



Office of the Superintendent of
Financial Institutions Canada

Office of the Chief Actuary

Bureau du surintendant des
institutions financières Canada

Bureau de l'actuaire en chef

Actuarial Report

12th

on the Pension Plan for the Federally Appointed Judges

as at 31 March 2019

Office of the Chief Actuary

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30 September 2020

The Honourable Jean-Yves Duclos, P.C., M.P.
President of the Treasury Board
Ottawa, Canada
K1A 0R5

Dear Minister:

Pursuant to section 6 of the *Public Pensions Reporting Act*, I am pleased to submit this report on the actuarial review as at 31 March 2019 of the pension plan for the Federally Appointed Judges. This actuarial review is in respect of benefits and contributions which are established under the *Judges Act*.

Yours sincerely,



Assia Billig, FCIA, FSA, PhD
Chief Actuary

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1 Executive Summary

This actuarial report on the pension plan for the Federally Appointed Judges (the Plan) was made pursuant to the *Public Pensions Reporting Act* (PPRA).

This actuarial valuation is as at 31 March 2019 and is in respect of pension benefits and contributions defined by the *Judges Act*.

The previous statutory actuarial report was prepared as at 31 March 2016. The next periodic review is scheduled for no later than 31 March 2022.

1.1 Purpose of the Report

The Plan is financed through the Consolidated Revenue Fund (CRF) on a pay-as-you-go basis. The government's cost for any given year therefore corresponds to the difference between the Plan benefits and the judges' contributions. The purpose of this actuarial report is to show estimates as at the valuation date of projected plan benefits and contributions in accordance with the pay-as-you-go financing arrangement in effect.

As well, the PPRA requires that a cost certificate be prepared showing the estimated cost of benefits in respect of service. Accordingly, this report shows theoretical estimates of the actuarial liabilities as at the valuation date as well as the projected current service costs.

This report may not be suitable for other purposes.

1.2 Valuation Basis

This report is based on pension benefit provisions enacted by legislation, summarized in Appendix A. Since the previous valuation report as at 31 March 2016, amendments¹ were made to the *Judges Act* to reflect the fact that an annuity may be either paid or granted. However, the benefits and conditions of payment do not change and therefore there is no impact on the level of benefits and contributions nor on the actuarial liabilities and estimated cost of the Plan.

The Plan is financed through the CRF on a pay-as-you go basis. The Supplementary Retirement Benefits Account (SRB Account) was established by the government to track its pension benefit obligations with respect to the indexation provisions of the Plan. The SRB Account is summarized in Appendix B. No other accounts were established to track obligations or transactions related to other provisions of the Plan. The membership data and tests performed are summarized in Appendix C.

The valuation was prepared in accordance with accepted actuarial practice in Canada and is based on methods and assumptions summarized in Appendices D, E and F.

All actuarial assumptions used in this report are best-estimate assumptions. They are independently reasonable and appropriate in aggregate for the purposes of the valuation at the date of this report.

Actuarial assumptions used in the previous report were revised based on economic trends and

¹ Bill C-63 section 2.7.11 - Division 11: Amendments to the *Judges Act*

demographic experience. A complete description of the assumptions is shown in Appendices E and F. A summary of the ultimate economic assumptions used in this report is shown in the following table.

Table 1 Ultimate Best-Estimate Economic Assumptions

	31 March 2019 Valuation	31 March 2016 Valuation
Assumed level of inflation	2.0%	2.0%
Real increases in remuneration	1.0%	1.1%
Valuation rate	4.5%	4.7%

We have reflected the impacts of the COVID-19 pandemic on the economic assumptions used in this report. It is important to note that the pandemic is a very fluid situation that will likely continue to evolve for some time. We have estimated the impacts based on the information known at the time the report was prepared. The final impacts of this health and economic crisis will likely generate some differences in the future.

1.3 Main Findings

The Plan benefits are estimated to be \$179.6 million and the judges' contributions are estimated to be \$21.8 million in the 2020 plan year¹. In accordance with the pay-as-you-go financing arrangement in effect, the government cost is estimated to be \$157.8 million, which corresponds to the difference between the Plan benefits and the judges' contributions for plan year 2020.

Plan benefits are estimated to be \$188.2 million in plan year 2021 and \$198.6 million in plan year 2022.

Based on the data, methodology and assumptions described in this report, if the Plan cost were valued on an accrual basis, the current service cost would be 54.1% of payroll for plan year 2020, 53.0% for plan year 2021 and 52.4% for plan year 2022.

The actuarial liability would be \$4,406 million as at 31 March 2019.

¹ Any reference to a given *plan year* in this report should be taken as the 12-month period ending 31 March of the given year.

2 Projected Benefits and Contributions

The government finances the Plan through the CRF on a pay-as-you-go basis. Other than the SRB Account, which was established by the government to track its pension benefit obligations with respect to the indexation provisions of the Plan, no other accounts were established to track obligations or transactions related to the Plan.

A material portion of the cost of the benefit indexation provisions would normally be debited from the SRB Account. However, in practice, the prescribed contributions¹ credited to the SRB Account are effectively locked in the Account by a legislative anomaly².

Judges contribute 1% of salary to the SRB Account and contribute 6% of salary to the CRF if not eligible for an immediate (unreduced) annuity. In practice, all judges' contributions, including their prescribed contribution credited to the SRB Account, are made to the CRF and all benefits are paid from the CRF.

The following table shows the projected benefits of the Plan with the corresponding judges' contributions to the CRF (including the judges' contributions credited to the SRB Account).

Table 2 Projection of CRF Benefits and Contributions

Plan Year	\$ Millions			% of Payroll		
	Benefits	Judges contributions	Net CRF Cost	Benefits	Judges contributions	Net CRF Cost
2020	179.6	21.8	157.8	45.5	5.5	40.0
2021	188.2	22.8	165.4	46.1	5.6	40.5
2022	198.6	23.9	174.7	47.0	5.7	41.3
2023	210.1	24.6	185.5	48.5	5.7	42.8
2024	222.2	25.7	196.5	49.6	5.7	43.9

¹ Judges contribute 1% of payroll and the government matches those contributions.

² Practically the only events to trigger a debit from the SRB Account are the death (with no survivor) or nonvested termination of a judge. Moreover, when such a death or termination occurs, only the judge's own accumulated contributions are debited, leaving the government's matching contributions as a credit in the SRB Account.

The following table shows the projected judges' contributions and the corresponding government matching contributions to be credited to the SRB Account.

Table 3 SRB Account Contributions

Plan Year	(\$ millions)		
	Judges	Government	Total
2020	3.9	3.9	7.8
2021	4.1	4.1	8.2
2022	4.2	4.2	8.4
2023	4.3	4.3	8.6
2024	4.5	4.5	9.0

3 Actuarial Review of the Plan

The PPRA requires that a cost certificate be prepared showing the estimated cost of benefits in respect of service for the major pension plans sponsored by the Federal Government as well as for the pension plan for the Federally Appointed Judges. However, the judges' plan differs significantly from the major public sector pension plans as it is financed in practice on a pay-as you-go basis and the Plan benefits generally do not vary by length of service.

To conduct this actuarial review on an accrual basis, it was necessary to express each judge's projected benefit in unit credit terms, for each type of benefit. The projected accrued benefit actuarial cost method (used in the actuarial valuations of the major federal public sector pension plans) was used for valuation purposes. As described in Appendix D, the actuarial liability is the government's obligation in respect of all service rendered as at the valuation date; the current service cost is the future government's obligation in regards of all future payable benefits considered to accrue in respect of a given year.

The following actuarial liabilities and current service costs required by the PPRA are purely hypothetical since they do not reflect the pay-as-you-go financial arrangement of the Plan. They were computed using the data described in Appendix C, the methodology described in Appendix D, and the assumptions described in Appendices E and F.

3.1 SRB Account and Actuarial Liabilities

Table 4 SRB Account and Actuarial Liabilities
(\$ millions)

	31 March 2019	31 March 2016
Recorded SRB Account balance	247	215
Actuarial Liability		
For benefits accrued by, and in respect of, judges	2,068	1,695
For benefits payable to, and in respect of:		
Retirement pensioners	1,893	1,393
Disability pensioners	128	114
Surviving dependents	317	266
Total Actuarial Liability	4,406	3,468

3.2 Cost Certificate

Table 5 Projection of Current Service Costs

	Judges Contributions	Government Current Service Cost	Total Current Service Cost	
Plan Year	(\$ millions)	(\$ millions)	(\$ millions)	% of Payroll
2020	21.8	191.8	213.6	54.1%
2021	22.8	193.4	216.2	53.0%
2022	23.9	197.5	221.4	52.4%
2023	24.6	198.7	223.3	51.5%
2024	25.7	200.2	225.9	50.5%

3.3 Reconciliation of Results with Previous Report

This section reconciles the actuarial liability and current service cost with the corresponding items of the previous valuation. Details on the experience gains and losses and on the revision of actuarial assumptions are provided herein afterward.

Table 6 Reconciliation of Results

	Actuarial Liability (\$ millions)	Current Service Cost (% of payroll)
As at 31 March 2016	3,468	45.5
Change in the valuation system	19	-
Expected current service cost	519	-
Expected benefit payments	(465)	-
Interest	259	-
Expected current service cost change		(1.4)
Expected as at 31 March 2019	3,800	44.1
Experience (gains) and losses	(41)	0.7
Revision of valuation assumption	642	9.3
Data corrections	5	-
As at 31 March 2019	4,406	54.1

3.3.1 Experience Gains and Losses

Since the previous valuation, experience gains and losses have decreased the actuarial liability by \$41 million and increased the current service cost by 0.7% of payroll. The main items shown in the following table are explained afterward.

Table 7 Experience (gains) and losses
(\$ millions)

	Impact on Actuarial Liability
Pensionable disabilities	(4)
Mortality	14
Pensionable retirements and terminations	(5)
Salary increases	(35)
New entrants	(6)
Pension indexing	(2)
Miscellaneous	3
Experience (gains) and losses	(41)

3.3.1.1 Disability

The number of disabilities among judges was less than anticipated creating a gain of \$4 million on the actuarial liability.

3.3.1.2 Mortality

The total number of deaths among judges, pensioners and surviving spouses was less than anticipated creating a loss of \$14 million on the actuarial liability.

3.3.1.3 Pensionable Retirements and Terminations

The total number of pensionable retirements and terminations were higher than expected creating a gain of \$5 million on the actuarial liability.

3.3.1.4 Salary Increases

The judicial salary increases during the inter-valuation period were lower than expected producing a gain of \$35 million on the actuarial liability.

3.3.1.5 Pension Indexing

In the previous report, pension indexing was projected to be 1.9% as at 1 January 2018 and 2.0% as at 1 January 2019. The actual indexation of pension was 1.6% as at 1 January 2018 and 2.2% as at 1 January 2019, which resulted in a gain of \$2 million on the actuarial liability.

3.3.2 Revision of Valuation Assumptions

Actuarial assumptions were revised based on economic trends and demographic experience as described in Appendices E and F. The following table presents the impact of the revision of the assumptions.

Table 8 Revision of Valuation Assumptions		
	Impact on Actuarial Liability (\$ millions)	Impact on Current Service Cost (% of payroll)
Retirement Rates	26	0.4
Economic assumptions - indexation	(1)	0.0
Economic assumptions - Salary	(59)	(1.3)
Economic assumptions - Interest rate	677	10.3
Net impact of revision	642	9.3

3.4 Sensitivity of Valuation Results to Variations in Longevity Improvements

This valuation assumes that the current mortality rates applicable to members of the Plan will improve over time based on the mortality improvement scale CPM Improvement Scale B (CPM-B) published by the Canadian Institute of Actuaries. The following table measures the effect of varying the longevity improvement assumptions on the plan year 2020 current service cost and liabilities as at 31 March 2019.

Table 9 Sensitivity of Results to Variations in Longevity Improvement Factors

Longevity improvement factors	Current Service Cost (% of payroll)		Actuarial Liability (\$ millions)		Life Expectancy of a Member aged 65 as at 31 March 2019	
	2020	Effect	2020	Effect	Male	Female
Current basis	54.1	None	4,406	None	24.3	25.2
- if 0%	51.5	(2.6)	4,242	(164)	23.0	24.1
- if ultimate 50% higher	54.7	0.5	4,429	23	24.5	25.4
- if ultimate 50% lower	53.6	(0.5)	4,384	(22)	24.2	25.0
- if kept at 2020 level	54.8	0.7	4,436	30	24.8	25.5

3.5 Sensitivity to Variations in Key Economic Assumptions

The information required by statute, which is presented in this report, has been derived using best-estimate assumptions regarding future demographic and economic trends. The key best-estimate assumptions, i.e. those for which changes within a reasonable range have the most significant impact on the long-term financial results, are described in Appendices E and F. Given the length of the projection period and the number of assumptions required, it is unlikely that the actual experience will develop precisely in accordance with best-estimate assumptions that underlie the actuarial estimates. Individual sensitivity tests have been performed using alternative assumptions.

The following table measures the effect on the plan year 2020 current service cost and the liabilities as at 31 March 2019 when key economic assumptions are varied by one percentage point per annum.

Table 10 Sensitivity of Results to Variations in Key Economic Assumptions

Assumption(s) Varied	Current Service Cost (% of payroll)		Actuarial Liability (\$ millions)	
	2020	Effect	2020	Effect
None (i.e. current basis)	54.1	None	4,406	None
Interest Rates				
- if 1% higher	45.0	(9.1)	3,908	(498)
- if 1% lower	65.8	11.6	5,011	605
Pension Indexation				
- if 1% higher	59.6	5.5	4,831	425
- if 1% lower	49.4	(4.8)	4,036	(370)
Salary				
- if 1% higher	59.5	5.4	4,546	140
- if 1% lower	49.4	(4.8)	4,279	(127)
All economic assumptions				
- if 1% higher	54.0	(0.1)	4,388	(18)
- if 1% lower	54.2	0.1	4,425	19

The differences between the results above and those shown in the valuation can also serve as a basis for approximating the effect of other numerical variations in one of the key assumptions to the extent that such effects are linear.

4 Actuarial Opinion

In our opinion, considering that this report was prepared pursuant to the *Public Pensions Reporting Act* which requires that the Plan be valued on an accrual basis, and that the purpose of this actuarial report is to show estimates of plan contributions in accordance with the financing arrangement (pay-as-you-go basis) in effect,

- the data on which the valuation is based are sufficient and reliable for the purposes of the valuation;
- the assumptions used are individually reasonable and appropriate in the aggregate for the purposes of the valuation; and
- the methodology employed is appropriate for the purposes of the valuation.

This report has been prepared, and our opinions given, in accordance with accepted actuarial practice in Canada. In particular, this report was prepared in accordance with the Standards of Practice (General Standards and Practice – Specific Standards for Pension Plans) published by the Canadian Institute of Actuaries.

We have reflected the impacts of the COVID-19 pandemic on the economic assumptions used in this report. It is important to note that the pandemic is a very fluid situation that will likely continue to evolve for some time. We have estimated the impacts based on the information known at the time the report was prepared. The final impacts of this health and economic crisis will likely generate some differences in the future.

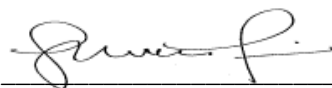
To the best of our knowledge, after discussions with the Treasury Board of Canada Secretariat, there were no other subsequent events between the valuation date and the date of this report that would materially impact the results of the actuarial valuation report.



Assia Billig, FCIA, FSA
Chief Actuary



François Lemire, FCIA, FSA



Laurence Frappier, FCIA, FSA

Ottawa, Canada
30 September 2020

Appendix A — Summary of Plan Provisions

This summary describes the provisions in force as at 31 March 2019 of the pension plan established under the *Judges Act* (“Act”) and modified under the *Supplementary Retirement Benefits Act*. The first federal statute dealing with pensions for judges was enacted in 1868, with many subsequent amendments. The Act shall prevail if there is a discrepancy between this summary and the Act.

A.1 Membership

Membership in the Plan is compulsory for all judges appointed to federal or provincial courts by the Government of Canada.

A.2 Contributions

A.2.1 Judges

Judges contribute 1% of salary to the Supplementary Retirement Benefits (SRB) Account, and if not eligible for an unreduced pension, 6% of salary to the CRF.

A.2.2 Government

The government deemed contributions are the excess of the Plan benefits paid from the CRF over the contributions by judges thereto. Government contributions of 1% of salary are also credited to the SRB Account.

A.3 Summary Description of Benefits

The judges’ pension plan mainly aims at providing an earnings-related lifetime retirement pension to eligible members of the judiciary. The Plan also provides pensions to judges in case of disability and to their spouses and children in case of death.

All annuities are indexed annually to the Consumer Price Index (CPI). They are payable in equal monthly instalments in arrears until the end of the month in which the pensioner or the survivor dies. If applicable, either a survivor annuity (Note A.4.11) or a residual benefit (Note A.4.12) is payable upon the death of the pensioner, and a residual benefit may be payable to the estate upon the death of the last survivor.

The explanatory notes referred to in this summary description are given in Appendix A.4.

1. Judges

<u>Type of Termination</u>	<u>Benefit</u>
Normal pensionable retirement (Notes A.4.1 and A.4.3)	Immediate annuity, reduced pro-rata if under 10 years of service at normal retirement age
Early pensionable retirement (Note A.4.4)	Deferred annuity, or reduced immediate annuity
Pensionable disability (Note A.4.2)	Immediate annuity
Nonvested termination (Note A.4.6)	Return of contributions (Note A.4.7)
Death leaving no eligible survivor(s) (Notes A.4.8 and A.4.9)	Return of contributions, and lump sum (Notes A.4.7 and A.4.10)
Death leaving eligible survivor(s) (Notes A.4.8 and A.4.9)	Annuity to eligible survivor(s), and lump sum (Notes A.4.10 and A.4.11)

2. Pensioners

<u>Type of Termination</u>	<u>Benefit</u>
Death leaving no eligible survivor(s) (Notes A.4.8 and A.4.9)	Residual benefit (Note A.4.12), if applicable
Death leaving eligible survivor(s) (Notes A.4.8 and A.4.9)	Annuity to eligible survivor(s) (Note A.4.11)

A.4 Explanatory Notes

A.4.1 Normal Pensionable Retirement

Normal pensionable retirement means ceasing to hold judicial office on reaching normal retirement age of 75 years (70 years for certain judges appointed prior to 1 March 1987) or by satisfying the requirement that the sum of age and service (minimum of 15 years of service) be at least 80 years or, in respect only of a judge of the Supreme Court of Canada, that service be ten years or more.

An immediate annuity is payable upon retirement, except when a judge who has attained the normal retirement age has held judicial office for less than 10 years, in which case a pro-rated portion of the immediate annuity is payable.

A.4.2 Disability Retirement

Disability retirement refers to the benefit applicable to a judge that has become afflicted with a permanent infirmity disabling him or her from the due execution of the office of judge and resigns from office by reason of that infirmity.

The benefit is an annuity payable is equal to two thirds of the salary annexed to the office held by the judge at the time of his or her disability termination.

A.4.3 Immediate Annuity

Immediate annuity means an annuity that becomes payable immediately upon a normal pensionable retirement or a disability retirement. The initial annual amount of the annuity is equal to two-thirds of the judge's annual salary at the time of ceasing to hold office, or in the case of a supernumerary judge of the then current salary applicable to a higher judicial office, if such higher office was formerly held.

A.4.4 Early Pensionable Retirement

Early pensionable retirement means ceasing to hold judicial office and becoming entitled to a deferred annuity or a reduced immediate annuity before normal pensionable retirement by satisfying the requirement that age be at least 55 years with service of 10 years or more.

A.4.4.1 Deferred Annuity

Deferred annuity means an annuity that becomes payable following early pensionable retirement to a former judge who reaches age 60 following early pensionable retirement.

The amount of the deferred annuity is calculated by multiplying two thirds of the amount of the salary annexed to the judge's office at the time of the election multiplied by a fraction of which:

- the numerator is the number of years, to the nearest one tenth of a year, during which the judge has continued in judicial office, and
- the denominator is the number of years, to the nearest one tenth of a year, during which the judge would have been required to continue in judicial office in order to be eligible for an unreduced pension (normal pensionable retirement).

A.4.4.2 Reduced Immediate Annuity

Reduced immediate annuity means a reduced annuity that becomes payable immediately upon early pensionable retirement. The initial annual amount of the annuity is equal to the amount of deferred annuity, but is reduced by 5% for every year that the annuity commences in advance of age 60.

A.4.5 Service

Service means holding the office of judge of a superior or county court or of the Tax Court of Canada, and includes the office of a person who is a deputy judge by virtue of section 60 of the *Federal Court Act*. Superior court is interpreted to include the Supreme Court of Canada; county court includes any district court.

A.4.6 Nonvested Terminations

Nonvested termination means ceasing to hold judicial office under any circumstance other than pensionable retirement, pensionable disability, or death.

A.4.7 Return of Contributions

Return of contributions means the payment of an amount equal to the accumulated contributions paid with respect to the Plan by a judge. Interest is credited at the specified rate each 31 December on the accumulated contributions as at the preceding 31 December. The specified rate is the one applied under the *Income Tax Act* in respect of refunds of overpayments of tax.

A.4.8 Eligible Surviving Spouse

In the case of a judge, the eligible surviving spouse is the person who was married to the judge at the time of the judge's death or who establishes that he or she was cohabiting with the judge in a conjugal relationship at the time of the judge's death and had so cohabited for a period of at least one year.

In the case of a pensioner, the eligible surviving spouse is the person who was married to the pensioner before his or her death and before the time when he or she ceased to be a judge, or who was cohabiting in a relationship of a conjugal nature with the pensioner for at least one year immediately before his or her death, where such cohabitation commenced while the pensioner was a judge. An annuity may also be granted to a survivor who became a spouse or began to cohabit with the judge in a conjugal relationship after the judge ceased to hold office if the former judge elects to reduce his annuity so that an annuity may be paid to that person.

A.4.9 Eligible Surviving Children

Eligible surviving children of a judge or pensioner include each child under age 18 and any child under age 25 who is in full-time attendance at a school or university, having been in attendance substantially without interruption since reaching 18 or, if more recent, since the death of the judge or pensioner.

A.4.10 Lump Sum

If a judge dies, a lump sum equal to one-sixth of the yearly salary of the judge is paid to the surviving spouse or, if there is no survivor, to the estate or succession of the judge.

A.4.11 Annuities to Eligible Survivor(s)

Annuities to the eligible surviving spouse and children of a judge or pensioner become payable immediately upon the death of that judge (pensioner). The annuity to the eligible surviving spouse is equal to one-third of the annual salary of the judge or to one-half of the pensioner's annuity, as applicable at the time of death. An eligible child receives an annuity equal to 20% of the surviving spouse's annuity, subject to reduction if there are more than four eligible children in the same family. The annuity otherwise payable to an eligible child is doubled if that child is an orphan.

A pensioner can elect an enhanced surviving spouse benefit with a maximum of 75% of his pension on an actuarially reduced basis to fund the enhancement.

A.4.12 Residual Benefit

Residual benefit is equal to the amount, if any, by which the return of contributions exceeds the aggregate of all amounts paid to and in respect of a pensioner until the death of the pensioner, or, if applicable, until the subsequent death or loss of eligibility of the last survivor entitled to an annuity.

A.4.13 Indexation

All annuities payable under the Plan are adjusted every January to the extent warranted by the increase, as at 30 September of the previous year, in the 12-month average CPI. If the indicated adjustment is negative, annuities are not decreased for that year; however, the next following positive adjustment is diminished accordingly. Moreover, the first annual adjustment is prorated to reflect the number of whole months since the date of termination of service.

A.4.14 Division of Pension with Former Spouse

Upon the breakdown of a spousal union (including common-law), a lump sum could be transferred by court order or by mutual consent to the credit of the former spouse of a judge or pensioner. The maximum transferable amount would be half of the actuarial value, calculated as at the transfer date, of the retirement pension deemed accrued by the judge or pensioner during the period of cohabitation.

Appendix B — Supplementary Retirement Benefits Account

The SRB Account was established by the government to track its pension benefit obligation with respect to the indexation provision of the Plan. Judges contribute 1% of payroll and the government matches those contributions. These credits would normally track a material portion of the cost of the benefit indexation provision, but in practice they are effectively locked in the SRB Account by a legislative anomaly. Practically the only events to trigger a debit from the SRB Account are the death (with no survivor) or non-vested termination of a judge. Moreover, when such a death or termination occurs, only the judge's own accumulated contributions are debited, leaving the government's matching contributions as a credit in the SRB Account. In practice, all judges' contributions are made to the CRF and all benefits under the Plan are borne by the CRF when they become due.

The SRB Account, which forms part of the Public Accounts of Canada, tracks individual balances held in respect of judges. Each such balance is the cumulative excess of the prescribed interest credits and SRB contributions over the benefits charged to the SRB Account in respect of the given judge. No formal debt instrument is issued to the SRB Account by the government in recognition of the amounts therein. Interest is credited quarterly on the minimum monthly balances in the SRB Account at the monthly rate corresponding to the effective annual yield, reduced by 0.125%, available at the end of the month on 5-year Government of Canada bonds.

Table 11 Reconciliation of Balances in the SRB Account¹
(\$ Millions)

Plan Year	2017	2018	2019
Account Opening Balance	215.1	223.7	234.4
Judges contributions	3.6	3.7	3.8
Government contributions	3.6	3.7	3.8
Interest credits	1.5	3.3	4.7
Account Closing Balance	223.7	234.4	246.7

The rates of return on the Account in plan years 2017, 2018 and 2019 were 0.7%, 1.5% and 2.0% respectively. They were calculated based on the assumption that contributions were made in the middle of the year.

¹ Numbers may not add up due to rounding.

Appendix C — Membership Data

C.1 Sources and Validation of Membership Data

The Office of the Commissioner of Federal Judicial Affairs provided relevant valuation input data on judges and on the corresponding pensioners and survivors.

We performed certain tests of internal consistency, as well as tests of consistency with the data used in the previous valuation, with respect to membership reconciliation, basic information (date of birth, date of hire, date of termination, sex, etc.), salary levels, and pensions to survivors and pensioners.

Based on the omissions and discrepancies identified by these and other tests, appropriate adjustments were made to the basic data after consulting with the data providers.

C.2 Summary of Membership Data

A summary of the valuation data as at 31 March 2019 and the reconciliation of judges, pensioners, and survivors during the period from April 2016 to March 2019 inclusive are shown in this section. Relevant detailed statistics on judges, pensioners and survivors are shown in Appendix G.

Table 12 Summary of Membership Data

	As at 31 March 2019	As at 31 March 2016
Judges		
· Number	1,187	1,139
· Average Payroll for the following year	\$330,900	\$315,300 ¹
· Average Age	61.7	61.8
· Average Service	10.6	11.3
Retirement Pensioners		
· Number	677	587
· Average Pension	\$203,100	\$189,400
· Average Age	79.1	79.1
Disability Pensioners		
· Number	40	44
· Average Pension	\$191,700	\$176,000
· Average Age	75.4	75.7
Eligible Surviving Spouses		
· Number	340	317
· Average Pension	\$90,200	\$81,600
· Average Age	83.0	81.9
Eligible Surviving Children		
· Number	3	4
· Average Pension	\$26,800	\$23,500

¹ The amount shown in the Actuarial Report on the Pension Plan for the Federally Appointed Judges as at 31 March 2016 excluded the salary increase as at 1 April 2016 of 1.8%; however, it is included in the table above.

Table 13 Reconciliation of Membership

	Judges	Retirement Pensioners	Disability Pensioners	Surviving Spouses	Surviving Children
As at 31 March 2016	1,139	587	44	317	4
Data corrections				5	
New entrants	232				
Pensionable retirements	(162)	162			
Pensionable disabilities	(6)		6		
Non vested terminations	(4)				
New survivors				63	
Deaths	(12)	(72)	(10)	(45)	
Loss of eligibility					(1)
At 31 March 2019	1,187	677	40	340	3

Table 14 Reconciliation of Judges

	Male	Female	Total
As at 31 March 2016	731	408	1,139
New entrants	101	131	232
Pensionable retirements	(113)	(49)	(162)
Pensionable disabilities	(5)	(1)	(6)
Non vested terminations	(2)	(2)	(4)
Deaths	(9)	(3)	(12)
As at 31 March 2019	703	484	1,187

Table 15 Reconciliation of Retirement Pensioners

	Male	Female	Total
As at 31 March 2016	500	87	587
Data corrections	-	-	-
Pensionable retirements	113	49	162
Deaths	(71)	(1)	(72)
As at 31 March 2019	542	135	677

Table 16 Reconciliation of Disabled Pensioners

	Male	Female	Total
As at 31 March 2016	33	11	44
Pensionable disabilities	5	1	6
Deaths	(8)	(2)	(10)
As at 31 March 2019	30	10	40

Table 17 Reconciliation of Surviving Spouses

	Male	Female	Total
As at 31 March 2016	7	310	317
Data corrections	-	5	5
New surviving spouses	3	60	63
Deaths	-	(45)	(45)
As at 31 March 2019	10	330	340

Appendix D — Methodology

D.1 Actuarial Cost Method

Although the Plan provides benefits that do not vary by length of service, the projected accrued benefit actuarial cost method (also known as the projected unit credit method) was used, as in the previous valuation, to compute current service costs and actuarial liabilities.

To allow the use of the projected accrued benefit actuarial cost method, it was necessary to express each judge's projected benefit in unit credit terms, for each type of benefit. To do so, the benefit projected in respect of a given judge was considered to have accrued uniformly from the date of the judge's appointment to the commencement date of that benefit. For example, a retirement pension commencing at age 75 was deemed to accrue at the following rates, expressed as a percentage of salary throughout a judge's career.

Table 18 Assumed Annual Accrual Rates

Age at Appointment	Annual Accrual (%)
40	1.9
45	2.2
50	2.7
55	3.3
60	4.4
65	6.7

Consistent with this cost method, earnings are projected up to retirement using the assumed annual increases in judicial salaries.

D.1.1 Current Service Cost

Under the projected accrued benefit actuarial cost method, the current service cost, also called normal cost, computed in respect of a given year is the sum of the value, discounted in accordance with the actuarial assumptions, of all future payable benefits considered to accrue in respect of that year's service.

All other things being equal, the current service cost for the total population, expressed as a percentage of total payroll, can be expected to remain stable as long as the average age and service of the total population remains constant.

The government current service cost is the total current service cost reduced by the judges' contributions.

D.1.2 Actuarial Liability

The actuarial liability with respect to contributors corresponds to the value, discounted in accordance with the actuarial assumptions, of all future payable benefits accrued as at the valuation date in respect of all previous service. For pensioners and survivors, the actuarial liability corresponds to the value, discounted in accordance with the actuarial assumptions, of future payable benefits.

D.1.3 Actuarial Excess / (Shortfall)

Under the projected accrued benefit actuarial cost method, an actuarial excess (shortfall) that corresponds to the difference between the assets (or accounts) and actuarial liabilities would normally be calculated to determine necessary amortization payments or account adjustments. As the Plan is financed on a pay-as-you-go basis, actuarial deficits and amortization payments/account adjustments are not required and hence not presented in this report.

D.1.4 Hypothetical Wind-up Valuation

The government is responsible for the payment of accrued pension benefits. As such, the likelihood of the plan being wound-up and its obligations not fulfilled is practically non-existent. Additionally, the *Judges Act* does not define the benefits payable upon wind-up. Therefore, a hypothetical wind-up valuation has not been performed.

D.2 Membership Data

The membership data shown in Appendices C and G were provided as at 31 March 2019. Individual data on each member were used.

Appendix E — Economic Assumptions

All assumptions used in this report are best-estimate assumptions which reflect our best judgement of the future long-term experience of the Plan and do not include margins. We have reflected the impacts of the COVID-19 pandemic on the economic assumptions used in this report, which are based on the information known at the time the report is prepared.

E.1 Inflation-Related Assumptions

E.1.1 Level of Inflation

Price increases, as measured by changes in the Consumer Price Index (CPI), tend to fluctuate from year to year. In 2016, the Bank of Canada and the Government renewed their commitment to keep inflation between 1% and 3% until the end of 2021. In this report, to reflect recent experience and the expected impact of the COVID-19 pandemic, it is assumed that the level of inflation will decrease from 2.0% in plan year 2020 to 1.0% in plan year 2021 before reaching its ultimate level of 2.0% in plan year 2022.

E.1.2 Pension Indexing

The year's pension indexing factor was derived by applying the indexation formula described in Appendix A, which relates to the assumed Consumer Price Index increases over successive 12-month periods ending on 30 September.

E.2 Employment Earnings Increases

E.2.1 Average Canadian Wage Increase

The real-wage differential (i.e. increase in average employment earnings in excess of inflation) is developed taking into account historical trends, a possible labour shortage and an assumed moderate economic growth for Canada. Thus, a real-wage differential of 0.5% is assumed for 2021, and is assumed to gradually increase to the ultimate assumption of 1.0% by 2026 (1.1% by 2024 in the previous valuation). The ultimate real-wage differential assumption combined with the ultimate price increase assumption results in an assumed annual increase in nominal wages of 3.0% in 2026 and thereafter.

E.2.2 Judicial Salary Increase

Judicial salaries are expected to follow the same pattern of increase as the Industrial Aggregate (see foregoing discussion of average Canadian wage increase assumption) to which they are indexed, with a lag of a few months.

E.3 Valuation Interest Rates

The judges' plan differs significantly from the major public sector pension plans as it is financed in practice on a pay-as you-go basis. However, the *Public Pensions Reporting Act* requires that a cost certificate be prepared showing the estimated cost of benefits in respect of service for the major pension plans sponsored by the Federal Government as well as for the pension plan for the Federally Appointed Judges. Since benefits paid from the Plan are paid with borrowed money (i.e. there are no invested assets), the actuarial liabilities and current service costs are valued

using the government's long term cost of borrowing.

The government's real¹ cost of borrowing is equal to the new money rate less the assumed rate of inflation. The new money rate is the nominal yield on 10-year-plus Government of Canada bonds and is set for each year in the projection period.

Recognizing recent experience and the expected impact of the COVID-19 pandemic, the annual real yield on 10-year-plus federal bonds is assumed to be (0.4)% in plan year 2020, 0.3% for 2021 and then is assumed to increase gradually to its ultimate level of 2.5% first attained in plan year 2036. The ultimate real yield was 2.7% in the previous valuation.

The resulting assumed valuation interest rate in plan year 2020 is 1.6%. It is expected to decrease to 1.3% in plan year 2021 before gradually increasing to its ultimate value of 4.5% in plan year 2036. For purpose of calculating the liability as at 31 March 2019, using the variable interest rates is equivalent to using a flat discount rate of 3.0%.

¹ Note that all of the real rates referred to in this report are actually real differentials.

E.4 Summary of Economic Assumptions

The economic assumptions used in this report are summarized in the following table.

Table 19 Summary of Economic Assumptions¹

Plan Year	Inflation		Employment Earnings Increase		Interest
	(%)	(%)	(%)	(%)	(%)
	CPI Increase	Pension Indexing ²	Industrial Aggregate	Judicial Salaries ³	Valuation Rate
2020	2.0	2.0	2.3	2.6	1.6
2021	1.0	1.3	1.5	2.7	1.3
2022	2.0	1.8	2.6	1.7	1.6
2023	2.0	2.0	2.7	2.3	1.7
2024	2.0	2.0	2.8	2.7	2.0
2025	2.0	2.0	2.9	2.8	2.4
2026	2.0	2.0	3.0	2.9	2.7
2027	2.0	2.0	3.0	3.0	2.9
2028	2.0	2.0	3.0	3.0	3.1
2029	2.0	2.0	3.0	3.0	3.3
2030	2.0	2.0	3.0	3.0	3.5
2031	2.0	2.0	3.0	3.0	3.7
2032	2.0	2.0	3.0	3.0	3.9
2033	2.0	2.0	3.0	3.0	4.1
2034	2.0	2.0	3.0	3.0	4.3
2035	2.0	2.0	3.0	3.0	4.4
2036+	2.0	2.0	3.0	3.0	4.5

As a reference, for the period ending December 2018, the following table was prepared based on the Canadian Institute of Actuaries Report on Canadian Economic Statistics 1924-2018.

Period of Years Ending December 2018	15	25	50
Level of Inflation	1.7%	1.8%	4.0%
Real Increases in Average Earnings	0.7%	0.4%	0.7%
Real Yield of Long-Term Canada Bonds	1.5%	2.7%	3.1%
Real Return on Long-Term Canada Bonds	4.0%	5.0%	4.2%

¹ Bold denotes actual figures

² Assumed to be effective as at 1 January

³ Assumed to be effective as at 1 April (e.g. 1 April 2019 for plan year 2020)

Appendix F — Demographic Assumptions

Except where otherwise noted, all demographic assumptions were determined from the Plan's own experience as was done in the past. Assumptions of the previous valuation were updated to reflect past experience to the extent that it was deemed credible.

F.1 New Entrants

The total number of judges is assumed to increase by 0.9% per annum and it is assumed that there will be an equal number of male and female judges by 2030 (2035 in previous valuation). The number of male judges is assumed to decrease by 0.8% per annum from 2020 to 2030 and the number of female judges is assumed to rise by 3.4% in plan year 2020, with smaller increases thereafter until the ultimate increase of 0.9% is attained in plan year 2030. By 2030, both the number of male and female judges is assumed to increase by 0.9 % per annum.

For each sex, the age distribution of the future new judges was based on that of the actual new judges in the April 2016 to March 2019 period. The initial salary of new judges was assumed to be \$329,900 for plan year 2020, with increases in future plan years in accordance with the assumption for judges' salary increases.

F.2 Non-Vested Terminations

The number of non-vested terminations during the three years ended 31 March 2019 was in line with what was expected. Rates of non-vested terminations are not changed from the previous valuation. They are 3 per 1,000 judges for the first year, 2 per 1,000 judges for the second year and 1 per 1,000 judges up to 9 years of service. Non-vested terminations rates are assumed to be nil after 10 years of service.

F.3 Disability Retirements

During the three years ended 31 March 2019, the reported disabilities were in line with what was expected. The disability incidence rates for both males and females were not changed from the previous valuation.

Table 20 Rates of Pensionable Disability¹
(per 1,000 judges)

Age Last Birthday	Male	Female
40	0.2	0.4
50	0.7	1.0
60	2.0	3.1
70	6.4	10.1

¹ Disability rates are nil once eligible for an unreduced annuity

F.4 Pensionable Retirements

During the three years ended 31 March 2019, the number of reported pensionable retirements represented 122% of those expected. Assumed pensionable retirement rates were increased for specific age/service ranges since the previous valuation (over age 70 with more than 21 years of service).

Table 21 Rates of Pensionable Retirement
(per 1,000 judges)

Age Last Birthday	Completed Years of Service											
	9-13	14	15	16	17	18	19	20	21	22	23	24+
55	5	5	5	5	5	5	5	5	5	5	150	150
60	5	5	5	5	5	110	130	10	10	20	20	20
65	5	60	30	30	40	40	50	50	50	50	60	60
70	5	120	40	80	80	80	80	80	80	80	80	80
74 ¹	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

F.5 Mortality Rates and Longevity Improvement Factors

Mortality rates for judges, pensioners and surviving spouses were not changed since last valuation. Given the small size of the population, the available data is not sufficient to build a credible mortality experience study. In the absence of credible Plan experience, it was decided to use the mortality rates of the 2014 Canadian Pensioners Mortality Table (CPM2014) published by the Canadian Institute of Actuaries as a starting point. These mortality rates were developed from combined experience exhibited under public and private sector plans. Pension size adjustment factors were applied to the CPM2014 base mortality rates for judges and pensioners to reflect the correlation between pension amounts and life expectancy. The weighted average adjustments for males and females are 0.74 and 0.92 respectively. No size adjustment was applied to the mortality rates for surviving spouses. Mortality rates for disabled pensioners are equal to the mortality rates of healthy pensioners as the CPM2014 reflects the combined expected rates of mortality for all retired members, including those who were disabled prior to retirement.

The mortality rates are projected from 2014 using the mortality improvement scale CPM Improvement Scale B (CPM-B). The CPM-B was published by the Canadian Institute of Actuaries and is based on the C/QPP study which reviewed trends of mortality experience since 1967. The longevity improvement assumption did not change since the last valuation.

A sample of the resulting mortality rates for plan year 2020 is shown in the table below. The following two tables provide a sample of the mortality improvement factors and the calculated life expectancies based on the mortality assumption described above.

¹ Retirement becomes compulsory on the 75th birthday.

Table 22 Rates of Mortality¹

For 2020 Plan Year (per 1,000 individuals)

Age Last Birthday	Judges and Pensioners		Surviving Spouses	
	Male	Female	Male	Female
40	0.9	0.6	1.3	0.6
50	1.9	1.2	2.6	1.3
60	4.2	3.2	5.8	3.4
70	8.8	7.9	11.9	8.6
80	27.8	24.9	37.7	26.9
90	117.6	99.4	142.4	104.8
100	375.0	325.5	375.0	325.4
110	583.7	534.3	583.7	534.3

Table 23 Mortality Improvement FactorsInitial and Ultimate Plan Year Mortality Reductions²(%)

Age Last Birthday	Male		Female	
	2020	2030+	2020	2030+
40	1.78	0.80	1.16	0.80
50	1.16	0.80	0.98	0.80
60	1.74	0.80	1.23	0.80
70	2.03	0.80	1.35	0.80
80	1.93	0.80	1.35	0.80
90	0.75	0.48	0.75	0.48
100	0.15	0.30	0.15	0.30
110+	0.11	0.23	0.11	0.23

¹ The pensioner mortality rates are to be used when a division of pension is requested upon the breakdown of a spousal union. These mortality rates apply to both retirement and disability pensioners. Plan year 2020 mortality rates shown above are projected in accordance with the following assumed mortality improvement factors.

² The mortality rate reduction applicable during any plan year within the select period is found by linear interpolation between the figures for plan years 2020 and 2030.

Table 24 Life Expectancy of Judges

Age	As at 31 March 2019		As at 31 March 2033	
	Male	Female	Male	Female
60	29.0	29.9	29.6	30.6
65	24.3	25.2	25.0	25.8
70	19.8	20.6	20.4	21.2
75	15.4	16.3	16.0	16.8
80	11.5	12.3	11.9	12.7
85	8.0	8.7	8.3	9.1
90	5.2	5.9	5.5	6.1

F.6 Family Composition

Assumptions for the proportion of members leaving, upon death, a spouse eligible for a survivor pension and the age of the survivor spouse are unchanged from the previous valuation. The number of new widows and widowers was 111% of expected during the three years ended 31 March 2019.

Assumptions for survivor benefits in respect of judges or pensioners are summarized in the following table.

Table 25 Assumptions for Survivor Benefits¹

Age Last Birthday at Death	Male		Female	
	Eligible Surviving Spouse	Spouse Age Difference ²	Eligible Surviving Spouse	Spouse Age Difference ²
40	0.90	(2)	0.90	3
50	0.95	(3)	0.90	3
60	0.98	(3)	0.83	3
70	0.88	(3)	0.61	2
80	0.74	(5)	0.35	0
90	0.47	(6)	0.14	(2)
100	0.17	(9)	0.02	(7)

¹ Benefits for surviving child have not been valued since they were deemed not material.

² Age of surviving spouse less age of judge or pensioner, both calculated at death of judge or pensioner.

F.7 Other Assumptions

F.7.1 Reversals and Recoveries

It is assumed that no pensioners will return to the active service.

F.7.2 Minimum Death Benefit

This valuation does not take into account the minimum death benefit in respect of deaths occurring after retirement. The resulting understatement of accrued liability and current service cost is immaterial because relatively few pensioners in the early years of retirement die without leaving an eligible survivor.

F.7.3 Special Retirement Provisions

Plan provisions allow certain judges to retire on a full pension before satisfying the normal requirement that the sum of age and service (minimum of 15 years) be at least 80 years. These provisions have been ignored in the valuation because only a handful of judges will retire thereunder.

F.7.4 Early Retirement Provisions

It is assumed that judges retiring under the early retirement provisions will choose a reduced immediate annuity.

F.7.5 Pension Benefits Division / Optional Survivor Benefit / Enhanced Survivor Benefit

No future pension benefits divisions were assumed in estimating current service costs and liabilities. Actual pension benefit divisions that occurred before 1 April 2019 were fully reflected in liabilities.

Two other provisions, namely the optional survivor benefit and the enhanced survivor benefit, were also treated like pension benefits divisions. Past elections were fully reflected in liabilities.

F.7.6 Sex of Surviving Spouses

Each eligible surviving spouse is assumed to be of the opposite sex to that of the member.

F.7.7 Salary of Supernumerary Judges

The pension for supernumerary judges is based on a projection of the current salary as opposed to the projection of a salary applicable to a higher judicial office, when such higher office was formerly held. This simplification does not have a material impact on valuation results.

Appendix G — Detailed Information on Membership Data

Table 26 Number of Male Judges as at 31 March 2019

Age Last Birthday	Completed Years of Service								Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	
40-44	2	1	-	-	-	-	-	-	3
45-49	24	7	-	-	-	-	-	-	31
50-54	43	17	4	-	-	-	-	-	64
55-59	47	55	16	2	-	-	-	-	120
60-64	42	47	39	19	3	1	-	-	151
65-69	13	53	56	42	25	9	1	-	199
70-74	2	12	34	33	35	14	4	1	135
All Ages	173	192	149	96	63	24	5	1	703

Average service: 10.7

Average salary: \$331,300 ¹

Total payroll: \$232,903,900 ¹

Table 27 Number of Female Judges as at 31 March 2019

Age Last Birthday	Completed Years of Service								Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	
40-44	9	-	-	-	-	-	-	-	9
45-49	41	8	-	-	-	-	-	-	49
50-54	57	30	7	-	-	-	-	-	94
55-59	48	20	21	3	-	-	-	-	92
60-64	16	26	29	33	12	2	-	-	118
65-69	1	5	11	27	35	16	1	-	96
70-74	-	1	2	6	9	5	2	1	26
All Ages	172	90	70	69	56	23	3	1	484

Average service: 10.5

Average salary: \$330,300 ¹

Total payroll: \$159,865,200 ¹

¹ The average salary and total payroll include a salary increase of 2.6% as at 1 April 2019.

Table 28 Male Pensioners as at 31 March 2019¹

Age	Retirement Pension			Disability Pension		
	Annual Pension			Annual Pension		
	Number	Average (\$)	Total (\$)	Number	Average (\$)	Total (\$)
Less than 65	7	210,800	1,475,600	*	*	*
65-69	21	203,400	4,272,300	4	216,400	865,700
70-74	79	208,900	16,503,400	6	201,100	1,206,700
75-79	157	212,600	33,371,200	4	188,400	753,700
80-84	124	205,100	25,427,400	4	176,400	705,600
85-89	113	195,300	22,066,100	6	168,700	1,012,100
90 +	41	174,900	7,168,900	*	*	*
All Ages	542	203,500	110,284,900	30	190,800	5,724,500

Retirement Pensioners

Average age at 31 March 2019 80.6

Average age at retirement 72.0

Disability Pensioners

Average age at 31 March 2019 76.3

Average age at retirement 61.9

Table 29 Female Pensioners as at 31 March 2019¹

Age	Retirement Pension			Disability Pension		
	Annual Pension			Annual Pension		
	Number	Average (\$)	Total (\$)	Number	Average (\$)	Total (\$)
Less than 65	12	181,500	2,178,500	-	-	-
65-69	39	200,600	7,821,900	6	204,400	1,226,200
70-74	41	204,500	8,383,100	*	*	*
75-79	27	208,900	5,640,900	-	-	-
80-84	7	207,700	1,453,600	*	*	*
85-89	3	196,300	589,000	*	*	*
90 +	6	186,200	1,117,000	-	-	-
All Ages	135	201,400	27,184,000	10	194,500	1,944,900

Retirement Pensioners

Average age at 31 March 2019 72.8

Average age at retirement 66.9

Disability Pensioners

Average age at 31 March 2019 72.4

Average age at retirement 60.2

¹ Certain values are obscured by an asterisk to protect the confidentiality of plan members.

Table 30 Eligible Survivors at 31 March 2019

Age	Number	Annualized Amount	
		Average (\$)	Total (\$)
55-59	4	102,900	411,600
60-64	7	97,100	680,000
65-69	18	92,600	1,666,800
70-74	46	94,100	4,329,200
75-79	43	96,100	4,131,400
80-84	60	94,100	5,644,800
85-89	85	88,400	7,514,900
90-94	56	83,600	4,683,800
95-99	16	77,300	1,236,000
100 +	5	77,300	386,300
Widows ¹	340	90,249	30,684,800
Children	3	26,800	80,400

Average age of spouses:

At 31 March 2019:	83.0
At death of member:	71.6

¹ As at 31 March 2019, there were 10 male survivors.

Appendix H — Acknowledgements

The Office of the Comptroller General of Canada provided the SRB Account balance as at 31 March 2019.

The Office of the Commissioner for Federal Judicial Affairs provided relevant valuation input data for all federally appointed judges and for the corresponding pensioners and survivors.

The co-operation and able assistance received from the above mentioned data provider deserve to be acknowledged.

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