



**Presentation by Chief Actuary, Jean-Claude Ménard
Office of the Chief Actuary (OCA)
Office of the Superintendent of Financial Institutions Canada (OSFI)
to the
Joint Colloquium of the IACA, PBSS and IAAHS Sections of the IAA**

**Boston, Massachusetts
Monday, May 5, 2008**

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Good afternoon, By way of introduction, I am Jean-Claude Ménard, Chief Actuary of the Canada Pension Plan, the Old Age Security Program and federal public sector pension plans in Canada.

(Slide 2) Today, I will begin by discussing the 1997 amendments to the Plan. Next, I will discuss some components of the 23rd CPP Actuarial Report including setting the asset mix assumption, volatility of results, the evolution of liabilities and the financial measure known as the actuarial balance. I will conclude with an overview of the CPP Peer Review Process and the results from the most recent Peer Review.

(Slide 3) When it was introduced in 1966, the CPP was designed as a pay-as-you-go plan with a small reserve. This meant that the benefits for one generation would be paid largely from the contributions of later generations. By the mid 1990s, rising costs were putting the future sustainability of the Plan in doubt. Continuing to finance the Plan on a pay-as-you-go basis would have meant imposing a heavy financial burden on Canadians in the workforce after 2020. This was deemed unacceptable by the federal and provincial governments. Following extensive consultations across Canada in 1996, governments agreed on these principles to guide decisions on the Plan: fairness, affordability, sustainability, investing in the best interest of members and more funding.

(Slide 4) In 1997, the provincial and federal government agreed to change the funding approach of the Plan to a hybrid of pay-as-you-go and full funding, called steady-state funding. Moving to a full-funding approach would have created unfairness across generations. During the transition, contributors of some generations would have paid higher contributions than others – they would have had to pay for the benefits of current retirees while simultaneously saving for their own retirement. A pure pay-as-you-go approach would also have been unfair, as it would have meant a sharp increase in the contribution rate over the coming decades. As a result of the consultation, the contributions were increased, the future growth of benefits was reduced and the CPP Investment Board was created to invest the funds not required by the CPP to pay current benefits.

(Slide 5) The major amendments to the CPP agreed to by the federal and provincial governments in 1997 included significant changes to the Plan's financing provisions. Steady-state funding introduced fuller funding to the existing pay-as-you-go financing in order to build a reserve of assets equivalent over time to about five and a half years of benefit expenditures or about 25 per cent of Plan liabilities. Investment earnings on this pool of assets would then help stabilize the contribution rate.

Incremental full funding requires that changes to the CPP that increase or add new benefits be fully funded, which means that their costs will be paid as the benefit is earned and any costs associated with benefits that are paid but have not been earned will be amortized and paid for over a defined period of time consistent with common actuarial practice.

Both of these funding principles were introduced to improve fairness and equity across generations. The move to steady-state funding eases some of the contribution burden on future generations and under fuller funding, each generation that will receive benefit enrichments is more likely to pay for it in full so that its costs are not passed on to future generations.

(Slide 6) With a legislated contribution rate of 9.9%, it is expected that contributions will exceed benefits until 2019. Funds not required to pay benefits are transferred to the CPP Investment Board for investment. Over time, this will create a large enough reserve to help pay the growing costs that are expected as more and more baby boomers begin to collect a retirement pension. Since the legislated rate (9.9%) is higher than the minimum contribution rate (9.82%), the funding status of the Plan will improve over time, and the greater the difference between these two rates, the greater the improvement.

(Slide 7) From 2000 to 2019, the net cash flows of the Plan, that is contributions less expenditures, have been and will continue to be positive, resulting in a rapid increase in the Plan's Asset/Expenditure ratio and funding status. These net cash flows will be invested by the CPPIB with a view to maximizing the rate of return without undue risk and further increasing the level of pre-funding in the Plan.

The A/E ratio is defined as the ratio of assets at the end of one year to the expenditures of the next year. This graph demonstrates that with a minimum contribution rate of 9.82%, the Asset/Expenditure ratio is fairly stable, at around 5.4 in 2019 and 2069. This means that in any given year, the Plan will be capable of paying benefits for the following 5 to 6 years. This represents a funding ratio of about 25%. The graph also demonstrates that with a minimum contribution rate below the legislated contribution rate, the A/E ratio will continue to improve over time and will result in a higher funding status.

(Slide 8) This leads me to the other side of the coin. What could happen if, in future actuarial reports, the calculated minimum contribution rate is higher than 9.9%? The default provisions in the *Canada Pension Plan Act* may result in adjustments being made to the contribution rate and, perhaps, benefits in payment if the federal and provincial governments are unable to reach an agreement in response to the actuarial determination of the minimum contribution rate. If the new minimum rate is 10.1%, one half of the excess of the new minimum rate over the 9.9%, that is 0.1%, will apply to an increase in the contribution rate and the other half will apply to non-indexation of benefits in payment in order to keep the steady-state rate at 10.0%. In other words, the contributors and the beneficiaries would equally support the additional cost shown in the actuarial report.

(Slide 10) In terms of investment management, one of the most important assumptions is the future asset mix of the Canada Pension Plan. The Canada Pension Plan Investment Board (CPPIB) was created in 1997 to invest the assets of the CPP not required to pay current benefits. Investment decisions made by the CPP are not based on targeting specific allocations for individual asset classes. Rather, risk is allocated to investment strategies subject to a risk limit determined by the Board. The CPPIB has developed a Reference Portfolio which acts as a benchmark against which the performance of the CPP Fund can be measured. It is not a target portfolio for the actual CPP Fund.

Given this information, the Office of the Chief Actuary must determine an appropriate long-term asset mix for CPP investments. In the short-term, a mix similar to the CPPIB Reference Portfolio is used. It is assumed that in the long-term, an investment portfolio that takes less risk is more appropriate.

(Slide 11) It is assumed that investments in “risky” assets such as equity will decline over time. The main reason for this is that as the ratio of active to retired members decreases, the asset mix of the portfolio must be adjusted to reflect a lower risk tolerance. Also, as the CPP portfolio continues to grow, adjustments should be made to minimize the potential for loss.

(Slide 12) This table summarizes the evolution of the CPP asset mix. The mix in 2007 is in line with the current holdings of the CPPIB. A small transition occurs in the next two years and the short-term asset mix is reached in 2010. The mix is then held constant through 2015, followed by a ten year transition into the long-term asset mix which is reached in 2025. The long-term asset mix is less risky than the short-term mix and this is reflected by shifting 10% of the portfolio out of equity and into bonds.

(Slide 13) The independent review panel of the 21st CPP Actuarial Report suggested a more extensive use of stochastic processes for future actuarial reports. Thus, in the 23rd Report, stochastic methods were used to project a probability distribution for potential outcomes of key assumptions, such as

investment returns and life expectancy. These probability distributions were then used to determine appropriate high- and low-cost alternative assumptions for sensitivity testing, as well as the probability that the actual outcome would be within this range. The objective of these sensitivity tests is to measure the impact that alternative assumptions have on the financial status of the Plan.

(Slide 14) An important measure of the CPP's funding status is defined by the ratio of assets at the end of one year to the expenditures of the next year. Under the best-estimate assumptions of the Plan, this ratio is projected to increase over the next two decades, reaching 5.6 by 2025. Thereafter, it rises slowly to a value of 6.0 in 2050 and 6.4 by 2075. The three assumptions that are most volatile in terms of funding status and the minimum contribution rate are mortality, investment returns and retirement age.

This graph demonstrates the impact that mortality rates, other than the best-estimate, could have on the Plan's funding status. The alternative assumptions for life expectancy were determined using stochastic time-series modeling techniques. It was projected that, on average, the life expectancy of a male age 65 in 2050 will be in the range 17.8 years to 25.1 years with 95% probability. For a female age 65 in 2050, life expectancy is projected to be in the range 18.6 years to 27.9 years. The result is that the minimum contribution rate required to finance the plan over a 75-year period could fall between 9.2% and 10.2%.

(Slide 15) This graph demonstrates the impact that investment returns, other than the best-estimate, could have on the Plan's funding status. The alternative assumptions for investment returns were determined stochastically. It was projected that, on average, investments could earn a real rate of return in the range 2.7% to 5.7% with 95% probability. The best-estimate real rate of return over the long-term is 4.2%. The range of investment returns determined for the sensitivity could result in a minimum contribution rate between 9% and 10.7%.

(Slide 16) In 2006, individuals applied for their retirement benefit, on average, at age 62.3. Retirement rates are used to determine the distribution of retirement ages of new retirement beneficiaries. This is one of the few individual sensitivity tests where stochastic modeling was not used to determine the alternative assumptions.

In the low-cost scenario, it was assumed that, on average, individuals applied for their benefit later (around age 65), thus increasing the proportion of contributors in the age range 60-64. For the high-cost scenario, it was assumed that, on average, individuals asked for their benefit earlier (around age 60), thus reducing the proportion of contributors in the age range 60-64. The result of these alternative assumptions is that the minimum contribution rate required to finance the plan over a 75-year period could fall in the range 9.7% to 10%.

(Slide 17) This table demonstrates the immediate impact that the real rate of return assumption has on the unfunded liability and funded ratio of the Plan. If future liabilities are discounted at a rate lower than the best-estimate, such as a risk-free bond rate, the present value of future liabilities will increase, thus increasing the unfunded liability and decreasing the current funding ratio. In addition, the current service cost will increase, as will the minimum contribution rate required to finance the Plan.

Conversely, if future liabilities are discounted at a rate higher than the best-estimate, such as the return on an all-equity portfolio, the present value of future liabilities will decrease, thus decreasing the unfunded liability and increasing the current funding ratio. In addition, the current service cost will decrease, as will the minimum contribution rate required to finance the Plan.

(Slide 18) The actuarial balance of a plan is the difference between annual income and expenditures summarized over various projection periods. An actuarial balance of zero for any period indicates that the estimated cost for the period is met, on average, with remaining assets at the end of the period equal the following year's expenditures. A negative actuarial balance indicates that, over the period, the present value of the plan's future income plus existing assets are less than the present value of the program's future expenditures. In the CPP actuarial reports, the actuarial balance is used as a financial measure to compare the CPP and OASDI in the United States.

(Slide 19) This table compares the actuarial balance between the CPP and OASDI programs over periods ranging from 25 to 75 years. It can be observed that the CPP's actuarial balances are always positive, while they are negative for the OASDI over periods of 50 and 75 years. This indicates that the CPP is in a better long term financial position than the OASDI.

(Slide 21) The federal and provincial governments, as co-stewards of the CPP, took meaningful steps to strengthen the transparency and accountability of actuarial reporting on the CPP during the 1997 Amendments. One major endorsement was to change the CPP review period from every 5 years to every 3 years. This had the effect of increasing the frequency of actuarial reporting to once every three years with a further requirement that the actuarial report be produced within one year of the valuation date. In addition, the Ministers of Finance endorsed plans to consult regularly with experts on assumptions to be used in actuarial reports, to establish regular peer reviews of actuarial reports on the CPP and to supply actuarial information to Canadians in a timely manner.

(Slide 22) Prior to the 21st CPP Actuarial Report, the independent peer review panel was selected by OSFI. However, due to a heightened sensitivity to the need for independence in this process, we felt that the selection of the panel should be independent of OSFI. As suggested by the Auditor General, we entered into an agreement with the United Kingdom Government Actuary's

Department (GAD) to select the independent Canadian actuaries to perform the peer review and to provide an opinion on the work done by the reviewers upon completion of the review. GAD has selected the independent peer review panel for the last two actuarial reports, the 21st and 23rd.

The independent panel has three months to perform the peer review. Their report should contain opinions on the following five questions or terms of reference:

- Is the professional experience adequate for carrying out the work required?
- Has the work complied with professional standards of practice?
- Did the Chief Actuary have access to the information required?
- Were the actuarial methods and assumptions used reasonable?
- Does the actuarial report fairly communicate the results?

(Slide 23) The independent panel of actuaries released a report in March 2008 confirming that the Terms of Reference from the previous slide were met. The staff of the Office of the Chief Actuary is competent and qualified to carry out the work required. The work of the Chief Actuary complies with all relevant professional standards of actuarial practice and statutory requirements.

In addition, the Chief Actuary had access to the required data and he completed relevant tests on the data as might be expected. The actuarial methods and assumptions used are reasonable. The Review Panel also found that the assumptions are, in the aggregate, reasonable, but towards the high-cost side of the reasonable range. The Review Panel also confirmed that the report fairly communicates the results of the valuation. The Review Panel report made a series of recommendations dealing with data, methodology, assumptions, communication of results and other actuarial issues. To ensure the quality of future actuarial reports, our office continues to consult with experts in the fields of demographic and economic projections in preparing actuarial reports as was recommended.

Thank you. I will be pleased to answer any questions you might have.