

# **Twenty-Second Actuarial Valuation**

**of the Assets and Liabilities  
Under the Railroad Retirement Acts  
as of December 31, 2001  
with  
Technical Supplement**



**U.S. Railroad Retirement Board  
Bureau of the Actuary  
Chicago, Illinois**

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as of December 31, 2001  
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Technical Supplement**

by  
Frank J. Buzzi, Chief Actuary

**with Statements of the  
Railroad Retirement Board  
and the  
Actuarial Advisory Committee**

U.S. Railroad Retirement Board  
Bureau of the Actuary  
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STATEMENT OF THE RAILROAD RETIREMENT BOARD

Section 15(g) of the Railroad Retirement Act of 1974 requires that the Railroad Retirement Board, at intervals not longer than three years, estimate the liabilities created by the Act and include the estimate in its annual report. Section 22 of the Railroad Retirement Act of 1974 requires that the Board submit to the President and the Congress, by July 1 of each year, a report containing a five-year projection of the revenues to and payments from the Railroad Retirement Account. Section 502 of the Railroad Retirement Solvency Act of 1983, Public Law 98-76, requires that the Board submit to the Congress, by July 1 of each year, a report on the actuarial status of the railroad retirement system. The 22<sup>nd</sup> valuation was prepared by the Board's Chief Actuary and meets these requirements. The Actuarial Advisory Committee reviewed the valuation as to assumptions and methods as required by Section 15(f) of the Railroad Retirement Act.

The Chief Actuary's report describes the results of three valuations, each valuation differing from the others as to the employment assumption on which it is based. Cash flow problems occur only under the most pessimistic employment assumption. Even under that assumption, the cash flow problems do not occur until the year 2022.

Section 502 of the Solvency Act requires recommendations with respect to tax rates and whether any part of the taxes on employers should be diverted to the Railroad Unemployment Insurance Account to aid in the repayment of any debt to the Railroad Retirement Account. The Chief Actuary's report does not recommend a change in the tax rate, nor does it recommend a diversion of taxes from the Railroad Retirement Account to the Railroad Unemployment Insurance Account.

The Board Members believe that the 22<sup>nd</sup> valuation presents a fair picture of the financial condition of the railroad retirement system, and we support the conclusions reached in the report.



The Railroad Retirement Board wishes to thank the members of the Actuarial Advisory Committee for their assistance in this important project.

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STATEMENT OF THE ACTUARIAL ADVISORY COMMITTEE  
May 29, 2003

This statement sets forth the Committee's review of the twenty-second actuarial valuation of the railroad retirement system. This valuation, performed as of December 31, 2001, was completed in the spring of 2003 by Mr. Frank J. Buzzi, Chief Actuary of the Railroad Retirement Board, and his staff. In both the planning and carrying out of the valuation, the Committee has counseled with Mr. Buzzi as to the structure, actuarial methods, actuarial assumptions, and procedures of the valuation and as to the scope and content of his report. In all, the Committee has met with the Chief Actuary on August 23, 2002, January 17, 2003, and May 29, 2003, for the purpose of reviewing and discussing the significant elements of the twenty-second valuation.

The Committee believes that the actuarial assumptions are reasonable and that the valuation results present a fair picture of the financial condition of the railroad retirement system.

Section 502 of the Railroad Retirement Solvency Act requires the Board to report to Congress on the actuarial status of the railroad retirement system each year. The report must include recommendations for any desirable financing changes. The Chief Actuary recommends no change in payroll tax rates under the railroad retirement system.

The Chief Actuary's report indicates that the actuarial condition ranges from a surplus of 0.29% of payroll to a deficit of 2.10% of payroll, depending on assumed future employment levels. This compares to a range of 5.75% of payroll surplus to 0.18% of payroll surplus in the twenty-first valuation. The change in actuarial condition since the twenty-first valuation results primarily from changes in benefit and financing provisions contained in the Railroad Retirement and Survivors' Improvement Act of 2001.

The Committee acknowledges the valuable help of the Board and of the Chief Actuary and his staff in the Committee's review of this valuation.

Respectfully submitted,



Peter A. Bleyler, M.A.A.A.



Maynard I. Kagen, M.A.A.A.

## **REPORT OF THE ACTUARY**

### **I. INTRODUCTION**

Section 15 of the Railroad Retirement Act of 1974 requires that the Railroad Retirement Board, at intervals of not more than three years, prepare actuarial valuations of the railroad retirement system.

Section 22 of the Railroad Retirement Act of 1974 requires that the Railroad Retirement Board prepare an annual report containing a five-year projection of revenues to and payments from the Railroad Retirement Account and to submit the report to the President and the Congress by July 1. Beginning in 2003, the report must also contain a five-year projection of the account benefits ratio and average account benefits ratio. If the five-year projection indicates that funds in the Railroad Retirement Account will be insufficient to pay full benefits, (1) representatives of railroad employees, railroad carriers and the President must submit proposals to the Congress to preserve the financial solvency of the Railroad Retirement Account, and (2) the Railroad Retirement Board must issue regulations to reduce annuity levels during any fiscal year in which there would be insufficient funds to make full payments.

Section 502 of the Railroad Retirement Solvency Act of 1983 requires the Railroad Retirement Board to prepare an annual report on the actuarial status of the railroad retirement system and to submit the report to the Congress by July 1. The report must contain recommendations for any financing changes which might be advisable, including (1) changes in the tax rates, and (2) whether any part of the taxes on employers should be diverted to the Railroad Unemployment Insurance Account to aid in the repayment of any debt to the Railroad Retirement Account.

This report, the 22<sup>nd</sup> actuarial valuation, is intended to meet these three requirements for 2003.

### **II. SUMMARY OF RECENT DEVELOPMENTS AND RESULTS**

Recent actuarial reports have discussed in detail the importance of the level of railroad employment to the railroad retirement system's financial stability. The payroll tax on railroad employment has been the major source of income to the system since its establishment in the 1930's. It is clear that the fewer railroad workers there are, the less money the retirement account collects in payroll taxes, and the more likely the system is to require additional funds. Declines in railroad employment over a long period, coupled with inflation and subsequent benefit increases, required legislation to strengthen the system's financial condition in 1974, 1981, 1983, and 1987.

The 21<sup>st</sup> valuation (2000 actuarial report) projected a surplus of 3.34 percent of tier 2 payroll under the intermediate employment assumption. This surplus has decreased to 0.24 percent largely due to benefit and financing changes contained in the Railroad Retirement and Survivors' Improvement Act of 2001 (RRSIA). The RRSIA, signed into law December 21, 2001, liberalized early retirement benefits for 30-year service employees and their spouses, eliminated a cap on monthly retirement and disability benefits, lowered the minimum service requirement from 10 years to 5 years of service if performed after 1995, and provided increased benefits for some widow(er)s. Financing sections in the law provided for investment of railroad retirement funds in non-governmental assets,

adjustments in payroll tax rates paid by employers and employees, and the repeal of the supplemental annuity work-hour tax.

The 22<sup>nd</sup> valuation has been prepared under three assumptions as to the future behavior of railroad employment. These employment assumptions are similar to the employment assumptions used in the 21<sup>st</sup> valuation. Employment assumptions I and II are based on the stability of employment in passenger service (Amtrak and commuter service) as distinguished from freight service. Employment assumption III follows the structure of assumptions I and II, except that it has declines in passenger employment and steeper declines in freight employment than employment assumptions I and II. Employment assumptions I, II and III are intended to provide an optimistic, moderate and pessimistic assumption, respectively. The specific results of the projections made in this report of the railroad retirement system's financial condition are as follows:

1. Under employment assumption I, the average tier 2 tax rate is 17.84 percent, and an actuarial surplus of 0.29 percent of tier 2 payroll exists as of December 31, 2001. There are no cash flow problems during the 75-year projection period.
2. Under employment assumption II, the average tier 2 tax rate is 20.07 percent, and an actuarial surplus of 0.24 percent of tier 2 payroll exists as of December 31, 2001. There are no cash flow problems during the 75-year projection period.
3. Under employment assumption III, the average tier 2 tax rate is 20.66 percent, and an actuarial deficiency of 2.10 percent of tier 2 payroll exists as of December 31, 2001. Cash flow problems arise in 2022 and remain through the end of the 75-year projection period.

The average tier 2 tax rate is calculated by dividing the present value of tier 2 payroll taxes by the present value of tier 2 compensation as of January 1, 2002. The surplus or deficiency figures given above represent the change in the average tier 2 tax rate which would produce a balance of zero in the combined National Railroad Retirement Investment Trust, Railroad Retirement Account and Social Security Equivalent Benefit Account at the end of the 75-year projection period.

The actuarial surplus or deficiency figures consider only benefits paid during the 75-year projection period, and not benefits earned during the period and paid after the end of the period. The average tax increase needed to fund all benefits paid during the 75-year period and to provide a fund balance on December 31, 2076, equal to the accrued liability (calculated using the entry age normal method) is shown below.

<u>Employment assumption</u>	<u>Average increase in tier 2 tax beginning January 1, 2004</u>
I	0.31%
II	0.23
III	2.86

The conclusion is that, barring a sudden, unanticipated, large drop in railroad employment, the railroad retirement system will experience no cash flow problems during the next 19 years. The long-term stability of the system, however, is not assured. Under the current financing structure,

actual levels of railroad employment and investment return over the coming years will determine whether additional corrective action is necessary.

As mentioned earlier, this report is intended to meet the requirements of Section 502 of the 1983 Solvency Act. Section 502 requires recommendations with regard to (1) the tax rates and (2) whether any part of the taxes on employers should be diverted to the Railroad Unemployment Insurance Account to aid in the repayment of its debt to the Railroad Retirement Account.

1. This report recommends no change in the rate of tax imposed on employers and employees.

Because of future financing problems occurring under employment assumption III, as discussed above, a decrease in tax rates is not recommended at the current time. On the other hand, the absence of projected cash flow problems for at least 19 years under each employment assumption indicates that an immediate increase in tax rates is not required.

2. No diversion of taxes from the Railroad Retirement Account to the Railroad Unemployment Insurance Account is recommended. As of May 29, 2003, there are no loans outstanding from the Railroad Retirement Account to the Railroad Unemployment Insurance Account.

Section V of this report presents details of the valuations under the three employment assumptions.

### **III. REGULAR AND SUPPLEMENTAL BENEFITS AND THEIR FINANCING**

The Appendix contains a detailed description of the provisions of the current law. Sections III and IV provide a more general summary of the law.

Railroad retirement benefits are paid from four Accounts: the National Railroad Retirement Investment Trust (NRRIT), the Railroad Retirement (RR) Account, the Social Security Equivalent Benefit (SSEB) Account, and the Dual Benefits Payments Account. Because of their intertwined nature, the NRRIT, RR Account and SSEB Account are discussed together in this section. Dual benefits and the Dual Benefits Payments Account are discussed in a separate section, Section IV.

Benefits paid from the NRRIT, RR Account and SSEB Account consist mainly of monthly payments to retired or disabled employees, their spouses, and survivors. The various types of benefits and their eligibility requirements are described in the Appendix. The Accounts also pay out relatively small amounts in lump sums to employees and their survivors in certain cases. The monthly benefits consist of three components, known as tier 1, tier 2 and supplemental annuity.

For all categories of recipients, the gross tier 1 benefit is generally equivalent to the benefit that the social security system would pay if all the employee's earnings (railroad and non-railroad) had been covered under the Social Security Act. Any benefit actually received from social security is subtracted to determine the net tier 1 benefit payable. Section IV explains the logic behind this determination. The cost-of-living increase paid to social security beneficiaries automatically carries over to the tier 1 component of railroad retirement annuities.

There are some differences between social security benefits and tier 1 benefits. The most significant are as follows:

1. An employee may not retire before age 62 under the social security system. Under the railroad retirement system, an employee may retire at age 60 with 30 years of service. A spouse of a 30-year employee may also retire at age 60. If the employee retired after 2001, there is no age reduction in either case.
2. Railroad retirement pays an occupational disability benefit under tier 1 and tier 2. Social security requires total and permanent disability. The same five-month waiting period applies under both systems.
3. Widows who retire at age 60 or 61 under railroad retirement are deemed age 62 in the computation of the tier 1 benefit, resulting in a smaller age reduction than under social security.
4. From the start of the railroad retirement system through 1984, earnings up to a monthly maximum amount were taxed and credited for benefit computation purposes. Social security has always used an annual earnings limit. The 1983 Solvency Act changed railroad retirement to an annual earnings limit for 1985 and later years, but benefit computations for new beneficiaries will reflect the pre-1985 use of a monthly limit for many years into the future. All benefits awarded before 1985 reflect a monthly limit exclusively.

The formula used to compute the tier 2 component of railroad retirement is comparable to a private pension formula. Under the formula adopted in 1981, the employee tier 2 benefit is equal to 0.7 percent of the employee's average monthly railroad earnings for the 60 months of highest earnings, multiplied by the number of years of railroad service, less 25 percent of any vested dual benefit. Unlike private pensions, tier 2 benefits (1) provide automatic cost-of-living increases, and (2) are paid to spouses and survivors without any reduction in employee benefit for the payment of these auxiliary benefits.

The tier 2 benefit for spouses is equal to 45 percent of the employee's tier 2 benefit. The survivor's tier 2 benefit is a specified percentage of the employee's tier 2 benefit. The Appendix lists the percentages and describes an initial minimum widow(er)'s amount which became payable beginning in calendar year 2002.

The tier 2 cost-of-living increases for employees, spouses and survivors are equal to 32.5 percent of the percentage increase which is used in computing social security increases (and tier 1 increases). The increase is paid at the same time as the tier 1 cost-of-living increase.

The portion of tier 1 benefits which is considered equivalent to social security benefits is subject to Federal income tax under the rules that apply to social security benefits. Tier 2 benefits, the portion of tier 1 benefits in excess of social security benefits, supplemental annuity benefits, and vested dual benefits are subject to Federal income tax under the rules that apply to private pensions.

A railroad retiree may receive a supplemental annuity in addition to his regular annuity if (1) the retiree has a "current connection" with the railroad industry at the time of retirement, and (2) the retiree has attained age 65 with 25 years of railroad service, or attained age 60 with 30 years of railroad service. A current connection is generally defined as at least 12 months of railroad service in the 30 months preceding retirement.

The 1981 amendments added the requirement that an employee must have worked in the railroad industry before October 1, 1981, to receive a supplemental annuity. This provision will result in phasing out the supplemental annuity over a long period. The first effect will not occur until October 2006. The last supplemental annuity check will probably not be paid until after 2060.

The monthly supplemental annuity benefit is \$23, plus \$4 for each year of service in excess of 25, with a maximum benefit of \$43. No cost-of-living increases are applied. Spouses and survivors do not receive a supplemental annuity.

If the recipient of a supplemental annuity receives a private pension from his railroad employer, the supplemental annuity is reduced by the portion of the private pension that is attributable to the employer's contributions. This reduction is not made if the private pension is reduced for receipt of the supplemental annuity.

Benefits paid from the NRRIT, RR Account and SSEB Account are financed by the following sources of income:

1. Payroll tax. Employees and employers pay a tax at the social security rate on earnings in a year up to the social security, or tier 1, earnings limit. (The hospital insurance portion of this rate is not subject to an earnings limit). This tax is called the tier 1 tax. In addition, employers and employees pay a tier 2 tax equal to a percentage of the employee's earnings up to the tier 2 earnings limit. The tier 2 earnings limit is what the social security limit would be if the 1977 social security amendments had not been enacted. The 2003 earnings limits are \$87,000 and \$64,500 for tier 1 and tier 2, respectively.

Beginning with the taxes payable for calendar year 2004, tier 2 taxes on both employers and employees will be based on the ratio of certain asset balances to the sum of benefits and administrative expenses (the average account benefits ratio). Depending on the average account benefits ratio, the tier 2 tax rate for employers will range between 8.2 percent and 22.1 percent, while the tier 2 tax rate for employees will be between 0 percent and 4.9 percent. This calculation is described in the Appendix.

2. Income tax. The tax on tier 1 benefits up to the social security level is credited to the SSEB Account and then to social security through the financial interchange. Revenue derived from taxing RR Account benefits (tier 2 and the excess of tier 1 over the social security level) is transferred to the RR Account.
3. Investment income.

4. The financial interchange with the social security system. This extremely important arrangement, which will be discussed in detail in Section IV, has resulted in the large annual lump sum transfers of money from social security to railroad retirement shown in Table 11.
5. Advances from general revenues related to certain features of the financial interchange. Financial interchange transfers are made in a lump sum for a whole fiscal year in the June following the end of that fiscal year. For example, the transfer reflecting transactions which occurred from October 2000 through September 2001 (fiscal year 2001) took place in June 2002. At any time, therefore, there are between 9 and 21 months' worth of financial interchange transfers that are, in a sense, owed to the railroad retirement system. Railroad retirement receives interest on this money, so this practice does no long-term harm to the financial condition of the railroad retirement system. The lag in the transfers, however, could cause short-term cash flow problems.

In order to avoid the cash flow problems caused by this lag, the 1983 Solvency Act provided for monthly loans to railroad retirement from U.S. Treasury general funds. Each loan is equal to the transfer the Railroad Retirement Board estimates railroad retirement would have received in the preceding month, with interest, if the financial interchange with social security were on an up-to-date basis. Railroad retirement must repay these loans when it receives the transfer from social security against which the money was advanced.

The 1983 Solvency Act created the SSEB Account, effective October 1, 1984. Before that date, all tier 1 benefits, tier 2 benefits, lump sums and administrative expenses had been paid from the RR Account, and all the income described above had been credited to the RR Account. Since then, the SSEB Account has paid the social security level of benefits and the administrative expenses allocable to that level of benefits. The tier 1 portion of the payroll tax, the income taxes on the social security level of benefits, the income from the financial interchange, and the advances from general revenues are credited to the SSEB Account. Repayment of the advances is made from the SSEB Account.

The Railroad Retirement and Survivors' Improvement Act of 2001 created the National Railroad Retirement Investment Trust to manage and invest amounts collected in the RR Account and SSEB Account. The portion of the RR Account that is not needed to pay current administrative expenses and the balance of the SSEB Account not needed to pay current benefits and administrative expenses must be transferred from time to time to the NRRIT in such manner as will maximize investment returns to the Railroad Retirement system.

The Railroad Retirement and Survivors' Improvement Act of 2001 also eliminated the Railroad Retirement Supplemental Account and supplemental work-hour tax. Prior to 2002, supplemental annuity benefits were paid from this account and financed through the work-hour tax.

#### **IV. DUAL BENEFITS, THEIR FINANCING, AND THE FINANCIAL INTERCHANGE**

In the early 1950's, an arrangement known as the financial interchange was established between the railroad retirement and social security systems. The purpose of the financial interchange is to place the social security trust funds in the same financial position they would have been if railroad employment had always been covered under social security. If railroad employment had been covered under social security, social security would have collected taxes on railroad employment, and it would have paid benefits based on railroad employment. Under the financial interchange, the railroad retirement system gives the social security system the taxes social security would have collected, and the social security system gives the railroad retirement system the additional benefits social security would have paid to railroad workers and their families over what it actually pays them.

The word "additional" in the preceding sentence is important, because it is possible for a railroad employee to be covered under both railroad retirement and social security. The social security coverage may be based on earnings from moonlighting while in a railroad job or from coverage under the two systems at different times. Fulfilling the purpose of the financial interchange requires deducting from social security's fund only the difference between what social security would have paid had it covered railroad employment, and what it actually pays the person based on his non-railroad employment. Under the financial interchange, therefore, social security subtracts an employee's social security benefit from the amount it would otherwise give to the railroad retirement system.

This arrangement gave rise to problems that became acute in the early 1970's. The problems arose from the weighting in the social security formula in favor of low-earning, short-service workers. A railroad employee's non-railroad earnings usually added little to the benefit social security would have paid on combined railroad and non-railroad earnings (called gross tier 1 today). However, the employee might qualify for the minimum social security benefit, receiving much more from social security than his non-railroad earnings added to his gross tier 1 benefit.

The following example of two hypothetical employees may clarify the problem. The size of the benefits is appropriate to the early 1970's. The employees are assumed to have identical dates of birth, dates of retirement, and histories of railroad earnings. One employee, however, is assumed to have had just enough covered employment under social security to qualify for a social security benefit. (The difference in railroad retirement benefits arises from minor reductions in the 1937 Act formula for receipt of a social security benefit.)



	<u>Eligible for social security</u>	<u>Not eligible for social security</u>
A. Railroad retirement benefit	\$380	\$400
B. Social security benefit	100	-
C. Total benefit, A + B	480	400
D. Social security benefit on combined earnings (gross tier 1)	240	220
E. Financial interchange transfer from social security to railroad retirement, D – B	140	220
F. Amount to be financed by excess of railroad retirement taxes over social security taxes, A – E	240	180

Two conclusions are apparent. First, the employee with benefits under both systems received an advantage over the career railroad worker, which many considered unfair. In the example, the employee who is eligible for social security collects \$80 more than the employee who is not eligible (the difference in line C), while, under a completely integrated system, the social security earnings would have added only \$20 (the difference in line D). Second, because social security subtracted the social security benefit in calculating the financial interchange transfer, railroad retirement paid most of the cost of these benefits. In the example, this is represented by the \$60 difference in line F.

This situation was a major cause of the poor financial condition of the railroad retirement system in the early 1970's. In order to improve the system's financial condition, the Railroad Retirement Act of 1974 provided that the tier 1 component of the railroad retirement annuity be reduced by any social security benefit. This essentially integrated the two systems and eliminated the advantage of qualifying for benefits under both systems.

However, it was generally considered unfair to eliminate this advantage entirely for those already retired or close to retirement when the 1974 Act became effective. The 1974 Act, therefore, provided for a restoration of social security benefits that were considered vested at the end of 1974. The restored amount is known as the "vested dual benefit." This benefit was available to qualifying spouses and survivors as well as to qualifying employees.

For employees retiring in 1975 or later, the vested dual benefit was to be equal to

- (1) a social security benefit based on social security earnings, plus
- (2) a social security benefit based on railroad earnings, minus
- (3) a social security benefit based on combined railroad and social security earnings.

Social security or railroad earnings after 1974 were not to be included in this calculation. The "social security benefit" referred to in (1), (2) and (3) is the one which would have been calculated

at the end of 1974. The resulting amount was to be increased by all the automatic social security cost-of-living adjustments between 1974 and the date the employee retired.

For spouses and survivors, the formulas were different and more complicated than those for employees.

The 1981 amendments made significant changes regarding vested dual benefits. Spouses and survivors were not to be awarded vested dual benefits after August 13, 1981, though they would continue to receive these benefits if they were awarded before that date. Also, vested dual benefits awarded to employees would take into account cost-of-living increases only through 1981, rather than through the date of retirement.

Since October 1981, vested dual benefits have been paid from a segregated Dual Benefits Payments Account, and appropriations have been made to that account. This means that, starting in fiscal year 1982, each annual appropriation is to be sufficient to pay the benefits for that year. If the appropriation for a fiscal year is less than required for full funding, the Railroad Retirement Board must reduce benefits to a level that the amount appropriated will cover.

The appropriation for vested dual benefits in fiscal year 1982 was less than required for full funding, resulting in a cutback in benefits during that year. Full funding was restored for the last two months of fiscal year 1982. The appropriation was less than required in fiscal year 1986, resulting in a cutback during April-September of that year. The appropriation was again less than required in fiscal year 1988, which resulted in a cutback during April-September. Benefits were cut back in January 1996 due to a lapse in government funding and then restored later that same month. For years other than those mentioned, full benefits have been paid.

## **V. ASSUMPTIONS, METHODOLOGY, AND VALUATION RESULTS**

### **A. Assumptions and Methodology**

Average railroad employment is assumed to be 227,000 in 2002 under each of the three employment assumptions. This is the estimated average for the year (subject to later adjustment) and was below the range projected for 2002 under the employment assumptions contained in the 2002 actuarial report.

Employment assumptions I and II, based on a model developed by the Association of American Railroads, assume that (1) passenger employment will remain at the level of 44,000, and (2) the employment base, excluding passenger employment, will decline at a constant annual rate (1.5 percent for assumption I and 3.0 percent for assumption II) for 25 years, at a reducing rate over the next 25 years, and remain level thereafter.

Employment assumption III differs from employment assumptions I and II by assuming that (1) passenger employment will decline by 500 per year until a level of 35,000 is reached and then remain level, and (2) the employment base, excluding passenger employment, will decline at a

constant annual rate of 4.5 percent for 25 years, at a reducing rate over the next 25 years, and remain level thereafter.

Because inflation has been fairly stable at relatively low levels in recent years, only one set of earnings and price inflation assumptions was used in this valuation. The ultimate earnings increase assumption is the same as that used in the 21<sup>st</sup> valuation. The ultimate cost-of-living increase assumption has been lowered to 3.0% in the 22<sup>nd</sup> valuation from 3.2% in the 21<sup>st</sup> valuation. The ultimate interest rate assumption has been increased to 8.0% in the 22<sup>nd</sup> valuation from 6.0% in the 21<sup>st</sup> valuation due to expanded investment authority in the National Railroad Retirement Investment Trust. Table 1 shows the employment, inflation and interest rate assumptions used in the 22<sup>nd</sup> valuation. A comparison of historical and projected employment is illustrated in Figure 1.

Only one combination of non-economic assumptions (for example, rates of mortality, disability, retirement, and withdrawal) was used in this valuation. These assumptions, some of which were changed from the previous valuation to reflect recent experience, are discussed in the Technical Supplement to this report.

Projections were made for the various components of income and outgo under each employment assumption for the 75 calendar years 2002-2076. The projections of these components were combined and the investment income calculated to produce the projected balances in the combined NRRIT and RR Account and in the SSEB Account separately for each year. The results are summarized in Table 2. Present values of the various components of NRRIT and RR Account income and outgo were calculated by discounting amounts in each projection year to December 31, 2001, using the interest rate series shown in Table 1. The present values were combined to calculate the NRRIT and RR Account actuarial surplus or deficiency. The derivation of the surplus or deficiency appears in Table 6.

## B. Valuation Results

This section sets forth the results of the valuation in the form of a discussion of the tables in which the results appear. Because it is desirable for the discussion of a table to be reasonably self-contained, there is some repetition between tables and between this section and preceding sections of this report.

Table 2. Progress of the National Railroad Retirement Investment Trust (NRRIT), Railroad Retirement (RR) and Social Security Equivalent Benefit (SSEB) Accounts. Projections were made for the various components of income and outgo under each employment assumption for the 75 calendar years 2002-2076. The projections of these components were combined and the investment income calculated to produce the projected balances in the NRRIT, RR Account and the SSEB Account at the end of each projection year. The results are summarized in Table 2.

Table 2 consists of three tables, one for each of employment assumptions I, II, and III. The tables show, for each account, (1) the various elements of income and outgo, (2) the account balance on December 31, and (3) the account benefits ratio, average account benefits ratio and combined employer and employee tier 2 tax rate.

The balances of the RR Account and NRRIT are combined because amounts not needed to pay current administrative costs are transferred from the RR Account to the NRRIT for investment. The SSEB Account is assumed to maintain a target balance of 1.5 months of benefit payment for contingencies and transfer any excess to the NRRIT.

Table 2 indicates that no cash-flow problems arise under employment assumptions I and II (Tables 2-I and 2-II).

Under employment assumption I, the combined account balance grows to \$24,622 million in 2010, decreases to \$17,756 million in 2026, and grows thereafter through the end of the projection period. The combined employer and employee tier 2 tax rate decreases to 17% in 2006-2009, increases to 23% in 2028-2032, and then decreases until reaching the minimum rate of 8.2%.

Under employment assumption II, the combined account balance grows to \$23,863 million in 2008, decreases to \$2,388 million in 2034, and grows thereafter through the end of the projection period. The combined employer and employee tier 2 tax rate decreases to 17% in 2006-2009, increases to the maximum rate of 27% in 2024-2051, and then decreases until reaching the minimum rate of 8.2%.

Under employment assumption III, the combined account balance builds to a maximum of \$23,415 million in 2007, and then it begins to decline (Table 2-III). The balance becomes negative in 2022 and remains negative throughout the remainder of the projection period. Negative after-transfer balances indicate the amount that would be owed, including interest, if unreduced benefits were paid by borrowing from some unknown source. The SSEB Account is assumed to transfer to the NRRIT any excess of income over outgo in 2022 and later. The combined employer and employee tier 2 tax rate decreases to 17% in 2006-2008, increases to the maximum rate of 27% in 2022, and remains at 27% through the remainder of the projection period.

Table 3. Present value of benefits in millions of dollars. This table shows, for each employment assumption, the present value of tier 2 benefits, supplemental annuity benefits and the portion of tier 1 benefits which exceeds the social security level of benefits. The portion of tier 1 benefits in excess of the social security level is referred to as "tier 1 liability." The most important components of this liability were described in Section III. Supplemental annuity benefits are included with tier 2 benefits in this table. The present values are shown separately by type of beneficiary (employee, spouse, survivor) and by employee status on the valuation date (retired, retired and deceased, active, inactive, future entrants).

Table 4. Present value of benefits as a percentage of the present value of tier 2 payroll. The format for this table is the same as for Table 3. Each number in Table 4 was obtained by dividing the corresponding number in Table 3 by the appropriate present value of one percent of tier 2 payroll. The payroll figures are shown in Table 6.

Table 5. Balance of the Railroad Retirement and Social Security Equivalent Benefit Accounts as of December 31, 2001. This table derives the balance in the two accounts as of December 31, 2001, after certain accrual adjustments for amounts due and unpaid on that date. The accrual adjustments are appropriate for present value calculations. No adjustment is made for benefit payments due January 2, 2002, because these benefits are included in the present value of benefits in the present value calculations. The NRRIT is not shown because the NRRIT was not established until February 1, 2002.

The item captioned "Market value of market-based specials" reflects the bid price of market-based specials. The remaining market-based specials in the RR Account were sold by February 2003, and the proceeds were transferred to the NRRIT.

The amount captioned "Financial interchange - OASDI" is the transfer from social security to the SSEB Account of the excess of the OASDI (Old-Age, Survivors, and Disability Insurance) benefit payments and related administrative expenses due the railroad retirement system over the OASDI taxes due social security. The transfer is made in June for the fiscal year ending the preceding September 30. The \$4,479 million in the table is the amount transferred in June 2002 for the fiscal year ending September 30, 2001, plus that part of the transfer to be made in June 2003 that relates to experience for October-December 2001.

The amount captioned "Financial interchange - HI" is the transfer from the SSEB Account to social security of the hospital insurance taxes collected by the Railroad Retirement Board. The period covered is the same as for the OASDI accrual adjustment.

The item "Advances against the financial interchange" is the amount, including interest to December 31, 2001, that the Treasury has loaned to the SSEB Account in anticipation of the SSEB Account's receipt of the financial interchange transfer from social security. As explained in Section III, the SSEB Account will repay the advances made in a fiscal year when it receives the financial interchange transfer for that year; in the meantime, this item is a liability.

Table 6. Actuarial surplus or (deficiency) for National Railroad Retirement Investment Trust and Railroad Retirement Account. The top half of Table 6 expresses the asset and liability components of the actuarial balance as present values in dollars. The bottom half expresses these components as a percentage of tier 2 payroll. The actuarial surplus or deficiency was calculated for the NRRIT and RR Account, but not for the SSEB Account, for the following reason.

The SSEB Account pays the social security level of benefits and administrative expenses allocable to those benefits, and it receives as income the social security level of taxes. If there were no other source of income or outgo during the course of a year, a surplus or deficiency would build up, depending on whether taxes exceeded or were less than benefits. However, the SSEB Account also receives or pays any financial interchange transfers. The financial interchange transfer, subject to qualifications described in the next paragraph, should be enough to offset any surplus or deficit for the year. Furthermore, this would be the case even if the social security level of benefits or taxes are raised or lowered. The SSEB Account can thus be regarded as automatically funded, the financial interchange being the mechanism for correcting any surplus or deficiency. Therefore, the concept of actuarial balance is not meaningful when applied to the SSEB Account.

The qualification mentioned above arises because, in a relatively small number of cases, the railroad retirement system does not pay benefits when social security would pay benefits. In these cases, mainly dependent children of retired railroad employees, the SSEB Account collects an amount through the financial interchange but does not pay a corresponding benefit. This imbalance between outgo and income is transferred from time to time to the NRRIT. The value of these transfers, or amounts available for transfer, is included as an asset in Table 6 as "Available from SSEB Account."

Revenue derived from taxing NRRIT and RR Account benefits (tier 2 and the excess of tier 1 over the social security level) is transferred to the RR Account. The present value of these transfers is shown as an asset in Table 6 as "Income taxes on benefits."

The cost of the system to the railroad industry may be considered as the excess of "Retirement taxes" over "Actuarial surplus or (deficiency)." Table 6 shows that the cost of the system is much more stable when expressed in dollars than when expressed as a percentage of payroll. For example, the cost of the system under employment assumption III is \$37,855 million, or 22.76 percent of payroll; whereas the cost under employment assumption I is \$40,705 million, or 17.55 percent of payroll. Using employment assumption III as the base, the percentage cost variation in dollars between the two valuations is 7.53 percent. As a percentage of payroll, the percentage cost variation is 22.89 percent.

Table 7. Minimum contribution required under ERISA. The railroad retirement system is specifically exempt from the minimum funding provisions of the Employee Retirement Income Security Act (ERISA). In the past, there has been some interest in what the contribution requirement of the system would be if this were not the case. The following discussion is limited to the regular minimum funding standard (ERISA Section 302(b)) for multiemployer plans.

The funding goal of the railroad retirement system is to receive enough funds each year to cover benefits and expenses for the year and to maintain a reasonable account balance. In terms of the participants in the system, payroll taxes collected each year from rail employers and employees are used to pay benefits to rail retirees, their spouses and survivors. In contrast, ERISA essentially requires that pension plans be "advance-funded." Under this arrangement, the goal is to receive enough funds each year over the employees' working lifetimes to fully fund their retirement benefits.

ERISA recognizes that when a private pension plan is initiated, it will usually have an "accrued liability." This liability represents the value placed on future benefits and expenses of the plan that is attributable to employee service preceding the date of the plan (often referred to as "past service"). As such, the liability might be measured by the amount that would have been accumulated if contributions to fund each employee's benefits had been made from the time employment began. Since a new plan would have no funds at the time it is initiated, the accrued liability is also the unfunded accrued liability. The unfunded accrued liability is specifically identified by ERISA, because ERISA has separate funding rules for benefits based on past and future service.

In the case of an existing pension plan which becomes subject to ERISA funding standards, as for a new plan, the accrued liability must be determined. This determination is made based on employee service preceding the date the plan becomes subject to ERISA standards, but taking into account projected future levels of employee pay. The unfunded accrued liability for an existing plan is the excess of the accrued liability over the funds on hand.

Table 7 illustrates what the minimum funding requirements would be for the railroad retirement system as of December 31, 2001, using the entry age normal actuarial funding method, if it became subject to ERISA on that date. The unfunded accrued liability of \$34,263 million shown in Table 7 may be considered to be the amount needed, in excess of funds on hand and tier 2 payroll taxes at a 5.41 percent rate, to fund combined NRRIT and RR Account benefits and expenses for former and present employees. The 5.41 percent rate (normal cost rate) is the average cost expressed as a percentage of tier 2 payroll that would fund each employee's benefits and expenses over the employee's working lifetime.

Under ERISA requirements, the minimum annual contribution to be made would be equivalent to tier 2 payroll taxes at the rate of 5.41 percent, plus the level annual amount of \$2,964 million which would amortize the unfunded accrued liability of \$34,263 million over 30 years.

Since the amortization payment is a level dollar amount, and since the taxable payroll would change from year to year, the required contribution expressed as a percentage of payroll would vary during the amortization period. Line 10 of the table shows the level percentage of tier 2 payroll that would be required to fund the unfunded accrued liability and meet a 5.41 percent payroll tax over the 30 year amortization period. Under the ERISA requirements, the minimum annual contribution after 30 years, if all assumptions were realized, would be the 5.41 percent of payroll normal cost.

In summary, the effect of ERISA would be to accelerate funding for the railroad retirement system. Contributions equivalent to an average of 24.52 to 29.64 percent of tier 2 payroll would be required for 30 years with 5.41 percent contributions thereafter.

Table 8. Vested dual benefit amounts and average number of beneficiaries. This table shows a projection of vested dual benefit payments for every fiscal year from 2004 through 2030. After 2030, the amounts become insignificant. The amounts shown assume that the benefits are fully funded. Fiscal years are shown because vested dual benefit appropriations are made on a fiscal year basis. The table also indicates the average number of vested dual beneficiaries in each fiscal year. The table applies to all the employment assumptions discussed in this report.

The revenue derived from taxing pre-October 1988 vested dual benefits was transferred to the RR Account. The revenue derived from taxing vested dual benefits in fiscal years 1989 and later is transferred to the Dual Benefits Payments Account, and it reduces the amount of the appropriation by the same amount. Therefore, the amount available for the payment of vested dual benefits is unaffected by income tax revenues derived from these benefits.

The 1981 amendments removed much of the uncertainty from projections of future vested dual benefit payments. The volatility caused by inflation is gone, since future awards take into account cost-of-living increases from 1975 through 1981, rather than through the date of retirement. Also,

awards of these benefits to spouses and widows ceased after August 13, 1981. Uncertainties which remain in projecting future vested dual benefit payments are when employees will retire, what their benefits will be, and when beneficiaries will die.

The projections of vested dual benefit payments by the Railroad Retirement Board are the basis for the agency's requests for appropriated amounts. Generally, a margin of about 2 percent is added to projected amounts to determine the appropriated amounts requested. This margin is needed because of the uncertainties in making projections and to ensure that adequate funds are available for the full payment of vested dual benefits. Appropriated amounts remaining in a fiscal year after all benefit payments have been made are returned to the Treasury.

Table 9. Supplemental annuity benefit amounts and average number of beneficiaries. This table shows a projection of supplemental annuity benefits for every calendar year from 2003 through 2040. Since service before October 1, 1981 is required for a supplemental annuity, benefit amounts after 2040 will continue to decline.

Table 10. Average number of railroad retirement annuitants and number of annuitants per full time employee. The left half of Table 10 shows the average number of annuitants under each employment assumption, and the right half shows the average number per full time employee. Under employment assumption I, the average number of annuitants per full time employee decreases initially, then increases gradually to 2.74 in 2017, and declines thereafter. A similar pattern is followed under employment assumption II, with a maximum of 3.32 annuitants per employee reached in 2021. Under employment assumption III, the average number of annuitants per full time employee increases steadily to 4.45 in 2026-2027, and declines thereafter.

## VI. STATEMENT OF ACTUARIAL OPINION

It is my opinion that (1) the techniques and methodology used herein to evaluate the financial and actuarial status of the Railroad Retirement System are generally accepted within the actuarial profession; and (2) the assumptions used and the resulting actuarial estimates are, in the aggregate, reasonable for the purpose of evaluating the financial and actuarial status of the trust funds, taking into consideration the experience and expectations of the program.

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Table 1. Employment, inflation and interest assumptions

Calendar year	Average employment (thousands)			Percentage increase over prior year		Interest rate
	I	II	III	Earnings	Cost of living	
2002	227	227	227	4.0%	2.6%	11.7%
2003	224	222	218	4.0	1.4	6.0
2004	222	216	210	4.0	3.0	8.0
2005	219	211	202	4.0	3.0	8.0
2006	216	206	194	4.0	3.0	8.0
2007	214	201	187	4.0	3.0	8.0
2008	211	196	180	4.0	3.0	8.0
2009	209	192	173	4.0	3.0	8.0
2010	206	187	167	4.0	3.0	8.0
2011	204	183	160	4.0	3.0	8.0
2012	201	179	154	4.0	3.0	8.0
2013	199	175	149	4.0	3.0	8.0
2014	197	171	143	4.0	3.0	8.0
2015	194	167	138	4.0	3.0	8.0
2016	192	163	133	4.0	3.0	8.0
2017	190	160	128	4.0	3.0	8.0
2018	188	156	124	4.0	3.0	8.0
2019	186	153	119	4.0	3.0	8.0
2020	183	150	115	4.0	3.0	8.0
2021	181	147	111	4.0	3.0	8.0
2022	179	144	108	4.0	3.0	8.0
2023	177	141	105	4.0	3.0	8.0
2024	175	138	101	4.0	3.0	8.0
2025	173	135	98	4.0	3.0	8.0
2026	171	132	96	4.0	3.0	8.0
2027	169	129	93	4.0	3.0	8.0
2028	168	127	90	4.0	3.0	8.0
2029	166	125	88	4.0	3.0	8.0
2030	164	123	86	4.0	3.0	8.0
2031	163	121	84	4.0	3.0	8.0
2032	161	119	82	4.0	3.0	8.0
2033	160	117	81	4.0	3.0	8.0
2034	159	115	79	4.0	3.0	8.0
2035	158	114	78	4.0	3.0	8.0
2036	157	113	77	4.0	3.0	8.0
2037	155	111	75	4.0	3.0	8.0
2038	155	110	74	4.0	3.0	8.0
2039	154	109	74	4.0	3.0	8.0
2040	153	108	73	4.0	3.0	8.0
2041	152	107	72	4.0	3.0	8.0
2042	152	107	71	4.0	3.0	8.0
2043	151	106	71	4.0	3.0	8.0
2044	150	105	70	4.0	3.0	8.0
2045	150	105	70	4.0	3.0	8.0
2046	150	104	69	4.0	3.0	8.0
2047	149	104	69	4.0	3.0	8.0
2048	149	104	69	4.0	3.0	8.0
2049	149	104	69	4.0	3.0	8.0
2050	149	103	69	4.0	3.0	8.0
2051	149	103	68	4.0	3.0	8.0
2052	149	103	68	4.0	3.0	8.0
2053	149	103	68	4.0	3.0	8.0
2054	149	103	68	4.0	3.0	8.0
2055-2076	149	103	68	4.0	3.0	8.0

**Figure 1. Average Railroad Employment 1937-2076, Historical and Projected**

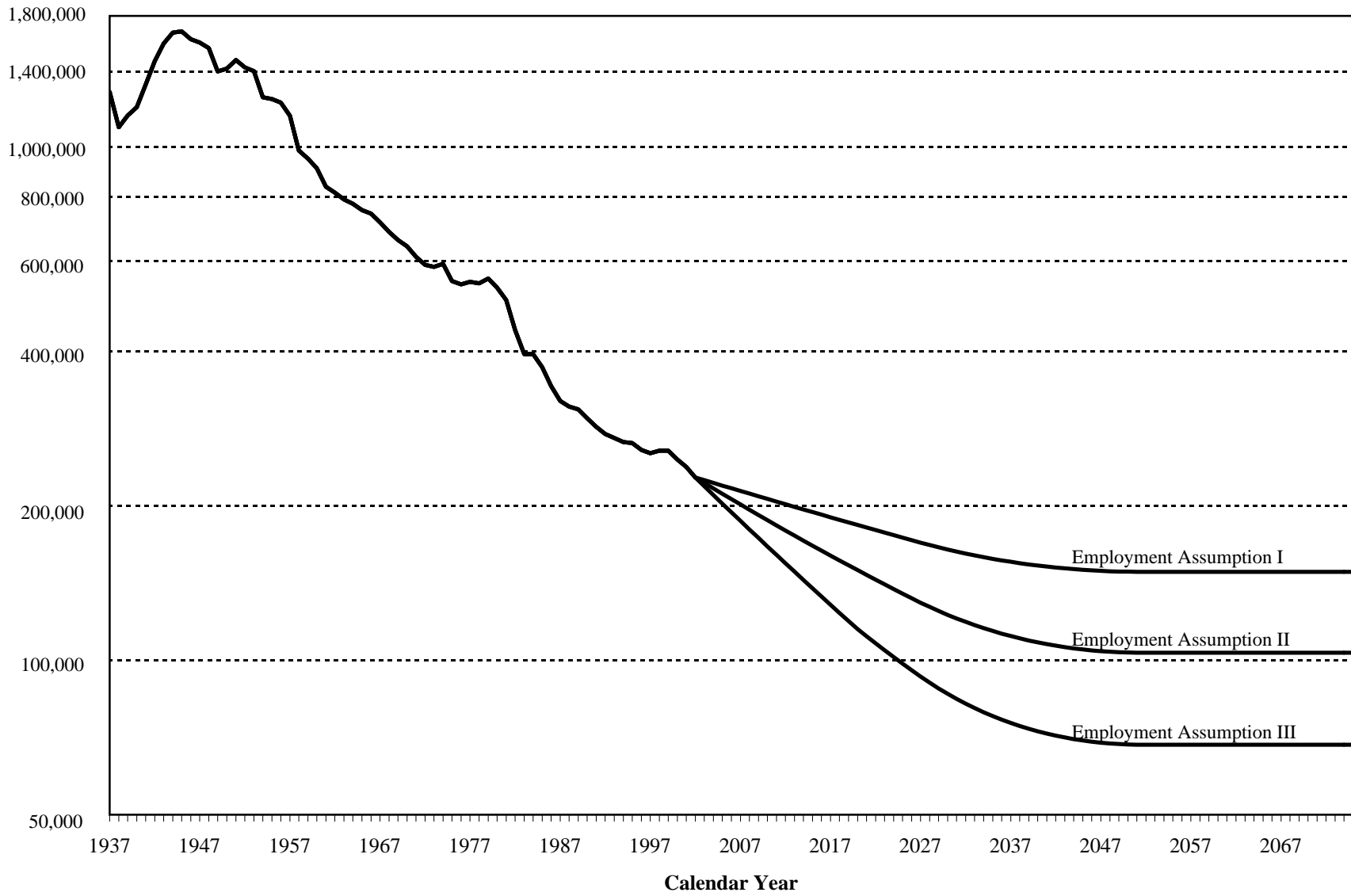


Table 2-I. Progress of the National Railroad Retirement Investment Trust (NRRIT), Railroad Retirement (RR) Account and Social Security Equivalent Benefit (SSEB) Account under Employment Assumption I  
(Dollar amounts in millions)

Calendar year	Average			Combined NRRIT and RR Account				SSEB Account				Combined balance, end year
	Account benefits ratio <sup>a</sup>	account benefits ratio <sup>b</sup>	Tier 2 tax rate	Benefits and admin- istration	Tax income <sup>c</sup>	Other income <sup>d</sup>	Balance, end year	Benefits and admin- istration	Tax income <sup>c</sup>	Other income and expense <sup>e</sup>	Balance, end year	
2003			19.1%	\$3,651	\$2,639	\$2,632	\$21,883	\$5,275	\$2,180	\$1,795	\$657	\$22,540
2004	6.00	5.80	18.0%	3,781	2,562	1,789	22,453	5,391	2,234	3,171	671	23,124
2005	5.95	6.00	18.0%	3,905	2,625	1,833	23,006	5,512	2,291	3,237	686	23,692
2006	5.83	6.10	17.0%	4,045	2,558	1,778	23,298	5,641	2,349	3,223	617	23,915
2007	5.65	6.10	17.0%	4,221	2,624	1,800	23,500	5,766	2,408	3,459	718	24,218
2008	5.45	6.20	17.0%	4,420	2,692	1,904	23,676	5,907	2,467	3,458	735	24,411
2009	5.24	6.10	17.0%	4,611	2,763	1,911	23,739	6,081	2,530	3,573	757	24,496
2010	5.05	6.00	18.0%	4,796	2,980	1,918	23,841	6,280	2,595	3,709	781	24,622
2011	4.84	5.90	18.0%	4,991	3,059	1,826	23,735	6,488	2,664	3,752	710	24,445
2012	4.62	5.70	18.0%	5,190	3,141	1,812	23,498	6,706	2,736	4,092	831	24,329
2013	4.41	5.50	18.0%	5,380	3,225	1,889	23,232	6,941	2,812	4,161	864	24,096
2014	4.20	5.40	18.0%	5,564	3,313	1,871	22,853	7,187	2,887	4,331	894	23,747
2015	3.99	5.20	18.0%	5,738	3,403	1,842	22,360	7,436	2,965	4,501	925	23,285
2016	3.77	5.00	18.0%	5,887	3,496	1,688	21,657	7,692	3,049	4,582	864	22,521
2017	3.56	4.80	18.0%	6,007	3,592	1,651	20,893	7,949	3,138	4,936	989	21,882
2018	3.39	4.60	18.0%	6,106	3,690	1,697	20,174	8,197	3,231	4,997	1,020	21,194
2019	3.22	4.40	18.0%	6,183	3,791	1,647	19,429	8,429	3,328	5,130	1,049	20,478
2020	3.07	4.20	18.0%	6,240	3,895	1,596	18,681	8,642	3,430	5,238	1,075	19,756
2021	2.91	4.00	18.0%	6,278	4,001	1,398	17,802	8,833	3,535	5,271	1,048	18,850
2022	2.80	3.80	19.0%	6,300	4,312	1,439	17,253	9,005	3,643	5,435	1,120	18,373
2023	2.73	3.60	19.0%	6,317	4,429	1,460	16,824	9,159	3,753	5,425	1,139	17,963
2024	2.69	3.40	20.0%	6,337	4,762	1,444	16,692	9,298	3,864	5,451	1,156	17,848
2025	2.67	3.30	20.0%	6,361	4,889	1,441	16,661	9,430	3,977	5,470	1,173	17,834
2026	2.64	3.10	20.0%	6,383	5,019	1,276	16,572	9,562	4,092	5,482	1,184	17,756
2027	2.66	3.00	20.0%	6,408	5,151	1,440	16,756	9,699	4,208	5,512	1,206	17,962
2028	2.78	2.90	23.0%	6,446	6,008	1,498	17,816	9,840	4,328	5,530	1,223	19,039
2029	2.95	2.90	23.0%	6,500	6,171	1,589	19,075	9,989	4,451	5,556	1,241	20,316
2030	3.14	2.80	23.0%	6,555	6,342	1,697	20,559	10,148	4,581	5,587	1,261	21,820
2031	3.35	2.80	23.0%	6,610	6,520	1,676	22,145	10,321	4,716	5,626	1,282	23,427
2032	3.62	2.90	23.0%	6,663	6,706	1,956	24,144	10,512	4,858	5,677	1,306	25,450
2033	3.83	3.00	20.0%	6,703	6,068	2,088	25,597	10,725	5,008	5,744	1,332	26,929
2034	4.05	3.10	20.0%	6,740	6,246	2,214	27,317	10,947	5,165	5,810	1,360	28,677
2035	4.30	3.20	20.0%	6,806	6,433	2,361	29,306	11,167	5,328	5,866	1,387	30,693
2036	4.55	3.40	20.0%	6,905	6,630	2,414	31,445	11,386	5,496	5,917	1,414	32,859
2037	4.79	3.60	19.0%	7,014	6,521	2,693	33,645	11,625	5,672	5,983	1,443	35,088
2038	5.07	3.80	19.0%	7,117	6,726	2,875	36,130	11,889	5,857	6,065	1,476	37,606
2039	5.34	4.00	18.0%	7,210	6,605	3,068	38,592	12,173	6,053	6,156	1,511	40,103
2040	5.63	4.30	18.0%	7,328	6,820	3,274	41,359	12,459	6,256	6,239	1,547	42,906
2041	5.91	4.50	18.0%	7,493	7,047	3,423	44,337	12,740	6,467	6,308	1,581	45,918
2042	6.19	4.80	18.0%	7,682	7,286	3,749	47,690	13,039	6,687	6,389	1,619	49,309
2043	6.51	5.00	18.0%	7,874	7,536	4,022	51,373	13,371	6,919	6,493	1,660	53,033
2044	6.84	5.30	18.0%	8,073	7,798	4,323	55,420	13,728	7,163	6,610	1,704	57,124
2045	7.19	5.60	18.0%	8,296	8,074	4,654	59,852	14,101	7,419	6,728	1,750	61,602
2050	8.72	7.10	15.0%	9,668	8,193	6,541	84,394	16,306	8,911	7,455	2,024	86,418
2055	9.75	8.60	10.0%	11,224	6,895	8,517	109,221	19,069	10,829	8,313	2,367	111,588
2060	10.04	9.60	8.2%	12,905	7,016	10,101	129,216	22,278	13,192	9,171	2,765	131,981
2065	10.36	10.10	8.2%	14,918	8,483	12,030	154,277	26,008	16,060	10,047	3,228	157,505
2070	10.72	10.40	8.2%	17,511	10,273	14,568	187,334	30,555	19,538	11,139	3,793	191,127
2075	11.03	10.70	8.2%	20,904	12,464	17,850	230,093	36,292	23,773	12,675	4,505	234,598
2076	11.09	10.80	8.2%	21,698	12,958	18,608	239,961	37,614	24,726	13,052	4,669	244,630

<sup>a</sup> The fair market value of the assets in the RR Account and NRRIT as of the close of the fiscal year (September 30) divided by the total benefits and administrative expenses paid from the RR Account and NRRIT during the fiscal year.

<sup>b</sup> The average of the account benefits ratios for the 10 most recent fiscal years ending before the calendar year.

<sup>c</sup> Includes payroll taxes and income taxes on benefits.

<sup>d</sup> Includes investment income and transfers from SSEB Account.

<sup>e</sup> Other income includes financial interchange income, advances from general revenues, and interest income. Other expense includes repayment of advances from general revenues and transfers to the NRRIT.

Table 2-II. Progress of the National Railroad Retirement Investment Trust (NRRIT), Railroad Retirement (RR) Account and Social Security Equivalent Benefit (SSEB) Account under Employment Assumption II  
(Dollar amounts in millions)

Calendar year	Average			Combined NRRIT and RR Account				SSEB Account				Combined balance, end year
	Account benefits ratio <sup>a</sup>	account benefits ratio <sup>b</sup>	Tier 2 tax rate	Benefits and admin- istration	Tax income <sup>c</sup>	Other income <sup>d</sup>	Balance, end year	Benefits and admin- istration	Tax income <sup>c</sup>	Other income and expense <sup>e</sup>	Balance, end year	
2003			19.1%	\$3,651	\$2,619	\$2,631	\$21,862	\$5,275	\$2,164	\$1,811	\$657	\$22,519
2004	5.98	5.80	18.0%	3,781	2,521	1,785	22,388	5,391	2,198	3,207	671	23,059
2005	5.91	6.00	18.0%	3,905	2,561	1,826	22,870	5,512	2,234	3,293	686	23,556
2006	5.77	6.10	17.0%	4,044	2,472	1,763	23,060	5,641	2,269	3,303	617	23,677
2007	5.57	6.10	17.0%	4,221	2,512	1,777	23,128	5,766	2,303	3,564	718	23,846
2008	5.33	6.20	17.0%	4,420	2,553	1,868	23,128	5,907	2,336	3,589	735	23,863
2009	5.08	6.10	17.0%	4,610	2,594	1,860	22,972	6,080	2,371	3,731	757	23,729
2010	4.85	6.00	18.0%	4,795	2,770	1,848	22,795	6,279	2,408	3,896	781	23,576
2011	4.58	5.80	18.0%	4,989	2,815	1,731	22,353	6,486	2,446	3,968	710	23,063
2012	4.29	5.60	18.0%	5,187	2,862	1,690	21,718	6,703	2,487	4,338	831	22,549
2013	4.01	5.40	18.0%	5,376	2,911	1,733	20,986	6,937	2,531	4,439	863	21,849
2014	3.72	5.20	18.0%	5,558	2,961	1,676	20,065	7,180	2,571	4,640	893	20,958
2015	3.42	5.00	18.0%	5,731	3,013	1,602	18,950	7,426	2,615	4,842	924	19,874
2016	3.09	4.70	18.0%	5,878	3,067	1,397	17,534	7,678	2,662	4,955	863	18,397
2017	2.77	4.40	18.0%	5,996	3,121	1,302	15,961	7,931	2,712	5,343	987	16,948
2018	2.46	4.20	18.0%	6,091	3,177	1,281	14,327	8,172	2,766	5,436	1,017	15,344
2019	2.17	3.90	19.0%	6,164	3,387	1,162	12,712	8,397	2,823	5,602	1,045	13,757
2020	1.88	3.60	19.0%	6,218	3,448	1,041	10,983	8,600	2,882	5,743	1,070	12,053
2021	1.57	3.30	20.0%	6,251	3,670	769	9,172	8,780	2,943	5,808	1,041	10,213
2022	1.29	3.00	20.0%	6,267	3,736	725	7,366	8,939	3,006	6,004	1,112	8,478
2023	1.06	2.70	23.0%	6,276	4,302	665	6,057	9,078	3,069	6,026	1,129	7,186
2024	0.94	2.40	27.0%	6,289	5,058	597	5,423	9,198	3,132	6,081	1,144	6,567
2025	0.84	2.10	27.0%	6,304	5,148	553	4,821	9,309	3,194	6,128	1,157	5,978
2026	0.72	1.90	27.0%	6,315	5,240	341	4,087	9,417	3,257	6,168	1,166	5,253
2027	0.63	1.60	27.0%	6,326	5,333	453	3,546	9,525	3,321	6,222	1,184	4,730
2028	0.55	1.40	27.0%	6,348	5,429	420	3,047	9,634	3,386	6,261	1,197	4,244
2029	0.48	1.20	27.0%	6,382	5,531	385	2,580	9,745	3,454	6,305	1,211	3,791
2030	0.41	1.00	27.0%	6,414	5,639	352	2,158	9,863	3,526	6,352	1,225	3,383
2031	0.33	0.90	27.0%	6,442	5,755	178	1,647	9,989	3,603	6,402	1,241	2,888
2032	0.28	0.80	27.0%	6,466	5,877	288	1,347	10,128	3,684	6,461	1,258	2,605
2033	0.24	0.70	27.0%	6,472	6,008	270	1,153	10,282	3,773	6,528	1,277	2,430
2034	0.23	0.60	27.0%	6,472	6,148	264	1,092	10,438	3,867	6,590	1,296	2,388
2035	0.24	0.50	27.0%	6,496	6,296	268	1,161	10,584	3,965	6,636	1,314	2,475
2036	0.24	0.50	27.0%	6,535	6,454	167	1,247	10,724	4,068	6,674	1,331	2,578
2037	0.29	0.40	27.0%	6,571	6,620	296	1,592	10,880	4,177	6,722	1,351	2,943
2038	0.36	0.40	27.0%	6,604	6,797	332	2,116	11,043	4,293	6,771	1,371	3,487
2039	0.47	0.40	27.0%	6,626	6,985	383	2,858	11,215	4,416	6,820	1,392	4,250
2040	0.60	0.40	27.0%	6,668	7,183	453	3,827	11,383	4,545	6,859	1,413	5,240
2041	0.76	0.40	27.0%	6,738	7,395	460	4,943	11,539	4,679	6,879	1,432	6,375
2042	0.95	0.40	27.0%	6,820	7,617	638	6,379	11,709	4,821	6,909	1,453	7,832
2043	1.18	0.50	27.0%	6,908	7,853	762	8,085	11,890	4,970	6,942	1,476	9,561
2044	1.44	0.60	27.0%	7,001	8,102	907	10,094	12,084	5,128	6,980	1,500	11,594
2045	1.74	0.70	27.0%	7,112	8,366	1,077	12,426	12,287	5,295	7,017	1,525	13,951
2050	3.77	1.80	27.0%	7,855	9,946	2,362	29,972	13,504	6,290	7,248	1,676	31,648
2055	5.91	3.60	19.0%	8,716	8,654	4,067	51,693	15,086	7,606	7,522	1,873	53,566
2060	7.95	5.70	18.0%	9,644	9,960	5,976	77,269	16,945	9,239	7,755	2,103	79,372
2065	10.24	7.80	14.0%	10,831	9,560	8,592	111,430	19,144	11,221	7,983	2,376	113,806
2070	11.22	9.90	8.2%	12,457	7,167	10,853	139,621	21,945	13,626	8,397	2,724	142,345
2075	11.78	11.10	8.2%	14,686	8,680	13,373	172,721	25,651	16,558	9,195	3,184	175,905
2076	11.87	11.30	8.2%	15,219	9,022	13,966	180,489	26,524	17,218	9,414	3,292	183,781

<sup>a</sup> The fair market value of the assets in the RR Account and NRRIT as of the close of the fiscal year (September 30) divided by the total benefits and administrative expenses paid from the RR Account and NRRIT during the fiscal year.

<sup>b</sup> The average of the account benefits ratios for the 10 most recent fiscal years ending before the calendar year.

<sup>c</sup> Includes payroll taxes and income taxes on benefits.

<sup>d</sup> Includes investment income and transfers from SSEB Account.

<sup>e</sup> Other income includes financial interchange income, advances from general revenues, and interest income. Other expense includes repayment of advances from general revenues and transfers to the NRRIT.

Table 2-III. Progress of the National Railroad Retirement Investment Trust (NRRIT), Railroad Retirement (RR) Account and Social Security Equivalent Benefit (SSEB) Account under Employment Assumption III  
(Dollar amounts in millions)

Calendar year	Account benefits ratio <sup>a</sup>	Average account		Combined NRRIT and RR Account				SSEB Account				Combined balance, end year
		benefits ratio <sup>b</sup>	Tier 2 tax rate	Benefits and admin- istration	Tax income <sup>c</sup>	Other income <sup>d</sup>	Balance, end year	Benefits and admin- istration	Tax income <sup>c</sup>	Other income and expense <sup>e</sup>	Balance, end year	
2003			19.1%	\$3,651	\$2,596	\$2,631	\$21,838	\$5,275	\$2,145	\$1,830	\$657	\$22,495
2004	5.96	5.80	18.0%	3,781	2,473	1,781	22,312	5,391	2,156	3,249	671	22,983
2005	5.88	6.00	18.0%	3,905	2,486	1,816	22,709	5,512	2,168	3,359	686	23,395
2006	5.71	6.10	17.0%	4,044	2,373	1,746	22,785	5,641	2,177	3,395	617	23,402
2007	5.47	6.10	17.0%	4,220	2,384	1,749	22,697	5,766	2,183	3,684	718	23,415
2008	5.20	6.10	17.0%	4,419	2,394	1,826	22,498	5,907	2,187	3,737	735	23,233
2009	4.92	6.00	18.0%	4,609	2,525	1,807	22,222	6,080	2,192	3,909	757	22,979
2010	4.64	5.90	18.0%	4,793	2,535	1,778	21,741	6,278	2,198	4,104	781	22,522
2011	4.31	5.80	18.0%	4,986	2,545	1,636	20,935	6,485	2,205	4,207	709	21,644
2012	3.95	5.50	18.0%	5,184	2,556	1,563	19,871	6,701	2,213	4,608	830	20,701
2013	3.59	5.30	18.0%	5,372	2,568	1,571	18,638	6,932	2,223	4,741	863	19,501
2014	3.21	5.00	18.0%	5,553	2,581	1,472	17,138	7,173	2,229	4,974	893	18,031
2015	2.81	4.70	18.0%	5,724	2,594	1,350	15,359	7,416	2,237	5,209	923	16,282
2016	2.38	4.40	18.0%	5,869	2,608	1,090	13,188	7,663	2,248	5,354	861	14,049
2017	1.93	4.10	18.0%	5,984	2,621	933	10,759	7,910	2,261	5,773	984	11,743
2018	1.50	3.70	19.0%	6,076	2,756	847	8,286	8,144	2,276	5,898	1,013	9,299
2019	1.07	3.40	20.0%	6,145	2,891	659	5,691	8,360	2,293	6,094	1,040	6,731
2020	0.61	3.00	20.0%	6,193	2,906	457	2,860	8,553	2,310	6,266	1,064	3,924
2021	0.15	2.60	23.0%	6,221	3,297	105	41	8,720	2,335	6,355	1,034	1,075
2022	-0.07	2.20	27.0%	6,231	3,819	1,103	(1,268)	8,866	2,361	5,470	-	(1,268)
2023	-0.47	1.80	27.0%	6,238	3,851	(117)	(3,772)	8,987	2,388	6,599	-	(3,772)
2024	-0.89	1.40	27.0%	6,246	3,884	(315)	(6,449)	9,087	2,414	6,672	-	(6,449)
2025	-1.34	1.00	27.0%	6,253	3,916	(527)	(9,313)	9,175	2,440	6,735	-	(9,313)
2026	-1.84	0.50	27.0%	6,255	3,949	(929)	(12,547)	9,256	2,466	6,790	-	(12,547)
2027	-2.36	0.10	27.0%	6,254	3,982	(1,011)	(15,829)	9,335	2,491	6,843	-	(15,829)
2028	-2.91	-0.40	27.0%	6,261	4,019	(1,271)	(19,342)	9,409	2,518	6,890	-	(19,342)
2029	-3.49	-0.90	27.0%	6,277	4,060	(1,550)	(23,109)	9,479	2,547	6,932	-	(23,109)
2030	-4.12	-1.30	27.0%	6,288	4,107	(1,849)	(27,140)	9,554	2,580	6,974	-	(27,140)
2031	-4.81	-1.80	27.0%	6,292	4,159	(2,315)	(31,589)	9,631	2,617	7,014	-	(31,589)
2032	-5.53	-2.30	27.0%	6,289	4,217	(2,521)	(36,182)	9,716	2,658	7,058	-	(36,182)
2033	-6.31	-2.80	27.0%	6,265	4,283	(2,884)	(41,048)	9,808	2,705	7,103	-	(41,048)
2034	-7.16	-3.40	27.0%	6,229	4,355	(3,268)	(46,190)	9,893	2,756	7,136	-	(46,190)
2035	-8.05	-4.00	27.0%	6,211	4,434	(3,674)	(51,641)	9,962	2,810	7,151	-	(51,641)
2036	-9.01	-4.70	27.0%	6,189	4,522	(4,221)	(57,530)	10,024	2,870	7,154	-	(57,530)
2037	-10.04	-5.40	27.0%	6,150	4,615	(4,570)	(63,635)	10,098	2,934	7,164	-	(63,635)
2038	-11.14	-6.20	27.0%	6,114	4,716	(5,052)	(70,085)	10,160	3,002	7,158	-	(70,085)
2039	-12.32	-7.00	27.0%	6,065	4,825	(5,560)	(76,885)	10,219	3,076	7,142	-	(76,885)
2040	-13.58	-7.90	27.0%	6,030	4,942	(6,097)	(84,069)	10,271	3,154	7,117	-	(84,069)
2041	-14.90	-8.80	27.0%	6,005	5,068	(6,746)	(91,753)	10,305	3,236	7,069	-	(91,753)
2042	-16.29	-9.90	27.0%	5,976	5,202	(7,272)	(99,799)	10,349	3,323	7,026	-	(99,799)
2043	-17.75	-10.90	27.0%	5,962	5,345	(7,909)	(108,325)	10,385	3,415	6,970	-	(108,325)
2044	-19.28	-12.10	27.0%	5,949	5,498	(8,583)	(117,360)	10,423	3,513	6,910	-	(117,360)
2045	-20.87	-13.30	27.0%	5,952	5,661	(9,299)	(126,950)	10,464	3,616	6,848	-	(126,950)
2050	-29.76	-20.40	27.0%	6,100	6,659	(13,616)	(184,882)	10,782	4,244	6,538	-	(184,882)
2055	-40.83	-29.20	27.0%	6,358	8,008	(19,502)	(263,914)	11,369	5,096	6,273	-	(263,914)
2060	-54.72	-40.10	27.0%	6,706	9,682	(27,580)	(372,460)	12,194	6,161	6,033	-	(372,460)
2065	-70.88	-53.70	27.0%	7,288	11,723	(38,790)	(523,276)	13,316	7,457	5,859	-	(523,276)
2070	-88.39	-69.50	27.0%	8,230	14,215	(54,551)	(735,540)	14,928	9,038	5,891	-	(735,540)
2075	-107.00	-86.80	27.0%	9,603	17,257	(76,949)	(1,037,431)	17,223	10,972	6,251	-	(1,037,431)
2076	-110.87	-90.40	27.0%	9,935	17,942	(82,471)	(1,111,895)	17,777	11,409	6,368	-	(1,111,895)

<sup>a</sup> The fair market value of the assets in the RR Account and NRRIT as of the close of the fiscal year (September 30) divided by the total benefits and administrative expenses paid from the RR Account and NRRIT during the fiscal year.

<sup>b</sup> The average of the account benefits ratios for the 10 most recent fiscal years ending before the calendar year.

<sup>c</sup> Includes payroll taxes and income taxes on benefits.

<sup>d</sup> Includes investment income and transfers from SSEB Account.

<sup>e</sup> Other income includes financial interchange income, advances from general revenues, and interest income. Other expense includes repayment of advances from general revenues and transfers to the NRRIT.

Table 3. Present value of benefits in millions of dollars

	Employment assumption I			Employment assumption II			Employment assumption III		
	Tier 2 <sup>a</sup>	Tier 1 liability	Total	Tier 2 <sup>a</sup>	Tier 1 liability	Total	Tier 2 <sup>a</sup>	Tier 1 liability	Total
<b>Employee annuities</b>									
Retired	\$11,671	\$ 4,253	\$15,924	\$11,671	\$ 4,253	\$15,924	\$11,671	\$ 4,253	\$15,924
Active	15,065	7,829	22,893	15,065	7,829	22,893	15,065	7,829	22,893
Inactive	1,203	489	1,692	1,203	489	1,692	1,203	489	1,692
Future entrants	<u>3,013</u>	<u>1,299</u>	<u>4,312</u>	<u>2,243</u>	<u>968</u>	<u>3,211</u>	<u>1,507</u>	<u>650</u>	<u>2,158</u>
Total	30,952	13,870	44,821	30,182	13,538	43,720	29,446	13,221	42,667
<b>Spouse annuities</b>									
Retired	3,272	927	4,200	3,272	927	4,200	3,272	927	4,200
Active	3,702	2,709	6,411	3,702	2,709	6,411	3,702	2,709	6,411
Inactive	257	112	369	257	112	369	257	112	369
Future entrants	<u>603</u>	<u>274</u>	<u>877</u>	<u>450</u>	<u>205</u>	<u>655</u>	<u>302</u>	<u>138</u>	<u>440</u>
Total	7,834	4,023	11,857	7,681	3,954	11,635	7,533	3,887	11,420
<b>Survivor annuities</b>									
Retired & deceased	4,597	777	5,374	4,597	777	5,374	4,597	777	5,374
Active	1,858	226	2,084	1,858	226	2,084	1,858	226	2,084
Inactive	57	20	76	57	20	76	57	20	76
Future entrants	<u>414</u>	<u>85</u>	<u>498</u>	<u>310</u>	<u>63</u>	<u>373</u>	<u>208</u>	<u>43</u>	<u>251</u>
Total	6,925	1,107	8,032	6,821	1,086	7,907	6,720	1,065	7,785
<b>All annuities combined</b>									
Retired & deceased	19,540	5,957	25,497	19,540	5,957	25,497	19,540	5,957	25,497
Active	20,624	10,764	31,388	20,624	10,764	31,388	20,624	10,764	31,388
Inactive	1,517	621	2,138	1,517	621	2,138	1,517	621	2,138
Future entrants	<u>4,030</u>	<u>1,658</u>	<u>5,687</u>	<u>3,003</u>	<u>1,236</u>	<u>4,239</u>	<u>2,018</u>	<u>831</u>	<u>2,849</u>
Total annuities	\$45,711	\$19,000	\$64,710	\$44,684	\$18,578	\$63,262	\$43,699	\$18,173	\$61,872
Lump sum payments			<u>71</u>			<u>71</u>			<u>71</u>
Total benefits			\$64,781			\$63,333			\$61,943

Note: Detail may not add to totals due to rounding.

<sup>a</sup> Includes supplemental annuity benefits.

Table 4. Present value of benefits as a percentage of the present value of tier 2 payroll

	Employment assumption I			Employment assumption II			Employment assumption III		
	Tier 2 <sup>a</sup>	Tier 1 liability	Total	Tier 2 <sup>a</sup>	Tier 1 liability	Total	Tier 2 <sup>a</sup>	Tier 1 liability	Total
<b>Employee annuities</b>									
Retired	5.03%	1.83%	6.87%	5.90%	2.15%	8.05%	7.02%	2.56%	9.57%
Active	6.50	3.38	9.87	7.61	3.96	11.57	9.06	4.71	13.76
Inactive	0.52	0.21	0.73	0.61	0.25	0.86	0.72	0.29	1.02
Future entrants	1.30	0.56	1.86	1.13	0.49	1.62	0.91	0.39	1.30
Total	13.35	5.98	19.33	15.26	6.84	22.10	17.70	7.95	25.65
<b>Spouse annuities</b>									
Retired	1.41	0.40	1.81	1.65	0.47	2.12	1.97	0.56	2.52
Active	1.60	1.17	2.76	1.87	1.37	3.24	2.23	1.63	3.85
Inactive	0.11	0.05	0.16	0.13	0.06	0.19	0.15	0.07	0.22
Future entrants	0.26	0.12	0.38	0.23	0.10	0.33	0.18	0.08	0.26
Total	3.38	1.73	5.11	3.88	2.00	5.88	4.53	2.34	6.87
<b>Survivor annuities</b>									
Retired & deceased	1.98	0.33	2.32	2.32	0.39	2.72	2.76	0.47	3.23
Active	0.80	0.10	0.90	0.94	0.11	1.05	1.12	0.14	1.25
Inactive	0.02	0.01	0.03	0.03	0.01	0.04	0.03	0.01	0.05
Future entrants	0.18	0.04	0.21	0.16	0.03	0.19	0.13	0.03	0.15
Total	2.99	0.48	3.46	3.45	0.55	4.00	4.04	0.64	4.68
<b>All annuities combined</b>									
Retired & deceased	8.42	2.57	10.99	9.88	3.01	12.89	11.75	3.58	15.33
Active	8.89	4.64	13.53	10.42	5.44	15.87	12.40	6.47	18.87
Inactive	0.65	0.27	0.92	0.77	0.31	1.08	0.91	0.37	1.29
Future entrants	1.74	0.71	2.45	1.52	0.62	2.14	1.21	0.50	1.71
Total annuities	19.71%	8.19%	27.90%	22.59%	9.39%	31.98%	26.27%	10.92%	37.19%
Lump sum payments			0.03			0.04			0.04
Total benefits			27.93%			32.01%			37.24%

Note: Detail may not add to totals due to rounding.

<sup>a</sup> Includes supplemental annuity benefits.

Table 5. Balance of the Railroad Retirement and Social Security Equivalent  
Benefit Accounts as of December 31, 2001  
(Dollar amounts in millions)

	RR Account	SSEB Account
Securities:		
Par value specials <sup>a</sup>	\$ 7,755	\$ 1,849
Accrued interest	25	5
Market value of market-based specials <sup>b</sup>	10,878	-
Cash accounts	(2)	-
Total securities	18,656	1,854
Present value of transfers from Railroad Retirement Supplemental Account <sup>c</sup>	65	
Accrual adjustments <sup>d</sup> :		
Retirement taxes	68	72
Financial interchange - OASDI	-	4,479
Benefit accruals	(12)	(11)
Financial interchange - HI	-	(520)
Advances against the financial interchange	-	(3,792)
Balance	\$18,777	\$ 2,082

<sup>a</sup> Par value specials are securities issued by the Treasury directly to the Railroad Retirement and Social Security Equivalent Benefit Accounts, maturing on the first business day of the month following the month of issue. Their yield rate each month is the average yield rate, computed as of the last day of the previous month, of marketable Treasury notes with maturity dates not less than three years away.

<sup>b</sup> A market-based special may be any marketable Treasury bill, note or bond, except that notes and bonds within six months of maturity are not currently available to the Railroad Retirement Board. The price is the same as the market price, but purchases and sales are made directly with the Treasury, so as not to affect the securities market.

<sup>c</sup> The balance of the Railroad Retirement Supplemental Account was transferred to the National Railroad Retirement Investment Trust (NRRIT) on September 18, 2002. This amount is shown as an asset of the RR Account because the balances in the RR Account and NRRIT (established February 1, 2002) are combined in the actuarial projections.

<sup>d</sup> Excludes benefit payments due January 2, 2002, because these benefits are included in the present value of benefits in the present value calculations.



Table 6. Actuarial surplus or (deficiency) for National Railroad Retirement  
Investment Trust and Railroad Retirement Account

	Employment assumption		
	I	II	III
	<u>Present values in millions of dollars</u>		
Funds on hand, 12/31/2001	\$ 18,777	\$ 18,777	\$ 18,777
Retirement taxes	41,377	39,707	34,365
Income taxes on benefits	5,073	4,959	4,850
Available from SSEB Account	<u>2,070</u>	<u>2,042</u>	<u>2,016</u>
Total, present and prospective assets	67,297	65,485	60,008
Benefit payments	64,781	63,333	61,943
Administrative expenses	<u>1,844</u>	<u>1,668</u>	<u>1,555</u>
Total liabilities	<u>66,625</u>	<u>65,001</u>	<u>63,498</u>
Actuarial surplus or (deficiency)	<u>672</u>	<u>484</u>	<u>(3,490)</u>
One percent of tier 2 payroll	\$ 2,319	\$ 1,978	\$ 1,664
	<u>Present values as a percentage of tier 2 payroll</u>		
Funds on hand, 12/31/2001	8.10%	9.49%	11.29%
Retirement taxes	17.84	20.07	20.66
Income taxes on benefits	2.19	2.51	2.92
Available from SSEB Account	<u>0.89</u>	<u>1.03</u>	<u>1.21</u>
Total, present and prospective assets	29.02	33.10	36.07
Benefit payments	27.93	32.01	37.24
Administrative expenses	<u>0.80</u>	<u>0.84</u>	<u>0.93</u>
Total liabilities	<u>28.73</u>	<u>32.85</u>	<u>38.17</u>
Actuarial surplus or (deficiency)	<u>0.29</u>	<u>0.24</u>	<u>(2.10)</u>

Table 7. Minimum contribution required under ERISA  
(Dollar amounts in millions)

	Amount or rate		
1. Present value of benefits for former and present employees	\$59,094		
2. Present value of administrative expenses for former and present employees	1,557		
3. Present value of 1 percent of tier 2 payroll for present employees	1,022		
4. Normal cost as a percentage of tier 2 payroll	5.41%		
5. Present value of future service costs for present employees = (3) x (4)	5,529		
6. Accrued liability = (1) + (2) - (5)	55,122		
7. Funds on hand 12/31/2001 <sup>a</sup>	20,859		
8. Unfunded accrued liability = (6) - (7)	34,263		
9. Level amount to fund accrued liability in 30 years	2,964		
	Employment Assumption		
	I	II	III
10. Level tax rate to fund accrued liability and meet normal costs for next 30 years	24.52%	26.74%	29.64%
11. Tax rate after 30 years (normal cost rate)	5.41%	5.41%	5.41%

<sup>a</sup> The amount shown is the sum of the RR and SSEB Account balances shown in Table 5.

Table 8. Vested dual benefit amounts and average number of beneficiaries

Fiscal year	Vested dual benefit amounts <sup>a</sup> (Millions)	Average number of beneficiaries
2004	\$119	66,000
2005	108	59,000
2006	97	53,000
2007	87	47,000
2008	77	41,000
2009	69	36,000
2010	60	32,000
2011	53	28,000
2012	46	24,000
2013	40	21,000
2014	35	18,000
2015	30	15,000
2016	25	13,000
2017	21	11,000
2018	18	9,000
2019	15	8,000
2020	12	6,000
2021	10	5,000
2022	8	4,000
2023	7	4,000
2024	5	3,000
2025	4	2,000
2026	3	2,000
2027	3	1,000
2028	2	1,000
2029	2	1,000
2030	1	1,000

<sup>a</sup> When projected amounts are used to determine the appropriation needed for benefit payments, a margin must be added to ensure payment of full benefits.

Table 9. Supplemental annuity benefit amounts and average number of beneficiaries

Calendar year	Supplemental benefit amounts (Millions)	Average number of beneficiaries <sup>a</sup>
2003	\$65	130,000
2004	64	126,000
2005	62	123,000
2006	61	121,000
2007	60	120,000
2008	59	119,000
2009	59	118,000
2010	59	118,000
2011	59	118,000
2012	59	118,000
2013	59	118,000
2014	58	117,000
2015	58	117,000
2016	58	116,000
2017	57	114,000
2018	56	112,000
2019	54	109,000
2020	53	106,000
2021	51	102,000
2022	49	97,000
2023	46	92,000
2024	44	88,000
2025	41	83,000
2026	39	78,000
2027	36	73,000
2028	34	68,000
2029	31	63,000
2030	29	58,000
2031	27	53,000
2032	24	49,000
2033	22	45,000
2034	20	40,000
2035	18	36,000
2036	16	33,000
2037	14	29,000
2038	13	26,000
2039	11	22,000
2040	10	19,000

<sup>a</sup> Average number in a year. Excludes cases where the supplemental annuity is totally eliminated because of a private pension. On January 1, 2002, there were about 33,000 of these cases.

Table 10. Average number of railroad retirement annuitants and number of annuitants per full time employee

Calendar year	Average number of annuitants under each employment assumption			Average number of annuitants per full time employee		
	I	II	III	I	II	III
2003	632,200	632,200	632,200	2.82	2.85	2.90
2004	617,500	617,500	617,500	2.79	2.86	2.94
2005	603,500	603,500	603,500	2.76	2.86	2.99
2006	590,600	590,600	590,600	2.73	2.87	3.04
2007	579,200	579,200	579,200	2.71	2.88	3.10
2008	569,700	569,700	569,600	2.70	2.90	3.17
2009	561,600	561,600	561,500	2.69	2.93	3.24
2010	554,600	554,500	554,500	2.69	2.96	3.33
2011	548,500	548,400	548,200	2.69	2.99	3.42
2012	543,200	543,000	542,800	2.70	3.03	3.51
2013	538,500	538,200	537,900	2.71	3.08	3.62
2014	534,100	533,700	533,300	2.72	3.12	3.72
2015	529,700	529,100	528,500	2.73	3.17	3.83
2016	524,800	524,100	523,300	2.73	3.21	3.93
2017	519,500	518,500	517,400	2.74	3.24	4.04
2018	513,300	512,100	510,700	2.73	3.27	4.13
2019	506,300	504,700	502,900	2.73	3.30	4.22
2020	498,200	496,300	494,100	2.72	3.31	4.30
2021	489,100	486,800	484,100	2.70	3.32	4.35
2022	479,300	476,500	473,300	2.67	3.32	4.39
2023	468,900	465,500	461,800	2.65	3.31	4.42
2024	458,200	454,200	449,800	2.61	3.30	4.43
2025	447,400	442,800	437,600	2.58	3.28	4.44
2026	436,700	431,300	425,300	2.55	3.26	4.45
2027	426,200	419,900	413,000	2.52	3.24	4.45
2028	416,200	409,000	401,000	2.48	3.22	4.44
2029	406,700	398,400	389,300	2.45	3.19	4.42
2030	397,500	388,100	377,900	2.42	3.17	4.39
2031	388,700	378,100	366,600	2.39	3.14	4.36
2032	380,500	368,600	355,800	2.36	3.10	4.32
2033	372,600	359,300	345,100	2.33	3.07	4.28
2034	365,000	350,200	334,400	2.30	3.03	4.22
2035	357,900	341,500	324,100	2.27	3.00	4.16
2036	351,300	333,100	313,800	2.24	2.96	4.10
2037	345,100	325,100	303,900	2.22	2.92	4.03
2038	339,400	317,400	294,200	2.20	2.88	3.95
2039	333,900	309,800	284,500	2.17	2.84	3.87
2040	328,800	302,500	275,200	2.15	2.79	3.78
2041	324,000	295,500	266,000	2.13	2.75	3.70
2042	319,700	288,900	257,100	2.11	2.71	3.61
2043	315,800	282,600	248,500	2.09	2.67	3.51
2044	312,100	276,600	240,200	2.07	2.62	3.42
2045	308,800	270,900	232,300	2.06	2.58	3.33
2050	296,200	247,000	198,500	1.99	2.39	2.90
2055	286,100	227,800	172,600	1.92	2.20	2.52
2060	275,100	210,300	152,000	1.85	2.03	2.22
2065	263,700	194,800	135,900	1.77	1.88	1.99
2070	253,900	182,800	124,600	1.71	1.77	1.82
2075	247,200	174,900	117,600	1.66	1.69	1.72
2076	246,300	173,800	116,600	1.66	1.68	1.70

Table 11. Transfers to railroad retirement system under financial interchange with social security system, 1937-2003<sup>a</sup>  
(Millions of dollars)

Determination number	Fiscal years covered	Benefit credits to railroad retirement <sup>b</sup>	Tax credits to social security	Cash transfers to <sup>c</sup> railroad retirement	
				Amount	Year of transfer
1-20	1937-71 d	12,981.3	6,572.3	6,636.3 d	1953-72 d
21	1972	1,217.1	470.9	802.5	1973
22	1973	1,412.8	556.4	930.9	1974
23	1974	1,575.6	653.5	1,010.3	1975
24	1975	1,853.3	718.7	1,238.7	1976
25	1976	1,872.2 f	772.0	1,207.5	1977
26	1977 e	2,556.6 f	1,060.8	1,618.5	1978
27	1978	2,230.3	902.6	1,477.4	1979
28	1979	2,389.5	1,089.9	1,429.9	1980
29	1980	2,683.4	1,204.8	1,614.3	1981
30	1981	2,973.7	1,322.5	1,819.7	1982
31	1982	3,321.9	1,296.0	2,278.6	1983
32	1983	3,471.8	1,287.9	2,425.6	1984
33	1984	3,524.1	1,472.8	2,352.9	1985
34	1985	3,658.5	1,443.1	2,652.8	1986
35	1986	3,744.8	1,398.7	2,614.2	1987
36	1987	3,864.4	1,305.0	2,851.3	1988
37	1988	4,028.8	1,427.3	2,933.5	1989
38	1989	4,149.5	1,418.9	3,049.2	1990
39	1990	4,415.3	1,451.1	3,456.7	1991
40	1991	4,434.7	1,476.5	3,206.4	1992
41	1992	4,720.1	1,523.1	3,435.3	1993
42	1993	4,796.5	1,583.3	3,525.6	1994
43	1994	5,199.6	1,515.5	4,120.1	1995
44	1995	4,836.2 f	1,545.1	3,556.3	1996
45	1996	5,008.0	1,566.8	3,747.2	1997
46	1997	5,114.1	1,615.4	3,819.0	1998
47	1998	5,173.5	1,641.9	3,816.0	1999
48	1999	5,195.6	1,767.5	3,697.6	2000
49	2000	4,767.8 f	1,750.9	3,282.8	2001
50	2001	5,180.5	1,756.9	3,646.8	2002
51	2002	5,217.5	1,748.2	3,747.4	2003
Total	1937-2002	127,569.1	47,316.4	88,001.6	

<sup>a</sup> Financial interchange transactions with the Hospital Insurance Trust Fund are not included. These involve mainly a transfer of collected taxes to the Centers for Medicare and Medicaid Services, with some adjustments for difference in earnings bases under the two systems.

<sup>b</sup> Benefit amounts were credited to Railroad Retirement Account for covered years 1983 and earlier and to Social Security Equivalent Benefit Account for covered years 1984 and later. Amounts include allowances for administrative expenses and adjustments to previous determinations.

<sup>c</sup> Cash transfers were made to Railroad Retirement Account in 1984 and earlier and to Social Security Equivalent Benefit Account in 1985 and later. Transfers include interest, which is not shown in table.

<sup>d</sup> First determination covered period January 1937-June 1952. Initial balance of \$488.2 million was never transferred to social security; only interest was paid until debt was liquidated by subsequent offsets in favor of railroad retirement.

<sup>e</sup> 1977 figure covered 15 months (July 1976 - September 1977) because of change in definition of fiscal year.

<sup>f</sup> Includes adjustment for pre-1957 military service.

## APPENDIX

### Outline of the benefit and financing provisions of the railroad retirement system as amended through December 31, 2002

#### EMPLOYEE BENEFITS

##### 1. Normal age annuity

Requirement of 10 years of service or 5 years of service after 1995 for retirement at social security retirement age (see definition at end of outline). Employees with less than 10 years of service must meet Social Security Act eligibility requirements to receive a tier 1 benefit.

##### 2. Prenormal age annuity

A. Eligible upon later of (1) attainment of age 60 and (2) completion of 30 years of service (60/30 eligibility).

1. If became eligible before 7-1-84 or employee retires after 12-31-01, unreduced benefit for retirement at age 60.
2. If became eligible after 6-30-84 and employee retires before 1-1-02, unreduced benefit for retirement at age 62.
3. If became eligible after 12-31-85 and employee retires before 1-1-02 and before age 62, tier 1 benefit on annuity beginning date is equal to what social security would have paid an individual retiring at age 62 after applying any age reduction, except that the number of benefit computation years depends on the employee's actual year of birth. Tier 1 benefit is frozen until attainment of age 62, when it is recomputed to equal what social security would have paid the individual had he retired at that time. Tier 2 benefit is not reduced for age. If became eligible between 7-1-84 and 12-31-85, the same procedure applies, except that the age reduction in tier 1 benefit is only one-half the amount applicable after 12-31-85 and before 1-1-02.

B. Eligible upon later of (1) attainment of age 62 and (2) completion of 10 years of service or 5 years of service after 1995. If employee retires before attaining social security retirement age with less than 30 years of service, the benefit is reduced by 1/180 for each of the first 36 months and by 1/240 for each additional month the employee is under social security retirement age. (Reduction for age in excess of 36 months applies only to tier 1 benefit if employee had any service before 8-12-83.)

##### 3. Total and permanent disability annuity

10-year service requirement or 5 years of service after 1995. Benefit may not begin earlier than the later of (1) the first day of the sixth month following date disability begins and (2) the first day of the twelfth month before the month in which the application is filed. Employees with less than 10 years of service and at least 5 years of service after 1995 who meet Social Security eligibility requirements may qualify for a tier 1 benefit only (an age reduced tier 2 benefit would be payable at age 62).

##### 4. Occupational disability annuity

Requirement of 20 years of service or attainment of age 60 with 10 years of service; current connection (see definition at end of outline) required. Benefit may not begin earlier than the later of (1) the first day of the sixth month following date disability begins and (2) the first day of the twelfth month before the month in which the application is filed.

##### 5. Supplemental annuity

Requirement of attainment of age 60 with 30 years of service if retired on or after 7-1-74, or age 65 with 25 years of service. Must have service before 10-1-81. Current connection required.

## 6. Vested dual benefit

- A. Requirement of fully insured (see definition at end of outline) status under Social Security Act effective 12-31-74 and either (1) 25 years of railroad service before 1975 or (2) 10 years of railroad service before 1975, with some railroad work in 1974 or a current connection on 12-31-74 or at the time the annuity begins, or
- B. Requirement of fully insured status under Social Security Act as of last year of railroad work before 1975 and 10 years of railroad service before 1975.

## 7. Work restrictions

Suspension of annuity for any month annuitant is employed by a railroad. For disabilities, loss of one month's annuity for each \$400 in excess of \$4,800 earned in a year with the last \$200 of such excess treated as \$400 (no annuity is lost for any month with earnings below \$400). In addition, the tier 1 portion of a regular annuity based on railroad earnings (see definition at end of outline) after 1974 and all social security earnings (see definition at end of outline) is subject to social security work restrictions, unless a social security benefit is also being paid. If annuitant is employed by last non-railroad employer preceding retirement, the tier 2 portion and the supplemental annuity are also affected, being reduced one dollar for each two dollars of earnings, subject to a maximum reduction of 50 percent. All vested dual benefits are subject to social security work restrictions.

## 8. Creditable service (continuity not required)

All service after December 31, 1936. Service before 1937 may be used if annuitant had employment relation on August 29, 1935 or 6 months of service after August 29, 1935 and before 1946. No limit on service except 30-year maximum if pre-1937 service used. Additional service months may be deemed, for years after 1984, where employee does not work in every month of year, but railroad earnings exceed monthly prorations of annual tier 2 maximum earnings creditable.

## 9. Creditable and taxable railroad earnings

From 1966 through 1978, the maximum monthly earnings were one-twelfth of the annual social security maximum. The 1977 social security amendments introduced a difference between the maximum monthly earnings creditable for tier 1 and tier 2 benefits starting in 1979.

before July 1, 1954	\$ 300		<u>Tier 1</u>	<u>Tier 2</u>
July 1, 1954 - May 31, 1959	350	1979	\$1,908.33	\$1,575
June 1, 1959 - Oct. 31, 1963	400	1980	2,158.33	1,700
Nov. 1, 1963 - Dec. 31, 1965	450	1981	2,475	1,850
1966-67	550	1982	2,700	2,025
1968-71	650	1983	2,975	2,225
1972	750	1984	3,150	2,350
1973	900			
1974	1,100			
1975	1,175			
1976	1,275			
1977	1,375			
1978	1,475			

Starting in 1985, earnings are credited on an annual rather than a monthly basis. The annual maximums are:

	<u>Tier 1</u>	<u>Tier 2</u>		<u>Tier 1</u>	<u>Tier 2</u>
1985	\$39,600	\$29,700	1995	\$61,200	\$45,300
1986	42,000	31,500	1996	62,700	46,500
1987	43,800	32,700	1997	65,400	48,600
1988	45,000	33,600	1998	68,400	50,700
1989	48,000	35,700	1999	72,600	53,700
1990	51,300	38,100	2000	76,200	56,700
1991	53,400	39,600	2001	80,400	59,700
1992	55,500	41,400	2002	84,900	63,000
1993	57,600	42,900	2003	87,000	64,500
1994	60,600	45,000			



#### 10. Creditable military service and earnings

Military service is creditable in war and national emergency periods, and in some cases between June 15, 1948 and December 15, 1950, if preceded by railroad service in the year of entry into military service or the preceding year.

Earnings: \$160 before 1968  
 \$260 after 1967 but before 1975  
 For each calendar year after 1974, earnings are the same as that credited under social security.

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#### 11. Basic monthly annuity computation

Tier 1: Social security benefit based on combined railroad and social security earnings, less social security benefit actually payable (based on social security earnings only). See item 2 for computation of tier 1 benefit for employees with 60/30 eligibility.

Tier 2: 0.7% of the average monthly compensation (AMC) multiplied by the number of years of service. This amount is then reduced by 25% of the employee's gross vested dual benefit. The AMC is the average of an individual's highest 60 months of railroad earnings up to the tier 2 maximum. For each month of service in a year for which the Railroad Retirement Board's records do not show earnings on a monthly basis, the total earnings for the year divided by the months of service in that year will be considered the monthly earnings for each month of service in the year.

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#### 12. Vested dual benefit computation

A. For employees satisfying requirements in item 6.A., benefit is social security benefit based on railroad earnings through 1974, plus social security benefit based on social security earnings through 1974, less social security benefit based on combined railroad and social security earnings through 1974.

B. For employees satisfying requirements of item 6.B., benefit is the same as in A., except for the exclusion of all earnings after last pre-1975 year employee had railroad employment.

In both cases, benefit might be proportionally reduced so that the total amount paid out in vested dual benefits in any fiscal year does not exceed the total amount appropriated for that year (see item 40).

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#### 13. Supplemental annuity computation

For employees who were entitled to supplemental annuities or who would have been entitled, but for last person service, prior to 1975, the monthly benefit is a minimum of \$45 increased by \$5 for each year of service over 25, with a maximum benefit of \$70. These employees have a reduction in their regular railroad retirement annuity because of the supplemental annuity. For employees first entitled or potentially entitled after 1974, the monthly benefit is a minimum of \$23 increased by \$4 for each year of service over 25, with a maximum benefit of \$43. These employees have no reduction in their regular railroad retirement annuity. Supplemental annuity will be reduced if employee receives a private pension from railroad employer based on employer contributions.

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#### 14. Cost-of-living increases (annually, effective with January 1 payments)

Tier 1: Same as social security increases.

Tier 2: 32.5% of social security increases.

Vested dual benefits: Frozen at the 1974 level, except that social security cost-of-living increases effective between 12-31-74 and the earlier of January 1, 1982 and the annuity beginning date are included in the benefit computation.

Supplemental annuity: None.

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#### 15. Tax rebate lump sum

Employee who has at least 10 years of railroad service and is not eligible for the vested dual benefit will receive a lump sum at retirement computed by summing for each year from 1951 through 1974 the product of the social security tax rate for the year times the excess of the employee's combined railroad and social security earnings for the year over (approximately) the maximum creditable for the year under the 1937 Act. Survivors of employee may receive refund if employee dies before receiving it.

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## 16. Separation/severance lump sum

Lump sum, equal to tier 2 payroll taxes deducted from separation or severance payments, will be paid at retirement to employees with at least 10 years of service or 5 years of service after 1995 to the extent that separation or severance payments did not yield additional tier 2 service credits.

## SPOUSE BENEFITS

### 17. Eligibility

#### A. Unreduced annuity:

1. Spouse retiring at age 60 (or any age with a child in care), if (a) employee attained 60/30 eligibility before 7-1-84 or after 12-31-01 and retired at age 60 or later, (b) employee attained 60/30 eligibility after 6-30-84 and before 1-1-02 and retired at age 62 or later, or (c) spouse retired after 12-31-01, and employee retired from disability, has 30 or more years of service and is age 60 or over.
2. Spouse retiring at social security normal retirement age (or any age with a child in care), if (a) employee retired before 1-1-75 and is age 65 or over, (b) employee retired after 12-31-74 and is age 62 or over, or (c) employee retired after 6-30-74, has 30 or more years of service and is age 60 or over.

#### B. Reduced annuity:

1. Spouse retiring at age 60 if employee attained 60/30 eligibility after 6-30-84 and retired before 1-1-02 before attaining age 62. If employee and spouse have not both attained age 62, spouse tier 1 is one-half the tier 1 the employee received before attaining age 62. If employee and spouse have both attained age 62, spouse tier 1 is equal to a social security spouse benefit after applying an age reduction based on the spouse's age at the time both employee and spouse became age 62; in this case, if employee attained 60/30 eligibility between 7-1-84 and 12-31-85, spouse age reduction is one-half the amount otherwise applicable.
2. Spouse retiring at age 60 before 1-1-02, if employee attained 60/30 eligibility after 6-30-84 and retired from disability after 6-30-84 and before 1-1-02. Age reduction in tier 1 is 1/144 for each of first 36 months and 1/240 for each additional month spouse is under social security retirement age; spouses retiring at 60-61 are deemed 62.
3. Spouse retiring at age 62, if employee has less than 30 years of service, is retired, and has attained age 62. Age reduction is 1/144 for each of the first 36 months spouse is under social security retirement age and 1/240 for each month in excess of 36 that spouse is under retirement age. (Reduction for age in excess of 36 months applies to tier 1, but not tier 2, if employee had any service before 8-12-83.)

### 18. Work restrictions

Same as employee; in addition, spouse is not paid for any month employee annuity is not payable by virtue of work restrictions, and spouse is reduced \$1 for each \$2 of employee's earnings for last non-railroad employer preceding employee's retirement (see item 7).

### 19. Annuity computation

Tier 1: One-half of social security benefit based on employee's combined railroad and social security earnings. See item 17 for computation of spouse tier 1 in cases where employee is receiving a reduced 60/30 benefit. If spouse is entitled to a social security benefit, tier 1 is reduced by the amount of the benefit, but not below 0. If spouse is entitled to employee annuity or a public service pension, certain additional restrictions apply.

Tier 2: 45% of employee's tier 2 benefit. Spouse receives additional benefit if spouse is also an employee annuitant and either the employee or spouse has railroad service prior to 1975.

### 20. Vested dual benefit

A spouse receiving a vested dual benefit on August 13, 1981 will continue to receive a benefit (adjusted as described in item 12). No vested dual benefits will be awarded after that date.

## 21. Divorced spouse

Entitled to a tier 1 benefit only. Employee must be age 62 and retired. Divorced spouse must be social security retirement age (or age 62 for reduced benefit), unmarried, and have been married for at least 10 consecutive years to employee.

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## 22. Cost-of-living increases for spouses

Each tier is subject to same percentage increase as corresponding tier of employee benefit.

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## SURVIVOR AND DEATH BENEFITS

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## 23. Residual lump sum death benefit

Payable when it appears no further benefits will derive from deceased employee except possibly to a widow, widower or parent at a future date. In this case, survivor must waive the right to all future benefits based on the deceased employee's railroad service. The amount payable is the sum of 4% of taxable railroad earnings from 1-1-37 to 12-31-46, 7% from 1-1-47 to 12-31-58, 7-1/2% from 1-1-59 to 12-31-61, 8% from 1-1-62 to 12-31-65, 8.1% from 1-1-1966 to 12-31-1966, 8.65% from 1-1-1967 to 12-31-1967, 8.8% from 1-1-1968 to 12-31-1968, 9.45% from 1-1-1969 to 12-31-1970, 9.85% from 1-1-1971 to 12-31-1972, 10.1% from 1-1-1973 to 9-30-1973, 5.35% from 10-1-1973 to 12-31-1973, and 5.45% from 1-1-1974 to 12-31-1974. Railroad earnings after 1974 are not taken into account. The amount actually paid is reduced by the amount of benefits paid deriving from the deceased employee.

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## 24. Employee requirement for survivor benefits

All benefits except residual lump sum require deceased employee to have 10 years of railroad service or 5 years of service after 1995 and a current connection. If employee does not meet above conditions, his earnings record is transferred to social security, which pays any survivor benefits.

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## 25. Aged widow's and widower's eligibility

A widow or widower must be age 60 and unremarried. Those age 60-61 are deemed age 62 in computing the benefit. For those born before 1940, the benefit reduction is 19/40% for each month of age under 65 when benefits begin. For those born after 1939, the age reduction depends on the age at retirement and the social security retirement age. In this case, the monthly reduction factor is that percentage which would cause retirement at age 60 to result in a 28.5 percent reduction.

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## 26. Disabled widow's and widower's eligibility

A widow or widower must be at least age 50 and under age 60, unremarried, and totally and permanently disabled if disability occurs within 7 years of employee's death or within 7 years after widowed mother's or father's status terminated. Age reduction is 28.5%. Benefit may not begin earlier than the later of (1) the first day of the sixth month following the date disability begins and (2) the first day of the twelfth month before the month in which the application is filed.

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## 27. Widowed mother's and father's eligibility

Unremarried surviving spouse of a deceased employee who is under social security retirement age and who at the time of filing an application has in his or her care a minor or disabled child of the deceased employee.

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## 28. Divorced widow(er)'s and remarried widow(er)'s eligibility

The following are eligible for a tier 1 benefit only.

- A. Divorced widow(er) - must (1) have been married to employee at least 10 years, be unmarried or remarried after age 60 (after age 50 and disability onset if disabled), and have attained age 60 or age 50 if disabled, or (2) be unmarried and any age and have a child of the employee in care.
- B. Remarried widow(er) - must have remarried after age 60 (after age 50 and disability onset if disabled), or the remarriage must have ended. Widow(er) must have attained age 60, be between 50 and 59 and disabled or be any age with a child in care.

Benefits for divorced aged widow(er)s and remarried aged widow(er)s are reduced for the full number of months under social security retirement age.

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## 29. Child's eligibility

A child of a deceased employee must be under 18 or under 19 and a full-time elementary or secondary school student. Unmarried children continuously disabled since before age 22 are also eligible, regardless of age.

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## 30. Parent's eligibility

A parent of a deceased employee who has attained age 60 and received at least one-half of his or her support from the employee will be eligible for an annuity. If the employee died leaving a widow, widower or child who is or might become eligible in the future, the parent will be eligible for a tier 1 benefit only. In certain instances, a remarried parent of a deceased employee will be eligible for a tier 1 benefit.

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## 31. Work restrictions

Annuity not payable for any month in which survivor engages in railroad employment. Entire benefit subject to social security work restrictions.

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## 32. Annuity computation

Tier 1: Amount payable to survivor under Social Security Act, based on the deceased employee's combined railroad and social security earnings after 12-31-36, less the amount of any social security benefit received. Additional restrictions exist for a widow or widower who also receives an annuity as a railroad employee or who receives a public service pension.

Tier 2: Widow or widower - 50% of employee tier 2 benefit  
 Parent - 35% of employee tier 2 benefit  
 Children - 15% of employee tier 2 benefit for each child  
 The total family tier 2 benefit has a minimum of 35% and a maximum of 80% of the employee's tier 2 benefit (a maximum of 130% is used for the purpose of calculating the widow(er) intitial minimum amount).

For a widow or widower an "initial minimum amount" based on the two-tier annuity amount that would have been payable to the railroad employee at the time the widow(er)'s annuity is awarded is computed with a widow(er)'s tier 2 amount equal to 100 percent of the employee's tier 2 amount. Widow(er)s' annuities computed on the basis of the initial minimum amount are not adjusted for annual cost-of-living increases until the total annuity amount is exceeded by the annuity amount the widow(er) would have been paid under prior law (tier 2 amount equal to 50 percent of the employee's tier 2 amount), with all interim cost-of-living increases otherwise payable.

For an aged widow or widower, the total benefit exclusive of any vested dual benefit may not be less than amount received as spouse in month before employee's death.

All percentages are before deductions for work or entitlement to social security benefit or railroad retirement employee annuity.

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## 33. Vested dual benefit for widow or widower

A widow or widower receiving a vested dual benefit on August 13, 1981 will continue to receive a benefit (adjusted as described in item 12). No vested dual benefits will be awarded after that date.

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## 34. Insurance lump sum

Payable if employee leaves no survivor eligible for monthly benefits in the month of his death.

- A. If employee had 10 years of service before 1-1-75, the benefit is 10 times the basic amount. The basic amount is 52.4% of the first \$75 of average monthly remuneration (AMR), plus 12.8% of the remainder, increased by 1% for each year before 1975 with earnings of \$200 or more. The AMR is combined railroad and social security earnings before 1975 divided by the number of months after 1936 or age 22 and up to retirement or death.
- B. If employee had less than 10 years of service as of 12-31-74, the amount will be the amount social security would have paid (currently \$255). This amount will only be paid to a widow or widower living with the employee at the time of the employee's death.

## 35. Cost-of-living increases for survivors

Each tier is subject to same percentage increase as corresponding tier of employee benefit.

## FINANCING, INVESTMENTS AND TAXATION OF BENEFITS

## 36. Employee and employer payroll taxes

Employees and employers contribute at the prevailing social security rate up to the tier 1 earnings limit. In addition, employees and employers pay a tier 2 tax up to the tier 2 earnings limit. The employer tier 2 tax rate is 15.6 percent in 2002 and 14.2 percent in 2003, while the employee rate is 4.9 percent in both 2002 and 2003. Beginning with the taxes payable for calendar year 2004, tier 2 taxes on both employers and employees will be based on the ratio of certain asset balances to the sum of benefits and administrative expenses (the average account benefits ratio).

At the end of each fiscal year (September 30), an Account Benefits Ratio (ABR) is calculated by dividing the fair market value of the assets in the RR Account and of the NRRIT (and for years before 2002, the SSEB Account) as of the close of such fiscal year by the total benefits and administrative expenses paid from the RR Account and the NRRIT during such fiscal year. The Average Account Benefits Ratio (AABR), with respect to any calendar year, is then calculated as the average of the account benefits ratios for the 10 most recent fiscal years ending before such calendar year. If the AABR is not a multiple of 0.1, it is increased to the next highest multiple of 0.1. Beginning in calendar year 2004, the tier 2 tax rate is determined from a tax rate table based on the AABR.

AABR		Tier 2 tax rate	
At least	But less than	Employer	Employee
	2.5	22.1	4.9
2.5	3.0	18.1	4.9
3.0	3.5	15.1	4.9
3.5	4.0	14.1	4.9
4.0	6.1	13.1	4.9
6.1	6.5	12.6	4.4
6.5	7.0	12.1	3.9
7.0	7.5	11.6	3.4
7.5	8.0	11.1	2.9
8.0	8.5	10.1	1.9
8.5	9.0	9.1	0.9
9.0		8.2	0.0

Contributions to 401(k) deferred compensation plans and the value of employer-paid premiums for group term life insurance coverage in excess of \$50,000 are included in railroad earnings for payroll tax purposes.

## 37. Supplemental annuity tax

As of 1-1-02, the supplemental annuity work-hour tax has been repealed.

### 38. Financial interchange

Railroad retirement system pays to social security system the taxes social security would have collected and receives the additional amount of benefits and administrative expenses social security would have paid if railroad employment had been covered under social security. The net difference (including interest) is transferred in the June after the fiscal year for which the transfer is made.

The Railroad Retirement Board estimates the amount and direction of the financial interchange transfer that would be made for each month if transfers were on a current monthly basis. If this estimate favors the railroad retirement system, Treasury advances the amount with interest to the Railroad Retirement Account, as a loan from the general fund, by the middle of the succeeding month. Within 10 days after receipt of the annual financial interchange for a fiscal year, the RRB must repay the amount, with interest, advanced during the fiscal year.

### 39. Investments

Amounts in the Railroad Retirement Account not needed to pay current administrative expenses and amounts in the Social Security Equivalent Benefit Account not needed to pay current benefits and administrative expenses are transferred to the National Railroad Retirement Investment Trust whose Board of seven trustees is empowered to invest Trust assets in non-governmental assets, such as equities and debt, as well as in governmental securities.

### 40. Financing of vested dual benefits

General revenue appropriations finance all vested dual benefit payments since September 1981. Beginning October 1, 1981, each annual appropriation is placed in the Dual Benefits Payments Account. Total benefits paid in any fiscal year (starting with 1982) may not exceed the total available in the account. The account may borrow at the end of a fiscal year the amount that the Railroad Retirement Board estimates will be necessary to pay vested dual benefits for the first month of the next fiscal year.

### 41. Taxability of benefits

The portion of tier 1 benefits equivalent to social security benefits is taxed under the same rules as are social security benefits. Tier 1 benefits in excess of social security equivalent benefits, tier 2 benefits, vested dual benefits, and supplemental annuities are taxed under the rules by which private pensions are taxed.

Revenues from taxes on social security equivalent benefits are transferred to the social security system through the financial interchange. Revenues from taxes on tier 1 benefits in excess of social security equivalent benefits and tier 2 benefits are transferred to the Railroad Retirement Account. Revenue derived from taxing vested dual benefits is transferred to the Dual Benefits Payments Account.

## MISCELLANEOUS PROVISIONS

### 42. Benefit preservation

Each year the Railroad Retirement Board must report to the President and Congress the results of a five-year projection of anticipated revenues to and payments from the railroad retirement account. If the results show that the funds in the account will be insufficient to pay full benefits at any time during the five-year period, the report must indicate (1) the first fiscal year in which benefits would have to be reduced because of insufficient funds in the absence of any changes, and (2) the amount of adjustments necessary to preserve financial solvency. Within 180 days after publication of this report, representatives of railroad labor and management are obligated to submit proposals designed to preserve the fund's solvency. The Railroad Retirement Board will publish regulations necessary to provide a constant level of benefits at the maximum level possible and to insure that no individual receives less than what he would have had all his earnings been covered under social security. The Railroad Retirement Board's regulations will take effect beginning with the first year in which benefit reductions will be necessary and continue until legislative action supersedes them.

### 43. Minimum annuity

The overall minimum guaranty for employees and dependents is 100% of the amount, or the additional amount, the family would receive under the Social Security Act if the employee's railroad earnings after 1936 were credited as social security earnings.

#### 44. Automatic benefit eligibility adjustments

Liberalizations in social security eligibility requirements will automatically be reflected in railroad retirement eligibility requirements, but reductions in social security requirements for categories not entitled to railroad retirement annuities under the 1937 act will not confer railroad retirement eligibility. If the Social Security Act is amended to provide benefits to a class not previously entitled under social security, the new class will also be provided railroad retirement benefits. The amount will be the social security benefit based on the employee's combined railroad and social security earnings.

#### 45. Transfer of credits

Transfer of railroad retirement credits is made to social security if an employee had less than 10 years of railroad service and less than 5 years of service after 1995 or, in the case of a survivor, if the employee lacked a current connection.

## DEFINITIONS

The meanings of terms used in the outline are defined below:

Railroad earnings - earnings derived from covered railroad employment, up to the maximums specified in item 9.

Social security earnings - earnings derived from employment covered under the Social Security Act (excludes railroad earnings), up to the maximums allowed.

Current connection - generally defined as having at least 12 months of railroad service in the 30 months preceding death or retirement. An employee whose last 12 months of railroad service occurred prior to the 30 months before retirement or death may maintain a current connection if the employee did not perform any regular employment between the end of the 30 month period containing the last 12 months of railroad service and the month of retirement or death. For purposes of the supplemental annuity or survivors' benefits, an employee who was terminated involuntarily and without fault on or after October 1, 1975, after 25 years of service and did not thereafter decline an offer of employment in the same class or craft in the railroad industry is deemed to have a current connection.

Fully insured - insured for retirement at age 62 under social security; does not necessarily imply an insured status for disability benefits or for survivor benefits for death before age 62.

Social security benefit - when used in describing the computation of the vested dual benefit, the term "social security benefit" means a primary insurance amount computed by using the social security formula in effect in 1974 and the specified earnings; it does not imply an actual benefit.

Social security retirement age - the age at which an individual may receive an unreduced benefit at retirement under the Social Security Act, as follows:

Year of attainment of early retirement age (62 for employees and spouses, <u>60 for widows and widowers</u> )	Retirement age ( <u>age for unreduced benefit</u> )
1999 or earlier	65 years, 0 months
2000	65 years, 2 months
2001	65 years, 4 months
2002	65 years, 6 months
2003	65 years, 8 months
2004	65 years, 10 months
2005-2016	66 years, 0 months
2017	66 years, 2 months
2018	66 years, 4 months
2019	66 years, 6 months
2020	66 years, 8 months
2021	66 years, 10 months
2022 or later	67 years, 0 months

## TECHNICAL SUPPLEMENT

### GENERAL METHODOLOGY AND ASSUMPTIONS

1. Approach. The 22<sup>nd</sup> valuation presents results under three different employment assumptions. The same set of earnings inflation, price inflation, and interest rate assumptions was used with each of the three employment assumptions. This set of assumptions is discussed in Section V and listed in Table 1 of the valuation report.

A projection of the progress of the railroad retirement fund through 2076 is shown under each of the three employment assumptions. All the projections are based on an open group (that is, they include future entrants). The calculations were arranged so that closed-group valuations, limited to former and present employees, could be obtained as a by-product. A balance sheet deriving actuarial surplus or deficiency is also shown.

2. Basic data. All data concerning current beneficiaries were derived from a "universe" file (file including all beneficiaries as of December 31, 2001). This included information needed to project benefits for this group and to derive exposures and terminations for mortality and remarriage studies.

Active and inactive census data and data needed to study the withdrawal, mortality, and age and disability retirement experience of active employees were also compiled from a universe file.

3. Service tables. For the projections of employees in active service and new entrants, service tables by years of service and attained age were prepared.

Five sets of withdrawal rates were used with the differentiation made by attained age. Three sets of rates for disability retirement and two sets of rates for age retirement were used, with the differentiation made by completed years of service. Rates of death in active service are aggregate.

4. Actuarial assumptions.

Mortality after age retirement. Mortality studies for nondisability retirements covering the period 1997-2000 showed that the pattern of improved mortality at the younger ages found in the 1994-1997 experience continued. Based on the thinning of margin and the degree of fit by attained age, a new table, the 2001 RRB Annuitants Mortality Table, was constructed.

Mortality after disability retirement. The overall ratio of actual to expected deaths after disability retirement based on the 21<sup>st</sup> valuation standard was 102.1% and 103.5% for annuitants with and without disability freeze, respectively. Based on the improvement in mortality and the degree of fit by five-year age group, two new tables, the 2001 RRB Disabled Mortality Table for Annuitants with Disability Freeze and the 2001 RRB Disabled Mortality Table for Annuitants without Disability Freeze, were constructed.



Mortality of employees in active service. Mortality studies for active employees showed an overall ratio of actual to expected deaths of 103.7%. Based on the degree of fit by attained age and actual to expected ratio, the 21<sup>st</sup> valuation standard, the 1994 RRB Active Service Mortality Table, was retained.

Total termination for spouses. Total termination rates are used in projecting future tier 1 and tier 2 benefits for spouses receiving these benefits on the valuation date. Spouse benefits terminate at either the spouse's or the employee's death. A spouse receiving benefits at the time of the employee's death would begin to receive survivor benefits.

The overall ratio of actual terminations to those expected on the basis of the 21<sup>st</sup> valuation standard was 102.2%. Based on the thinning of the margin and the unevenness of actual to expected ratios by five-year age group, with the highest ratios for the youngest and oldest ages, a new table, the 2001 RRB Spouse Total Termination Table, was constructed.

Probability of a retired employee having an eligible spouse. Projected tier 1 and tier 2 benefits for spouses of active employees and future entrants were determined by applying factors to the projected employee tier 1 and tier 2 benefits, respectively. These factors, shown in Table S-6, reflect the age-by-age probability that an employee annuitant has a spouse receiving benefits. Although the overall ratio of the actual number of spouses on December 31, 2000, to the expected number based on the 21<sup>st</sup> valuation standard was 98.8% and 99.9%, for 10-29 years of service employees and 30 or more years of service employees, respectively, it has been past practice to update this table for each new valuation.

Mortality of widow annuitants. The ratio of actual to expected deaths for widow annuitants was 111.1% based on the 21<sup>st</sup> valuation standard, the 1995 RRB Mortality Table for Widows. Recently enacted increases in widow benefits may serve to improve the standard of living of widows and contribute to mortality improvement. Since it is not expected that widow mortality will continue to decline, the 21<sup>st</sup> valuation standard was retained.

Remarriage of widows. The overall ratio of actual to expected remarriages on the basis of the 21<sup>st</sup> valuation standard, the 1980 RRB Remarriage Table, was 121.9%. When consideration was given to the volatility of remarriage experience over the years, it was decided to retain the 21<sup>st</sup> valuation standard.

Total termination for disabled children. The overall ratio of actual terminations to those expected on the basis of the 21<sup>st</sup> valuation standard, the 1986 RRB Total Termination Table for Disabled Children, was 120.3%. Based on the variability of recent experience and the relatively small impact on the valuation results, the 21<sup>st</sup> valuation standard was retained.

Withdrawal from the railroad industry. The overall ratio of actual final withdrawals (withdrawals net of re-entrants) to those expected on the basis of the 21<sup>st</sup> valuation standard was 89.4%. Based on this result and the persistent long select period, a new withdrawal standard was constructed (Table S-12). Rates are grouped by attained age and service in the 22<sup>nd</sup> valuation rather than by entry age and elapsed time since entry as in the 21<sup>st</sup> valuation.

Age retirement. A normal age annuity is payable at social security normal retirement age (SSNRA) with 10 years of total service or 5 years of service after 1995. For employees with 30 or more years of service, an unreduced benefit is payable to those who retire after the attainment of age 60. Benefits are reduced for employees who retire from age 62 to SSNRA with 5-29 years of service. A supplemental annuity is payable to employees who have attained age 60 with 30 or more years of service, or attained age 65 with 25 or more years of service.

A comparison between the rates of age retirements assumed in the 21<sup>st</sup> and 22<sup>nd</sup> valuations and the crude rates during calendar years 1998-2000 is shown in Table S-28. For employees with 10-29 years of service, the assumed 22<sup>nd</sup> valuation rates are close to the 1998-2000 crude rates at ages under 69 and constant for ages over 68. The rates for employees with 10-29 years of service were also used for employees with 5-9 years of service. For employees with 30 or more years of service, the assumed 22<sup>nd</sup> valuation rates are between the 21<sup>st</sup> valuation rates and the crude rates for ages 64-68 and constant for ages over 68. Because of legislated changes in early retirement benefits, the 1998-2000 experience for employees with 30 years of service at ages 60-63 is not indicative of expected future experience. The recommended rates at ages 60-63 were based in part on consideration of the experience during 1980-1982, which was the most recent study period for which unreduced benefits were available at age 60 with 30 years of service.

Disability retirement. An employee is eligible for disability retirement based on total and permanent disability at any age with at least 10 years of service or 5 years of service after 1995. Eligibility for occupational disability requires (i) permanent disability for an employee's regular railroad occupation, (ii) attainment of age 60 with 10 years of service or any age with 20 years of service, and (iii) a current connection.

For employees with 10-19 years of service, the ratio of actual disability retirements during 1998-2000 to those expected based on the 21<sup>st</sup> valuation standard was 93.3%. The ratio of actual to expected disability retirements for employees with 20-29 years of service was 97.2%, and for employees with 30 or more years of service it was 107.3%. The overall ratio of actual to expected disability retirements for all employees was 99.6%. Based on these results, a new table of rates of disability retirement was constructed.

Disability retirements are not projected for participants with 5-9 years of service because the benefits are limited to what social security would pay and are reimbursed through the financial interchange. These employees become eligible for tier 2 benefits at age 62 and are treated as vested withdrawals in our projections.

The ratio of actual to expected disability retirements qualifying for a disability freeze based on the 21<sup>st</sup> valuation standard was 99.3% and 107.3% for employees with 10-19 years of service and 20 or more years of service, respectively. A new table of percentages eligible for a disability freeze was constructed for the 22<sup>nd</sup> valuation. Since there was no clear pattern of difference between the disability freeze rates for the 20-29 years of service group and the 30 or more years of service group, a single set of rates was used for employees with 20 or more years of service. These rates are shown in Table S-11.

Other assumptions. Assumptions involving (1) service months and salary scales, (2) family composition, and (3) the age distribution of new entrants are shown in Tables S-13, S-14, and S-42, respectively.

A complete list of the assumptions and the tables that present them follows.

List of assumptions and tables used in the 22<sup>nd</sup> valuation

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Item	Assumption or table
<b>A. Mortality and total termination rates</b>	
1. After age retirement	
(a) Current retirements	Table S-1
(b) Future retirements	Table S-1 with a 1-year rateback in age
2. After disability retirement	
(a) with Disability Freeze	Table S-2
(b) without Disability Freeze	Table S-3
3. Employees in active service	Table S-4
4. Spouses	Table S-5
5. Nondisabled widows	
(a) Widows of deceased employees	Table S-7
(b) Widows coming from future employee deaths	Table S-7 with a 1-year rateback in age
6. Disabled widows	Table S-2
7. Children under age 18	Disregarded
8. Disabled children age 18 and over	Table S-9
<b>B. Remarriage rates for widows</b>	Table S-8
<b>C. Retirement rates</b>	
1. Age retirement	Table S-10
2. Disability (with "disability freeze" percentages)	Table S-11
<b>D. Withdrawal rates</b>	Table S-12
<b>E. Other assumptions</b>	
1. Probability of a retired employee having an eligible spouse	Table S-6
2. Economic assumptions	Table 1 of valuation report
3. Service months and salary scales	Table S-13
4. Family composition	Table S-14
5. Age distribution of future entrants	Table S-42

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Table S-1. 2001 RRB Annuitants Mortality Table

Age <sup>a</sup>	1,000q <sub>x</sub>	Age <sup>a</sup>	1,000q <sub>x</sub>
60	7.61	95	256.82
61	8.64	96	274.83
62	9.80	97	290.06
63	11.10	98	304.43
64	12.55	99	318.11
65	14.17	100	330.97
66	15.98	101	342.89
67	17.99	102	352.12
68	20.22	103	359.73
69	22.70	104	366.12
70	25.45	105	371.35
71	28.48	106	375.51
72	31.83	107	378.65
73	35.52	108	380.83
74	39.58	109	382.11
75	44.03	110	1,000.00
76	48.90		
77	54.22		
78	60.03		
79	66.34		
80	73.20		
81	80.63		
82	88.65		
83	97.31		
84	106.62		
85	116.61		
86	127.30		
87	138.71		
88	150.86		
89	163.75		
90	177.40		
91	191.80		
92	206.96		
93	222.86		
94	239.49		

<sup>a</sup> Age nearest birthday.

Table S-2. 2001 RRB Disabled Mortality Table for Annuitants with Disability Freeze<sup>a</sup>

Age <sup>b</sup>	1,000q <sub>x</sub>	Age <sup>b</sup>	1,000q <sub>x</sub>	Age <sup>b</sup>	1,000q <sub>x</sub>
30	17.03	65	43.73	100	356.59
31	17.13	66	46.45	101	364.73
32	17.25	67	49.37	102	371.64
33	17.37	68	52.51	103	377.41
34	17.51	69	55.87	104	382.16
35	17.65	70	59.48	105	385.96
36	17.81	71	63.35	106	388.91
37	17.99	72	67.50	107	391.08
38	18.18	73	71.94	108	392.54
39	18.38	74	76.71	109	393.37
40	18.61	75	81.80	110	1,000.00
41	18.86	76	87.26		
42	19.12	77	93.10		
43	19.41	78	99.33		
44	19.72	79	106.00		
45	20.07	80	113.12		
46	20.45	81	120.72		
47	20.85	82	128.83		
48	21.29	83	137.47		
49	21.78	84	146.67		
50	22.30	85	156.46		
51	22.88	86	166.87		
52	23.50	87	177.92		
53	24.18	88	189.65		
54	24.92	89	202.07		
55	25.72	90	215.23		
56	26.59	91	229.13		
57	27.73	92	243.80		
58	29.26	93	259.26		
59	30.91	94	275.53		
60	32.68	95	292.61		
61	34.59	96	309.04		
62	36.63	97	323.48		
63	38.83	98	336.10		
64	41.19	99	347.09		

<sup>a</sup> Qualified under social security definition of disability.

<sup>b</sup> Age nearest birthday.

Table S-3. 2001 RRB Disabled Mortality Table for Annuitants without Disability Freeze <sup>a</sup>

Age <sup>b</sup>	1,000q <sub>x</sub>	Age <sup>b</sup>	1,000q <sub>x</sub>	Age <sup>b</sup>	1,000q <sub>x</sub>
40	3.69	70	39.53	100	342.46
41	3.76	71	43.33	101	352.18
42	3.84	72	47.49	102	360.51
43	3.91	73	52.04	103	367.55
44	3.99	74	57.00	104	373.40
45	4.11	75	62.43	105	378.12
46	4.48	76	68.34	106	381.78
47	4.88	77	74.80	107	384.44
48	5.32	78	81.84	108	386.16
49	5.80	79	89.19	109	386.99
50	6.27	80	96.81	110	1,000.00
51	6.83	81	105.04		
52	7.44	82	113.92		
53	8.15	83	121.78		
54	8.94	84	130.18		
55	9.82	85	139.25		
56	10.78	86	149.02		
57	11.84	87	159.50		
58	12.99	88	170.72		
59	14.26	89	182.69		
60	15.66	90	195.41		
61	17.18	91	208.90		
62	18.86	92	223.14		
63	20.70	93	238.13		
64	22.71	94	253.86		
65	24.92	95	270.31		
66	27.33	96	287.44		
67	29.98	97	303.90		
68	32.88	98	318.46		
69	36.06	99	331.26		

<sup>a</sup> Not qualified under social security definition of disability.

<sup>b</sup> Age nearest birthday.

Table S-4. 1994 RRB Active Service Mortality Table<sup>a</sup>

Age <sup>b</sup>	1,000q <sub>x-1/2</sub>	Age <sup>b</sup>	1,000q <sub>x-1/2</sub>
		45	1.78
		46	1.89
17	.91	47	2.02
18	.91	48	2.17
19	.92	49	2.33
20	.92	50	2.51
21	.93	51	2.72
22	.94	52	2.95
23	.94	53	3.22
24	.95	54	3.51
25	.96	55	3.85
26	.97	56	4.22
27	.98	57	4.65
28	1.00	58	5.12
29	1.01	59	5.66
30	1.03	60	6.27
31	1.05	61	6.95
32	1.07	62	7.72
33	1.09	63	8.59
34	1.12	64	9.57
35	1.15	65	10.67
36	1.19	66	11.91
37	1.22	67	13.31
38	1.27	68	14.88
39	1.32	69	16.66
40	1.37	70	18.66
41	1.44	71	20.91
42	1.51	72	23.45
43	1.59	73	26.31
44	1.68	74	29.54
		75	33.17

<sup>a</sup> Deaths in active service are those of employees who last worked in the railroad industry in the year in which death occurred or in the preceding calendar year. The exposures correspond to this definition.

<sup>b</sup> Age attained in calendar year of exposure.



Table S-5. 2001 RRB Spouse Total Termination<sup>a</sup> Table

Age <sup>b</sup>	1,000 $q'_x$	Age <sup>b</sup>	1,000 $q'_x$
60	26.78	95	378.64
61	28.77	96	397.91
62	30.93	97	416.91
63	33.27	98	435.62
64	35.81	99	454.02
65	38.57	100	472.11
66	41.56	101	489.87
67	44.82	102	507.27
68	48.35	103	524.32
69	52.20	104	541.00
70	56.38	105	557.30
71	60.93	106	573.21
72	65.88	107	588.73
73	71.26	108	603.85
74	77.12	109	618.56
75	83.50	110	1,000.00
76	90.44		
77	97.99		
78	106.21		
79	115.14		
80	124.85		
81	135.41		
82	146.87		
83	159.32		
84	172.81		
85	187.42		
86	203.24		
87	220.32		
88	238.74		
89	258.57		
90	279.00		
91	299.29		
92	319.43		
93	339.38		
94	359.12		

<sup>a</sup> Mainly death of employee or death of spouse.

<sup>b</sup> Age nearest birthday.

Table S-6. Probability of a retired employee having a spouse eligible for railroad retirement benefits

Age <sup>a</sup> of employee	Employees with 30 or more years of service	Employees with less than 30 years of service
59 and under	0.000	0.000
60	0.191	0.000
61	0.316	0.000
62	0.427	0.159
63	0.520	0.227
64	0.596	0.295
65	0.657	0.361
66	0.703	0.422
67	0.737	0.475
68	0.760	0.519
69	0.774	0.550
70	0.780	0.568
71	0.780	0.577
72	0.776	0.578
73	0.768	0.576
74	0.759	0.571
75	0.748	0.565
76	0.738	0.557
77	0.726	0.548
78	0.713	0.537
79	0.700	0.525
80	0.684	0.512
81	0.667	0.498
82	0.649	0.482
83	0.629	0.465
84	0.606	0.447
85	0.581	0.428
86	0.555	0.408
87	0.527	0.388
88	0.497	0.366
89	0.466	0.343
90	0.434	0.320
91	0.400	0.297
92	0.366	0.272
93	0.331	0.247
94	0.295	0.222
95	0.259	0.196
96	0.222	0.170
97	0.186	0.143
98	0.149	0.117
99 & over	0.113	0.090

<sup>a</sup> Age last birthday.

Table S-7. 1995 RRB Mortality Table for Widows

Age <sup>a</sup>	1,000q <sub>x</sub>	Age <sup>a</sup>	1,000q <sub>x</sub>	Age <sup>a</sup>	1,000q <sub>x</sub>
20	0.23	55	5.42	90	128.50
21	0.25	56	5.93	91	140.66
22	0.27	57	6.49	92	153.98
23	0.30	58	7.11	93	168.56
24	0.33	59	7.78	94	184.52
25	0.36	60	8.52	95	201.99
26	0.39	61	9.32	96	221.00
27	0.43	62	10.21	97	241.15
28	0.47	63	11.17	98	261.92
29	0.52	64	12.23	99	282.85
30	0.56	65	13.39	100	303.44
31	0.62	66	14.66	101	323.26
32	0.68	67	16.04	102	341.87
33	0.74	68	17.56	103	358.88
34	0.81	69	19.23	104	373.89
35	0.89	70	21.05	105	386.55
36	0.97	71	23.04	106	396.55
37	1.06	72	25.22	107	403.60
38	1.16	73	27.61	108	407.43
39	1.27	74	30.22	109	407.86
40	1.39	75	33.08	110	1,000.00
41	1.53	76	36.21		
42	1.67	77	39.64		
43	1.83	78	43.40		
44	2.00	79	47.51		
45	2.19	80	52.00		
46	2.40	81	56.93		
47	2.63	82	62.32		
48	2.88	83	68.22		
49	3.15	84	74.67		
50	3.45	85	81.74		
51	3.77	86	89.48		
52	4.13	87	97.96		
53	4.52	88	107.23		
54	4.95	89	117.38		

<sup>a</sup> Age nearest birthday.

Table S-8. 1980 RRB Remarriage Table  
(Probabilities of remarriage)

Age <sup>a</sup> at widowhood [x]	1,000 $q_{(x)+n}^m$ for n equal to					Age <sup>a</sup> x	1,000 $q_x^m$
	0	1	2	3	4		
20	76.00	131.82	86.31	73.35	66.58	25	40.70
21	73.40	129.32	84.50	72.55	66.08	26	39.80
22	69.80	126.17	82.48	71.85	65.68	27	38.79
23	65.58	122.58	80.07	71.25	65.44	28	37.68
24	61.98	118.99	78.33	69.65	64.00	29	36.78
25	58.58	115.40	77.03	67.83	62.23	30	36.11
26	55.09	111.81	75.97	66.30	60.70	31	35.62
27	51.35	108.22	74.98	65.32	59.71	32	35.26
28	47.36	104.63	73.95	64.85	59.26	33	34.96
29	43.25	101.04	72.78	64.59	59.07	34	34.61
30	39.27	97.45	71.44	64.02	58.61	35	34.09
31	35.72	93.86	69.90	62.48	57.22	36	33.28
32	32.90	90.27	68.16	59.38	54.28	37	32.05
33	30.94	85.38	66.20	54.47	49.55	38	30.37
34	29.71	79.96	63.97	48.05	43.32	39	28.26
35	28.78	74.22	61.40	41.03	36.55	40	25.85
36	27.54	68.43	58.40	34.72	30.58	41	23.34
37	25.57	62.75	54.93	30.04	26.33	42	20.87
38	22.68	57.34	50.94	27.36	25.02	43	18.49
39	19.06	52.15	46.52	26.26	24.90	44	16.18
40	15.20	47.15	41.91	26.32	24.87	45	14.00
41	11.77	42.22	37.44	26.22	24.78	46	12.00
42	9.70	37.33	33.36	25.31	23.90	47	10.21
43	9.02	32.46	29.78	23.37	21.47	48	8.66
44	8.72	27.70	26.65	20.68	17.91	49	7.35
45	8.35	23.22	23.89	17.61	13.80	50	6.29
46	7.92	19.24	21.36	14.69	10.04	51	5.45
47	7.43	15.91	18.93	12.33	7.28	52	4.81
48	6.83	13.30	16.59	10.61	6.69	53	4.38
49	5.98	11.34	14.40	9.38	6.22	54	4.15
50	5.03	9.94	12.43	8.56	5.85	55	4.06
51	4.33	8.93	10.75	7.98	5.58	56	4.04
52	4.01	8.20	9.44	7.52	5.41	57	4.03
53	3.81	7.96	8.51	7.15	5.28	58	4.02
54	3.66	7.76	7.91	6.93	5.16	59	3.99
55	3.56	7.60	7.56	6.78	5.06	60	3.95
56	3.46	7.48	7.34	6.70	4.97	61	3.90
57	3.37	7.40	7.17	6.63	4.88	62	3.82
58	3.29	7.35	7.01	6.57	4.82	63	3.72
59	3.22	7.32	6.87	6.49	4.77	64	3.59
60	3.16	7.30	6.72	6.38	4.73	65	3.43
61	3.08	7.26	6.54	6.19	4.68	66	3.21
62	2.98	7.16	6.32	5.92	4.53	67	2.95
63	2.78	6.89	6.05	5.55	4.23	68	2.63
64	2.38	6.53	5.72	5.07	3.84	69	2.27
65	2.08	6.08	5.33	4.54	3.40	70	1.89
66	1.83	5.59	4.91	4.01	2.95	71	1.53
67	1.64	5.09	4.47	3.51	2.55	72	1.24
68	1.51	4.57	4.01	3.06	2.20	73	1.02
69	1.40	4.04	3.52	2.65	1.90	74	0.86
70	1.30	3.52	3.04	2.28	1.64	75	0.75
71	1.20	3.04	2.60	1.95	1.38	76	0.66
72	1.10	2.63	2.22	1.66	1.19	77	0.57
73	1.01	2.29	1.91	1.41	1.02	78	0.48
74	0.92	2.03	1.67	1.19	0.87	79	0.40
75	0.84	1.81	1.51	1.01	0.73	80	0.33
76	0.76	1.64	1.31	0.87	0.59	81	0.26
77	0.68	1.48	1.16	0.76	0.46	82	0.21
78	0.60	1.33	1.02	0.66	0.38	83	0.17
79	0.52	1.16	0.87	0.57	0.33	84	0.14
80	0.44	0.98	0.71	0.48	0.29	85	0.12
81	0.36	0.78	0.56	0.39	0.25	86	0.10
82	0.28	0.55	0.40	0.30	0.21	87	0.09
83	0.21	0.37	0.28	0.22	0.16	88	0.08
84	0.15	0.25	0.19	0.14	0.11	89	0.07

<sup>a</sup> Age nearest birthday.

Table S-9. 1986 RRB Total Termination Table for Disabled Children

Age <sup>a</sup>	1,000 $q'_x$	Age <sup>a</sup>	1,000 $q'_x$	Age <sup>a</sup>	1,000 $q'_x$
		50	15.01	85	129.41
		51	15.82	86	139.81
		52	16.73	87	150.77
18	18.95	53	17.74	88	162.29
19	18.82	54	18.85	89	174.44
20	18.63	55	20.06	90	187.31
21	18.38	56	21.37	91	201.04
22	18.08	57	22.77	92	215.75
23	17.72	58	24.22	93	231.78
24	17.32	59	25.71	94	249.20
25	16.89	60	27.24	95	267.59
26	16.43	61	28.81	96	286.29
27	15.95	62	30.42	97	305.02
28	15.47	63	32.07	98	324.06
29	14.99	64	33.76	99	344.16
30	14.49	65	35.49	100	366.41
31	14.00	66	37.26	101	392.04
32	13.52	67	39.14	102	422.27
33	13.07	68	41.11	103	458.24
34	12.67	69	43.11	104	500.99
35	12.35	70	45.18	105	551.42
36	12.12	71	47.34	106	610.34
37	11.98	72	49.64	107	678.45
38	11.91	73	52.17	108	1,000.00
39	11.90	74	54.94		
40	11.92	75	58.05		
41	11.95	76	61.79		
42	12.01	77	66.17		
43	12.10	78	72.03		
44	12.24	79	78.55		
45	12.46	80	85.69		
46	12.77	81	93.38		
47	13.18	82	101.57		
48	13.69	83	110.28		
49	14.30	84	119.57		

<sup>a</sup> Age nearest birthday.

Table S-10. Calendar year rates<sup>a</sup> of immediate<sup>b</sup> age retirement  
(Retirements per 1,000 exposed)

Age <sup>c</sup>	Years of service	
	5-29	30 & over
60		600
61		400 <sup>d</sup>
62	200	400 <sup>d</sup>
63	170	400
64	130	420
65	530	460
66	390	390
67	370	350
68	330	310
69	250	250
70	250	250
71	250	250
72	250	250
73	250	250
74	250	250
75 & over	250	250

<sup>a</sup> Technically probabilities.

<sup>b</sup> Immediate retirements are defined as those for which the calendar year of retirement is the same as, or the year following, the calendar year of last employment in the railroad industry.

<sup>c</sup> The age interval is from  $x-.5$  to  $x+.5$ , except as indicated below:

Age	Years of service	Interval for	
		Exposure	Retirements
60	30 or more	59.5-60.5	60-60.5
62	5-29	61.5-62.5	62-62.5

<sup>d</sup> For calendar year 2002 only, a rate of 800 per 1,000 is used.

Table S-11. Rates<sup>a</sup> of immediate<sup>b</sup> disability retirement and of eligibility for disability freeze<sup>c</sup>

Age <sup>d</sup>	Calendar year rates per 1,000 exposed			Percent of retirements eligible for disability freeze	
	10-19 years of service	20-29 years of service	30 or more years of service	10-19 years of service	20 or more years of service
Under 35	1.0	4.7	3.0	95.9%	30.9%
35	1.3	5.3	3.4	95.9	30.9
36	1.5	5.9	3.8	95.9	31.0
37	1.8	6.6	4.4	95.9	31.0
38	2.2	7.4	5.0	95.9	31.1
39	2.6	8.2	5.6	95.9	31.2
40	3.0	9.1	6.2	95.9	31.3
41	3.4	10.0	6.9	95.9	31.5
42	3.9	11.0	7.7	95.9	31.8
43	4.5	12.1	8.5	95.9	32.1
44	5.1	13.3	9.5	95.9	32.5
45	5.8	14.6	10.5	95.9	33.1
46	6.5	16.0	11.5	95.9	34.0
47	7.3	17.5	12.7	95.9	35.1
48	8.3	19.1	14.0	95.9	36.5
49	9.3	20.9	15.5	95.9	38.6
50	10.4	22.8	17.0	95.9	41.3
51	11.6	24.9	18.7	95.9	44.9
52	12.9	27.1	20.4	95.9	49.8
53	14.4	29.5	22.4	95.9	56.5
54	16.0	32.1	24.6	95.9	65.4
55	17.8	35.0	26.9	95.9	77.6
56	19.8	38.0	29.5	95.9	84.2
57	22.0	41.3	32.3	95.9	84.2
58	24.5	44.9	35.3	95.9	84.2
59	27.1	48.8	38.6	95.9	84.2
60	44.2	53.0	37.7	79.6	84.2
61	48.0	57.5	0.0	79.6	84.2
62	52.1	62.4	0.0	79.6	84.2
63	49.3	59.1	0.0	79.6	84.2
64	34.7	41.6	0.0	79.6	84.2
65	6.1	7.3	0.0	79.6	84.2

<sup>a</sup> Technically probabilities.

<sup>b</sup> Immediate retirements are defined as those for which the calendar year of retirement is the same as, or the year following, the calendar year of last employment in the railroad industry.

<sup>c</sup> Qualified under the social security definition of disability.

<sup>d</sup> Age attained in calendar year of exposure.

Table S-12. Calendar year rates<sup>a</sup> of final withdrawal

Years of service <sup>b</sup>	Attained age <sup>c</sup>				
	Under 25	25-34	35-44	45-54	55 & over
0	0.196	0.148	0.177	0.208	0.269
1	0.171	0.116	0.115	0.106	0.116
2	0.097	0.087	0.077	0.072	0.110
3	0.072	0.072	0.059	0.058	0.103
4	0.062	0.062	0.052	0.047	0.093
5	0.054	0.054	0.046	0.039	0.082
6	0.049	0.049	0.042	0.032	0.071
7	0.044	0.044	0.038	0.028	0.060
8	0.041	0.041	0.035	0.024	0.049
9	0.038	0.038	0.032	0.022	0.040
10	0.036	0.036	0.030	0.021	0.032
11	0.034	0.034	0.028	0.020	0.027
12	0.032	0.032	0.026	0.019	0.023
13	0.030	0.030	0.024	0.018	0.020
14	0.028	0.028	0.023	0.017	0.019
15	0.026	0.026	0.021	0.016	0.018
16	0.024	0.024	0.019	0.015	0.017
17	0.022	0.022	0.017	0.014	0.017
18	0.021	0.021	0.016	0.013	0.016
19	0.019	0.019	0.014	0.013	0.016
20	0.017	0.017	0.013	0.012	0.015
21	0.015	0.015	0.011	0.011	0.014
22	0.013	0.013	0.010	0.010	0.014
23	0.011	0.011	0.009	0.009	0.013
24	0.010	0.010	0.008	0.009	0.012
25	0.008	0.008	0.008	0.008	0.011
26	0.007	0.007	0.007	0.007	0.010
27	0.007	0.007	0.007	0.007	0.010
28	0.006	0.006	0.006	0.006	0.009
29	0.006	0.006	0.006	0.005	0.008
30 & over	0.014	0.014	0.014	0.014	0.022

<sup>a</sup> Technically probabilities.

<sup>b</sup> Rounded up to nearest whole year.

<sup>c</sup> Age attained in calendar year of exposure.



Table S-13. Service months and salary scales

Years of service <sup>a</sup>	Service months	Increase in average monthly salary from prior service level	
		Tier 1	Tier 2
0	6.3		
1	11.3	12.9%	11.9%
2	11.4	9.6%	8.8%
3	11.5	7.2%	6.5%
4	11.6	5.2%	4.6%
5	11.6	3.5%	3.0%
6	11.6	2.0%	1.5%
7	11.6	1.2%	0.8%
8	11.6	1.1%	0.7%
9	11.7	1.1%	0.7%
10	11.7	1.0%	0.6%
11	11.7	1.0%	0.6%
12	11.7	0.9%	0.6%
13	11.7	0.8%	0.5%
14	11.7	0.8%	0.5%
15	11.7	0.8%	0.5%
16	11.7	0.7%	0.5%
17	11.8	0.7%	0.4%
18	11.8	0.6%	0.4%
19	11.8	0.6%	0.4%
20	11.8	0.6%	0.4%
21	11.9	0.5%	0.3%
22	11.9	0.5%	0.3%
23	11.9	0.5%	0.3%
24	11.9	0.5%	0.3%
25	11.9	0.4%	0.3%
26	11.9	0.4%	0.3%
27	11.9	0.4%	0.3%
28	11.9	0.4%	0.2%
29	11.9	0.3%	0.2%
30	11.9	0.3%	0.2%
31	11.9	0.3%	0.2%
32	11.9	0.3%	0.2%
33	11.9	0.3%	0.2%
34	11.9	0.3%	0.2%
35	11.9	0.3%	0.2%
36	11.9	0.2%	0.2%
37	11.9	0.2%	0.1%
38	11.9	0.2%	0.1%
39	11.9	0.2%	0.1%
40	11.9	0.2%	0.1%
41	11.9	0.2%	0.1%
42	11.9	0.2%	0.1%
43	11.9	0.2%	0.1%
44	11.9	0.2%	0.1%
45 & over	11.9	0.2%	0.1%

<sup>a</sup> Rounded up to nearest whole year.

Table S-14. Family characteristics of railroad employees assumed for the valuation of survivor benefits

Age of employee <sup>a</sup>	Percent married							Percent with eligible child	
	Total	Widow age 62 & over	Widow age 60-61	Widow under age 60	Widow under 60 with eligible child				
					Youngest child under 16	Youngest child age 16-17	Youngest child disabled	Minor child	Disabled child
Under 35	71.9	-	-	71.9	60.5	-	-	77.8	-
35 - 39	71.9	-	-	71.9	60.5	-	-	86.0	-
40 - 44	71.9	-	-	71.9	52.1	7.2	0.7	75.1	2.2
45 - 49	71.9	-	-	71.9	31.9	8.2	1.5	53.0	2.2
50 - 54	71.9	1.6	0.7	69.6	16.0	5.5	1.5	25.2	2.2
55 - 59	71.9	3.6	2.8	65.5	6.1	2.5	1.5	10.8	2.2
60 - 64	71.9	18.9	15.6	37.4	2.4	0.9	0.9	5.1	2.1
65 - 69	71.9	53.5	7.5	10.9	0.6	0.2	0.3	1.6	1.6
70 - 74	71.9	66.0	1.9	4.0	0.3	0.1	0.1	0.7	1.4
75 - 79	67.8	65.6	0.7	1.5	0.1	-	-	0.3	1.0
80 - 84	61.4	60.4	0.3	0.7	0.1	-	-	0.2	0.9
85 - 89	49.7	49.2	0.1	0.4	-	-	-	0.1	0.7
90 & over	30.7	30.3	0.1	0.3	-	-	-	0.1	0.6

Age of employee <sup>a</sup>	Average ages of widows									
	Widow age 62 & over	Widow age 60-61	Widow under age 60	Widow under 60 with eligible child			Average ages of children			Average number of minor children <sup>c</sup>
				Youngest child under 16	Youngest child age 16-17	Youngest child disabled	Youngest child under 16 <sup>b</sup>	All minor children	All disabled children	
Under 35	-	-	32	32	-	-	5	5	-	2.3
35 - 39	-	-	37	36	-	-	7	8	-	2.0
40 - 44	-	-	41	40	42	44	10	11	20	2.0
45 - 49	-	-	45	42	46	46	10	12	21	1.7
50 - 54	65	61	49	46	47	50	11	12	24	1.5
55 - 59	65	61	53	48	50	53	11	12	27	1.3
60 - 64	66	61	56	49	50	57	11	13	32	1.3
65 - 69	67	61	56	50	52	57	11	13	35	1.3
70 - 74	70	61	55	47	52	58	12	12	38	1.3
75 - 79	74	61	54	46	-	-	12	12	42	1.3
80 - 84	78	61	54	46	-	-	11	12	46	1.3
85 - 89	82	61	54	-	-	-	-	12	48	1.3
90 & over	86	61	53	-	-	-	-	12	56	1.3

<sup>a</sup> Age nearest birthday at time of death.

<sup>b</sup> Includes families with widows under 60 and children under 16 only.

<sup>c</sup> Includes families with minor children only.

## MORTALITY AND REMARRIAGE EXPERIENCE

1. Mortality of age annuitants. The mortality studies conducted for age annuitants are summarized in Tables S-15 through S-17. The tables show actual-to-expected ratios by age, sex, year and duration on the basis of the 21<sup>st</sup> and 22<sup>nd</sup> valuation standards.
2. Mortality after disability retirement. The mortality studies conducted for disability annuitants are summarized in Tables S-18 through S-20. The tables show select, ultimate and aggregate crude death rates, actual-to-expected ratios, and disability freeze percentages.
3. Mortality in active service. The mortality experience of active railroad employees is shown in Table S-21. The table provides crude rates and actual-to-expected ratios.
4. Total termination, mortality and probability of spouse. Tables S-22 and S-23 show, respectively, the total termination and mortality experience of spouse annuitants between anniversaries of retirement in 1997 and 2000. Spouse mortality is not used directly in any part of the valuation. Table S-24 shows, as of December 31, 2000, the number of retired employees and the number of eligible spouses of employees, by age of employee. The probabilities shown in Table S-6 are based on the results shown in Table S-24.
5. Mortality and remarriage of widows. Table S-25 shows ratios of actual deaths of widow annuitants to those expected on the basis of the 21<sup>st</sup> valuation standard, which was retained for the 22<sup>nd</sup> valuation. Table S-26 shows ratios of actual remarriages to those expected on the basis of the 1980 RRB Remarriage Table.
6. Termination of disabled children. Table S-27 shows ratios of actual terminations of disabled children annuitants to those expected on the basis of the 1986 RRB Total Termination Table for Disabled Children.

Table S-15. Mortality experience of railroad age annuitants<sup>a</sup> between anniversaries of retirement in 1997 and 2000, by sex and type of retirement

	Attained age <sup>b</sup>								
	All ages	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95 & over
<b>A. Both sexes combined</b>									
Exposed	757,102	53,302	129,220	185,404	169,896	119,332	62,717	28,253	8,978
Actual deaths	48,175	619	2,541	6,490	9,486	11,226	9,053	5,947	2,813
Age specific death rates (per thousand)	63.6	11.6	19.7	35.0	55.8	94.1	144.3	210.5	313.3
Ratio of actual to expected deaths									
1994 GAM males <sup>c</sup>	122.1%	102.5%	106.8%	121.6%	123.0%	126.6%	126.7%	118.8%	116.4%
1998 RRB <sup>d</sup>	104.3%	97.8%	98.7%	102.8%	99.7%	106.0%	107.2%	105.8%	112.2%
2001 RRB <sup>e</sup>	106.0%	106.0%	105.7%	108.3%	103.1%	107.4%	106.2%	104.4%	108.5%
<b>B. Male</b>									
Exposed	679,629	48,971	119,288	166,563	152,264	108,363	54,641	22,847	6,692
Actual deaths	43,868	602	2,408	6,089	8,844	10,544	8,175	5,016	2,190
Age specific death rates (per thousand)	64.5	12.3	20.2	36.6	58.1	97.3	149.6	219.5	327.3
Ratio of actual to expected deaths									
1994 GAM males <sup>c</sup>	127.0%	108.6%	109.6%	127.3%	127.8%	131.0%	131.7%	124.2%	122.0%
1998 RRB <sup>d</sup>	108.3%	103.5%	101.2%	107.6%	103.6%	109.7%	111.4%	110.5%	117.5%
2001 RRB <sup>e</sup>	110.2%	112.2%	108.4%	113.4%	107.2%	111.1%	110.3%	109.1%	113.7%
<b>C. Female</b>									
Exposed	77,473	4,331	9,932	18,841	17,632	10,969	8,076	5,406	2,286
Actual deaths	4,307	17	133	401	642	682	878	931	623
Age specific death rates (per thousand)	55.6	3.9	13.4	21.3	36.4	62.2	108.7	172.2	272.5
Ratio of actual to expected deaths									
1995 RRB Widows <sup>f</sup> , 1-year rateback	110.9%	38.7%	90.0%	89.4%	101.6%	110.1%	121.4%	124.7%	119.5%
1998 RRB <sup>d</sup>	75.7%	32.8%	68.0%	61.0%	65.7%	69.9%	79.4%	85.8%	96.7%
2001 RRB <sup>e</sup>	76.3%	35.6%	72.8%	64.2%	68.0%	70.8%	78.5%	84.7%	93.5%
<b>D. Immediate<sup>g</sup></b>									
Exposed	494,725	31,748	73,767	114,892	117,002	86,362	44,672	19,536	6,746
Actual deaths	33,346	350	1,437	4,045	6,537	8,203	6,457	4,189	2,128
Age specific death rates (per thousand)	67.4	11.0	19.5	35.2	55.9	95.0	144.5	214.4	315.4
Ratio of actual to expected deaths									
1998 RRB <sup>d</sup>	104.8%	92.6%	97.6%	102.9%	99.4%	106.9%	107.5%	107.6%	112.6%
2001 RRB <sup>e</sup>	106.4%	100.3%	104.5%	108.5%	102.8%	108.2%	106.5%	106.2%	109.0%
<b>E. Deferred<sup>g</sup></b>									
Exposed	262,377	21,554	55,453	70,512	52,894	32,970	18,045	8,717	2,232
Actual deaths	14,829	269	1,104	2,445	2,949	3,023	2,596	1,758	685
Age specific death rates (per thousand)	56.5	12.5	19.9	34.7	55.8	91.7	143.9	201.7	306.9
Ratio of actual to expected deaths									
1998 RRB <sup>d</sup>	103.1%	105.5%	100.2%	102.5%	100.4%	103.8%	106.5%	101.7%	110.7%
2001 RRB <sup>e</sup>	105.2%	114.3%	107.3%	108.0%	103.9%	105.2%	105.4%	100.4%	107.1%

<sup>a</sup> Nondisability retirement.

<sup>b</sup> Age attained during the calendar year in which the year of exposure begins, which is on the date or an anniversary of retirement. Approximates age nearest birthday at the beginning of the year of exposure.

<sup>c</sup> 1994 Group Annuity Mortality Static Table.

<sup>d</sup> 1998 RRB Annuitants Mortality Table.

<sup>e</sup> 2001 RRB Annuitants Mortality Table.

<sup>f</sup> 1995 RRB Mortality Table for Widows.

<sup>g</sup> Immediate retirements are those which occur in the same calendar year as, or the calendar year following, the year of last employment in the railroad industry; all others are deferred retirements.

Table S-16. Mortality experience of railroad age annuitants<sup>a</sup> between anniversaries of retirement in 1997 and 2000, by year

	Attained age <sup>b</sup>								
	All ages	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95 & over
1. 1997-2000 experience									
Exposed	757,102	53,302	129,220	185,404	169,896	119,332	62,717	28,253	8,978
Actual deaths	48,175	619	2,541	6,490	9,486	11,226	9,053	5,947	2,813
Crude rate per 1,000	63.6	11.6	19.7	35.0	55.8	94.1	144.3	210.5	313.3
Ratio Act./Exp. <sup>c</sup>	104.3%	97.8%	98.7%	102.8%	99.7%	106.0%	107.2%	105.8%	112.2%
Ratio Act./Exp. <sup>d</sup>	106.0%	106.0%	105.7%	108.3%	103.1%	107.4%	106.2%	104.4%	108.5%
2. Crude rate per 1,000 for individual years <sup>e</sup>									
1997 - 1998	63.0	11.8	20.4	36.0	55.7	95.3	145.1	206.1	312.2
1998 - 1999	63.4	11.5	19.1	34.2	56.1	93.1	144.0	209.1	320.8
1999 - 2000	64.6	11.5	19.4	34.6	55.7	93.8	143.9	216.6	307.0
3. Ratio Act./Exp. <sup>c</sup> for individual years <sup>e</sup>									
1997 - 1998	105.1%	99.4%	102.4%	106.3%	99.5%	107.5%	107.6%	103.7%	111.7%
1998 - 1999	103.7%	96.9%	95.6%	100.6%	100.3%	105.0%	107.0%	105.0%	114.7%
1999 - 2000	104.0%	96.8%	97.5%	101.1%	99.3%	105.5%	107.1%	108.7%	110.1%
4. Ratio Act./Exp. <sup>d</sup> for individual years <sup>e</sup>									
1997 - 1998	106.8%	107.8%	109.6%	112.0%	102.9%	108.9%	106.5%	102.4%	108.0%
1998 - 1999	105.4%	105.0%	102.4%	106.0%	103.8%	106.4%	105.9%	103.7%	111.0%
1999 - 2000	105.7%	105.0%	104.4%	106.6%	102.8%	106.8%	106.1%	107.3%	106.6%

<sup>a</sup> Nondisability retirement.

<sup>b</sup> Age attained during the calendar year in which the year of exposure begins, which is on the date or an anniversary of retirement. Approximates age nearest birthday at the beginning of the year of exposure.

<sup>c</sup> Expected based on 1998 RRB Annuitants Mortality Table.

<sup>d</sup> Expected based on 2001 RRB Annuitants Mortality Table.

<sup>e</sup> Exposure is between anniversaries of retirement in indicated years.

Table S-17. Mortality ratios for railroad age annuitants on a select and ultimate basis between anniversaries of retirement in 1997 and 2000

Duration	Exposure	Actual deaths	Crude rate per 1,000	Ratio Act./Exp. <sup>a</sup>	Ratio Act./Exp. <sup>b</sup>
0	20,881	246	11.8	96.0%	103.8%
1	20,810	264	12.7	92.1	99.3
2	21,709	336	15.5	100.4	108.1
3	22,368	371	16.6	95.9	102.9
4	24,105	421	17.5	89.3	95.5
5	26,567	575	21.6	98.5	105.0
6	29,339	740	25.2	102.9	109.4
7	31,923	871	27.3	101.0	107.0
8	34,655	1,061	30.6	101.9	107.7
9	37,465	1,243	33.2	97.6	102.6
10 & over	487,280	42,047	86.3	105.2	106.2
All durations	757,102	48,175	63.6	104.3%	106.0%

<sup>a</sup> Expected based on 1998 RRB Annuitants Mortality Table.

<sup>b</sup> Expected based on 2001 RRB Annuitants Mortality Table.

Table S-18. Age specific death rates of railroad disability annuitants between anniversaries of retirement in 1997 and 2000, by age and duration

Select section

	Age at retirement <sup>a</sup>						
	All ages	Under 40	40-44	45-49	50-54	55-59	60-64
<b>Exposed</b>							
Duration 0	13,791	117	1,220	2,654	4,001	3,859	1,941
1	13,558	155	1,416	2,788	3,702	3,562	1,936
2	13,522	222	1,554	2,902	3,537	3,374	1,935
3	13,483	282	1,726	2,903	3,310	3,309	1,954
4	12,964	335	1,792	2,771	3,053	3,166	1,847
<b>Actual deaths</b>							
Duration 0	489	b	22	62	132	170	100
1	336	b	23	53	71	101	85
2	277	b	23	54	66	74	57
3	263	b	13	36	65	86	60
4	260	b	25	42	50	79	61
<b>Crude rate per 1,000</b>							
Duration 0	35.5	b	18.0	23.4	33.0	44.1	51.5
1	24.8	b	16.2	19.0	19.2	28.4	43.9
2	20.5	b	14.8	18.6	18.7	21.9	29.5
3	19.5	b	7.5	12.4	19.6	26.0	30.7
4	20.1	b	14.0	15.2	16.4	25.0	33.0

Ultimate section, durations 5 and over

Attained age <sup>c</sup>	Exposed	Actual deaths	Crude rate per 1,000
Under 50	8,006	92	11.5
50-54	13,454	187	13.9
55-59	16,959	340	20.0
60-64	22,521	706	31.3
65-69	36,041	1,618	44.9
70-74	38,855	2,467	63.5
75-79	25,086	2,346	93.5
80-84	14,083	1,801	127.9
85 & over	10,065	2,021	200.8
All ages	185,069	11,578	62.6

<sup>a</sup> Age attained in calendar year of retirement. Those retiring before birthday in year of attainment of age 65 included in group 60-64.

<sup>b</sup> Fewer than 10 actual deaths.

<sup>c</sup> Age attained during the calendar year in which the year of exposure begins, which is on the date or an anniversary of retirement. Approximates age nearest birthday at the beginning of the year of exposure.

Table S-19. Mortality experience of railroad disability annuitants between anniversaries of retirement in 1997 and 2000, by disability freeze status

Attained age <sup>a</sup>	All disability annuitants			Annuitants with disability freeze					Annuitants without disability freeze				
	Exposed	Actual deaths	Crude rate per 1,000	Exposed	Actual deaths	Crude rate per 1,000	Ratio Act./Exp <sup>b</sup>	Ratio Act./Exp <sup>c</sup>	Exposed	Actual deaths	Crude rate per 1,000	Ratio Act./Exp <sup>d</sup>	Ratio Act./Exp <sup>e</sup>
Under 40	479	f	f	449	f	f	f	f	30	f	f	f	f
40-44	5,649	78	13.8	3,621	71	19.6	86.2%	101.5%	2,028	f	f	f	f
45-49	18,658	275	14.7	9,656	224	23.2	93.8	110.5	9,002	51	5.7	95.0%	111.9%
50-54	30,581	537	17.6	16,212	431	26.6	95.6	112.6	14,369	106	7.4	83.6	98.0
55-59	34,186	810	23.7	21,919	662	30.2	92.6	107.4	12,267	148	12.1	90.3	102.5
60-64	36,653	1,170	31.9	25,147	939	37.3	93.7	101.5	11,507	231	20.1	96.2	104.9
65-69	38,092	1,691	44.4	23,795	1,216	51.1	100.3	103.0	14,297	475	33.2	103.6	108.6
70-74	38,855	2,467	63.5	22,666	1,641	72.4	107.8	107.6	16,189	826	51.0	106.8	108.1
75-79	25,086	2,346	93.5	16,377	1,651	100.8	109.9	108.9	8,709	695	79.8	111.0	108.3
80-84	14,083	1,801	127.9	9,790	1,308	133.6	105.3	105.4	4,293	493	114.8	106.6	103.5
85-89	6,953	1,205	173.3	4,685	813	173.5	96.9	99.2	2,268	392	172.8	107.3	109.8
90-94	2,435	598	245.6	1,388	372	268.0	110.9	114.2	1,047	226	215.9	94.5	98.8
95 & over	677	218	322.0	217	81	373.3	118.9	118.9	460	137	297.8	96.0	97.1
All ages	252,386	13,203	52.3	155,922	9,416	60.4	102.1%	106.0%	96,465	3,787	39.3	103.5%	106.0%

<sup>a</sup> Age attained during the calendar year in which the year of exposure begins, which is on the date or an anniversary of retirement. Approximates age nearest birthday at the beginning of the year of exposure.

<sup>b</sup> Expected based on 1998 RRB Disabled Mortality Table for Annuitants with Disability Freeze.

<sup>c</sup> Expected based on 2001 RRB Disabled Mortality Table for Annuitants with Disability Freeze.

<sup>d</sup> Expected based on 1998 RRB Disabled Mortality Table for Annuitants without Disability Freeze.

<sup>e</sup> Expected based on 2001 RRB Disabled Mortality Table for Annuitants without Disability Freeze.

<sup>f</sup> Fewer than 10 actual deaths.



Table S-20. Percentages of railroad disability annuitants included in the 22nd valuation mortality studies who would have qualified for a benefit under the social security disability standards

Duration and type of freeze decision <sup>a</sup>	Period between anniversaries of retirement					
	1997-1998		1998-1999		1999-2000	
	Exposures	Actual deaths	Exposures	Actual deaths	Exposures	Actual deaths
<b>Duration 0</b>						
Freeze allowed	65.9%	85.9%	65.4%	90.3%	63.8%	90.7%
Freeze disallowed	34.0	14.1	34.4	9.7	33.9	9.3
No freeze decision <sup>a</sup>	0.1	0.0	0.2	0.0	2.3	0.0
<b>Duration 1</b>						
Freeze allowed	64.6	81.5	65.2	81.7	64.5	89.8
Freeze disallowed	35.4	18.5	34.7	18.3	35.2	9.3
No freeze decision	0.0	0.0	0.1	0.0	0.2	0.9
<b>Duration 2</b>						
Freeze allowed	65.4	83.3	64.1	84.3	64.8	86.0
Freeze disallowed	34.5	15.7	35.9	15.7	35.1	14.0
No freeze decision	0.0	1.0	0.0	0.0	0.1	0.0
<b>Duration 3</b>						
Freeze allowed	61.5	84.5	65.0	90.7	63.7	82.9
Freeze disallowed	38.5	15.5	35.0	9.3	36.3	17.1
No freeze decision	0.0	0.0	0.0	0.0	0.0	0.0
<b>Duration 4</b>						
Freeze allowed	58.7	81.9	61.0	77.4	64.4	83.9
Freeze disallowed	41.2	18.1	38.9	22.6	35.6	16.1
No freeze decision	0.1	0.0	0.0	0.0	0.0	0.0
<b>Duration 5 and over</b>						
Freeze allowed	61.7	69.5	60.9	69.3	60.4	69.2
Freeze disallowed	38.3	30.5	39.0	30.6	39.6	30.8
No freeze decision	0.0	0.0	0.0	0.1	0.0	0.1

<sup>a</sup> No decision is made if death occurs within 5 months of onset of disability. For the mortality studies, these were included as though a freeze was allowed.

Table S-21. Mortality experience of active<sup>a</sup> railroad employees during calendar years 1995-99

Age <sup>b</sup>	Exposed	Actual deaths	Crude rate per 1,000	Ratio Act./Exp. <sup>c</sup>
Under 35	201,643	201	1.0	97.9%
35-39	142,514	180	1.3	101.7
40-44	258,990	452	1.7	114.2
45-49	301,350	655	2.2	106.8
50-54	236,889	718	3.0	103.1
55-59	150,676	739	4.9	106.4
60-64	65,706	443	6.7	93.7
65 & over	7,466	101	13.5	93.4
All ages	1,365,233	3,489	2.6	103.7%

<sup>a</sup> An employee is said to have died in active service if he died before retirement and had last worked in the railroad industry in the calendar year of his death or the calendar year immediately preceding.

<sup>b</sup> Age attained in calendar year of exposure.

<sup>c</sup> Expected deaths based on 1994 RRB Active Service Mortality Table.

Table S-22. Total termination experience of spouse annuitants between anniversaries of retirement in 1997 and 2000<sup>a</sup>

	Attained age <sup>b</sup>							
	All ages	60-64	65-69	70-74	75-79	80-84	85-89	90 & over
1. 1997-2000 experience								
Exposed <sup>c</sup>	545,389	75,979	135,599	141,663	110,702	56,491	20,068	4,887
Actual terminations	45,220	2,597	6,628	9,813	11,335	8,777	4,433	1,637
Crude rate per 1,000	82.9	34.2	48.9	69.3	102.4	155.4	220.9	335.0
Ratio Act./Exp. I <sup>d</sup>	102.2%	104.7%	103.4%	99.6%	100.0%	103.7%	103.8%	114.2%
Ratio Act./Exp. II <sup>e</sup>	106.0%	106.3%	107.6%	104.8%	105.3%	108.1%	103.7%	106.1%
2. Crude rate per 1,000 for individual years								
1997 - 1998	81.8	36.1	49.3	68.5	102.5	157.0	216.5	330.9
1998 - 1999	83.4	34.1	48.3	70.1	103.3	154.7	223.2	349.0
1999 - 2000	83.6	32.2	49.0	69.2	101.4	154.5	222.9	324.3
3. Ratio Act./Exp. for individual years I <sup>d</sup>								
1997 - 1998	102.5%	110.4%	104.6%	98.6%	100.3%	104.7%	101.8%	113.0%
1998 - 1999	102.7%	104.2%	102.1%	100.7%	100.9%	103.4%	104.9%	118.9%
1999 - 2000	101.4%	98.6%	103.6%	99.4%	98.9%	103.1%	104.6%	110.3%
4. Ratio Act./Exp. for individual years II <sup>e</sup>								
1997 - 1998	106.3%	112.2%	108.8%	103.8%	105.6%	109.2%	101.8%	105.0%
1998 - 1999	106.5%	105.9%	106.2%	106.0%	106.3%	107.8%	104.8%	110.6%
1999 - 2000	105.1%	100.1%	107.8%	104.6%	104.1%	107.4%	104.5%	102.5%

<sup>a</sup> Excludes spouses under age 60 with child in care.

<sup>b</sup> Age attained during the calendar year in which the year of exposure begins, which is on the date or an anniversary of retirement. Approximates age nearest birthday at the beginning of the year of exposure.

<sup>c</sup> Exposure is between anniversaries of retirement in indicated years.

<sup>d</sup> Expected based on 1995 RRB Spouse Total Termination Table.

<sup>e</sup> Expected based on 2001 RRB Spouse Total Termination Table.

Table S-23. Mortality experience of spouse annuitants between anniversaries of retirement in 1997 and 2000<sup>a</sup>

	Attained age <sup>b</sup>							
	All ages	60-64	65-69	70-74	75-79	80-84	85-89	90 & over
1. 1997-2000 experience								
Exposed <sup>c</sup>	530,037	75,022	133,194	138,262	106,820	53,610	18,699	4,431
Actual deaths	14,516	682	1,818	3,011	3,570	3,015	1,695	725
Crude rate per 1,000	27.4	9.1	13.6	21.8	33.4	56.2	90.6	163.6
Ratio Act./Exp. <sup>d</sup>	85.1%	83.8%	82.2%	83.9%	82.0%	87.7%	89.5%	96.2%
2. Crude rate per 1,000 for individual years								
1997 - 1998	27.1	10.0	14.1	21.5	33.8	56.1	89.2	165.8
1998 - 1999	27.6	8.7	13.8	22.2	33.6	56.8	91.5	162.7
1999 - 2000	27.4	8.5	13.0	21.6	32.8	55.8	91.2	162.2
3. Ratio Act./Exp. for individual years <sup>d</sup>								
1997 - 1998	85.8%	91.8%	84.8%	82.9%	83.2%	87.3%	88.3%	98.1%
1998 - 1999	85.8%	80.5%	83.1%	85.6%	82.4%	88.8%	90.3%	94.8%
1999 - 2000	83.7%	78.2%	78.2%	83.2%	80.4%	86.9%	89.7%	95.7%

<sup>a</sup> Excludes spouses under age 60 with child in care.

<sup>b</sup> Age attained during the calendar year in which the year of exposure begins, which is on the date or an anniversary of retirement. Approximates age nearest birthday at the beginning of the year of exposure.

<sup>c</sup> Exposure is between anniversaries of retirement in indicated years.

<sup>d</sup> Expected based on 1995 RRB Mortality Table for Widows.

Table S-24. Number of retired employees and number with a spouse eligible for railroad retirement benefits, by attained age of employee on December 31, 2000

Age <sup>a</sup> of employee	30 or more years of service			Less than 30 years of service		
	Number of employees	Number of eligible spouses	Ratio of spouses to employees	Number of employees	Number of eligible spouses	Ratio of spouses to employees
60	1,143	218	0.191			
61	1,692	519	0.307			
62	3,656	1,556	0.426	2,967	471	0.159
63	4,186	2,206	0.527	3,394	770	0.227
64	4,116	2,440	0.593	3,435	1,013	0.295
65	4,496	3,007	0.669	4,302	1,553	0.361
66	4,881	3,441	0.705	4,384	1,867	0.426
67	4,771	3,496	0.733	4,337	2,012	0.464
68	5,263	3,950	0.751	4,550	2,407	0.529
69	5,631	4,324	0.768	4,543	2,504	0.551
70	6,293	4,881	0.776	4,963	2,791	0.562
71	6,814	5,393	0.791	4,987	2,897	0.581
72	7,720	6,002	0.777	5,448	3,139	0.576
73	8,458	6,518	0.771	5,757	3,376	0.586
74	8,271	6,296	0.761	5,696	3,223	0.566
75	7,899	5,851	0.741	5,444	3,057	0.562
76	7,945	5,871	0.739	5,275	2,921	0.554
77	7,621	5,526	0.725	5,120	2,812	0.549
78	7,106	5,045	0.710	4,650	2,484	0.534
79	6,753	4,813	0.713	4,437	2,307	0.520
80	6,623	4,503	0.680	3,783	1,912	0.505
81	5,789	3,815	0.659	3,272	1,598	0.488
82	5,563	3,609	0.649	3,252	1,595	0.490
83	4,894	3,094	0.632	2,891	1,403	0.485
84	4,344	2,632	0.606	2,548	1,159	0.455
85	3,718	2,158	0.580	2,118	924	0.436
86	3,038	1,680	0.553	1,946	818	0.420
87	2,556	1,384	0.541	1,729	677	0.392
88	2,056	1,030	0.501	1,575	575	0.365
89	1,660	759	0.457	1,273	431	0.339
90	1,324	561	0.424	1,076	342	0.318
91	1,073	428	0.399	965	266	0.276
92	906	333	0.368	783	185	0.236
93	673	215	0.319	711	172	0.242
94	534	161	0.301	481	87	0.181
95	405	107	0.264	413	82	0.199
96	298	69	0.232	313	56	0.179
97	208	39	0.188	167	34	0.204
98	159	28	0.176	120	18	0.150
99 & over	304	30	0.099	240	30	0.125

<sup>a</sup> Age last birthday.

Table S-25. Mortality experience of widow annuitants between anniversaries of retirement in 1997 and 2000

	Attained age <sup>a</sup>											
	All ages	under 50	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95 & over
1. 1997-2000 experience												
Exposed	645,723	3,037	799	687	21,175	50,629	90,084	129,799	134,968	113,635	70,836	30,077
Actual deaths	51,482	5	3	12	255	972	2,627	5,607	9,132	12,530	12,073	8,266
Crude rate per 1,000	79.7	1.6	3.8	17.5	12.0	19.2	29.2	43.2	67.7	110.3	170.4	274.8
Ratio Act./Exp. <sup>b</sup>	111.1%	86.0%	91.8%	268.6%	113.1%	115.6%	112.9%	107.2%	107.9%	112.9%	112.8%	111.3%
2. Crude rate per 1,000 for individual years <sup>c</sup>												
1997 - 1998	77.8	0.0	7.4	21.6	11.8	19.7	28.4	41.0	68.0	110.5	167.4	267.1
1998 - 1999	80.0	1.0	3.8	4.4	11.4	18.9	30.5	43.1	66.5	110.5	172.6	274.0
1999 - 2000	81.5	4.2	0.0	26.4	12.9	18.9	28.6	45.6	68.5	109.8	171.4	283.5
3. Ratio Act./Exp. for individual years <sup>c</sup>												
1997 - 1998	109.6%	0.0%	177.9%	331.9%	111.2%	118.9%	110.0%	102.1%	108.4%	112.9%	110.8%	108.3%
1998 - 1999	111.4%	51.6%	94.9%	68.2%	107.2%	114.1%	117.9%	107.2%	106.1%	113.3%	114.4%	111.0%
1999 - 2000	112.4%	216.3%	0.0%	401.0%	121.7%	113.5%	110.7%	112.7%	109.4%	112.6%	113.2%	114.5%

<sup>a</sup> Age attained during the calendar year in which the year of exposure begins, which is on the date or an anniversary of retirement. Approximates age nearest birthday at the beginning of the year of exposure.

<sup>b</sup> Expected based on 1995 RRB Mortality Table for Widows.

<sup>c</sup> Exposure is between anniversaries of retirement in indicated years.

Table S-26. Remarriage experience of widows between 1991 and 2000 anniversaries of widowhood

		Age <sup>a</sup>									
		All ages	Under 35	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 & over
1. Exposed											
Duration <sup>b</sup>	0	85,373	151	308	474	468	656	933	7,419	13,020	61,946
	1	85,448	168	328	481	451	731	1,826	8,132	13,637	59,694
	2	84,791	187	327	432	429	716	2,745	8,604	14,109	57,243
	3	84,063	199	320	370	405	721	3,591	9,101	14,581	54,775
	4	83,315	214	297	325	423	718	4,466	9,658	14,993	52,222
	5 or more	1,636,039	195	802	1,616	1,764	2,661	6,054	49,086	117,640	1,456,222
2. Actual remarriages											
Duration <sup>b</sup>	0	147	c	c	c	c	c	c	38	33	62
	1	336	c	c	10	c	c	18	73	81	129
	2	301	c	c	13	c	c	26	63	82	96
	3	269	c	10	c	c	c	30	71	62	71
	4	249	c	11	c	c	c	40	70	54	55
	5 or more	1,442	c	27	25	25	20	19	241	322	759
3. Crude remarriage rate per 1,000											
Duration <sup>b</sup>	0	1.72	c	c	c	c	c	c	5.12	2.53	1.00
	1	3.93	c	c	20.80	c	c	9.86	8.98	5.94	2.16
	2	3.55	c	c	30.09	c	c	9.47	7.32	5.81	1.68
	3	3.20	c	31.25	c	c	c	8.35	7.80	4.25	1.30
	4	2.99	c	37.06	c	c	c	8.96	7.25	3.60	1.05
	5 or more	0.88	c	33.69	15.47	14.17	7.52	3.14	4.91	2.74	0.52
4. Ratio Act./Exp. <sup>d</sup>											
Duration <sup>b</sup>	0	134.9%	c	c	c	c	c	c	181.4%	152.6%	158.5%
	1	114.5%	c	c	55.9%	c	c	133.7%	128.6%	119.2%	146.4%
	2	113.6%	c	c	88.7%	c	c	134.7%	117.9%	132.9%	136.0%
	3	123.7%	c	98.8%	c	c	c	127.0%	135.8%	122.1%	143.1%
	4	146.4%	c	130.5%	c	c	c	184.4%	166.6%	141.4%	163.1%
	5 or more	120.6%	c	108.8%	75.0%	134.5%	154.1%	78.1%	130.7%	97.1%	135.9%

<sup>a</sup> For durations 0-4, age nearest birthday on date of employee's death. For durations 5 and over, age nearest birthday at beginning of year of exposure which is on an anniversary of employee's death.

<sup>b</sup> Completed years since employee's death.

<sup>c</sup> Fewer than 10 actual remarriages.

<sup>d</sup> Expected based on 1980 RRB Remarriage Table.

Table S-27. Total termination experience of disabled children annuitants between anniversaries of retirement in 1997 and 2000

Age <sup>a</sup>	Exposed	Actual terminations	Ratio Act./Exp. <sup>b</sup>
Under 25	644	13	111.4%
25-29	798	14	110.8
30-34	1,445	9	46.5
35-39	2,485	24	80.3
40-44	3,417	39	94.7
45-49	3,822	65	128.0
50-54	4,175	78	110.8
55-59	3,852	100	114.7
60-64	3,229	144	146.8
65-69	2,889	134	118.2
70-74	2,665	182	137.7
75 & over	3,301	348	120.3
All ages	32,722	1,150	120.3%

<sup>a</sup> Age attained during the calendar year in which the year of exposure begins, which is on the date or an anniversary of retirement. Approximates age nearest birthday at the beginning of the year of exposure.

<sup>b</sup> Expected based on 1986 RRB Total Termination Table for Disabled Children.



## RETIREMENT STUDIES

1. Age retirement. Age retirement studies covering experience during calendar years 1998-2000 are summarized in Tables S-28 through S-30. Table S-28 shows a comparison among crude retirement rates for 1998-2000, the 21<sup>st</sup> valuation retirement rates, and the 22<sup>nd</sup> valuation retirement rates. Tables S-29 and S-30 show ratios of actual retirements to those expected for employees with 10-29 years of service and for employees with 30 or more years of service, respectively.
2. Disability retirement. Table S-31 shows a comparison of crude disability retirement rates for 1998-2000 with the 21<sup>st</sup> and 22<sup>nd</sup> valuation standards. Table S-32 shows ratios of actual retirements in 1998-2000 to those expected by age and service.

Table S-33 shows percentages of disability retirements in 1998-2000 that were eligible for a disability freeze. Disability freeze standards are needed because of the financial interchange with social security. Assumptions must be made regarding the percentage of railroad retirement disability annuitants who would qualify under the social security definition of disability. Only these disabilities qualify for reimbursement under the financial interchange.

Table S-28. Rates<sup>a</sup> of immediate age retirement

Age <sup>b</sup>	10-29 years of service			30 or more years of service		
	Assumed rates 21st valuation	Assumed rates 22nd valuation <sup>c</sup>	1998-2000 Crude rates	Assumed rates 21st valuation	Assumed rates 22nd valuation	1998-2000 Crude rates
60				0.13	0.60	0.112
61				0.13	0.40 <sup>d</sup>	0.102
62	0.23	0.20	0.194	0.72	0.40 <sup>d</sup>	0.744
63	0.19	0.17	0.167	0.51	0.40	0.537
64	0.14	0.13	0.125	0.39	0.42	0.433
65	0.50	0.53	0.537	0.45	0.46	0.484
66	0.37	0.39	0.391	0.40	0.39	0.383
67	0.33	0.37	0.370	0.33	0.35	0.360
68	0.25	0.33	0.330	0.25	0.31	0.360
69	0.25	0.25	0.336	0.25	0.25	0.221
70	0.25	0.25	0.273	0.25	0.25	0.309
71	0.25	0.25	0.229	0.25	0.25	0.225
72	0.25	0.25	0.310	0.25	0.25	0.230
73	0.25	0.25	e	0.25	0.25	0.353
74	0.25	0.25	e	0.25	0.25	e
75 & over	0.25	0.25	0.173	0.25	0.25	0.233

<sup>a</sup> Technically probabilities, because exposures were not adjusted for other separations.

<sup>b</sup> Age attained in calendar year of exposure.

<sup>c</sup> Assumed rates for 22nd valuation apply to employees with 5-29 years of service.

<sup>d</sup> For calendar year 2002 only, a rate of 0.80 is used.

<sup>e</sup> Insufficient data.

Table S-29. Immediate age<sup>a</sup> retirement experience of railroad employees with 10-29 years of service during calendar years 1998-2000

Age <sup>b</sup>	Exposed <sup>c</sup>	Actual retirements	Crude rate <sup>d</sup> per 1,000	Ratio Act./Exp. I <sup>e</sup>	Ratio Act./Exp. II <sup>e</sup>
62	3,405	662	194.4	84.5%	97.2%
63	2,214	369	166.7	87.7	98.0
64	1,550	193	124.5	88.9	95.8
65	1,137	611	537.4	107.5	101.4
66	478	187	391.2	105.7	100.3
67	276	102	369.6	112.0	99.9
68	182	60	329.7	131.9	99.9
69	140	47	335.7	134.3	134.3
70-74	252	66	261.9	104.8	104.8
75 & over	81	14	172.8	69.1	69.1
All ages	9,715	2,311	237.9	95.5	99.3

<sup>a</sup> Nondisability retirement.

<sup>b</sup> Age attained in calendar year of exposure.

<sup>c</sup> Exposure includes part of the year in which employees were not eligible for age retirement because they were under 62.

<sup>d</sup> Technically probabilities, because exposures were not adjusted for other separations.

<sup>e</sup> I and II denote expected according to rates used in the 21st and 22nd valuations, respectively.

Table S-30. Immediate age<sup>a</sup> retirement experience of railroad employees with 30 or more years of service during calendar years 1998-2000

Age <sup>b</sup>	Exposed <sup>c</sup>	Actual retirements	Crude rate <sup>d</sup> per 1,000	Ratio Act./Exp. I <sup>e</sup>	Ratio Act./Exp. II <sup>e</sup>
60	9,237	1,030	111.5	85.8%	20.3%
61	8,174	836	102.3	78.7	25.6
62	7,357	5,476	744.3	103.4	186.1
63	2,147	1,154	537.5	105.4	134.4
64	1,220	528	432.8	111.0	103.0
65	821	397	483.6	107.5	105.1
66	478	183	382.8	95.7	98.2
67	308	111	360.4	109.2	103.0
68	211	76	360.2	144.1	116.2
69	136	30	220.6	88.2	88.2
70-74	338	89	263.3	105.3	105.3
75 & over	129	30	232.6	93.0	93.0
All ages	30,556	9,940	325.3	99.4	73.3

<sup>a</sup> Nondisability retirement.

<sup>b</sup> Age attained in calendar year of exposure.

<sup>c</sup> Exposure includes part of the year in which employees were not eligible for age retirement because they were under 60.

<sup>d</sup> Technically probabilities, because exposures were not adjusted for other separations.

<sup>e</sup> I and II denote expected according to rates used in the 21st and 22nd valuations, respectively.

Table S-31. Rates<sup>a</sup> of immediate<sup>b</sup> disability retirement

Age <sup>c</sup>	10-19 years of service			20-29 years of service			30 or more years of service		
	Assumed rates 21st valuation	Assumed rates 22nd valuation	1998-2000 Crude rates	Assumed rates 21st valuation	Assumed rates 22nd valuation	1998-2000 Crude rates	Assumed rates 21st valuation	Assumed rates 22nd valuation	1998-2000 Crude rates
Under 35	0.0015	0.0010	d	0.0077	0.0047	d	0.0035	0.0030	d
35	0.0017	0.0013	d	0.0082	0.0053	d	0.0038	0.0034	d
36	0.0019	0.0015	d	0.0087	0.0059	d	0.0041	0.0038	d
37	0.0021	0.0018	0.0038	0.0092	0.0066	d	0.0043	0.0044	d
38	0.0024	0.0022	0.0023	0.0098	0.0074	d	0.0047	0.0050	d
39	0.0027	0.0026	0.0021	0.0105	0.0082	0.0085	0.0052	0.0056	d
40	0.0031	0.0030	0.0024	0.0112	0.0091	0.0114	0.0057	0.0062	d
41	0.0035	0.0034	0.0029	0.0120	0.0100	0.0115	0.0062	0.0069	d
42	0.0039	0.0039	0.0041	0.0128	0.0110	0.0123	0.0067	0.0077	d
43	0.0044	0.0045	0.0048	0.0138	0.0121	0.0143	0.0074	0.0085	d
44	0.0050	0.0051	0.0051	0.0148	0.0133	0.0153	0.0081	0.0095	d
45	0.0057	0.0058	0.0072	0.0159	0.0146	0.0137	0.0089	0.0105	d
46	0.0065	0.0065	0.0057	0.0171	0.0160	0.0144	0.0099	0.0115	d
47	0.0073	0.0073	0.0066	0.0185	0.0175	0.0161	0.0108	0.0127	d
48	0.0083	0.0083	0.0072	0.0199	0.0191	0.0170	0.0120	0.0140	d
49	0.0094	0.0093	0.0105	0.0215	0.0209	0.0180	0.0132	0.0155	0.0096
50	0.0107	0.0104	0.0116	0.0233	0.0228	0.0235	0.0147	0.0170	0.0131
51	0.0122	0.0116	0.0097	0.0252	0.0249	0.0269	0.0163	0.0187	0.0175
52	0.0138	0.0129	0.0146	0.0272	0.0271	0.0284	0.0180	0.0204	0.0171
53	0.0157	0.0144	0.0125	0.0295	0.0295	0.0319	0.0201	0.0224	0.0253
54	0.0178	0.0160	0.0139	0.0320	0.0321	0.0340	0.0223	0.0246	0.0251
55	0.0202	0.0178	0.0200	0.0347	0.0350	0.0364	0.0248	0.0269	0.0312
56	0.0230	0.0198	0.0187	0.0377	0.0380	0.0397	0.0276	0.0295	0.0316
57	0.0261	0.0220	0.0280	0.0409	0.0413	0.0383	0.0308	0.0323	0.0328
58	0.0296	0.0245	0.0250	0.0445	0.0449	0.0479	0.0343	0.0353	0.0343
59	0.0337	0.0271	0.0226	0.0484	0.0488	0.0435	0.0383	0.0386	0.0364
60	0.0488	0.0442	0.0419	0.0526	0.0530	0.0507	0.0372	0.0377	0.0377
61	0.0530	0.0480	0.0531	0.0572	0.0575	0.0544	0.0298	0.0000	0.0319
62	0.0578	0.0521	0.0624	0.0623	0.0624	0.0657	0.0071	0.0000	0.0082
63	0.0555	0.0493	0.0425	0.0599	0.0591	0.0591	0.0000	0.0000	d
64	0.0351	0.0347	d	0.0379	0.0416	0.0416	0.0000	0.0000	d
65	0.0063	0.0061	d	0.0068	0.0073	d	0.0000	0.0000	d

<sup>a</sup> Technically probabilities, because exposures were not adjusted for other terminations.

<sup>b</sup> Immediate retirements are defined as those for which the calendar year of retirement is the same as, or the year following, the calendar year of last employment in the railroad industry.

<sup>c</sup> Age attained in calendar year of exposure.

<sup>d</sup> Fewer than 10 actual retirements.

Table S-32. Immediate disability retirement experience of railroad employees during calendar years 1998-2000

	Attained age <sup>a</sup>												
	All ages	Under 40	40-44	45-49	50-54	55-59	60-65 <sup>b</sup>	60	61	62	63	64	65 <sup>b</sup>
1. 10-19 years of service													
Exposed	143,273	35,079	45,198	32,926	17,858	8,297	3,915	1,003	867	801	541	396	307
Actual retirements	1,055	66	175	239	218	187	170	42	46	50	23	f	f
Crude rate per 1,000 <sup>c</sup>	7.4	1.9	3.9	7.3	12.2	22.5	43.4	41.9	53.1	62.4	42.5	f	f
Ratio Act./Exp. <sup>d</sup>	93.3%	90.4%	97.3%	100.4%	90.5%	88.1%	90.9%	85.8%	100.1%	108.0%	76.6%	f	f
Ratio Act./Exp. <sup>e</sup>	100.0%	106.0%	97.3%	100.3%	96.7%	104.4%	100.0%	94.7%	110.5%	119.8%	86.2%	f	f
2. 20-29 years of service													
Exposed	306,117	1,987	52,798	118,918	87,426	32,126	12,862	3,569	3,035	2,602	1,674	1,155	827
Actual retirements	7,041	14	723	1,890	2,447	1,297	670	181	165	171	99	48	f
Crude rate per 1,000 <sup>c</sup>	23.0	7.0	13.7	15.9	28.0	40.4	52.1	50.7	54.4	65.7	59.1	41.6	f
Ratio Act./Exp. <sup>d</sup>	97.2%	67.9%	101.2%	85.1%	105.0%	100.7%	99.5%	96.4%	95.0%	105.5%	98.7%	109.7%	f
Ratio Act./Exp. <sup>e</sup>	100.1%	87.4%	115.9%	89.7%	105.9%	99.8%	98.7%	95.7%	94.5%	105.3%	100.1%	99.9%	f
3. 30 or more years of service													
Exposed	132,153	0	0	4,201	42,948	56,058	28,946	9,230	8,174	7,355	2,146	1,220	821
Actual retirements	3,474	f	f	33	897	1,858	686	348	261	60	f	f	f
Crude rate per 1,000 <sup>c</sup>	26.3	f	f	7.9	20.9	33.1	23.7	37.7	31.9	8.2	f	f	f
Ratio Act./Exp. <sup>d</sup>	107.3%	f	f	61.1%	109.8%	107.5%	107.3%	101.4%	107.1%	114.9%	f	f	f
Ratio Act./Exp. <sup>e,g</sup>	100.0%	f	f	52.1%	97.8%	102.8%	g	100.0%	g	g	g	g	g

<sup>a</sup> Age attained in calendar year of exposure.

<sup>b</sup> Refers to employees retiring before age 65 in the calendar year in which they will attain age 65. Exposure includes part of the year in which employees were not eligible for disability retirement because they passed their 65th birthday.

<sup>c</sup> Technically probabilities of retirement, because exposures were not adjusted for other terminations.

<sup>d</sup> Expected based on 21st valuation disability rates.

<sup>e</sup> Expected based on 22nd valuation disability rates.

<sup>f</sup> Insufficient data.

<sup>g</sup> Actual to expected ratios for 30-year service employees based on 22nd valuation disability rates exclude employees over age 60.

Table S-33. Percentages of immediate<sup>a</sup> disability retirements in 1998-2000 meeting the disability freeze standards of the Social Security Act<sup>b</sup>

Age <sup>c</sup>	10-19 years of service			20-29 years of service			30 or more years of service		
	Assumed rates 21st valuation	Assumed rates 22nd valuation	1998-2000 Crude rates	Assumed rates 21st valuation	Assumed rates 22nd valuation	1998-2000 Crude rates	Assumed rates 21st valuation	Assumed rates 22nd valuation	1998-2000 Crude rates
Under 35	95.9%	95.9%	d	21.5%	30.9%	d	44.3%	30.9%	d
35	95.9	95.9	d	21.6	30.9	d	44.3	30.9	d
36	95.9	95.9	d	21.8	31.0	d	44.3	31.0	d
37	95.9	95.9	100.0%	21.9	31.0	d	44.3	31.0	d
38	95.9	95.9	100.0	22.1	31.1	d	44.3	31.1	d
39	95.9	95.9	100.0	22.4	31.2	28.6%	44.3	31.2	d
40	95.9	95.9	100.0	22.7	31.3	36.6	44.3	31.3	d
41	95.9	95.9	100.0	23.2	31.5	23.6	44.3	31.5	d
42	95.9	95.9	87.2	23.7	31.8	29.9	44.3	31.8	d
43	95.9	95.9	95.3	24.4	32.1	34.0	44.3	32.1	d
44	95.9	95.9	93.0	25.2	32.5	26.5	44.4	32.5	d
45	95.9	95.9	92.9	26.3	33.1	30.9	44.4	33.1	d
46	95.9	95.9	88.1	27.7	34.0	32.6	44.4	34.0	d
47	95.9	95.9	100.0	29.4	35.1	35.7	44.5	35.1	d
48	95.9	95.9	92.5	31.6	36.5	36.6	44.6	36.5	d
49	95.9	95.9	96.3	34.4	38.6	45.2	44.8	38.6	37.0%
50	95.9	95.9	94.2	37.9	41.3	46.9	45.3	41.3	43.1
51	95.9	95.9	97.6	42.4	44.9	45.0	46.2	44.9	41.9
52	95.9	95.9	92.5	48.0	49.8	47.3	48.1	49.8	48.3
53	95.9	95.9	100.0	55.1	56.5	56.6	51.8	56.5	49.4
54	95.9	95.9	97.1	64.1	65.4	66.5	59.1	65.4	60.0
55	95.9	95.9	97.6	75.5	77.6	81.5	73.8	77.6	78.8
56	95.9	95.9	100.0	78.6	84.2	84.7	80.2	84.2	78.2
57	95.9	95.9	95.7	78.6	84.2	80.6	80.2	84.2	83.7
58	95.9	95.9	100.0	78.6	84.2	86.0	80.2	84.2	84.6
59	95.9	95.9	100.0	78.6	84.2	81.8	80.2	84.2	83.5
60	84.1	79.6	75.0	78.6	84.2	83.9	80.2	84.2	87.1
61	84.1	79.6	78.0	78.6	84.2	87.0	80.2	84.2	87.8
62	84.1	79.6	80.0	78.6	84.2	88.0	80.2	84.2	81.7
63	84.1	79.6	91.3	78.6	84.2	89.8	80.2	84.2	d
64	84.1	79.6	d	78.6	84.2	77.1	80.2	84.2	d
65	84.1	79.6	d	78.6	84.2	d	80.2	84.2	d

<sup>a</sup> Immediate retirements are defined as those for which the calendar year of retirement is the same as, or the year following, the calendar year of last employment in the railroad industry.

<sup>b</sup> Individuals who died within 1 year of the onset of disability were deemed to qualify if no decision was made.

<sup>c</sup> Age attained in calendar year of exposure.

<sup>d</sup> Insufficient data.

## WITHDRAWAL STUDIES

Table S-34 shows withdrawal experience for the years 1996-99. The actual withdrawals are shown net of re-entrants into the industry for each attained age and service group. Since a re-entrant has his earnings record restored for benefit purposes, he cannot be considered a final withdrawal. The table presents crude net withdrawal rates by attained age and years of service along with ratios of actual net withdrawals to those expected on the basis of both the 21<sup>st</sup> and 22<sup>nd</sup> valuations standards.



Table S-34. Withdrawal experience of railroad employees during calendar years 1996-1999, by attained age and years of service

Years of service <sup>a</sup>	Attained age <sup>b</sup> under 25					Attained age <sup>b</sup> 25-34					Attained age <sup>b</sup> 35-44				
	Exposed	Actual net <sup>c</sup> withdrawals	Crude rate per 100	Ratio Act./Exp.		Exposed	Actual net <sup>c</sup> withdrawals	Crude rate per 100	Ratio Act./Exp.		Exposed	Actual net <sup>c</sup> withdrawals	Crude rate per 100	Ratio Act./Exp.	
				I <sup>d</sup>	II <sup>d</sup>				I <sup>d</sup>	II <sup>d</sup>				I <sup>d</sup>	II <sup>d</sup>
0	16,943	3,325	19.6	92.3%	100.1%	27,678	4,109	14.8	90.6%	100.3%	16,370	2,895	17.7	86.4%	99.9%
1	11,557	1,971	17.1	109.1	99.7	25,015	2,898	11.6	91.7	99.9	14,137	1,649	11.7	99.6	101.4
2	5,862	597	10.2	86.6	105.0	19,859	1,733	8.7	88.9	100.3	11,077	858	7.7	84.7	100.6
3	3,156	209	6.6	71.8	92.0	16,704	1,194	7.1	91.8	99.3	9,689	566	5.8	80.8	99.0
4	1,648	85	5.2	69.5	83.2	14,405	893	6.2	99.1	100.0	9,307	466	5.0	87.3	96.3
5	610	29	4.8	74.2	88.0	12,227	651	5.3	103.4	98.6	8,780	373	4.2	91.4	92.4
6	104	e	e	e	e	10,028	510	5.1	116.0	103.8	8,022	384	4.8	124.2	114.0
7	3	e	e	e	e	8,590	384	4.5	118.2	101.6	8,135	332	4.1	121.9	107.4
8	3	e	e	e	e	7,251	283	3.9	115.2	95.2	8,442	234	2.8	93.7	79.2
9	1	e	e	e	e	5,608	177	3.2	102.4	83.1	8,462	200	2.4	88.5	73.9
10	1	e	e	e	e	3,858	154	4.0	136.1	110.9	8,127	270	3.3	133.8	110.7
11	1	e	e	e	e	2,555	110	4.3	154.4	126.6	7,861	232	3.0	119.9	105.4
12	-	e	e	e	e	1,697	53	3.1	113.5	97.6	8,284	224	2.7	109.8	104.0
13	-	e	e	e	e	1,024	34	3.3	166.0	110.7	9,171	219	2.4	147.8	99.5
14	-	e	e	e	e	579	16	2.8	138.2	98.7	10,529	269	2.6	159.4	111.1
15	-	e	e	e	e	309	e	e	e	e	12,251	293	2.4	150.5	113.9
16	-	e	e	e	e	81	e	e	e	e	14,700	317	2.2	137.0	113.5
17	-	e	e	e	e	4	e	e	e	e	18,032	322	1.8	114.7	105.0
18	-	e	e	e	e	1	e	e	e	e	20,609	307	1.5	97.3	93.1
19	-	e	e	e	e	-	e	e	e	e	21,869	263	1.2	80.2	85.9
20	-	e	e	e	e	-	e	e	e	e	21,517	299	1.4	94.5	106.9
21	-	e	e	e	e	-	e	e	e	e	18,393	209	1.1	79.1	103.3
22	-	e	e	e	e	-	e	e	e	e	16,633	169	1.0	72.4	101.6
23	-	e	e	e	e	-	e	e	e	e	13,470	89	0.7	48.0	73.4
24	-	e	e	e	e	-	e	e	e	e	9,271	77	0.8	61.3	103.8
25	-	e	e	e	e	-	e	e	e	e	5,284	38	0.7	54.2	89.9
26	-	e	e	e	e	-	e	e	e	e	1,458	15	1.0	79.0	147.0
27	-	e	e	e	e	-	e	e	e	e	40	e	e	e	e
28	-	e	e	e	e	-	e	e	e	e	2	e	e	e	e
29	-	e	e	e	e	-	e	e	e	e	1	e	e	e	e
30 & over	-	e	e	e	e	-	e	e	e	e	-	e	e	e	e
All years	39,889	6,222	15.6	94.9%	99.8%	157,473	13,203	8.4	94.8%	100.0%	319,923	11,570	3.6	94.8%	100.0%

<sup>a</sup> Service as of beginning of calendar year of exposure rounded up to next highest whole year.

<sup>b</sup> Age attained in calendar year of exposure.

<sup>c</sup> Withdrawals less re-entrants.

<sup>d</sup> I and II denote expected according to rates used in the 21st and 22nd valuations, respectively.

<sup>e</sup> Fewer than 10 actual net withdrawals.

Table S-34. continued

Years of service <sup>a</sup>	Attained age <sup>b</sup> 45-54					Attained age <sup>b</sup> 55 and over					All ages				
	Exposed	Actual net <sup>c</sup> withdrawals	Crude rate per 100	Ratio Act./Exp.		Exposed	Actual net <sup>c</sup> withdrawals	Crude rate per 100	Ratio Act./Exp.		Exposed	Actual net <sup>c</sup> withdrawals	Crude rate per 100	Ratio Act./Exp.	
				I <sup>d</sup>	II <sup>d</sup>				I <sup>d</sup>	II <sup>d</sup>				I <sup>d</sup>	II <sup>d</sup>
0	5,660	1,178	20.8	78.5%	100.1%	939	253	26.9	101.6%	100.2%	67,590	11,760	17.4	88.8%	100.1%
1	5,012	531	10.6	74.1	99.9	844	98	11.6	80.1	100.1	56,565	7,147	12.6	95.8	100.2
2	3,962	283	7.1	65.0	99.2	695	76	10.9	95.3	99.4	41,455	3,547	8.6	85.1	101.0
3	3,751	222	5.9	67.4	102.0	760	84	11.1	117.6	107.3	34,060	2,275	6.7	84.5	99.0
4	3,637	172	4.7	66.4	100.6	812	64	7.9	100.2	84.8	29,809	1,680	5.6	89.4	97.4
5	3,677	125	3.4	57.3	87.2	889	70	7.9	116.0	96.0	26,183	1,248	4.8	92.1	95.0
6	3,586	139	3.9	78.6	121.1	965	78	8.1	137.6	113.8	22,705	1,117	4.9	113.1	109.9
7	3,706	95	2.6	60.4	91.6	987	65	6.6	123.4	109.8	21,421	876	4.1	108.5	103.0
8	3,915	92	2.3	62.3	97.9	1,137	60	5.3	109.6	107.7	20,748	669	3.2	95.8	90.1
9	3,984	80	2.0	59.5	91.3	1,196	27	2.3	51.0	56.4	19,251	484	2.5	82.5	78.1
10	3,976	103	2.6	84.3	123.4	968	36	3.7	91.5	116.2	16,930	563	3.3	118.1	113.2
11	3,893	60	1.5	56.1	77.1	935	32	3.4	94.2	126.8	15,245	434	2.8	107.0	105.8
12	4,014	94	2.3	92.3	123.3	916	22	2.4	71.1	104.4	14,911	393	2.6	102.4	107.1
13	4,576	69	1.5	125.7	83.8	954	13	1.4	55.9	68.1	15,725	335	2.1	135.8	95.1
14	5,320	71	1.3	111.2	78.5	1,030	20	1.9	80.2	102.2	17,458	376	2.2	139.7	102.1
15	6,445	115	1.8	148.7	111.5	1,164	32	2.7	112.6	152.7	20,169	442	2.2	144.2	113.5
16	7,899	148	1.9	156.1	124.9	1,453	18	1.2	49.9	72.9	24,133	485	2.0	133.3	114.3
17	10,666	149	1.4	116.4	99.8	1,893	26	1.4	56.0	80.8	30,595	497	1.6	109.2	101.8
18	13,373	153	1.1	95.3	88.0	2,374	33	1.4	56.4	86.9	36,357	493	1.4	92.2	91.0
19	16,473	195	1.2	98.6	91.1	2,885	54	1.9	76.9	117.0	41,227	512	1.2	85.9	90.4
20	19,452	251	1.3	107.5	107.5	3,292	55	1.7	68.3	111.4	44,261	605	1.4	96.0	107.6
21	20,372	214	1.1	87.5	95.5	3,361	41	1.2	49.5	87.1	42,126	464	1.1	78.5	98.0
22	23,718	262	1.1	92.1	110.5	3,741	51	1.4	55.6	97.4	44,092	482	1.1	79.0	105.7
23	27,309	276	1.0	84.2	112.3	4,075	58	1.4	57.6	109.5	44,854	423	0.9	68.9	100.7
24	29,768	223	0.7	62.4	83.2	4,318	41	0.9	38.2	79.1	43,357	341	0.8	57.8	86.6
25	33,848	292	0.9	71.9	107.8	5,056	58	1.1	46.0	104.3	44,188	388	0.9	64.4	105.2
26	34,679	255	0.7	61.3	105.0	5,673	54	1.0	38.1	95.2	41,810	324	0.8	56.2	104.6
27	32,586	204	0.6	52.2	89.4	6,448	66	1.0	41.0	102.4	39,074	271	0.7	49.0	92.5
28	29,122	159	0.5	45.5	91.0	7,339	80	1.1	43.7	121.1	36,463	239	0.7	44.9	99.3
29	23,926	146	0.6	50.9	122.0	8,013	48	0.6	23.7	74.9	31,940	194	0.6	39.6	105.6
30 & over	52,212	713	1.4	113.8	97.5	65,954	1,435	2.2	81.5	98.9	118,166	2,148	1.8	89.9	98.4
All years	444,517	7,069	1.6	77.6%	100.0%	141,066	3,148	2.2	73.3%	99.2%	1,102,868	41,212	3.7	89.4%	99.9%

<sup>a</sup> Service as of beginning of calendar year of exposure rounded up to next highest whole year.

<sup>b</sup> Age attained in calendar year of exposure.

<sup>c</sup> Withdrawals less re-entrants.

<sup>d</sup> I and II denote expected according to rates used in the 21st and 22nd valuations, respectively.

<sup>e</sup> Fewer than 10 actual net withdrawals.

## EMPLOYEE AND BENEFICIARY CENSUSES, FAMILY COMPOSITION, AND MISCELLANEOUS STATISTICS

Age and service distributions of active and inactive employees are shown in Tables S-35 and S-36. A comparison between 1998 and 2001 active censuses is shown in Table S-37.

Tables S-38 and S-39 provide a census of beneficiaries on December 31, 2001. Also included are their tier 1, tier 2, vested dual benefit and supplemental annuity amounts.

Table S-40 shows the average number of service months in a year for calendar years 1997-1999 by attained age group and years of service. The number of service months credited to an employee for a given year is equal to the employee's total creditable tier 2 earnings in the year, divided by one-twelfth of the tier 2 earnings base for the year, with a maximum of 12 and a minimum of the number of months in which the individual had service.

The average creditable earnings per service month during 2001 are shown in Table S-41. Because of the difference in the maximum creditable earnings for tier 1 and tier 2 benefits, separate salary scales were constructed.

The age distribution of new entrants during calendar years 1997-2000 is shown in Table S-42, as is the distribution for 1994-1997.

Table S-43 presents family characteristics of railroad employees who died in the period 1997-2000 with a current connection.

Table S-44 provides selected employment and benefit statistics for 1998 and 2001.

Table S-35. Distribution of 2001 active employees<sup>a</sup> by age and completed years of service

Age in 2001	Completed years of service											
	Total	0	1	2-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Total	263,409	10,535	11,624	36,446	31,739	20,919	18,481	40,524	46,628	32,984	11,573	1,956
Under 20	447	374	68	5	0	0	0	0	0	0	0	0
20-24	7,582	2,267	2,028	3,080	207	0	0	0	0	0	0	0
25-29	17,197	2,082	2,418	8,217	4,362	118	0	0	0	0	0	0
30-34	23,753	1,805	2,240	8,454	8,157	3,050	47	0	0	0	0	0
35-39	23,252	1,450	1,733	6,200	6,653	5,138	1,914	164	0	0	0	0
40-44	34,151	1,082	1,418	4,777	5,155	4,670	5,757	10,168	1,124	0	0	0
45-49	53,979	751	931	3,140	3,561	3,745	5,518	16,159	18,672	1,502	0	0
50-54	54,702	423	464	1,613	2,199	2,383	3,229	9,023	18,146	16,533	689	0
55-59	34,927	200	229	704	957	1,185	1,385	3,641	6,409	12,353	7,573	291
60-64	12,197	63	76	208	400	532	531	1,232	2,080	2,491	3,235	1,349
65-69	974	28	11	33	67	78	82	120	172	86	64	233
70 & over	248	10	8	15	21	20	18	17	25	19	12	83

<sup>a</sup> Employees alive and not retired at the end of 2001 with some railroad service in 2001.

Table S-36. Census of vested<sup>a</sup> inactive employees<sup>b</sup> in 2001 by age and completed years of service

Age in 2001	Completed years of service						
	Total	5-9	10-14	15-19	20-24	25-29	30 & over
Total	65,664	60	35,457	16,127	7,599	3,109	3,312
Under 35	176	28	147	1	0	0	0
35-39	835	11	758	65	1	0	0
40-44	4,978	9	3,512	1,212	245	0	0
45-49	14,850	1	9,385	3,711	1,485	262	6
50-54	20,091	0	10,845	5,428	2,473	968	377
55-59	16,706	5	6,957	3,924	2,337	1,224	2,259
60-64	7,438	5	3,439	1,679	1,014	640	661
65 & over	590	1	414	107	44	15	9

<sup>a</sup> Employees with at least 10 years of total service, or 5 years of service after 1995.

<sup>b</sup> Employees alive and not retired at the end of 2001 with no railroad work in 2001.

Table S-37. Comparison between 2001 and 1998 of selected characteristics of active<sup>a</sup> railroad employees

	2001	1998	<u>Change from 1998 to 2001</u>	
			Number	Percent
Number alive and not retired	263,409	289,036	-25,627	-8.9%
Percent with 5 or more years of service	77.8%	77.0%	b	b
Number age 60 or over	13,419	12,735	684	5.4%
Number age 65 or over	1,222	1,227	-5	-0.4%
Number age 60-64 with 30 or more years of service	7,075	6,213	862	13.9%
Average age on December 31	45.7	44.7	1.0	b
Median age on December 31	47.5	46.0	1.5	b
Average years of service				
All employees	18.0	17.3	0.7	b
Employees under age 45	8.0	9.2	-1.2	b
Employees age 45-49	20.5	20.7	-0.2	b
Employees age 60 or over	29.6	29.8	-0.2	b
Employees age 65 or over	27.2	27.6	-0.4	b

<sup>a</sup> Active employees were those with some railroad service during the year.

<sup>b</sup> Not applicable.

Table S-38. Census of employee and spouse annuitants on December 31, 2001<sup>a</sup>

Age <sup>c</sup>	Number	Monthly benefits <sup>b</sup>			
		Tier 1	Tier 2	Vested dual	Supplemental
<b>1. Employee age annuitants</b>					
60-64	15,563	\$ 19,725,911	\$ 11,458,138	\$ 132,598	\$ 335,546
65-69	33,855	36,412,615	19,923,915	678,968	657,155
70-74	47,268	46,747,518	24,291,190	1,646,974	956,441
75-79	52,778	49,216,974	21,684,094	2,714,495	1,101,203
80-84	37,999	35,793,252	11,154,346	2,291,972	881,785
85-89	19,859	17,479,709	4,517,431	1,077,020	461,392
90-94	7,435	4,700,847	1,229,148	393,246	200,384
95 & over	2,231	1,201,572	218,368	141,116	69,785
Total	216,988	\$ 211,278,398	\$ 94,476,630	\$ 9,076,389	\$ 4,663,691
<b>2. Employee disability annuitants</b>					
Under 40	65	\$ 84,970	\$ 17,623	\$ -	\$ -
40-44	995	1,359,095	375,331	-	-
45-49	5,474	7,495,276	2,384,807	-	-
50-54	12,024	16,298,646	5,867,923	-	-
55-59	14,288	18,876,821	7,499,706	2,323	-
60-64	12,863	15,936,435	6,628,265	97,155	144,585
65-69	10,907	12,156,471	4,870,557	242,770	205,277
70-74	11,047	11,329,219	4,082,706	422,756	236,564
75-79	8,274	7,704,339	2,035,770	449,854	168,872
80-84	4,507	3,718,653	698,892	243,855	80,567
85-89	1,860	1,273,105	207,852	99,785	28,707
90-94	675	435,140	66,140	29,125	15,801
95 & over	146	78,947	6,971	5,977	1,237
Total	83,125	\$ 96,747,117	\$ 34,742,543	\$ 1,593,600	\$ 881,610
<b>3. Spouse annuitants</b>					
Under 60	1,008	\$ 570,894	\$ 268,825	\$ -	\$ -
60-64	21,386	9,766,589	6,870,768	156	-
65-69	34,891	11,767,528	8,658,091	95	-
70-74	39,578	13,132,312	8,499,863	300	-
75-79	32,338	10,463,116	5,847,986	1,375	-
80-84	18,262	5,748,656	2,677,939	396,283	-
85-89	5,998	1,356,623	729,562	356,655	-
90-94	1,155	193,821	121,716	67,192	-
95 & over	143	23,756	12,545	7,382	-
Total	154,759	\$ 53,023,295	\$ 33,687,295	\$ 829,438	\$ -

<sup>a</sup> Includes annuities which were in withheld status as of December 31, 2001.  
Therefore, these figures may disagree with other published data.

<sup>b</sup> Amounts shown reflect benefits paid in January 2002.

<sup>c</sup> Age attained in 2001.

Table S-39. Census of survivor annuitants on December 31, 2001<sup>a</sup>

Age <sup>c</sup>	Number	Monthly benefits <sup>b</sup>		
		Tier 1	Tier 2	Vested dual
1. Aged widows and widowers <sup>d</sup>				
60-64	5,866	\$ 5,437,893	\$ 1,056,594	\$ -
65-69	12,856	10,831,110	2,278,265	-
70-74	24,795	20,290,999	4,081,988	-
75-79	36,547	28,914,889	5,570,984	-
80-84	41,972	31,861,788	5,475,728	88,782
85-89	32,754	20,105,875	3,870,186	218,050
90-94	18,869	10,070,390	2,179,846	135,837
95 & over	8,000	4,101,851	947,156	55,506
Total	181,659	\$ 131,614,795	\$ 25,460,747	\$ 498,175
2. Other survivors <sup>e</sup>				
0-4	53	\$ 39,230	\$ 3,238	\$ -
5-9	316	273,654	26,210	-
10-14	1,162	1,013,329	93,122	-
15-19	1,760	1,610,619	168,812	-
20-24	140	127,684	13,868	-
25-29	241	191,668	20,957	-
30-34	384	291,054	36,747	-
35-39	800	565,978	78,009	-
40-44	1,325	940,567	147,450	-
45-49	1,577	1,083,917	174,936	-
50-54	1,922	1,254,594	214,465	-
55-59	2,401	1,515,364	280,157	-
60-64	2,247	1,379,416	248,966	-
65-69	1,838	1,070,709	177,649	-
70-74	1,753	950,158	166,389	4,230
75-79	1,495	753,782	153,183	11,900
80-84	1,013	480,351	102,423	12,884
85-89	483	234,122	49,102	3,633
90-94	106	51,603	10,633	399
95 & over	2	621	154	-
Total	21,018	\$ 13,828,418	\$ 2,166,471	\$ 33,046

<sup>a</sup> Includes annuities which were in withheld status as of December 31, 2001. Therefore, these figures may disagree with other published data.

<sup>b</sup> Amounts shown reflect benefits paid in January 2002.

<sup>c</sup> Age attained in 2001.

<sup>d</sup> Includes divorced and remarried aged widows and widowers, and parents.

<sup>e</sup> Includes disabled widows and widowers, remarried and divorced disabled widows and widowers, widowed mothers and fathers, remarried and divorced widowed mothers and fathers, minor children, student children and disabled children.



able S-40. Comparison of service months of railroad employees during calendar years 1997-99 with assumptions used in the 22nd valuation  
(For employees not separated in the year)

Years of service <sup>a</sup>	Service months by attained age						Service months by calendar year				22nd valuation assumption
	Under 25	25-34	35-44	45-54	55 & over	Total	1997	1998	1999	Total	
0	6.0	6.4	6.3	6.2	6.3	6.3	5.9	6.4	6.6	6.3	6.3
1	10.9	11.4	11.4	11.3	10.9	11.3	11.2	11.3	11.3	11.3	11.3
2	11.3	11.5	11.5	11.4	11.3	11.4	11.4	11.5	11.4	11.4	11.4
3	11.4	11.6	11.5	11.4	11.2	11.5	11.5	11.6	11.5	11.5	11.5
4	11.7	11.7	11.6	11.4	11.4	11.6	11.5	11.7	11.6	11.6	11.6
5	11.7	11.7	11.6	11.5	11.5	11.6	11.5	11.6	11.7	11.6	11.6
6	11.9	11.7	11.5	11.5	11.4	11.6	11.5	11.6	11.6	11.6	11.6
7		11.7	11.6	11.5	11.5	11.6	11.6	11.6	11.6	11.6	11.6
8		11.8	11.6	11.6	11.4	11.7	11.7	11.7	11.6	11.7	11.6
9		11.8	11.7	11.6	11.7	11.7	11.7	11.7	11.7	11.7	11.7
10		11.8	11.7	11.6	11.6	11.7	11.6	11.7	11.7	11.7	11.7
11		11.9	11.7	11.5	11.6	11.6	11.6	11.6	11.7	11.6	11.7
12		11.8	11.7	11.6	11.7	11.7	11.6	11.7	11.7	11.7	11.7
13		11.8	11.7	11.6	11.6	11.7	11.7	11.7	11.7	11.7	11.7
14		11.8	11.7	11.6	11.6	11.7	11.6	11.7	11.7	11.7	11.7
15		11.9	11.7	11.6	11.6	11.7	11.7	11.7	11.7	11.7	11.7
16		11.9	11.8	11.7	11.7	11.7	11.7	11.8	11.7	11.7	11.7
17			11.8	11.7	11.6	11.8	11.8	11.8	11.7	11.8	11.8
18			11.8	11.8	11.7	11.8	11.8	11.8	11.8	11.8	11.8
19			11.9	11.8	11.7	11.8	11.8	11.8	11.8	11.8	11.8
20			11.9	11.8	11.7	11.8	11.8	11.8	11.8	11.8	11.8
21			11.9	11.8	11.7	11.9	11.9	11.9	11.9	11.9	11.9
22			11.9	11.9	11.8	11.9	11.9	11.9	11.9	11.9	11.9
23			11.9	11.9	11.8	11.9	11.9	11.9	11.9	11.9	11.9
24			11.9	11.9	11.8	11.9	11.9	11.9	11.9	11.9	11.9
25			11.9	11.9	11.8	11.9	11.9	11.9	11.9	11.9	11.9
26			12.0	11.9	11.8	11.9	11.9	11.9	11.9	11.9	11.9
27				11.9	11.8	11.9	11.9	11.9	11.9	11.9	11.9
28				11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9
29				11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9
30 & over				11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9

<sup>a</sup> Rounded up to nearest whole year.

Table S-41. Average creditable<sup>a</sup> compensation per service month during 2001

Years of service <sup>b</sup>	Tier 1	Tier 2
0	\$2,790	\$2,758
1	3,093	3,024
2	3,403	3,306
3	3,671	3,575
4	3,967	3,804
5	4,068	3,887
6	4,305	4,050
7	4,349	4,074
8	4,215	3,947
9	4,138	3,903
10	4,168	3,900
11	4,304	4,019
12	4,392	4,055
13	4,387	4,060
14	4,367	4,013
15	4,423	4,048
16	4,417	4,071
17	4,438	4,083
18	4,337	4,018
19	4,335	4,025
20	4,480	4,132
21	4,496	4,150
22	4,611	4,225
23	4,720	4,289
24	4,693	4,279
25	4,726	4,304
26	4,701	4,274
27	4,787	4,321
28	4,912	4,378
29	4,892	4,367
30	4,922	4,390

<sup>a</sup> Maximum creditable annual compensation during 2001 was \$80,400 and \$59,700 for tier 1 and tier 2, respectively.

<sup>b</sup> Completed service at beginning of year rounded up to nearest whole year.

Table S-42. Age distribution of new entrants during calendar years 1997-2000 and comparison with assumptions of the 21st valuation

Age at entry <sup>a</sup>	Year of entry					21st Val. 1994-97
	1997	1998	1999	2000	1997-00 <sup>b</sup>	
All ages						
Number	16,579	23,753	15,226	14,541	70,099	56,066
Percent	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Under 20	3.5%	3.3%	3.4%	3.4%	3.4%	4.2%
20-24	21.6	21.3	20.0	20.9	21.0	22.7
25-29	24.3	23.7	21.3	20.5	22.6	23.6
30-34	18.1	17.6	17.6	17.0	17.6	18.6
35-39	14.1	14.8	14.7	14.0	14.4	13.3
40-44	9.4	9.8	11.5	11.2	10.3	8.8
45-49	5.3	5.6	6.6	7.1	6.1	8.8
50-54	2.5	2.6	3.1	3.5	2.9	0.0
55 & over	1.2	1.3	1.9	2.3	1.6	0.0
Average age at entry	31.3	31.6	32.4	32.6	31.9	31.1
Median age at entry	29.6	29.9	30.8	30.8	30.2	29.4

<sup>a</sup> Age attained in the year of entry (year of entry minus year of birth).

<sup>b</sup> Used in 22nd valuation.

Table S-43. Family characteristics of railroad employees who died in 1997-2000 with a current connection

Age of employee <sup>a</sup>	Number of deaths <sup>b</sup>	Percent married								
		Total	Widow age 62 & over	Widow age 60-61	Widow under age 60	Widow under 60 with eligible child			Percent with eligible child	
						Youngest child under 16	Youngest child age 16-17	Youngest child disabled	Minor child	Disabled child
Under 35	9	66.7	-	-	66.7	55.6	-	-	77.8	-
35 - 39	43	72.1	-	-	72.1	60.5	-	-	86.0	2.3
40 - 44	265	72.8	-	-	72.8	52.1	7.2	0.4	75.1	0.4
45 - 49	598	67.6	-	-	67.6	31.9	8.2	0.8	53.0	2.3
50 - 54	1,058	74.5	1.6	0.7	72.2	15.0	5.5	2.2	25.2	2.8
55 - 59	1,434	72.7	3.6	2.8	66.3	6.1	2.5	1.3	10.8	2.0
60 - 64	2,067	71.5	18.6	15.6	37.3	2.4	0.9	0.9	5.1	2.1
65 - 69	4,010	71.5	53.1	7.5	10.9	0.6	0.2	0.2	1.6	1.6
70 - 74	8,439	72.1	66.2	1.9	4.0	0.3	-	0.1	0.7	1.4
75 - 79	11,773	67.8	65.6	0.7	1.5	0.1	0.1	-	0.3	1.0
80 - 84	13,546	61.4	60.4	0.3	0.7	0.1	-	-	0.2	0.9
85 - 89	10,947	49.7	49.2	0.1	0.4	-	-	-	0.1	0.7
90 & over	11,107	30.7	30.3	0.1	0.3	-	-	-	0.1	0.6

Age of employee <sup>a</sup>	Average ages of widows									
	Widow age 62 & over	Widow age 60-61	Widow under age 60	Widow under 60 with eligible child			Average ages of children			Average number of minor children <sup>d</sup>
				Youngest child under 16	Youngest child age 16-17	Youngest child disabled	Youngest child under 16 <sup>c</sup>	All minor children	All disabled children	
Under 35	e	e	e	e	e	e	e	4.8	e	2.3
35 - 39	e	e	37.3	36.3	e	e	7.4	8.1	e	2.0
40 - 44	e	e	41.2	39.9	43.6	e	9.6	10.6	e	2.0
45 - 49	e	e	44.9	42.4	46.4	e	10.1	11.7	21.4	1.7
50 - 54	66.2	60.6	49.3	46.0	47.3	49.5	11.3	11.6	24.1	1.5
55 - 59	65.6	60.9	53.4	48.7	50.3	53.0	11.4	12.2	27.1	1.3
60 - 64	65.2	60.9	55.9	48.2	50.1	57.2	11.5	13.3	32.1	1.3
65 - 69	66.8	61.1	55.7	51.2	52.1	56.9	11.0	12.2	34.7	1.3
70 - 74	70.3	61.0	55.1	47.4	e	58.1	11.7	12.8	37.8	1.3
75 - 79	74.4	61.0	54.3	43.6	e	e	11.6	12.0	42.5	1.4
80 - 84	78.4	61.0	53.9	50.2	e	e	10.5	11.4	46.2	1.1
85 - 89	81.8	60.7	54.4	e	e	e	e	12.9	47.8	1.6
90 & over	85.7	60.8	53.1	e	e	e	e	14.4	56.0	1.3

<sup>a</sup> Age nearest birthday at time of death.

<sup>b</sup> Includes employees with 120 or more service months only.

<sup>c</sup> Includes families with widows under 60 and children under 16 only.

<sup>d</sup> Includes families with minor children only.

<sup>e</sup> Insufficient data.

Table S-44. Selected employment and benefit<sup>a</sup> statistics for 1998 and 2001

	1998	2001	Percentage change
<b>1. Membership (thousands of employees)</b>			
Average employment for the year	256	238	-7.0%
Active census, Dec. 31	289	263	-9.0
Retired, Dec. 31	324	300	-7.4
Nonretired employees with vested rights <sup>b</sup> , total			
Active census, Dec. 31	260	271	+4.2
Inactive census, Dec. 31	194	205	+5.7
	66	66	+0.0
Employees in active census with 30 or more years of service			
	36	47	+30.6
<b>2. Number of beneficiaries (thousands), Dec. 31, total<sup>c</sup></b>			
Retired employees	719	651	-9.5
Spouses	324	300	-7.4
Survivors	175	155	-11.4
	228	203	-11.0
<b>3. Average monthly benefits paid in December</b>			
Retired employees	\$1,304.08	\$1,492.49	+14.4
Spouses	507.88	565.65	+11.4
Survivors	750.24	856.54	+14.2
<b>4. Amount of monthly benefit payments for the year (millions), total</b>			
Retired employees and their spouses	\$8,158	\$8,373	+2.6
Survivors	6,110	6,310	+3.3
	2,048	2,063	+0.7
<b>5. Miscellaneous information</b>			
Tier 1 taxable payroll as a percentage of total payroll	93.6%	96.6%	
Benefit payments in year as a percentage of tier 1 taxable payroll	62.0%	63.3%	
Number of beneficiaries per 100 full-time employees	281	274	
Percentage distribution of amount of monthly benefit payments in year			
Retired employees	61.9%	63.0%	
Spouses	13.1	12.4	
Survivors	25.0	24.6	

<sup>a</sup> Includes tier 1, tier 2 and vested dual benefit payments. Excludes supplemental annuities.

<sup>b</sup> Employees with at least 10 years of total service, or 5 years of service after 1995.

<sup>c</sup> Individuals receiving more than one type of benefit (for example, an employee and a spouse benefit) are counted separately in each category but only once in total.