u>66</u>	<u>21</u>	<u>9</u>	<u>2</u>	<u>1</u>	<u>-</u>	<u>-</u>	<u>106</u>
Total	3	121	691	409	231	109	86	20	8	1,678

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

SECTION V. APPENDICES

Inactive and Terminated Members Who are Assumed Not to Withdraw Contributions

Age	COUNT			ANNUAL BENEFITS		
	Males	Females	Total	Males	Females	Total
Under 25	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-
40 – 44	2	1	3	*	*	*
45 – 49	14	10	24	*	*	*
50 – 54	18	10	28	*	*	*
55 – 59	19	22	41	*	\$327,716	\$327,716
60 – 64	9	4	13	*	*	*
65 – 69	5	4	9	*	*	*
70 – 74	4	2	6	*	*	*
75 – 79	1	1	2	*	*	*
80 – 84	2	1	3	*	-	*
85 – 89	-	-	-	-	-	-
90 & Over	-	-	-	-	-	-
Total	74	55	129	-	\$327,716	\$327,716

* Not shown if less than 20 members. The totals only sum the cells that are displayed.

Age	ANNUAL BENEFIT LEVEL									Total
	<\$5k	\$5-10k	\$10-15k	\$15-20k	\$20-25k	\$25-30k	\$30-40k	\$40-50k	\$50k+	
Under 40	-	-	-	-	-	-	-	-	-	-
40 – 44	-	1	1	0	1	0	0	0	0	3
45 – 49	3	9	6	1	2	2	1	0	0	24
50 – 54	5	3	7	8	1	1	2	1	0	28
55 – 59	3	12	8	6	6	3	1	0	2	41
60 – 64	0	4	4	0	2	2	1	0	0	13
65 – 69	2	4	2	0	0	0	0	1	0	9
70 – 74	2	3	-	-	-	-	1	-	-	6
75 – 79	1	-	-	-	-	1	-	-	-	2
80 – 84	1	2	-	-	-	-	-	-	-	3
85 – 89	-	-	-	-	-	-	-	-	-	-
90 & Over	-	-	-	-	-	-	-	-	-	-
Total	17	38	28	15	12	9	6	2	2	129

This work product was prepared solely for the Government of Guam Retirement Fund 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 this Milliman work product.

APPENDIX D. GLOSSARY OF KEY TERMS

Actuarial Accrued Liability or Total Pension Liability. The Present Value of Future Benefits allocated to past service in accordance with the actuarial cost method. GASB 67 uses the term Total Pension Liability.

Actuarial Cost Method. A method of allocating the present value of benefits to past and future periods. Actuarial cost methods take into consideration the effect of wage inflation.

Actuarial Gains and Losses. Changes to the Actuarial Accrued Liability due to deviations from the actuarial assumptions. These can include gains and losses from investments, employee turnover, disability, retirement, mortality, and administrative expenses.

Actuarial Value of Assets. A method of valuing Fund assets that may smooth gains and losses that occur in the market value over a period of time.

GASB. Government Accounting Standards Board. GASB Statements No. 67, and 68 are accounting standards issued by GASB that require certain items be disclosed in the Fund's financial statements.

Fiduciary Net Position. The market value of Fund assets.

Net Pension Liability. The dollar value of the Total Pension Liability that exceeds the market value of Fund assets. A fully funded plan will have no Net Pension Liability.

Normal Cost or Service Cost. The value of benefits earned for one year of service. The normal cost is calculated in accordance with the actuarial cost method. The accumulation of all normal costs assigned to past service equals the Actuarial Accrued Liability. GASB 68 uses the term Service Cost.

Present Value of Benefits. The sum of all benefits expected to be paid in the future by the retirement system, with the payments discounted to the present using the valuation interest rate. This includes benefits to be earned in the future for current employees.

Present Value of Future Normal Cost. The sum of all future normal costs expected for current employees, with the costs discounted back to the present using the valuation interest rate.

Security Ratio. The percentage of the Actuarial Accrued Liability that is funded by the Fund assets. A fully funded plan will have a security ratio of 100%.

Unfunded Actuarial Accrued Liability. The dollar value of the Actuarial Accrued Liability that exceeds the Actuarial Value of Assets. A fully funded plan will have no unfunded actuarial accrued liability.