Canada Pension Plan Actuarial Report and its Independent Review Process
Presentation at the CIA Annual Meeting
20 June 2008, Quebec City

(Slide 2) Good morning. It is my pleasure to be with you today to discuss the most recent actuarial report on the Canada Pension Plan and its independent peer review process. I will begin with the purpose of the report and then provide an overview of the major demographic and economic assumptions used in the report. I will then discuss CPP financing, followed by the reconciliation and uncertainty of results of the 23rd actuarial report. I will conclude with the findings of the peer review conducted on this report.

(Slide 3) The 23rd CPP Actuarial Report was tabled before Parliament by the Minister of Finance on October 29, 2007. The purpose of the report is to inform on the current and projected financial status of the Plan and to calculate the minimum contribution rate. The minimum contribution rate determined for this actuarial report is 9.82%. It consists of a steady-state contribution rate of 9.80% to finance the Plan without Bill C-36 and a contribution rate of 0.02% to fully fund the increase in eligibility for disability benefits with respect to long term contributors generated by the amendments of Bill C-36.

(Slide 4) Prior to determining appropriate assumptions for actuarial reports, the OCA consults with experts in the fields of demography, economics and investments. The OCA hosted an inter-disciplinary seminar in March 2006 and attended a similar seminar hosted by the Régie des rentes du Québec in September 2006. These seminars were attended by federal and provincial officials. Input from such experts is critical as it ensures that assumptions in the actuarial report are based on thorough analysis, giving consideration to a wide range of opinions.

(Slide 6) The demographic projections start with the populations of Canada and Québec on 1 July 2006, to which are applied fertility, migration and mortality assumptions. I will discuss the best-estimate assumptions relating to each component in turn.

(Slide 7) For Canada, the total fertility rate (average number of children born to a woman in her lifetime) has decreased significantly from an average level of 2.8 children per woman between the mid 50s and late-70s to an average level of 1.6 over the last 25 years. The total fertility rate has decreased and the average age of motherhood has increased over time, thus contributing to the aging of the population. For this report, a fertility rate of 1.60 was assumed for Canada for 2010 and thereafter. The ultimate assumption of 1.60 is the same as in the previous report but is reached six years earlier. The independent review panel found the fertility assumption to be reasonable.

(Slide 8) The net migration rate was, on average, 0.56% of the Canadian population per year over the last 10 years (about 175,000 individuals annually). The net migration rate is assumed to be 0.50% of the population from 2007 to 2015 (about 170,000 individuals). This is the average rate experienced over the last 30 years and is equivalent to the assumption used in the previous report. Then, from 2015 to 2020, the rate is slowly increased to 0.54% to reflect the use of net migration to partially combat the expected labour shortage. From 2020 onward, the rate is maintained at 0.54% which is equivalent to the assumption used in the previous report. The independent review panel found the net migration assumption to be reasonable.

(Slide 9) Another element that has contributed to the aging of the population is the significant reduction in age-specific mortality rates. This can be best measured by the increase in life expectancy at age 65, which directly affects how long retirement benefits will be paid to beneficiaries. Male life expectancy at age 65 increased 28% between 1966 and 2004 (last statistical year available), rising from 14 to 18 years. For women, life expectancy at age 65 increased 25%, from 17 to 21 years over the same period. Although the overall rates of increase in life expectancy since 1966 are similar for males and females, more than half of the increase in life expectancy at age 65 occurred after 1989 for males, while for females, 70% of the increase occurred prior to 1990.

Further improvements in mortality are projected in the future, thus resulting in higher life expectancies and increased Plan costs as more contributors are expected to reach the retirement age of 65 and beneficiaries are expected to receive their benefit for a longer period. By 2075, it is projected that life expectancy at age 65 will be 22.3 years for males and 24.6 years for females. This is 1.4 years and 1.1 years higher for males and females, respectively, than in the previous report. The independent review panel found the mortality assumption to be reasonable.

(Slide 10) The aging of the Canadian population will be significant, with the population age 65 and over projected to reach 11 million by 2050, or 26% of the population. The proportion of the population age 65 and over is projected to increase from 13% in 2007 to 26% by 2050, almost doubling in proportion and more than doubling in number (from 4.4 to 11 million). Over the same time period, the population age 80 and above is projected to increase by 249%. Although migration would slow down the aging of the Canadian population, it is not expected to entirely offset it.

(Slide 11) The size of the working-age population is a critical factor in a publicly-funded pension plan. The working-age population in Japan, Italy, Germany and Spain are expected to decline significantly by 2050. This situation is attributed to a more rapid and substantial ageing of the population than that projected in the other countries.

The working-age population in Canada is expected to grow between 2010 and 2020. A slight decline is expected from 2020 to 2025. Almost all population growth after 2025 will come from migration as natural increases (births less deaths) will shrink and eventually turn negative. Of the countries contained in the study, only the United States projects continued growth among the working-age population.

(Slide 12) In setting the economic assumptions, various sources were considered. Economic assumptions include participation rates, the job creation rate, the unemployment rate, the rate of inflation and increases in average employment earnings.

(Slide 13) The increase in participation rates for those aged 15 to 69, especially for females, can be seen on the following graph. The participation rate for males has remained the same at about 79% from 2000 to 2006 and the rate for females has increased from 67% to 70% over the same period. Further, the gap between male and female rates has narrowed, from about 32% in 1976 to 9% by 2006. It is assumed that this gap will continue to narrow slowly, eventually reaching about 8% by 2030. It is quite possible that the gap could narrow more than expected. The independent review panel found the assumptions on labour force participation rates to be reasonable.

(Slide 14) Employment growth, or the job creation rate, has varied greatly historically, as can be seen on this graph. Over the period 1976 to 2006, the average job creation rate was 1.8%. The job creation rate is projected based on recent experience and various economic forecasts. In 2007, the rate is about 1.0%, and then gradually decreases, averaging about 0.6% over the next 10 years, and then reaching a level of about 0.3% by 2018. Starting from 2007, the job creation rate matches the growth in the labour force and as a result the unemployment rate remains flat at 6.3%.

(Slide 15) Price increases, as measured by changes in the Consumer Price Index, tend to fluctuate from year to year. Based on the renewed commitment of the Bank of Canada and the Government to keep inflation between 1% and 3% until 2011, a rate of price increase of 2.0% has been assumed for years 2007 to 2011. Beginning in 2011, the rate is uniformly increased until it reaches an ultimate rate of 2.5% in 2016. The ultimate assumption of 2.5% is somewhat lower than the assumption of 2.7% used in the previous report. The review panel found that the price increase assumption is within, but towards the high side of, the reasonable range.

(Slide 16) In the past, the annual real increase in earnings has fluctuated significantly from year to year. Over the last 50 years, the real increase in earnings has averaged 1.1% annually, and over the last 25 years it has averaged 0.2%. We assume a gradual increase from 0.2% in 2007 to an ultimate level of 1.3% for 2015 onward. This reflects the assumption that growing labour shortages will cause increases in real wage as a

means to attract and retain qualified workers. The review panel found the real wage increase assumption to be reasonable, but somewhat low within the range of expert opinion.

(Slide 17) The increase in real total earnings is composed of the increase in real wages and the increase in earners. Ultimately, real total earnings is expected to grow annually by 1.6% (1.3% from the real increase in earnings and 0.3% from the increase in number of earners), or 4.1% including inflation. The ultimate projected real increase is slightly higher than in the previous actuarial report.

(Slide 18) 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) does not target specific asset allocations, thus the Office of the Chief Actuary must determine an appropriate long-term asset mix for CPP investments. 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. The short-term mix is similar to the CPPIB Reference Portfolio which is a benchmark against which the performance of the CPP Fund can be measured.

It is assumed that in the long-term, an investment portfolio that takes less risk is more appropriate for the Plan. The main reason for this is that as the ratio of active to retired members decreases, the asset mix of the portfolio should be adjusted to reflect a lower risk tolerance. The long-term asset mix is reached in 2025 and is less risky than the short-term mix. This is reflected by shifting 10% of the portfolio out of equity and into bonds. The peer review panel indicated that the ultimate asset mix is more heavily weighted to fixed income investments than they would expect and that such a shift remains speculative. However, with no clear direction from the CPPIB on a long-term investment strategy, the assumption remains at the discretion of the Chief Actuary.

(Slide 19) Compared to the 21st actuarial report, the ultimate investment assumptions in the 23rd report are slightly more risky. The ultimate asset mix is invested in 50% equity, 40% bonds and cash and 10% inflation-sensitive investments such as real estate and infrastructure. This is a change from the previous report when the expected ultimate asset mix was 45% equity, 45% bonds and cash and 10% inflation-sensitive investments. In addition, the ultimate real rate of return assumption has changed for each major asset type. The expected returns on equity are higher than the 21st report, while expected returns on real estate and infrastructure, bonds and cash are slightly lower. The overall effect of these changes is an ultimate real portfolio return of 4.2% compared to 4.1% in the previous report.

In the short-term, investment returns are moderated to account for the current economic slowdown. The rates are held constant from 2007 to 2011 and then slowly increased to their ultimate values which are reached in 2016. The result is that in the first ten years of the projection, the average annual real portfolio return is 3.8%, compared to an ultimate annual rate of 4.2%. The review panel found that the assumption for the ultimate annual real rate of investment return on assets is within, but towards the low side of, the reasonable range.

(Slide 21) The major amendments to the CPP agreed upon 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.

(Slide 22) One major distinction between the partially funded CPP and fully-funded pension plans is its sources of income. The CPP follows the 70:30 rule in that in the long-term, 70% of CPP income is attributable to contributions while 30% is attributable to investment earnings. When the CPP A/E ratio reaches about 5.5, 30% of revenue will come from investment earnings. Fully funded pension plans are funded in the opposite way: 30% of income is attributable to contributions, with 70% coming from investment earnings.

Currently, 100% of CPP benefits are paid by contributions since contributions exceed benefits and are expected to continue to until 2019. However, beginning in 2020, a portion of investment income will be required to pay benefits. When the Asset/Expenditure ratio reaches about 5.5, 90% of the money required to pay benefits will come from contributions, with the remaining 10% coming from investment earnings. Under the 9.9% contribution scenario, each $100 of benefits paid in 2030 will be funded by $90 of contributions and $10 of investment earnings. This $10 needed to pay benefits represents 27% of expected investment earnings.

(Slide 23) 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 25) Better-than-anticipated experience, especially regarding investment performance, labour force participation and employment data, over the period 2004 to 2006 put downward pressure on the minimum contribution rate. However, a more costly demographic outlook due to the continuing increase in longevity combined with an unexpected increase in the number applying for early retirement benefits, lower inflation expectations and lower expected investment returns in the short-term put upward pressure on the minimum contribution rate. Overall, the minimum contribution rate increased 0.05% from the previous report and is now 9.82%.

(Slide 26) To measure the sensitivity of the long-term projected financial position of the Plan to future changes in the demographic and economic environment, three types of sensitivity tests were performed. For the first set of sensitivity tests, two demographically based scenarios were developed that portray a generally younger and older population. The economic outlook under both demographic alternatives was adjusted to reflect the anticipated economic effects of a modified demographic environment. The younger and older population scenarios produced minimum contribution rates of 9.1% and 10.7%, respectively.

The second set of sensitivity tests focus on the impact that equity market shocks could have on the financial sustainability of the Plan. Assuming the best-estimate portfolio of the CPP and a nominal equity return of -10% in 2009 and 2010, the assets of the CPP would be reduced by $28 billion by the end of 2010, which is comparable to nine months of contributions paid to the Plan in 2010. As well, the minimum contribution rate would increase to 10.0%.

The final set of sensitivity tests focus on varying the key assumptions individually in order to measure the impact on the financial status of the Plan. The alternative assumptions are the upper and lower points of a 95% confidence interval that was determined using stochastic time-series modelling. The peer review panel found the 95% confidence interval to be extremely wide and suggested that 80% would have been sufficient.

These individual tests demonstrate that the minimum contribution rate could deviate significantly from its best-estimate of 9.82% if other than best-estimate assumptions are realized. For example, if life expectancies at age 65 were to increase by approximately three more years by 2050, then the minimum contribution rate would increase to 10.2%. Furthermore, if early retirement rates were to increase at age 60 by an additional 20%, then the minimum contribution rate would increase to 10%.

(Slide 28) 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 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 29) 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 three major steps of the peer review process were announced officially by press releases. First, on May 14ᵗʰ, 2007, OCA commissioned the external peer review by press release. The process was explained and the application forms and terms of reference were included. Twelve Canadian actuaries, all fellows of the CIA, submitted their application. Second, on September 6ᵗʰ, 2007, OCA announced the establishment of the panel of actuaries to review the CPP23, as selected by GAD. Third, on April 21ˢᵗ, 2008, OCA released the findings of the peer review panel.

To complete the process, we posted GAD's opinion of the review on our Web site on April 28th, 2008. GAD explained how they selected the independent Canadian actuaries and stated that the terms of reference of the review were adequate and that the work carried out for the review and the review document adequately addressed the issues set out in the terms of reference.

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