

**Actuarial Valuation of the
Public Service Pension Plan
As of January 1, 2011**

April 12, 2012



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INTRODUCTION

The Public Service Pension Board (the "Board") has carried out, as required by the current Public Service Pension Law, an actuarial valuation of the main Public Service Pension Plan as of January 1, 2011 for funding purposes. The results of the valuation are provided in this report. The last actuarial valuation to be carried out was as of January 1, 2008 but this has not been tabled at the Legislative Assembly as of the date of this report.

The current pension arrangements originated in 1963. The Pensions (Amendment) Law, 1991 established the Public Service Pension Fund (the "Fund"), the purpose of which is to accumulate contributions, investment income and other payments accepted by the Public Service Pensions Board for the eventual payment of pensions and related benefits then being paid out of the general revenue of the Islands. The Fund was established with effect from January 1, 1990 but no benefits could be paid out of it during the 1990s since the Fund was not capable of meeting the projected liabilities, after taking into account the contributions and earnings of the Fund. Since the year 2000 or so, benefit payments have continued to be met by the Fund. The late establishment of the fund, some 26 years after the plan commenced, is one of the primary reasons for the continued unfunded situation and the consequent high funding requirements.

In this context, it should be noted that the steps taken towards establishing a fund is a major positive step given that many defined benefit civil service pension plans around the World, including those of the US and the UK, remain unfunded.

The Public Service Pensions Law (1999), "the 1999 Law", amended and restated the prior pension law. The 1999 Law resulted in several changes to the pension provisions. A major change brought out by the 1999 Law is that the retirement benefits for new entrants are based on defined contribution principles, with both the Government and participants contributing at a rate of 6% of pensionable earnings for the accumulation of defined contribution account balances. The Public Service Pensions Law (2000), "the 2000 Law", and The Public Service Pensions Law (2004) made various amendments and revisions to the 1999 Law. The Public Service Pensions Law (2011 Revision), "the 2011 Law", is a consolidation of all changes made to date.

The valuation is to serve the following purposes, as specified in Section 12 of the 2011 Law:

1. to determine whether the Fund remains capable of meeting its liabilities for the following period of at least 40 years at the rate or rates of contribution then in force;
2. if it is not so capable, to ascertain what rate or rates of contribution would be required to reinstate that capability; and
3. to determine the amount to be reflected on the balance sheet. *(Please note that this refers to the accounting for the Fund. Financial statement requirements of employers are governed, under the Public Management and Finance Law, by the International Public Sector Accounting Standards requirements; these are outside the scope of this report.)*



The Public Service Pension Plan (the “Plan”) is the program resulting from the provisions of the above referenced laws. Although there is only one plan, there are two categories of participants: the Defined Benefit (“DB”) participants who joined the Plan prior to the enactment of the 1999 Law, and the Defined Contribution (“DC”) participants who joined after the enactment of the 1999 Law. It should be noted at the outset that the defined contribution plan is not a pure defined contribution plan in the traditional sense. It can be referred to as a “hybrid DC” plan.

Normally, it is the “defined benefits” that require actuarial valuation and this is where the emphasis is placed in this report. It is, however, also important to consider the Hybrid DC benefits because of the financial consequences resulting from the interactions between the two parts.

The January 1, 2005 actuarial valuation, the last actuarial valuation to be tabled, established a required contribution, under the financing method adopted by the Board, of 40.53% of pensionable pay for DB participants for the plan as a whole, and 13% of pay for DC participants. Participating employers were provided their own individual assessment of how much the DB plan cost them. The DB contribution rates for all participating Statutory Authorities were significantly lower than 40.53% whereas that for CI Government (“CIG”) it was significantly more since CIG assumes the majority of the past service liabilities. The DC contribution rates were uniformly 13% for all participating employers.

The January 1, 2008 valuation showed an increase in the unfunded position of the Plan and consequently a higher contribution rate requirement.

Actual contribution income has been significantly less than what was required by the January 1, 2005 actuarial valuation. For CIG, this was mostly due to increasing financial constraints. A major contributing factor for this with respect to the Statutory Authorities is that the necessary regulations to prescribe contribution rates following the tabling of the January 1, 2005 valuation were never finalized, leaving the sponsoring employers with no formal bases for the contribution requirements. The rate of contribution currently being made to the plan for CIG is the default rate specified in the legislation when there are no contribution regulations. This rate is significantly less than the rates recommended by the Board pursuant to the requirements of Section (12) of the 2011 Law. One of the primary functions of this valuation is to recommend a rate of contribution that would reinstate the ability of the Fund to meet its liabilities over a period of at least 40 years.



It should be noted that the Parliamentarians Pension Plan and the Judicial Pension Plan are covered in respective separate reports. Furthermore, the results of this valuation are not suitable for reporting under International Public Sector Accounting Standards, for which separate actuarial valuations are prepared annually. Other unfunded pension arrangements, such as the Ex-Gratia provisions, are also not covered in this report, nor are other postretirement benefit arrangements, such as healthcare benefits.

All monetary amounts in this report have been expressed in Cayman Islands Dollars.

I am at the disposal of the Board to discuss this report and to answer any questions that may arise, or to provide any further information that may be required. Professional standards require me to state that I am currently compensated as an employee of the Public Service Pensions Board.

Respectfully Submitted



Subramanian Sundaresan, FIA, FCA, MAAA, ASA, EA
Actuary
Public Service Pensions Board

April 12, 2012



EXECUTIVE SUMMARY**1. Actuarial Position of the Fund as of January 1, 2011**

	<u>January 1, 2008</u>	<u>January 1, 2011</u>
	<u>Valuation</u>	<u>Valuation</u>
	(C\$ millions)	
	<i>7% Interest Basis</i>	<i>8% Interest Basis</i>
<u>Defined Benefit ("DB")</u>		
Value of Pension Fund Allocated Assets	174.35	206.05
Past Service Liability (No Projection of Pay)	310.81	331.72
Past Service Liability (With Projection of Pay)	366.66	371.91
<i>Actuarial Deficiency</i>	<i>192.31</i>	<i>165.86</i>
<u>Defined Contribution ("DC")</u>		
Assets = Liabilities	68.36	103.82
<u>Total</u>		
Value of Pension Fund Allocated Assets	242.71	309.87
Past Service Liability (Projection of Pay)	435.02	475.73
<u>Funded Ratio (Assets/PSL)</u>		
DB Plan only	48%	55%
DB and DC Plans together	56%	65%

2. Future Contribution Requirement

The contribution requirement for the DC participants is **12.40%** of their payroll, or **C\$19.25 million** for the year commencing January 1, 2011.

The contribution requirement for the DB participants on the basis of normal cost plus amortization of actuarial deficiency over 20 years is **C\$25.14 million** for the year commencing January 1, 2011. These contribution rates would be sufficient to meet the requirements of Section (12) of the 2011 Law.

The total annual plan funding cost for 2011, based on active pensionable payroll as of January 1, 2011, is therefore estimated as **C\$44.39 Million** (or **20.93%** of pay).



3. Main Comments

- A. Continuation of the current default rate of contributions at 12% of pay is projected to deplete the defined benefit portion of the fund by year 2026 and therefore does not satisfy the legal requirement of contributing at a rate that can sustain the fund for a period of at least 40 years.
- B. A very significant increase can be expected in the amount of benefits to be paid from the DB part over the course of the next 20 years at the end of which benefit payments are expected to peak at close to C\$60million per year. This will have severe implications for both funding and investment policy; sufficient cash will need to be made available to meet these benefit payments. Much of the fund's ability to be self-sustaining is very much dependent on the ability to accumulate assets over the next twenty years and meet these peak payment years with sufficient reserves to continue making benefit payments thereafter.
- C. The timing and magnitude of these benefit payments make the financing of the DB part very sensitive to the amount of contributions going in and the investment returns being generated over the next twenty years. A low rate of contributions during the next few years or poor investment returns will lead to significantly higher contribution requirements in subsequent years. With respect to investment returns, it will be noted that the main results of this valuation are based on an assumed long-term investment return, net of investment expenses, of 8% per year.
- D. Continuation of the current level of contributions to the DB plan (close to 12% of salaries) is projected to result in the depletion of the DB allocated fund by year 2026. By 2013, it is expected that, under this scenario, total plan contributions (including both DB and DC contributions) will be insufficient to meet benefit payments and expenses. The deficiency will have to be met by fund earnings, and eventually by sale of investments.
- E. It is recognized that under current financial strains, funds may not be available to meet the contribution requirements recommended in this report. In that event, this valuation can serve as a springboard for discussions between the Board and the Government. It is important for the Board and the Government to set out a long-term financing plan for this plan with defined objectives, after a thorough study of the implications of these objectives and the impact on Government finances.



- F. Many areas of the Plan need attention and review, some of them significantly impacting the fund and plan financing. The areas of review are detailed in Section VII of this report.

4. Principal Recommendations

A. Develop a long-term financing plan for the DB Part.

The law provides for some flexibility in establishing required contribution rates. There is scope to address short-term financing strains. The main direction is that long-term contribution rates should demonstrate that the fund will continue to meet its obligations for a period of at least 40 years. Any financing plan that is developed should be within this framework.

B. Develop different funding requirements between CIG and Statutory Authorities.

Statutory Authorities have widely varying funding levels and a much shorter time-frame to fund than CIG. As a result, it is important to have financing plans individually for each sponsoring employer.

C. Change the Current Law on Contribution Rate Setting.

The current law on contribution rate setting, implemented in 2004, has not really worked. It is suggested here that a more workable approach would be (1) the acceptance of the actuarial valuation report that provides the basic actuarial valuation results, followed by (2) the development of a long-term financing plan for each sponsoring employer, taking account of any short-term financial strains.

D. Recognize the issues surrounding the continuation of the current contribution rate of 12% of salaries.

Projected fund payments are expected to exceed the inflow of contributions at the current rate on a cash-flow basis by year 2013. The current reduced level of contributions will also lead to higher required contribution rates in the future as they are insufficient to cover even the ongoing normal costs, thereby leading to increasing the actuarial deficiency. Any necessary



liquidation of assets to meet benefit payments will dictate re-evaluation of investment strategies leading potentially to lower long-term asset returns.

E. Consider increasing the Normal Retirement Age.

Increasing the normal retirement age will benefit both fund and participants (DB and DC). It will provide the fund with a longer time horizon for funding and thereby reduce the annual contribution requirement. At the same time, participants have the opportunity to augment their retirement pension as a result of increasing their service accruals.

F. Redefine pensionable earnings for benefit calculations.

There are financial risks associated with the way DB pension benefits are computed based on the current definition of pensionable earnings. It is recommended that changes are made to mitigate these risks.

G. Institute strict non-payment penalties.

Once a financing plan has been developed and agreed upon by the respective sponsoring employers, a system of non-payment penalties should be instituted to non-complying employers.

H. Conduct financial impact assessments prior to implementing law changes.

The law requires this. Changes should consider the impact on (i) fund cash flows, (ii) fund investments, (iii) the impact on the financial position of the fund, and (iv) the impact on forward contribution requirements.



SECTION III - VALUATION BASIS**1. Census Data**

Information was provided for each individual covered by the Plan as of January 1, 2011. The table below shows a summary of the census data.

Fig. III.1 Summary of Participant Data

	<u>2005</u> <u>Valuation</u>	<u>2008</u> <u>Valuation</u>	<u>2011 Valuation</u>
<u>Actives - DB Part</u>			
Headcount	1,545	1,332	1,143
Total Annual Pensionable Pay	60,924,756	60,751,426	56,832,018
Average Age	40.95	42.98	44.64
Average Service	14.99	16.87	17.18
<u>Actives - DC Part</u>			
Headcount	2,043	3,313	3,531
Total Annual Pensionable Pay	74,121,600	130,890,352	155,211,889
Average Age	40.95	38.79	40.11
Total Account Balance	20,247,172	59,925,595	93,941,497
<u>Deferred Vested Participants DB Part 1/</u>			
Headcount	372	411	436
Total Deferred Annual Pension	1,593,098	2,050,580	2,331,703
<u>Deferred Vested Participants - DC Part 1/</u>			
Headcount	706	1,158	1,096
Average Age	34.00	35.55	38.34
Total Account Balance	2,679,036	8,419,259	9,879,252
<u>Current Pension Recipients</u>			
Headcount	611	1,018	1,255
Total Annual Pension	6,365,762	10,658,335	13,762,723
1/	Deferred vested participants are those who have left service but retain vested benefits under the plan payable at retirement.		

Exhibit 4 shows details of the census data used, as well as a breakdown between the different groups of participants.



2. Benefit Provisions

As of January 1, 2011, the legal document concerning the pension provisions is the Pension Law, which came into force on December 31, 1963, and subsequent amendments to it, in particular the 1999 Law, 2000 Law, the 2004 Law, and the 2011 Law. Exhibit 7 shows an outline of the principal provisions as they affect the actuarial valuation of the liabilities. Only the provisions that have the most important impact on the valuation are detailed in the outline. There are no substantial differences from the prior valuation.

As noted in the introduction, although there is only one fund and one plan, there are really two parts: the Defined Benefit part and the Defined Contribution part. The DC part is more of a hybrid DC plan and defers from a traditional defined contribution plan in the following manner:

- a. Interest credits to account balances are declared annually and determined as the average return on the total fund, net of investment and administrative expense, over the preceding three calendar years. This provides for a smoothing mechanism to counter market fluctuations.
- b. There are no investment fund choices by the participants.
- c. At retirement, there is an option to take up to 25% of the account balance as an immediate cash distribution. The balance is converted to one of three forms of pension annuities. The current annuity conversion factors have remained unchanged since inception. Compared to current annuity market conditions in the private sector, these factors provide a significant subsidy to retiring participants. On conversion to pension, the remaining account balance and the pension obligation is transferred to the DB part of the Plan.
- d. Participants receive additional benefits in some cases, over and above what their account balance provides, as follows:
 - i. On death-in-service, an additional amount is payable, equal to the excess, if any, of the annual rate of salary over the accumulated account balance.
 - ii. On duty-related death, additional pensions are payable based on the participant's salary.
 - iii. On duty-related permanent disability, additional pensions are payable, again based on the participant's salary.

3. Available Assets

Asset and cash flow information was made available by the Finance and Investment Department of the Board. Audited accounts for the period since the last valuation were not available. The Plan assets are combined with the assets of the Parliamentarians Pension Plan and the Judicial Pension Plan. The figure on the right shows the composition of the assets as of December 31, 2010. The long-term investment strategy adopted by the Investment Committee of the Board has been to invest up to 65% in equities/property and the balance in bonds/cash.

Fig. III.2 Asset Allocations at Dec 31, 2010

(CIS\$ millions)

Equities	\$	187.03	59%
Bonds	\$	106.50	34%
Property	\$	10.63	3%
Cash/other	\$	12.52	4%
	\$	<u>316.68</u>	<u>100%</u>

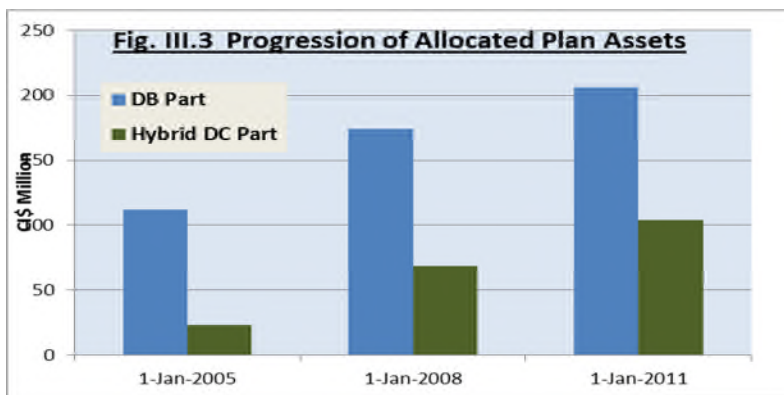
The Board maintains a notional allocation of assets between these three plans and this was used for purposes of this valuation. The allocation is based on the cash flows of the three plans. A summary of the three-year consolidated accounts for the three plans is shown in Exhibit 5. The Board maintains a similar allocation of assets



for each sponsoring employer of the main plan to enable the Board to carry out employer-specific valuations for funding and accounting purposes.

The value allocated to the main Public Service pension plan was CI\$309.87 million as of January 1, 2011. The value of the assets attributable to DC participants was derived as the total of the participants' account balances. This total was CI\$103.82 million, leaving a balance of CI\$206.05 million for the DB part.

The figure on the right shows the progression of the assets over the last six years. As of January 1, 2011, the proportion of Plan assets belonging to the DC part was approximately 33%.



4. Actuarial Assumptions Used for Valuing the Plan

4.1 Economic Assumptions

The economic assumptions were reviewed in detail with the Board Trustees prior to this valuation. In agreement with them, some of the assumptions have changed since the previous valuation – most importantly, the valuation rate of interest and the method of incorporating administrative expenses.

It is important to take a consistent view on all of the economic assumptions used in an actuarial valuation since they are inter-related. The following are the most important of the economic assumptions:

Inflation - It is usual to commence with an assumption on the underlying long-term rate of inflation, as inflation impacts such things as future salary increases, future asset earnings, future pension increases, and administrative expenses. A long-term rate of 2.5% per year has been used for purposes of this valuation. This assumption has remained unchanged since the previous valuation.

Interest Rate - The valuation interest rate is used to discount future benefit payments and represents the expected long-term rate of return on the Fund's invested assets. The previous two valuations have been carried out using a 7% per year rate, based on long-term expectations and composition of the portfolio. This rate was net of investment and administration expenses. The following changes have been made for this valuation:



- a. While it makes sense to use an interest rate net of investment expense, administration expenses are not directly related to investments. It was therefore decided to use an interest net of only investment expenses and to account for administrative expenses more directly and transparently.
- b. A decision was made to use a valuation interest rate of **8% per year**, net of investment expense, as the main basis for this valuation. It must be noted, at the outset, that the valuation interest rates of the previous valuation and the current one are not very different in their overall impact on developing contribution requirements after allowing for the different manner in which administration expenses are treated.
- c. The decision to use a valuation interest rate of 8% per year, net of investment expenses, was arrived at after consideration of the following:
 - A targeted exposure to equities by the Investment Committee of 65%.
 - Advice, based on surveys of similar funds, by the investment consultant.
 - Investment return rates used by US public funds, adjusted for the following:
 - Differences in inherent inflation assumptions
 - Differences in investment expenses
 - Superior performance of the PSPB fund vis-à-vis other public pension funds over the last five-year period
- d. Maintaining a long-term investment return assumption of 8% per year, net of investment expenses, can be supported provided a number of factors hold. These are discussed more extensively in Section VII of this report. Most importantly, the Fund should not encounter cash flow problems in the near future that would necessitate some liquidation of assets. Also, market conditions should not alter significantly the expected long-term performance of various asset classes.
- e. Results have also been provided using a 7% interest basis, to show the sensitivity of the results to this assumption.

Salary Increases - An allowance of 1.00% over and above inflation for merit and promotion has been made. The rate of salary increases used in this valuation is therefore 3.50% per year. The previous valuation used a salary increase rate of 4.00% per year.

Pension Increases - Future pensions have been assumed to increase at the rate of 2.5% per year, the same as the rate of inflation.

Administration expense – Total annual administration expenses are approximately CI\$3.5 million currently. Of this, it is estimated that CI\$ 1.4 million is attributable to administering the DB part. It has been assumed for projection purposes that these will increase in line with inflation, at 2.50% per year.

DC Annuity Conversion Factors – At retirement of DC participants, the conversion of account balances to annuities is based on plan actuarial factors. This implies guarantee of interest and mortality rates that are implicit in the factors. It has been assumed that these factors will be changed periodically and that they will,



overall, be cost neutral with respect to the actuarial valuations in the future. The current actuarial factors in use have been unchanged since inception but also use an interest rate of 8%.

4.2 Demographic Assumptions

Except for mortality rates, the demographic assumptions have remained unchanged since the previous valuation. The most important of the demographic assumptions are as follows:

Retirement Age - The plan provides unreduced benefits from age 55 after completing 10 years of service for all DB participants. Analyses of recent retirement experience indicate that the average retirement age has been close to 57. Therefore, age 57 has been selected as the assumed retirement age, the same as the previous valuation. Note that non-gazetted police officers are assumed to retire on completion of 21 years of service, if earlier, as permitted under special laws governing their service.

Mortality - The mortality rates used in the prior valuation were updated to reflect improvement using standard US mortality projection tables. The table used is described in Exhibit 6.

Turnover - Analyses carried out of the turnover experience suggested that experience was in line with the rates being used in the previous valuations. The age-related turnover rates used in this valuation are shown in Exhibit 6.

Disability - The disability benefits are based on service and pay accrued at the date of disability. Analysis has shown that this makes the disability provision cost neutral with respect to this Plan. Disability decrements have therefore been excluded. There are some additional duty-related disability benefits in the Plan. To date, the incidence of duty-related disability has been minimal but if this increases in the future, consideration should be made to incorporating disability assumptions in order to allow for these additional benefits.

New Entrants - The DB part is closed to new entrants. However, internal projections have been made for analyses purposes that include the long-term impact that the DC part has on the DB part. This requires making some assumptions about future participants to the DC part. It has been assumed that a sufficient number of new entrants will enter the plan to replace the employees who retire, die or leave service from the Plan (both parts) to keep the number of active participants constant throughout. The future new entrants have been assumed to have the same age and earnings profile as recent new participants to the plan. All new entrants are included under the DC part of the plan.

5. Actuarial Cost Method Used for Valuing the Benefits

5.1 Assessing the Actuarial Position of the Fund as of January 1, 2011

For the defined benefit section, the actuarial position of the Fund as of January 1, 2011 has been determined using the **projected unit credit actuarial cost method** in conjunction with the assumptions outlined in the preceding section. This method is commonly used for both measuring the funded status of the plan as of the valuation date as well as determining the amount of contribution required. Under this approach, two past service liabilities are developed, which are both based on pensionable service up to the valuation date.



The first past service liability is based on pensionable emoluments as of the valuation date and reflects the liability in respect of benefits actually earned up to December 31, 2011.

The second past service liability allows for the impact of future pay increases at the assumed annual rate of pay increase. This past service liability reflects the eventual liability of benefits related to past service at the valuation date. A surplus/ (deficiency) arises when the assets of the Fund are more/(less) than this projected past service liability under the projected unit credit actuarial cost method.

The second measure of past service liabilities is used for developing the ongoing required contribution rate. It is also the methodology used as amounts to be reflected in the balance sheet in most recognized accounting standards, but using different assumptions as required by the various accounting standards. The difference between the second and first measures the past service liability attributable to future pay increases.

For the defined contribution section, the past service liability is equal to the assets allocated to the defined contribution participants.

5.2 Assessing the Future Contribution Requirement

5.2.1 **For the DC participants**, future contributions are taken as 12% of pay for DC participants, all of it being allocated to participants' account balances. An extra contribution is required to finance the additional benefits detailed in Section III.2.d of this report. The cost of these benefits for the DC participants has been valued as a one-year term cost. This represents the estimated actuarial value of these benefits arising during the course of the year following the valuation date. This additional cost has been estimated to be 0.40% of pay for DC participants. The ongoing contribution requirement is thus 12.40% of pay.

5.2.2 **For the DB participants**, the projected unit credit actuarial cost method used for determining the past service liability also develops a **normal cost** of the Plan. The normal cost represents the cost of the accrual of one year's worth of benefit, based on projected pay. It can be taken as the ongoing cost of the plan if past service liabilities were fully funded. In this valuation, the annual cost of administering the DB plan has also been added to the normal cost.

5.2.3 Under the projected unit credit actuarial cost method, a common approach to developing the current required annual contribution is to amortize the (surplus)/ deficiency arising. The total annual cost is the normal cost (representing the current year's accrual of benefit) plus this amortization payment (representing past accruals). Based on decisions reached by the Board Trustees, **a 20- year amortization period** has been used in the past. The Board's recommendation is intended to achieve full funding for the Plan in 20 years. This method automatically meets the minimum funding requirements of Section (12) of the Law.

5.2.4 Contribution requirement are addressed in Section 12.(1)(a) of the 2011 Law, which states that one of the main purposes of an actuarial valuation is:

"to determine whether it remains capable of meeting its liabilities for the following period of at least forty years at the rate or rates of contribution then in force;"



The Law does not specify a particular cost method. It is possible to arrive at other methods of arriving at the contribution requirements and these should certainly be explored between the sponsoring employers and the Board. The requirement of the Law is that whatever contribution rate or long-term financing plan is adopted, there should be sufficient asset build-up to pay out benefits and expenses for the next 40 years. Therefore any financing plan should be tested for this criterion by making long-term projections of fund assets taking into account benefits, expenses, contributions and investment returns.



SECTION IV - FINANCIAL STATUS at DECEMBER 31, 2010

Exhibits 1A1, 1A2, 1B1, and 1B2 set out the results of the actuarial valuation on the basis outlined in Section III 5.1 above. **Exhibit 1A1** shows the results on the two interest base alternatives. **Exhibit 1A2** shows the results on the 2008 valuation basis and compares the results with the 2008 valuation. **Exhibit 1B1** shows the breakdown of the results on the main 8% basis between CIG and the Statutory Authorities in the aggregate. **Exhibit 1B2** shows the breakdown among the different sponsoring employers.

The most important items to note are as follows:

Past Service Liability (No Projection of Pay) - The first past service liability measurement, with no future pay projections, is shown in Item C. In Exhibit 1A1 it is equal to CI\$435.5million for the plan as a whole (DB and DC parts together) in the main 8% interest basis. This compares with Fund assets of CI\$309.9million. In the DC part, both the liabilities and assets are equal to the account balance. It should be noted that assets allocated to the DB part, CI\$206.0million, are sufficient to cover the past service liability for inactive participants in the DB part of CI\$179.5million.

Past Service Liability (With Projection of Pay) - The second past service liability measurement, with future pay projections, is shown in Item D. For the DB part, this is equal to CI\$371.9million using the main 8% interest basis. The resulting actuarial deficiency (shown as Item E) is **CI\$165.9million**, and it is this amount that forms the basis for developing the amortization costs. Item F.2 shows the extent to which this is covered by assets. This is **55%**.

If a 7.00% valuation interest rate is used, the actuarial deficiency increases to CI\$218.3 million and the asset coverage decreases to 49%.

Fig.IV.1 below shows the key extracts from these tables.

Fig. IV.1 Position at Dec 31, 2010 - Key Results

(CI\$ millions)

	<u>DC Part</u>		<u>DB Part</u>		
	Dec-08	Dec-11	Dec-08	Dec-11	Dec-11
				<u>2008 Basis</u>	<u>2011 Basis</u>
Assets	68.4	103.8	174.4	206.0	206.0
Past Service Liability	68.4	103.8	366.7	423.4	371.9
(Actuarial Deficiency)	-	-	(192.3)	(217.4)	(165.9)
Asset Coverage %	100%	100%	48%	49%	55%

As shown in Exhibit 1A2 and in the table above, the January 1, 2008 actuarial valuation had a deficiency of \$192.3million. With a 20-year amortization, the expected deficiency at January 1, 2011 using the 2008 valuation basis would have been \$177.2million had the actual experience during the intervening three years been exactly as expected and had the deficiency amortization payments been met. The actual actuarial deficiency of CI\$217.4million



implies that an additional deficiency of \$40.2million has arisen since the prior valuation. An analysis of gains and losses shows that this has been due to a number of factors, the main ones being as follows:

Fig. IV.2 Analysis of Gains and Losses

(CIS\$ millions)

a.	Loss due to investment earnings being less than expected	22.0
b.	Gain on pension increases being less than expected	(1.0)
c.	Gain on salary increases being less than expected	(4.9)
d.	Miscellaneous experience	5.3
e.	Loss on converting DC account balances to annuities at retirement 1/	1.5
f.	Gain due to 3-year averaging of interest credits to DC account balances 2/	(7.6)
g.	Loss due to PSL deficiency contributions being less than expected	24.9
	<u>TOTAL</u>	<u>40.2</u>

1/ Current annuity conversion factors imply a subsidy at retirement to DC participants with respect to the old valuation basis. This subsidy manifests as an increase in the DB actuarial deficiency.

2/ Interest credits to DC account balances are based on a three-year average of investment returns. In a wildly fluctuating market, this will give rise to gains or losses to the DB share of allocated asstes.

It can be observed in Fig. IV.1 above that there is a decrease in the actuarial deficiency of CIs\$ 51.5 million resulting from making changes to the 2008 actuarial basis. How each change in assumptions has contributed towards this is shown in Fig. IV.3 below. It will be noted that changing the interest rate has had, by far, the greatest impact.

Fig. IV.3 Gain/Loss Due to Change of Assumptions from the 2008

Valuation Basis

(CIS\$ millions)

a.	(Gain) due to reducing long-term salary increase rate from 4% per year to 3.50% per year	(8.6)
b.	Loss due to updating mortality rates to reflect improving longevity	9.5
c.	(Gain) on increasing the valuation interest rate from 7% per year to 8%.	(52.4)
	<u>TOTAL</u>	<u>(51.5)</u>



SECTION V – FUTURE CONTRIBUTION REQUIREMENTS

Exhibits 2A1, 2A2, and 2B1 show the determination of the future contribution requirement for the plan as a whole based on the funding method adopted by the Board as described in Section III 5.2 using the actuarial bases described in Section III 4.1 and 4.2. **Exhibit 2A1** shows the results on the two interest bases (8% as the main valuation basis and 7% to show the sensitivity of the interest rate choice). **Exhibit 2A2** shows the results on the 2008 valuation basis and compares the results with the 2008 valuation. **Exhibit 2B1** shows the breakdown of the results on the main 8% basis for the DB part between CIG and each Statutory Authority.

The most important items to note are the following:

Normal Cost - As mentioned above, the normal cost is the cost with respect to benefits being earned during the current year, with allowance for future pay projection, and including the annual cost of benefit administration. This is shown in Item E of Exhibit 2A1 and is CI\$8.9million (15.65% of current pay of DB participants) for the DB part using the main 8% interest basis and CI\$19.25million (12.40% of current pay of DC participants) for the DC part, based on the January 1, 2011 pensionable payroll.

Total Annual Cost - The total annual cost of the benefits provided under the projected unit credit actuarial cost method used is the sum of the normal cost and the amortization of the actuarial deficiency as of January 1, 2011. As explained above, the amortization period adopted by the Board is 20 years. The total annual cost for the DB part is CI\$25.14 million for the DB participants. The total annual cost for the DC participants is just the normal cost. The total annual cost for both plans for 2011 is \$44.38million, or 20.93% of the total combined DB and DC payroll.

The annual cost of administering the DB part has been included as a component of the normal cost. Investment management expenses have been implicitly taken into account in the determination of the valuation interest rate. In previous valuations, both investment management expenses and administration costs were allowed for as an adjustment to the rate of investment return.

Each participating employer's DB part costs will be different to the overall DB plan costs because of the variation of demographics among the various employers and also because a substantial portion of past service obligations have been allocated to CIG as a result of service prior to incorporation of most of the participating employers. Exhibit 1B1 and 1B2 sets out the actuarial position as of January 1, 2011 for each of these participating employers. Exhibit 2B1 sets out their contribution requirements as a result of participation in the DB part of the Plan. The contribution requirement of 12.40% of pensionable emoluments for participation in the DC part of the plan applies uniformly to all participating employers.



SECTION VI – PROJECTION ANALYSIS

One of the Law requirements, as mentioned previously, is to test the current rates of contribution to ascertain whether they can support meeting plan obligations for the next forty-years. This requires making long-term projections of benefit payments and fund size. Aside from this requirement, analysis of long-term projections is one of the most effective ways to explore the impact on funding of various scenarios and to put into effect a long-term financing plan.

Exhibit 3A shows the age distribution progression over the next 25 years (small footprint version shown on the right) for the DB participants. As the DB part of the plan is closed to new entrants, the number of active participants (as represented by the area under the graphs) is expected to diminish rapidly. By the year 2036, only a small number of participants are expected to remain active if the current retirement patterns continue to prevail. A major implication is that the size of the retiree population is going to increase significantly during this period with an accompanying rise in the amount of benefits to be paid out annually. Another implication is that the diminishing active payroll is going to result in increasing plan costs when these are expressed as a percentage of payroll (amortization costs are expressed as fixed dollars).

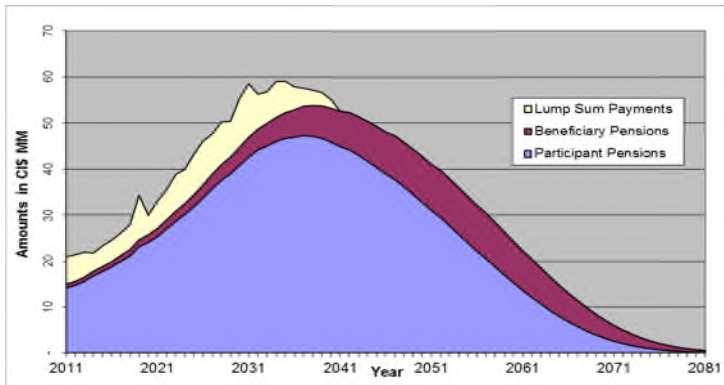
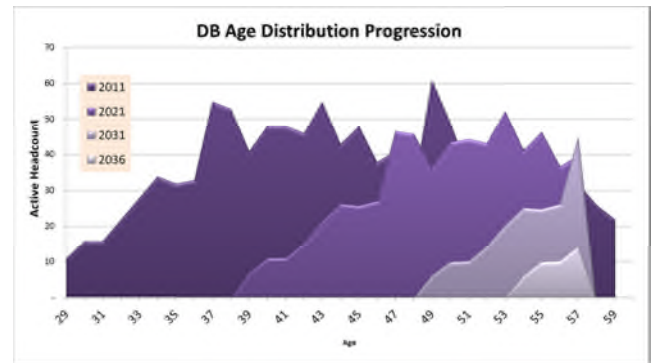


Exhibit 3B (small footprint version shown on the left) shows the projected benefit payments under the DB part for the next 70 years graphically and split according to retirement pensions, beneficiary pensions, and lump sum payments. A very significant increase can be expected in the amount of benefits to be paid over the course of the next 20 years when they are expected to peak at close to C\$60million per year. This will have severe implications for both funding and investment policy; sufficient cash will need to be made available to

meet these benefit payments. Much of the fund's ability to be self-sustaining is very much dependent on the ability to accumulate sufficient assets over the next twenty years and meet these peak payment years with sufficient reserves. This is what makes the financing so sensitive to the amount of contributions in-flow and the investment returns being generated over the next twenty years. For purposes of this chart and the ones shown below, benefit payments to DC participants who retire in the future have been excluded.



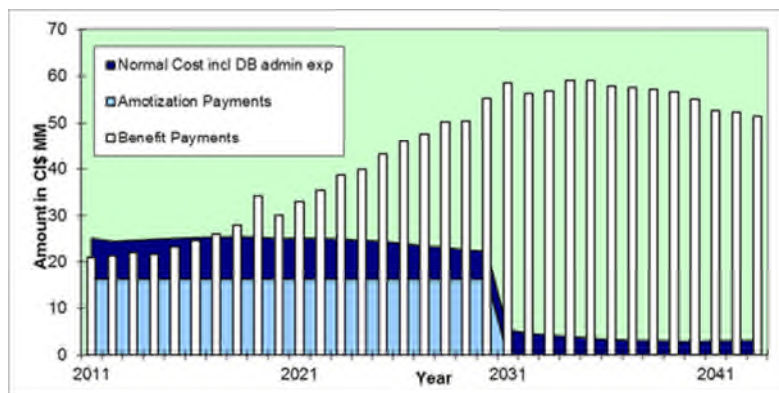
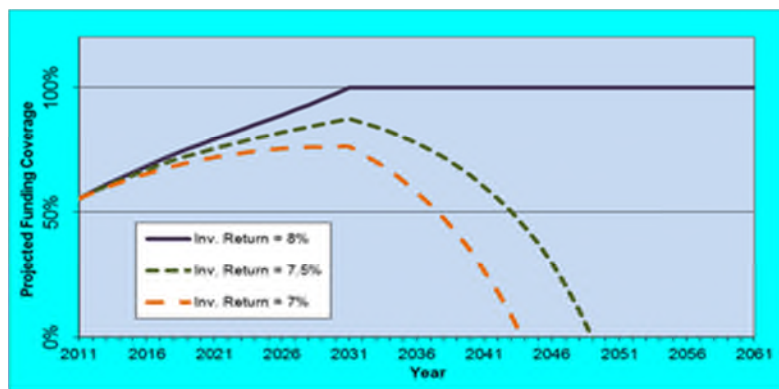
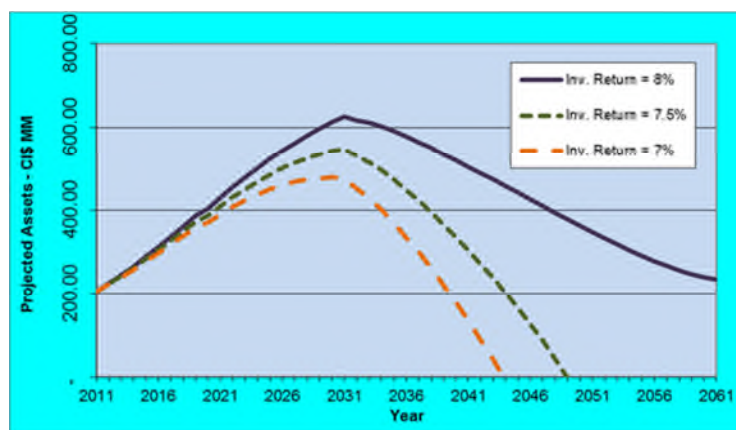


Exhibit 3C (small footprint version shown on the left) compares the expected benefit payments of Exhibit 3B with the expected contributions (normal cost plus amortization payments). If actual experience follows the actuarial assumptions and contributions are made in accordance with Exhibit 2A1 – 8% interest, DB benefit payments will not exceed incoming contributions to the DB part until the year 2017. A high rate of contribution is required for the next

twenty years, the period over which the actuarial deficiency is amortized. After this period, only the normal cost for the few remaining DB participants, plus administrative expenses will need to be funded, except for some actuarial losses that might arise. It should be noted that these projections assume a long-term rate of investment earnings of 8%. If the fund enters a period where benefit payments exceed contribution and investment income, it is likely that the portfolio composition will have less equity exposure, thereby reducing the expected rate of return.

As mentioned above, the incidence and magnitude of future expected benefit payments makes the fund extremely sensitive to (i) the amount of contributions being paid and (ii) the investment return performance.

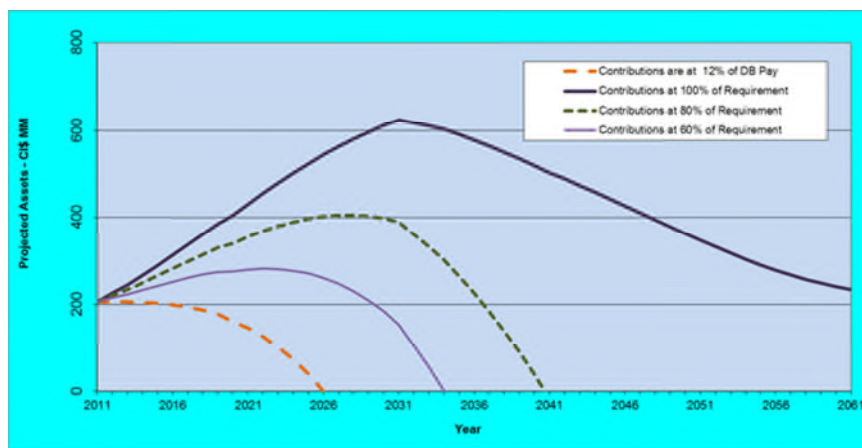
In **Exhibit 3D** (small footprint version shown on the right), the DB assets are projected assuming baseline contributions are made in accordance with the results of this report using a 8% interest rate assumption and amortization of the actuarial deficiency over a twenty-year period (Exhibit 2A1). The solid line shows the progression of the assets if the fund investments yield returns of 8% per year. The dotted lines below show the fund progression if the investment yields are $\frac{1}{2}\%$ and 1% below, respectively. These lines underline the importance of managing the investments effectively for this plan.



The chart at the left shows the same except that here, the assets are expressed as a percentage of the projected accrued liabilities (funding coverage level). If investments do earn 8% per year, as implied by the valuation interest rate, the funding coverage will expect to gradually increase to 100% in 20 years' time, the period for the actuarial deficiency amortization payments, when the 20-



year amortization payments cease, and is then expected to maintain at a steady level thereafter, close to 100%. The end of the twenty-year amortization period also coincides with when benefit payments payable to DB participants are expected to peak under the retirement assumptions used.



The contributions are varied in **Exhibit 3E** (small footprint version shown on the left) about the baseline contributions used in Exhibit 3D with investment returns assumed at 8% throughout. The first two lines underneath the baseline contributions show the progression of the DB fund if contributions are made at 80% and 60% of the baseline contributions. Under these scenarios, the fund is expected to run out by 2041 and 2034,

respectively. The shortest line shows the progression of the DB fund assets if contributions continue at 12% per year, close to the actual rate since October of 2009. Continuation at this rate would deplete the DB allocated fund by year 2026. In reality, the DB allocated fund would be depleted sooner as assets are continually converted to more liquid forms to make benefit payments thereby reducing the investment returns. As both DB and DC allocated funds are pooled together, the reduction in investment returns will impact account balance accumulations with the consequent reduction in eventual benefits for DC participants.

The inter-play between the DC part and the DB part of the Plan can have a significant influence in the financing of the latter. Plan actuarial factors that convert DC account balances to annuities at retirement could, in the future, represent significant subsidies with respect to the valuation basis. Currently, the amount of subsidy is minimal since both the plan actuarial factors and this valuation assumes an 8% interest basis. It is the DB part that is paying for any subsidies under the current setup. It is assumed, in this valuation, that these factors will be periodically updated and that these factors will be, in the long-run, cost neutral to the DB part.



SECTION VII – COMMENTS AND RECOMMENDATIONS

1. DB Plan Financing

Of the many action items needed, the most pressing is perhaps developing a long-term financing plan for the DB part of the plan. As mentioned previously in this report, the Law may be interpreted as providing a fair amount of flexibility in developing contribution requirements. The main stipulation appears to be that any contribution plan should insure that there are sufficient funds to pay benefits for at least forty-years. Any contribution financing plan should be tested for this criterion. Therefore, although this report develops contributions based on a funding method adopted by a Board resolution several years ago, other financing plans can be explored. This is likely to be necessary anyway given the current economic climate and financing strains.

Any alternative financing plan should be developed as a joint effort between the Board and key Government officers. Long-term projections under various scenarios and contribution schedules will assist in developing a suitable financing plan. There are many issues that would need to be considered in developing such a financing plan, including:

- a. Short-term, intermediate-term and long-term ability to pay required contributions, based on the Government's financial projections.
- b. Lower than required contributions in the short-term will translate to substantially higher contributions later.
- c. Acceptable levels of asset coverage. As of January 1, 2011, the DB past service liability is covered by DB allocated funds at 55%. If current low levels of funding (at 12% of pay) continue and/or if the valuation interest rate is lowered in future years, this coverage ratio can be expected to decrease. This ratio is an indicator of the extent to which the pension liability is being passed on to future generations. The lower the ratio, the greater is the reliance on future generations to pay for the benefits. A key issue here is the expected ability of future generations to finance these benefits. Tied to this is the expectation of the future growth of the Cayman economy.
- d. Another consequence of continuing with current levels of funding (at 12% of pay) is that benefits and expenses are very soon likely to exceed incoming contributions, necessitating partial sale of investments if investment income is not sufficient to cover the deficit. This will have consequences to the investment policy and a likely decrease in long-term expected investment returns as more assets move away from equity-type investments. In such a situation, support of an 8% valuation interest assumption may be difficult.
- e. Foreseeable changes to the plan structure.



2. Contribution Rates for Different Employers

Whereas CIG's time horizon for funding is long, this is not so for the other sponsoring employers. Under current arrangements, when a DB participant retires, any pension obligations that a Statutory Authority has as a result of service with that Authority will be transferred over to the CIG along with an actuarial equivalent amount of assets. This implies that the funding time-frame should only be up to retirement age. The Board and CIG should discuss this matter with each sponsoring employer and come to an agreement for a timeline to amortize any actuarial deficiencies.

3. Law on Contribution Rate Setting

The current pension law states that within six months of receiving the actuarial report from the Board, subject to its acceptance, the Governor will approve, by regulations, the rates recommended by the Board.

This provision in the law came into effect during 2004 but has never been applied. Although the January 1, 2005 valuation was accepted, no prescribed regulations ensued. CIG, in good faith, made contributions related to the results of the valuation until October 2009 when financial constraints restricted contributions to the DB part to 12% of salaries. The January 1, 2008 valuation has not been tabled.

The result of all of this is that currently there exist no contribution regulations. This is a particular problem for many Statutory Authorities, especially those who were formed after 2004. It may be desirable to revisit the whole legal procedure for establishing contribution rates for both CIG and Statutory Authorities, given that it has not really worked so far. In contrast, the arrangement that existed before the 2004 law change seemed to have worked well.

4. Short-term Cash Flow Issues

To date, all the sources of contributions combined, including contributions to the DB part and the DC part and the other plans that participate in the single fund, have been sufficient to meet the benefit payments and plan expenses, even at the current contribution rate of 12% of salaries paid by CIG under the DB part. However it expected that by 2013, continuation of the current contribution rate will need to draw on investment income, thereby reducing the amount available for re-investment. Further continuation of the 12% contribution rate will subsequently necessitate some partial asset sales. This can have some significant impact on investment policy and investment management issues that need to be closely monitored.

It should be noted that use of DC contributions to meet benefit payments to retirees is a cash flow management issue and has been necessary in order to avoid liquidation of assets. DC account balances continue to grow in relation to the amount of contributions made and interest credit earned.



5. Retirement Ages

The current normal retirement age in the plan is age 60. DB participants with 10 or more years of pensionable service can elect to retire from age 55 with benefits suffering no reductions for early retirement. Under both parts, retirement from the plan (not employment) is compulsory at age 60 at which age the retirement benefits commence.

The valuation data shows that although the average retirement age under the DB part is 57, a significant number of participants choose to retire at age 60, the latest age possible. This is especially so for those who joined the plan after July 10, 1980 who are on the lower “1/720th” rate of benefit accrual. This suggests that many employees would opt to retire later from the plan if the opportunity to do so was there.

The Government should seriously consider raising the retirement age. This will have benefits for both participants and the Fund. For the DB participants, especially those on the 1/720 accrual rate, it will provide an opportunity to accrue further benefits. For the Fund, it will delay the time needed to start paying pension benefits and hence provide a longer time-frame for funding purposes. For DC participants, this will provide a longer period to grow their account balances, resulting in higher pensions.

6. Valuation Interest Rate

Section III 4.1 above describes how the long-term investment return assumption (and therefore the valuation interest rate) of 8% was arrived at. Implicit in this decision is the assumption that various factors that are involved in its derivation do not alter significantly over time. These factors need to be continually monitored. In particular, the following has been assumed:

- a. Market conditions do not alter the long-term expected returns on various asset classes.
- b. The fund continues to have high equity exposure.
- c. The fund continues to outperform peers.
- d. Investment expenses do not change significantly.
- e. There are no changes to the inflation assumptions.
- f. Cash flow issues do not require significant disinvestment or changes to the asset allocation. One implication of this is that pension fund contributions will be significantly more in the future than they have been since the end of 2009. Another implication is that no changes to the plan will be made that would generate negative cash flows.
- g. The Defined Benefit and Defined Contribution parts will not be split into two separate plans, each with its own separate fund. The DB part needs the cash inflow from the DC part contributions to pay benefits without resorting to sale of investments. For its part, the DC part benefits by participating in a larger pool of assets with a greater equity exposure and thereby attracting a potentially greater investment return.



7. DC Annuity Conversion Factors

The annuity conversion factors used to convert DC account balances to pensions at retirement have remained unchanged since inception and are based on the then prevailing interest rates and older mortality tables. The differences between the actuarial bases implicit in these factors and the actuarial valuation basis determine the amount of cross-subsidy between the DB and the DC part. At the 8% interest basis used as the main valuation basis, there is only minimal cross-subsidy. Should the valuation interest rate be lower in the future, the cross-subsidy will come more into play and will be reflected in a lower share of the fund available for DB participants.

8. DB Plan Risks

There are some areas of the DB plan benefit structure that need to be examined from a risk management perspective. For example, the retirement pension formula is based on the final month's salary, which is conducive to potential abuse. The elements that make up the pensionable earnings should also be reviewed from this risk perspective.

9. Non-payment issues

Once a financing plan has been developed and agreed upon, and any necessary regulations to prescribe contribution rates implemented, decisions need to be made on the handling of employers who have not paid their prescribed contributions. In the past a system of interest penalty was used.

10. Actuarial Assessments

The current law requires that any proposed changes to the plan will need financial impact evaluation. The following is an excerpt from the 2011 Law:

The Board shall determine the financial impact of all amendments to this Law and regulations and shall advise the Governor of its findings prior to such amendment being considered by the Governor or laid before the Legislative Assembly.

If major changes to the plan take place, either as a result of the suggested reviews above, any changes brought about by Cabinet, Parliament or Government, it is recommended that an actuarial valuation be performed to assess the changes to the financial position, recommended contribution rates, and any impact on fund investments.



Actuarial Position as of January 1, 2011 - Full Plan

	DC	Shown for Interest Sensitivity		Main Valuation Results	
		7% Interest Rate	7% Interest Rate	8% Interest Rate	8% Interest Rate
		DB	Total	DB	Total
A. Summary of Valuation Data					
1. Number of participants currently receiving benefits	N/A	1,255	1,255	1,255	1,255
2. Number of participants with deferred vested benefits	1,096	436	1,532	436	1,532
3. Number of active participants	3,531	1,143	4,674	1,143	4,674
4. Total annual pensionable emoluments (CI\$000s)	155,212	56,832	212,044	56,832	212,044
B. Value of Pension Fund Allocated Assets (CI\$000s)	103,821	206,047	309,868	206,047	309,868
C. Past Service Liability (No Projection of Pay)					
1. Inactive participants (CI\$000s)	9,879	199,667	209,546	179,410	189,289
2. Active participants (CI\$000s)	93,942	175,748	269,690	152,313	246,255
3. Total (CI\$000s)	103,821	375,415	479,236	331,723	435,544
D. Past Service Liability (With Projection of Pay)					
1. Inactive participants (CI\$000s)	9,879	199,667	209,546	179,410	189,289
2. Active participants (CI\$000s)	93,942	224,726	318,668	192,497	286,439
3. Total (CI\$000s)	103,821	424,393	528,214	371,907	475,728
E. Surplus/(Deficiency) (CI\$000) (Item B less D3)	-	(218,346)	(218,346)	(165,860)	(165,860)
F. Funding Level					
1. PSL - No Pay Projection (Item B / Item C3)	100%	55%	65%	62%	71%
2. PSL - With Pay Projection (Item B / Item D3)	100%	49%	59%	55%	65%
Assumptions		Shown for Interest Sensitivity		Main Valuation Results	
Assumed Retirement Age		57	57	57	57
Discount Rate		7.00%	7.00%	8.00%	8.00%
Salary Increases		3.50%	3.50%	3.50%	3.50%
Pension Increases		2.50%	2.50%	2.50%	2.50%



Actuarial Position as of January 1, 2011 - 2008 Actuarial Basis

	<u>January 1, 2008 Results</u>		<u>January 1, 2011 Results</u>		
	<u>DC</u>	<u>DB</u>	<u>DC</u>	<u>DB</u>	<u>Total</u>
A. Summary of Valuation Data					
1. Number of participants currently receiving benefits	N/A	1,018	N/A	1,255	1,255
2. Number of participants with deferred vested benefits	1,158	411	1,096	436	1,532
3. Number of active participants	3,313	1,332	3,531	1,143	4,674
4. Total annual pensionable emoluments (CI\$000s)	130,890	60,751	155,212	56,832	212,044
B. Value of Pension Fund Allocated Assets (CI\$000s)	68,356	174,350	103,821	206,047	309,868
C. Past Service Liability (No Projection of Pay)					
1. Inactive participants (CI\$000s)	8,430	146,740	9,879	194,212	204,091
2. Active participants (CI\$000s)	59,926	164,071	93,942	172,705	266,647
3. Total (CI\$000s)	68,356	310,811	103,821	366,917	470,738
D. Past Service Liability (With Projection of Pay)					
1. Inactive participants (CI\$000s)	8,430	146,740	9,879	194,212	204,091
2. Active participants (CI\$000s)	59,926	219,920	93,942	229,221	323,163
3. Total (CI\$000s)	68,356	366,660	103,821	423,433	527,254
E. Surplus/(Deficiency) (CI\$000) (Item B less D3)	-	(192,310)	-	(217,386)	(217,386)
F. Funding Level					
1. PSL - No Pay Projection (Item B / Item C3)	100%	56%	100%	56%	66%
2. PSL - With Pay Projection (Item B / Item D3)	100%	48%	100%	49%	59%
Assumptions					
Assumed Retirement Age		57		57	
Discount Rate		7.00%		7.00%	7.00%
Salary Increases		4.00%		4.00%	4.00%
Pension Increases		2.50%		2.50%	2.50%



Actuarial Position as of January 1, 2011 - Defined Benefit Part**CIG/Statutory Authorities Split****Defined Benefit Part**

	<u>CIG</u>	<u>Statutory Authorities</u>	<u>Total</u>
A. Summary of Valuation Data			
1. Number of participants currently receiving benefits	1,255	-	1,255
2. Number of participants with deferred vested benefits	322	114	436
3. Number of active participants	895	248	1,143
4. Total annual pensionable emoluments (CI\$000s)	43,425	13,407	56,832
B. Value of Pension Fund Allocated Assets (CI\$000s)	187,012	19,035	206,047
C. Past Service Liability (With Projection of Pay)			
1. Inactive participants (CI\$000s)	177,381	2,029	179,410
2. Active participants (CI\$000s)	170,014	22,483	192,497
3. Total (CI\$000s)	347,395	24,512	371,907
D. Surplus/(Deficiency) (CI\$000) (Item B less C3)	(160,383)	(5,477)	(165,860)
E. Funding Level			
1. PSL - With Pay Projection (Item B / Item c3)	54%	78%	55%
<u>Assumptions</u>			
Assumed Retirement Age	57	57	57
Discount Rate	8.00%	8.00%	8.00%
Salary Increases	3.50%	3.50%	3.50%
Pension Increases	2.50%	2.50%	2.50%



Actuarial Position as of January 1, 2011 - Defined Benefit Part
Results by Sponsoring Employer

	Allocated Fund Assets CI\$000s	Total Past Service Liability CI\$000s	Surplus/ (Deficiency) CI\$000s	Funding Level
<u>Defined Benefit Part</u>				
Cayman Islands Airports Authority	2,468	5,979	(3,511)	41%
Civil Aviation Authority	1,644	2,646	(1,002)	62%
University College of Cayman Islands 1/	(497)	109	(606)	N/A
CAYS Foundation	128	116	12	110%
CINICO	49	37	12	132%
Cayman Islands Development Bank 1/	(43)	12	(55)	N/A
Electricity Regulatory Authority	-	-	-	N/A
Health Services Authority	5,816	7,278	(1,462)	80%
National Housing Development Trust	75	37	38	203%
Inform. And Comm. Tech, Authority	59	24	35	246%
Cayman Islands Monetary Authority	4,526	2,831	1,695	160%
Public Service Pensions Board	787	596	191	132%
National Roads Authority	1,301	1,422	(121)	91%
Maritime Authority of Cayman Islands	803	607	196	132%
Cayman Islands Turtle Farm	868	1,104	(236)	79%
Water Authority	1,053	1,728	(675)	61%
CIG	187,010	347,381	(160,371)	54%
<u>Total</u>	<u>206,047</u>	<u>371,907</u>	<u>(165,860)</u>	<u>55%</u>

1/ At retirement from a Statutory Authority, the obligations and an actuarial equivalent amount of assets are transferred to CIG. In situations where there are not sufficient assets, the amount owed is shown as a negative asset.



Contribution Requirements - Full Plan

	DC	Shown for Interest Sensitivity		Main Valuation Results	
		7% Interest Rate	7% Interest Rate	8% Interest Rate	8% Interest Rate
		DB	Total	DB	Total
A. Summary of Valuation Data					
1. Number of active participants	3,531	1,143	4,674	1,143	4,674
2. Total annual pensionable emoluments (CI\$000s)	155,212	56,832	212,044	56,832	212,044
B. Value of Pension Fund Allocated Assets (CI\$000s)	103,821	206,047	309,868	206,047	309,868
C. Past Service Liability (With Projection of Pay for DB)					
1. Inactive participants (CI\$000s)	9,879	199,667	209,546	179,410	189,289
2. Active participants (CI\$000s)	93,942	224,726	318,668	192,497	286,439
3. Total (CI\$000s)	103,821	424,393	528,214	371,907	475,728
D. Surplus/(Deficiency) (CI\$000s) (Item B less D3)	-	(218,346)	(218,346)	(165,860)	(165,860)

Funding for DB Section: Normal Cost Plus 20-year Amortization of Past Service Liability

E	Normal Cost for Year (CI\$000s)						
	1. Benefit Provisions	1/	19,246	8,919	28,165	7,495	26,741
	2. Provision for Administrative Expenses	2/		1,400	1,400	1,400	1,400
	3. Total			10,319	29,565	8,895	28,141
F.	Item E.3. as % of Emoluments		12.40%	18.16%	13.94%	15.65%	13.27%
G.	Amortization of Deficiency (over 20 years) (CI\$000s)		N/A	19,913	19,913	16,243	16,243
H.	Total Annual Cost of Benefits (CI\$000s) (Items E+G)		19,246	30,232	49,478	25,138	44,384

Assumptions

	Shown for Interest Sensitivity		Main Valuation Results	
Retirement Retirement	57	57	57	57
Discount Rate	7.00%	7.00%	8.00%	8.00%
Salary Increase Rate	3.50%	3.50%	3.50%	3.50%
Pension Increase Rate	2.50%	2.50%	2.50%	2.50%

1/ For DC participants: 12% plus additional 0.4% for defined benefit type risk benefits.

2/ For DC participants: administrative expenses are taken as reductions to the credited rates of return on account balances.



Contribution Requirements - 2008 Actuarial Basis

	<u>January 1, 2008 Results</u>		<u>January 1, 2011 Results</u>		
	<u>DC</u>	<u>DB</u>	<u>DC</u>	<u>DB</u>	<u>Total</u>
A. Summary of Valuation Data					
1. Number of active participants	3,313	1,332	3,531	1,143	4,674
2. Total annual pensionable emoluments (CI\$000s)	130,890	60,751	155,212	56,832	212,044
B. Value of Pension Fund Allocated Assets (CI\$000s)	68,356	174,350	103,821	206,047	309,868
C. Past Service Liability (With Projection of Pay for DB)					
1. Inactive participants (CI\$000s)	8,430	146,740	9,879	194,212	204,091
2. Active participants (CI\$000s)	59,926	219,920	93,942	229,221	323,163
3. Total (CI\$000s)	68,356	366,660	103,821	423,433	527,254
D. Surplus/(Deficiency) (CI\$000s) (Item B less D3)	-	(192,310)	-	(217,386)	(217,386)
Funding for DB Section: Normal Cost Plus 20-year Amortization of Past Service Liability					
E. Normal Cost for Year (CI\$000s)	17,016	9,738	20,850	9,238	30,088
F. Item F as % of Emoluments	1/ 13.00%	16.03%	13.43%	16.25%	14.19%
G. Amortization of Deficiency (over 20 years) (CI\$000s)	N/A	17,539	N/A	19,826	19,826
H. Total Annual Cost of Benefits (CI\$000s) (Items E.+G.)	17,016	27,277	20,850	29,064	49,914
I. Plan Administration Cost	2/				
<u>Assumptions</u>					
Retirement Retirement		57		57	57
Discount Rate		7.00%		7.00%	7.00%
Salary Increase Rate		4.00%		4.00%	4.00%
Pension Increase Rate		2.50%		2.50%	2.50%

1/ 12% plus additional 1% for defined benefit type risk benefits for DC participants.

2/ Administration expenses included implicitly in the determination of total annual cost.

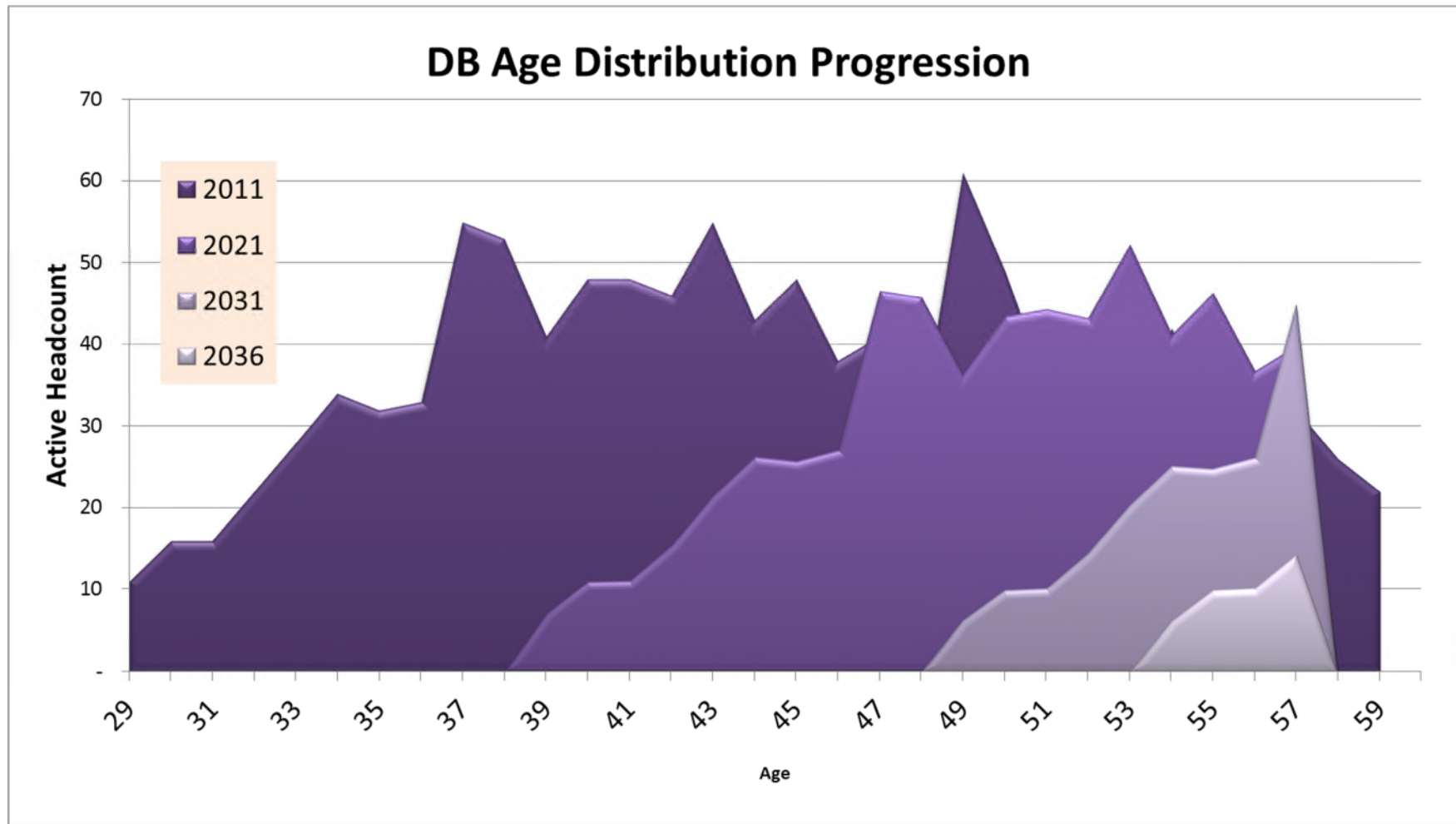


Contribution Requirements - Defined Benefit Part

Results by Sponsoring Employer

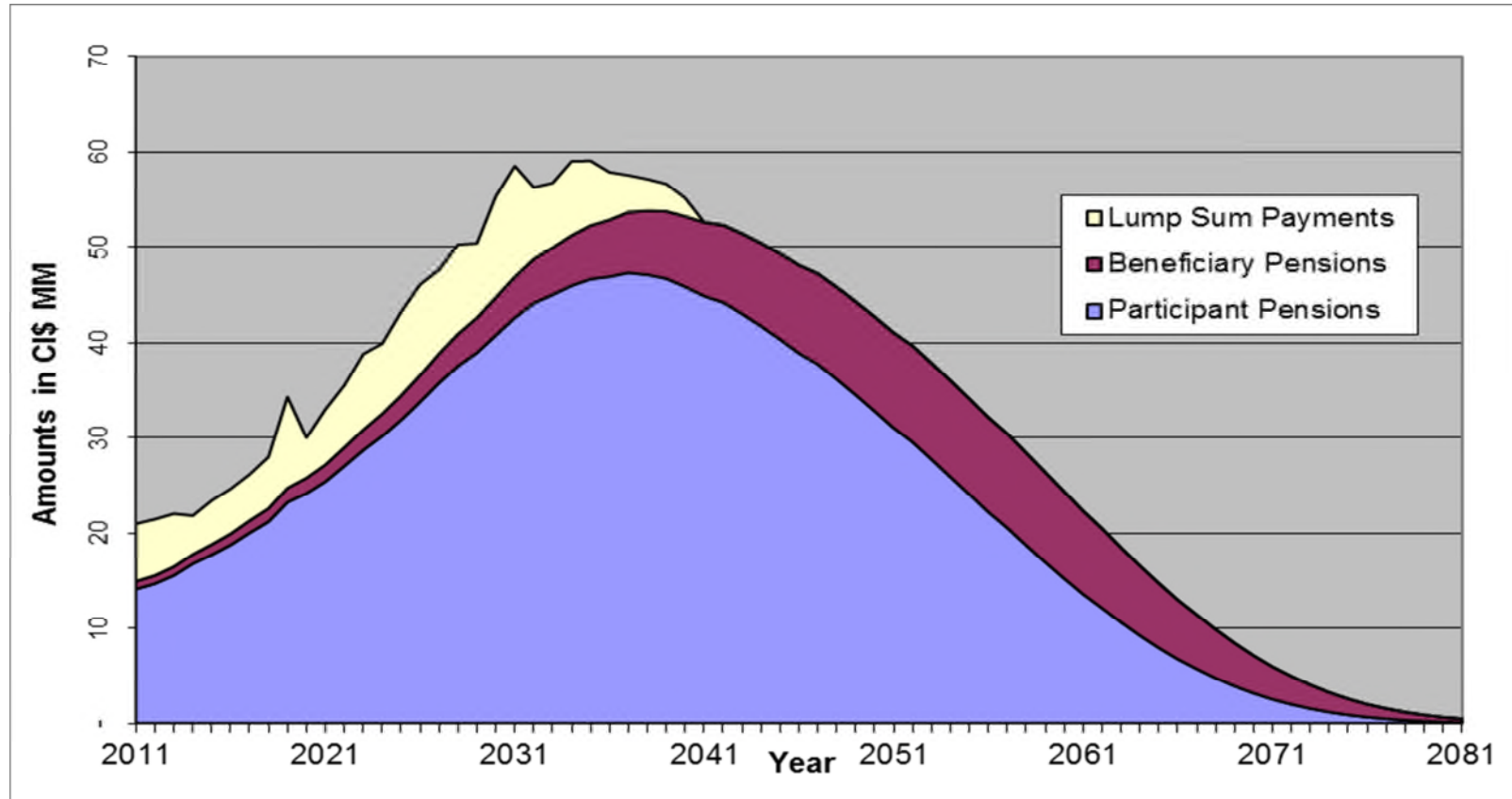
	<u>Total Annual Pensionable Pay CI\$000s</u>	<u>Actuarial Surplus/ (Deficiency) CI\$000s</u>	<u>Normal Cost CI\$000s</u>	<u>Normal Cost as % of Pay</u>	<u>Amorti- zation Cost CI\$000s</u>	<u>Total Cost CI\$000s</u>
Defined Benefit Part						
Cayman Islands Airports Authority	2,384	(3,511)	362	15.18%	344	706
Civil Aviation Authority	352	(1,002)	28	7.95%	98	126
University College of Cayman Islands	44	(606)	3	6.82%	59	62
CAYS Foundation	69	12	16	23.19%	(1)	15
CINICO	54	12	6	11.11%	(1)	5
Cayman Islands Development Bank	-	(55)	-	N/A	5	5
Electricity Regulatory Authority	-	-	-	N/A	-	-
Health Services Authority	5,143	(1,462)	702	13.65%	143	845
National Housing Development Trust	-	38	-	N/A	(4)	(4)
Inform. And Comm. Tech, Authority	47	35	3	6.38%	(3)	-
Cayman Islands Monetary Authority	1,637	1,695	214	13.07%	(166)	48
Public Service Pensions Board	482	191	68	14.11%	(19)	49
National Roads Authority	1,479	(121)	187	12.64%	12	199
Maritime Authority of Cayman Islands	977	196	146	14.94%	(19)	127
Cayman Islands Turtle Farm	319	(236)	54	16.93%	23	77
Water Authority	420	(675)	74	17.62%	66	140
CIG	43,425	(160,371)	7,032	16.19%	15,706	22,738
<u>Total</u>	<u>56,832</u>	<u>(165,860)</u>	<u>8,895</u>	<u>15.65%</u>	<u>16,243</u>	<u>25,138</u>





This graph shows the age distribution of active Defined Benefit participants as of January 1, 2011, and projects the distribution forward for the next 25 years. As the DB part of the plan is closed to new entrants, the number of active participants (as represented by the area under the graphs) is expected to diminish rapidly. By the year 2036, only a small number of participants are expected to remain active if the current retirement patterns continue to prevail.

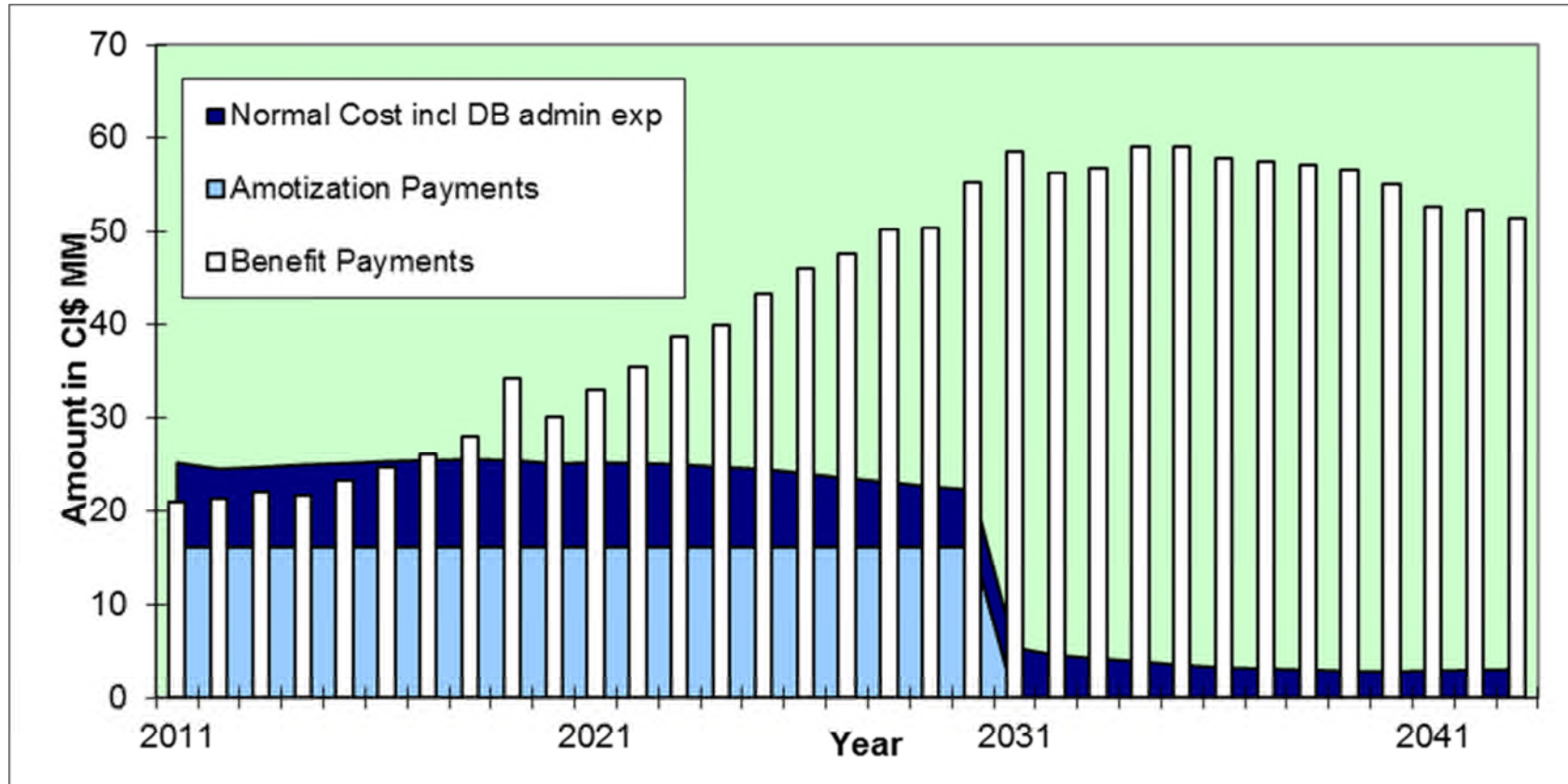


Projection of Benefit Payments from the Defined Benefit Part

The projected benefit payments for the next 70 years are shown graphically and split according to retirement pensions, beneficiary pensions, and lump sum payments. A very significant increase can be expected in the amount of benefits to be paid over the course of the next 20 years. This will have severe implications for both funding and investment policy; sufficient cash will need to be made available to meet these benefit payments and then to have sufficient reserves to meet the benefit payments arising subsequently.



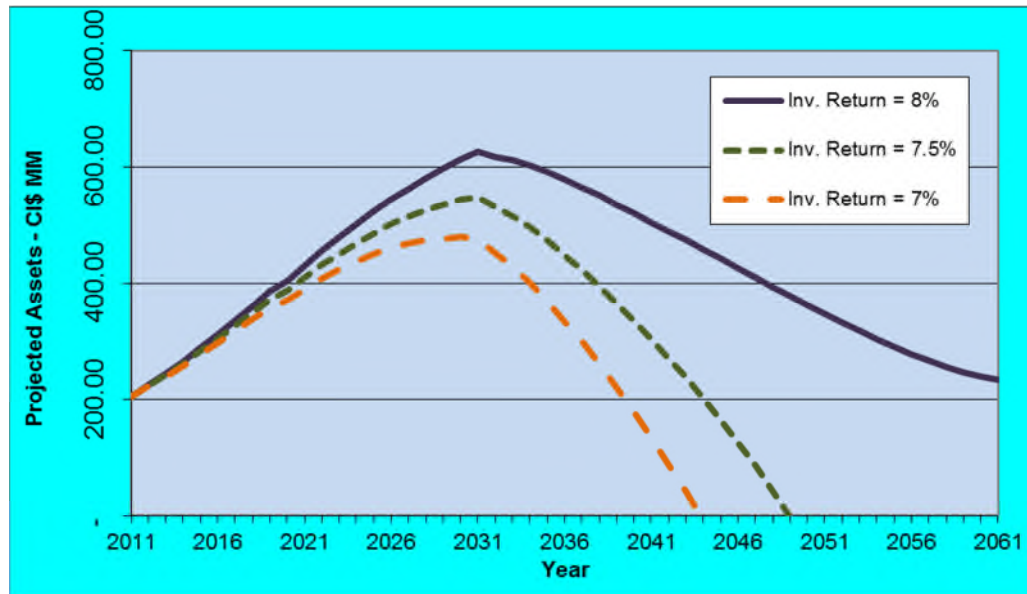
Projection of Benefit Payments and Expected Contributions from the Defined Benefit Part



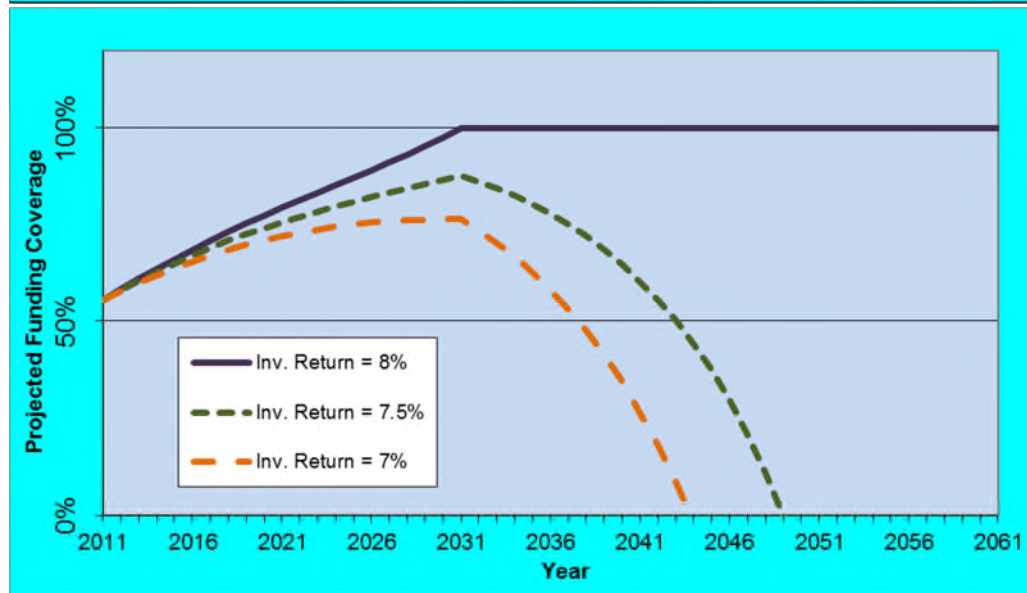
Here, a comparison is made between the expected benefit payments of Exhibit 3B with the expected contributions (normal cost plus amortization payments). If actual experience follows the actuarial assumptions and contributions are made in accordance with Exhibit 2A1 – 8% interest, DB benefit payments will not exceed incoming contributions to the DB part until the year 2017. The amortization component will cease after 2031 and by 2039, only the cost of plan administration will remain.



Projection of Defined Benefit Fund Assets – Sensitivity to Investment Returns



The Defined Benefit Fund Assets are projected over three different investment return scenarios: 8.00%, 7.50% and 7.00%, assuming contributions are made in accordance with the results of this report using an 8% interest rate assumption and amortization of the actuarial deficiency over a twenty-year period (Exhibit 2A1). The top chart expresses the projected assets in dollar amounts. The bottom chart expresses the projected assets as a percentage of accrued liability to provide the funding coverage at each time point. Note that the current funding policy is to amortize the funding deficiency over a 20-year period, which is meant to achieve 100% funding coverage by year 2031.

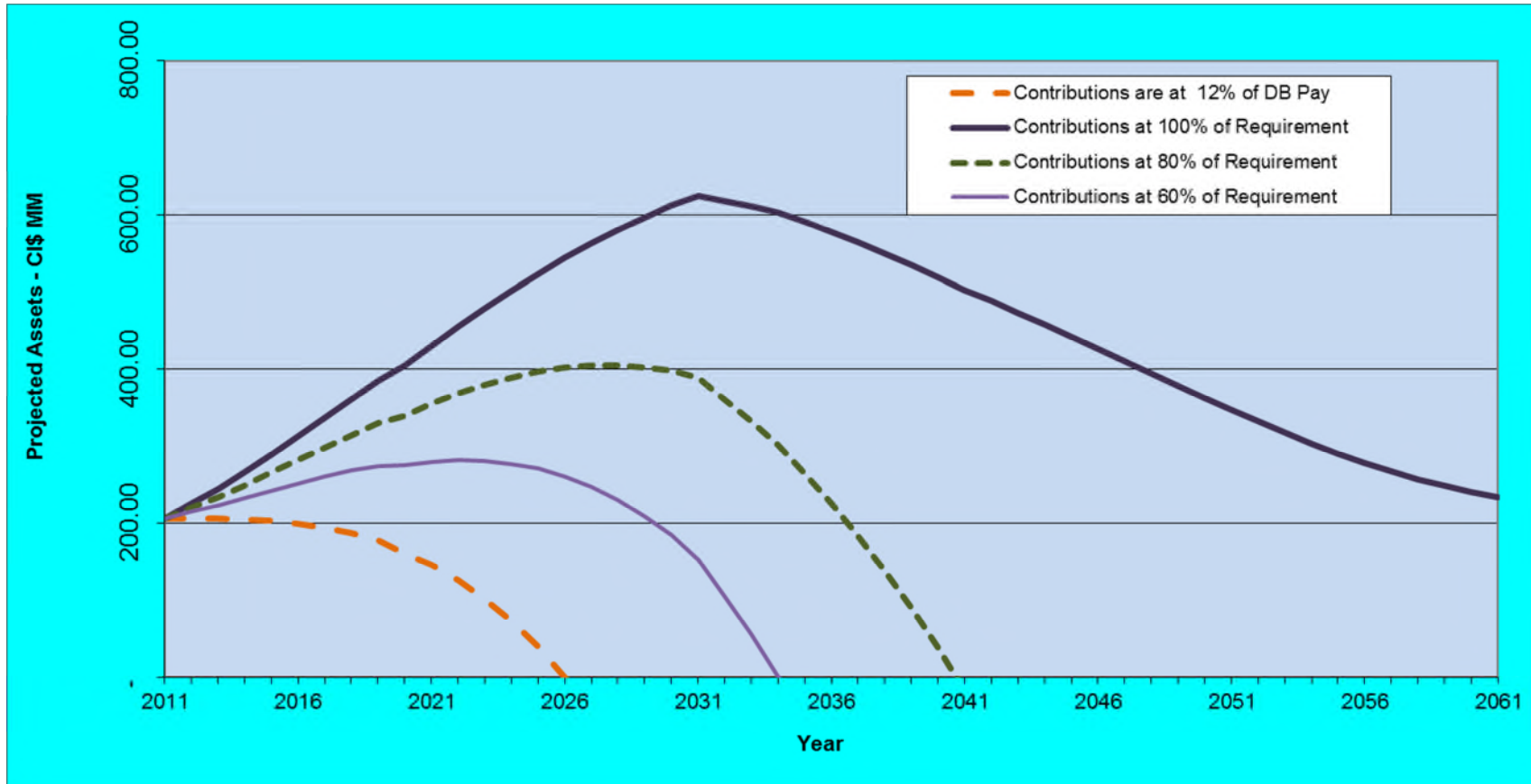


These graphs illustrate the high sensitivity of the Fund to investment returns. Even a small amount of asset underperformance with respect to the assumed rate in the contribution rate is sufficient to affect the fund adversely, translating to higher future funding costs in order to remain solvent in the long run.

Of particular importance is the need to build sufficient assets by year 2031, at which time benefit payments reach a peak, based on the retirement age assumptions used in the valuation (see Exhibit 3B).



Projection of Defined Benefit Fund Assets – Sensitivity to Plan Contribution Levels



The above chart shows the projection of DB fund assets with the top line assuming contributions are made in accordance with Exhibit 2A1 –8% interest basis, and assuming that the fund returns are 8% per year. The next two lines immediately below assume contributions are made at 80% and 60%, respectively. The short line shows projected assets if contributors remain only at 12% of DB participants’ payroll. Investment returns are assumed to be 8% per year throughout.



PARTICIPANT DATA - Defined Benefit Part - Actives

Page 1

	<u>Active Participants</u>				<u>Transferred Participants 1/</u>			
	<u>Number</u>	<u>Total Annual Payroll (CI\$ '000)</u>	<u>Average Age (years)</u>	<u>Average Total Past Service (years)</u>	<u>Number</u>	<u>Total Annual Payroll (CI\$ '000)</u>	<u>Average Age (years)</u>	<u>Average Service (years) for Retained Benefits</u>
<u>Defined Benefit Part</u>								
Cayman Islands Airports Authority	42	2,384	45.00	15.60	-	-	-	-
Civil Aviation Authority	3	352	48.33	18.53	3	235	38.00	10.58
University College of Cayman Islands	1	44	32.00	0.33	1	109	50.00	4.92
CAYS Foundation	1	69	58.00	7.42	-	-	-	-
CINICO	1	54	39.00	6.50	-	-	-	-
Cayman Islands Development Bank	-	-	-	-	-	-	-	-
Electricity Regulatory Authority	-	-	-	-	-	-	-	-
Health Services Authority	109	5,143	46.17	8.28	26	1,290	41.69	2.74
National Housing Development Trust	-	-	-	-	-	-	-	-
Inform. And Comm. Tech, Authority	1	47	33.00	7.33	-	-	-	-
Cayman Islands Monetary Authority	21	1,637	41.14	11.11	6	563	41.83	4.13
Public Service Pensions Board	4	482	43.00	7.79	4	315	41.75	2.08
National Roads Authority	37	1,479	43.27	7.00	-	-	-	-
Maritime Authority of Cayman Islands	12	977	43.67	4.09	-	-	-	-
Cayman Islands Turtle Farm	10	319	45.00	14.88	3	148	31.67	2.78
Water Authority	6	420	44.67	17.76	1	46	45.00	14.08
CIG	895	43,425	44.60	19.19	207	11,287	45.15	9.73
<u>Total</u>	<u>1,143</u>	<u>56,832</u>	<u>44.64</u>	<u>17.18</u>	<u>251</u>	<u>13,992</u>	<u>44.43</u>	<u>8.67</u>

1/ These are active participants currently employed with another plan sponsor but who had prior service with the listed employer as a result of which benefit obligations related to final month's pay are retained.



PARTICIPANT DATA - Defined Benefit Part - Inactive Participants

Page 2

	Number	Average Age (years)	Annual Deferred Pensions (CI\$000s)	Current Annual Pensions (CI\$000s)
<u>Deferred Vested Participants</u>				
Cayman Islands Airports Authority	5	38	11	
Civil Aviation Authority	22	45	117	
University College of Cayman Islands	4	39	3	
CAYS Foundation	2	41	2	
CINICO	-	-	-	
Cayman Islands Development Bank	1	49	28	
Electricity Regulatory Authority	-	-	-	
Health Services Authority	25	40	43	
National Housing Development Trust	1	49	6	
Inform. And Comm. Tech, Authority	-	-	-	
Cayman Islands Monetary Authority	21	40	112	
Public Service Pensions Board	2	33	4	
National Roads Authority	6	36	3	
Maritime Authority of Cayman Islands	3	39	4	
Cayman Islands Turtle Farm	8	42	68	
Water Authority	14	44	88	
CIG	322	42	1,843	
<u>Total</u>	<u>436</u>	<u>42</u>	<u>2,332</u>	
<u>Retired Participants</u>				
Arising from DB Part	801	64.99		12,389
Arising from DC Part	263	61.71		471
<u>Total</u>	<u>1064</u>	<u>64.18</u>		<u>12,860</u>
<u>Beneficiaries</u>				
Arising from DB Part	174	52.64		889
Arising from DC Part	17	50.00		14
<u>Total</u>	<u>191</u>	<u>52.40</u>		<u>903</u>



PARTICIPANT DATA - Defined Contribution Part

Page 3

	<u>Active Participants</u>			
	<u>Number</u>	<u>Total Annual Payroll (CI\$ '000)</u>	<u>Average Age (years)</u>	<u>Total Account Balance (CI\$ '000)</u>
<u>Active Participants</u>				
Cayman Islands Airports Authority	106	4,287	36.20	2,056
Civil Aviation Authority	9	477	36.88	217
University College of Cayman Islands	-	-	0.00	-
CAYS Foundation	27	1,092	44.89	803
CINICO	1	50	47.81	59
Cayman Islands Development Bank	14	842	45.89	355
Electricity Regulatory Authority	2	116	31.77	11
Health Services Authority	552	28,733	40.39	16,043
National Housing Development Trust	-	-	0.00	-
Inform. And Comm. Tech, Authority	7	560	38.08	312
Cayman Islands Monetary Authority	98	6,265	36.00	3,023
Public Service Pensions Board	25	1,636	39.58	682
National Roads Authority	66	2,311	37.63	1,622
Maritime Authority of Cayman Islands	12	708	38.83	526
Cayman Islands Turtle Farm	70	2,099	39.89	1,020
Water Authority	-	-	0.00	-
CIG	2,542	106,036	40.38	67,215
<u>Total</u>	<u>3,531</u>	<u>155,212</u>	<u>40.11</u>	<u>93,941</u>
<u>Deferred Vested Participants</u>	<u>1,096</u>		<u>38.34</u>	<u>9,879</u>



Consolidated Accounts for the Period January 1, 2008 to January 1, 2011

All amounts are in CI\$

	<u>Consolidated For All Plans</u>	<u>Public Service Pension Plan Allocation</u>	<u>Parliamentarians Pension Plan Allocation</u>	<u>Judiciary Pension Plan Allocation</u>
Net Assets Available for Benefits at Period Beginning	<u>246,531,439</u>	<u>242,705,674</u>	<u>1,924,680</u>	<u>1,901,085</u>
Adjustments				
Investment Income	34,918,456	33,935,523	614,512	368,421
Contributions				
Employees	44,261,916	43,594,387	409,998	257,531
Employers	42,858,180	42,179,238	409,998	268,944
Past Service and Additional	31,823,025	26,912,428	4,464,466	446,132
Government Grant	528,745	387,245	-	141,500
Operation Grant	1,470,000	1,443,606	14,653	11,741
Other Income	338,848	332,319	3,899	2,630
(Benefits Paid)	(72,000,659)	(67,825,139)	(3,880,080)	(295,441)
(Expenses of Administration)	(14,062,993)	(13,797,838)	(152,678)	(112,477)
Net Increase in Assets	70,135,518	67,161,769	1,884,767	1,088,982
Net Assets Available for Benefits at Period End	<u>316,666,957</u>	<u>309,867,443</u>	<u>3,809,448</u>	<u>2,990,066</u>



Actuarial Assumptions Employed

A. Economic Assumptions

- | | |
|-------------------------------|--|
| 1. Underlying Inflation Rate: | Long-term inflation rate of 2.5% per year. |
| 2. Interest: | 8% per year, net of investment expenses. Results at 7% are also shown in this report to illustrate sensitivity of the results towards this assumption. |
| 3. Salary Increases: | 3.5% per year, consisting of an allowance of 2.5% for inflation and 1.0% for merit and promotion. |
| 4. Pension Increases: | 2.5% per year, the same as the rate of inflation. |
| 5. Commutation of Pensions: | It has been assumed that all employees will exercise, to the maximum amount, their right to commute part of their pension for a lump sum payment. |

B. Demographic Assumptions:

- | | |
|---------------|--|
| 1. Mortality: | It is not anticipated that the mortality rates of the participants will be significantly different to that of employees of U.S. corporations. Standard U.S. mortality rates have been used for the valuation. The rates used are based on the UP-1994 Table, projected to the year 2011; sample rates are shown below: |
|---------------|--|

<u>Age</u>	<u>Males</u>	<u>Females</u>
20	0.000393	0.000232
30	0.000792	0.000318
40	0.001006	0.000590
50	0.002036	0.001148
60	0.006519	0.004383
70	0.019735	0.013557
80	0.056221	0.037593
90	0.153611	0.118791



Actuarial Assumptions Employed (Continued)**B. Demographic Assumptions (Cont'd.):**

2. Turnover: The rates at the following illustrative ages indicate the turnover assumptions, excluding mortality and disability:

Age	<u>Annual Rates of Turnover</u>	
	<u>Male</u>	<u>Female</u>
20	.075	.125
25	.050	.125
30	.035	.075
35	.025	.045
40	.015	.025
45	.005	.005
50	---	---

3. Disability: No disability incident rates have been used for regular disability benefits. Calculations have shown that, under the provisions of the Plan, use of disability incidence and associated disability mortality rates are cost neutral to the Plan.

4. Retirement Age: Completion of age 57 and 10 years of service for DB participants. Non-gazetted police officers are assumed to retire upon eligibility for full benefits (completion of 21 years of service), based on special laws that apply to them.

For projection purposes, DC participants are assumed to retire at age 60.

5. Family Assumptions:

- a. Percentage of Employees with Spouse - 80%.
- b. Age of Wife - 3 years younger than husband.
- c. Percentage Employees with Dependent Children -
- | | |
|----------|--|
| Males: | 65% pre-retirement
5% post-retirement |
| Females: | 20% pre-retirement
0% post-retirement |



Principal Benefit Provisions

1. Eligibility: Public service employees are immediately eligible for participation in the Plan.
 2. Pensionable Service: Continuous service from date of hire.
 3. Pensionable Earnings: Pensionable Earnings include monthly basic salary, acting allowances, and duty allowances.

Under the Defined Benefit Part, the retirement pension computation is generally based on the monthly Pensionable Earnings at the time of retirement but acting and duty allowances are averaged over a thirty-six month period.
 4. Employee Contributions: Employee contributions are currently pitched at a rate of 6% of pensionable earnings.
 5. Eligibility for Retirement Pension: Generally, on or after attaining age 50 and completing 10 years of service. There are special cases under which these conditions may be relaxed. Non-gazetted police officers, under special laws that apply to them, can retire after 21 years of service.
- 6A. Retirement Benefits – Defined Benefit Part:
- a. Pension at Retirement - A monthly pension equal to $\frac{1}{720}$ times the number of completed months of pensionable service times the final month's Pensionable Earnings. For officers first appointed to a pensionable office prior to July 10, 1980, the monthly pension is computed as $\frac{1}{600}$ times the number of completed months of pensionable service times the final month's Pensionable Earnings. The pension cannot exceed two-thirds of the highest Pensionable Earnings received during the officer's service.
 - b. Commutation - Up to $\frac{1}{4}$ of the retirement pension can be commuted for a lump sum. The pension to lump sum conversions will be determined by the plan's actuarial factors. At age 57, these factors call for a lump sum conversion rate equal to 14.59 times the annual pension surrendered.



Principal Benefit Provisions (Continued)

c. Pension Increases - Pensions in payment may be increased, once a year. The Pensions Law (2004) calls for these pension increases to match annual cost-of-living increases up to 5% and on a sliding scale thereafter.

d. Early Retirement - Early retirement reduction factors apply to retirement pensions prior to completion of age 55 and 10 years of service. For deferred vested participants, early retirement reduction factors apply for pension commencement prior to age 60. Non-gazetted police officers are allowed to retire with full benefits after completing 21 years of service under special laws that are applicable to them.

6B. Retirement Benefits – Defined Contribution Part:

a. Pension at Retirement - A monthly pension based on the accumulated account balance representing the accumulation of employee contributions, matching Government contributions and investment returns. The accumulated account balances are converted to annuities (3 different optional forms available) using actuarial conversion factors. These conversion factors have remained unchanged since the inception of the Defined Contribution Part.

b. Commutation - Part of the accumulated account balance may be taken in cash, while the remainder must be taken as a pension.

c. Pension Increases - Pensions in payment may be increased, once a year. The Pensions Law (1999) calls for these pension increases to match annual cost-of-living increases up to 5% and on a sliding scale thereafter.

7. Benefits on Death After Retirement or While Eligible to Retire: *Defined Benefit Part only:* A spouse's pension equal to 50% of the pensioner's benefit, payable until remarriage.

A dependent children's pension payable up to age 18 (or age 23 if in full-time education) equal to 50% of the pension received by the participant, divided by the number of dependent children. These amounts are doubled if there is no spouse.

Defined Contribution Part only: the benefit is based on the choice elected by the participant at the time of retirement.



Principal Benefit Provisions (Continued)

8. Benefits on Disablement: A pension based on accrued normal retirement pension is payable upon receipt of medical evidence of permanent disability and incapacity to perform duties.
- In addition, a pension is payable to an officer who is permanently injured in discharge of duty and who is not entitled to compensation under any Workmen's Compensation Law. The amount of the pension depends on the extent of disablement.
9. Benefits on Death in Service: *Defined Benefit Part only:* A spouse's pension equal to 50% of the member's pension accrued as of the date of death, based on pay and service at the date of death. An additional equivalent amount is divided equally among any children under the age of 18 or 23 (if in full-time education).
- Defined Contribution Part only:* Benefits payable to spouse and children equivalent in value to the participants account balances.
- Both Sections:*
- In addition, there will be paid an amount equal to the excess, if any, of the greater of:
- (a) a lump sum equal to 12 month' Pensionable Earnings
 - (b) the participant's contribution account balance
- over the actuarially equivalent present value of the pension benefits payable to the beneficiaries.
- An additional pension is paid to the beneficiaries of participants killed as a result of injuries received while in the actual discharge of duty.
10. Termination Benefits: An employee who terminates his employment can expect to receive a pension commencing at age 60, based on benefits accrued at the time of termination or alternatively to receive the participant contribution account balance. The pension has the same features of commutation, post-retirement death benefit, and post-retirement pension increases as for active employees eligible for retirement benefits.



Principal Benefit Provisions (Continued)

11. Other Benefits (Not Valued): Supplementary pensions on abolition of office and re-organization.

