

CHAPTER IV

PROJECTING CONRAIL'S CAPITAL PROGRAM AND CAPITAL CHARGES

Chapter Summary. The tonnage forecast from Chapter II indicates the potential use of the Conrail system and, consequently, the requirement for capital investment in the system to carry that traffic. The capital investment program projected by CBO for Conrail is designed to maintain the quality of the Conrail system at its current level while carrying the forecast tonnage over the next decade. This capital investment, in combination with past investments and assumptions about financing and depreciation rates, determines the level of Conrail's future capital charges, including depreciation, debt installments, and interest payments. Investment in the forecast period rises steadily in the base case from \$501 million in 1986 to \$942 million in 1995. In the low case, investment grows from \$501 million in 1986 to \$712 million in 1995. Because the levels of investment projected were chosen to maintain the present quality of the Conrail system, by definition they meet the viability criteria established at the start of this analysis.

Conrail's principal use of funds, after meeting operating expenses, is investment in its physical plant. This investment in the capital stock of the corporation is financed out of current income and through long-term debt. This chapter first projects Conrail's required capital investments over the forecast period and then estimates the capital charges that result from these and past investments. Capital investments and capital charges rise steadily over the period in both the base and low cases, reflecting continuous additions to the capital stock required to maintain the current quality of the Conrail system.

CAPITAL PROGRAM

Conrail's required capital investment over the forecast period is determined by its traffic level. The size of the system, the equipment required, and the

rate of wear all depend on the expected number of tons hauled. The projections of Conrail's capital spending in this study are predicated, therefore, on the macroeconomic and traffic forecasts presented in Chapter II. Any increases or decreases in projected or assumed ton levels would require a modification of the planned capital investment program.

While the level of expected traffic is a key determinant of the required level of capital investment, the actual level of funds expended is determined also by the level of inflation. Because inflation in the base case is nearly double the rate in the low case, the difference in spending between the cases appears to be greater than the difference in tonnage would indicate. In real 1985 dollars, total capital spending (investment) in 1990 is \$597 million in the base case and \$521 million in the low case, and in 1995 is \$633 million and \$546 million, respectively.

Assumptions and General Method

The following general assumptions are used in designing the capital program for the base and low cases. First, each component of the capital stock is sized for an average level of tons over the forecast period: 192 million tons in the base case and 180 million tons in the low case. Second, while the size of the total capital stock is fixed by the expected level of traffic over the period, changes in the capital stock (the annual investment program), are adjusted for expected cyclical fluctuations in the traffic level. Third, the cost of all capital goods is assumed to rise at the same rate as the projected general level of inflation. And fourth, Conrail's capital investment program planned for 1986 is assumed to be completed.

Conrail's capital program can be separated into three general classes of investments. The **discretionary track program** is the planned replacement of rails and ties and resurfacing of the track. These investments in the track structure are in addition to routine maintenance included in operating expenses. **Additions and improvements** are investments in structures other than track such as bridges, tunnels, yards, terminals, computers, and communications and signaling equipment. **Equipment purchases** are divided between investments in "nonrevenue" equipment such as locomotives, which do not carry revenue-producing freight, and "revenue" equipment, including freight cars and highway semitrailers, which carry Conrail's tonnage. Investment levels are projected for each of these categories as a function of the average total tons hauled over the period. Finally, projections are made of Conrail's investment in its subsidiaries, primarily for trucking equipment.

In estimating the appropriate size of the capital stock and the level of investment required to maintain it, actual units are used in some cases and expenditures are used in others. Units are used for the track program and for locomotive purchases. Projections of the track investment program are based on the actual miles of rail replaced and of track resurfaced and on the number of ties installed. Similarly, nonrevenue equipment purchases are based on the appropriate size of the locomotive fleet and the annual purchases of locomotives required to maintain it. Expenditures are used for revenue equipment and for additions and improvements. The actual breakdown of future investments in these categories to individual units was not feasible, and the level of investment is therefore projected at an aggregate expenditure level.

Discretionary Track Program

The discretionary track program is the largest category of capital spending. It includes expenditures for rail, ties, ballast, other track materials, and the labor and equipment associated with the track-laying program. Table 11 presents the discretionary track program by year for both cases.

Since the level of traffic is the key determinant of programmed track replacement, the estimates of track requirements differ somewhat between cases. In the base case, a steady-state track program geared to 192 million tons per year is adopted beginning in 1987, since traffic increases at a fairly uniform rate in this case. These expenditures are then adjusted each year for inflation to maintain investment at the real 1987 level. Although the traffic level varies during the forecast period, the total track program is designed to maintain adequate track investment given the overall level of traffic.

The 1987 steady-state track program adopted by CBO is based on a track investment program similar to the one projected for 1988 by Conrail in its June 1985 five-year outlook. The miles of rail replaced and the percentage of new rail installed will rise over the period from 1988 levels, but the increase in real costs that would result from such increases should be offset by productivity gains in the track replacement program. While these productivity gains are not explicitly calculated, it is assumed that improvements in efficiency on the order of those achieved in operating expenses (1.5 percent in the base case, and 2.0 percent in the low case) will be attained.

This same method is used in the low case but is geared to a steady-state level of 180 million tons. In this case, the investment schedule does

TABLE 11. PROJECTIONS OF CONRAIL'S CAPITAL INVESTMENT, 1986-1995
(In millions of dollars)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Base Case											
Discretionary Track	322	276	334	348	362	377	393	409	425	443	461
Additions and Improvements	142	116	134	140	146	152	158	164	171	178	185
Equipment	104	101	116	141	164	189	214	234	255	270	285
Nonrevenue	86	78	81	93	102	113	124	129	134	132	130
Revenue	18	23	35	48	62	76	90	105	121	138	155
Subsidiaries	<u>6</u>	<u>8</u>	<u>8</u>	<u>9</u>	<u>9</u>	<u>9</u>	<u>10</u>	<u>10</u>	<u>11</u>	<u>11</u>	<u>11</u>
Total Current Dollars	574	501	592	638	681	727	775	817	862	902	942
Total Real 1985 Dollars	574	484	549	568	583	597	612	619	628	631	633
Low Case											
Discretionary Track	322	276	312	321	331	338	345	353	360	368	375
Additions and Improvements	142	116	113	85	128	131	134	137	140	143	146
Equipment	104	101	101	104	118	135	156	165	175	178	182
Nonrevenue	86	78	77	79	86	96	111	113	115	111	107
Revenue	18	23	24	25	32	39	45	52	60	67	75
Subsidiaries	<u>6</u>	<u>8</u>	<u>6</u>	<u>6</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>9</u>	<u>9</u>	<u>9</u>	<u>9</u>
Total Current Dollars	574	501	532	516	585	612	643	664	684	698	712
Total Real 1985 Dollars	574	483	491	463	509	521	536	542	547	547	546

SOURCE: For 1985 and 1986, Conrail; for 1987-1995, Congressional Budget Office.

NOTE: Includes Conrail and subsidiaries. Historical data for 1985.

not anticipate deferral of expenditures for track replacement during the recession, so that overinvestment occurs early in the forecast period. The 1987 level of track investment is based on expenditures for the track program in the 1984-1986 period. As in the base case, an implicit rate of productivity growth allows for an increase in the percentage of new rail installed over the period.

Additions and Improvements

The investments included in this category are more discretionary, as a class, than other elements of the capital program, and tend to be judged more strictly on their return on investment. As a result, they may be easily and properly deferred when the cost of funds rises or the availability of funds from cash flow drops.

The method used to estimate additions and improvements differs slightly for each case. In the base case, the 1987 level is the average of the 1985 and 1986 investment levels adjusted for inflation. This amount increases at the rate of inflation over the remainder of the forecast period. In the low case, the level of investment drops from 1986 to 1987 in proportion to the decline in tonnage. At the trough of the recession in 1988, additions and improvements are further reduced by 25 percent from the 1987 level. Beginning in 1989 and continuing through 1995, these investments return to their real trend level (see Table 11).

Equipment

Equipment expenditures are a function of the expected traffic level, since the required size of the equipment fleet is determined by the average annual tonnage over the forecast period. Annual investment in equipment to maintain the required fleet size is calculated for each case based on an average annual purchase rate. Actual investment in each year differs from this rate according to expected macroeconomic conditions, but the average investment over the forecast period is sufficient to maintain an adequate fleet size. Table 11 presents investment in both revenue and nonrevenue equipment for both cases.

In the base case, most equipment purchases are for nonrevenue equipment, primarily locomotives, until the last few years of the forecast period. The investment program for locomotives is designed to maintain a fleet that is equivalent to a 1986 level of 2,000 locomotives. For every two locomotives entering the fleet, however, three are retired, since the new locomotives are more powerful. As a result, and by assuming a 20-year

economic life for each locomotive, the rate of investment (an average annual purchase of 66 locomotives) would yield a fleet size of 1,320 on a steady-state basis and a total purchase of 660 locomotives over the 10-year forecast period.

Revenue equipment such as freight cars and highway trailers is currently in surplus on the Conrail system and should remain so for the early years of the forecast period. Investment in revenue equipment therefore begins at the relatively low 1986 level and is increased each year by \$11 million plus inflation. By 1994, the investment in revenue equipment exceeds that in locomotives. This trend should continue beyond the forecast period, since the required rate of investment in revenue equipment will grow as the revenue fleet ages and the rate of retirements increases.

In the low case, the rate of investment in locomotives is designed to yield a 1986 equivalent of 1,800 locomotives, or 1,200 on a steady-state basis with newer equipment. During the 1987-1988 recession, spending is held below the steady-state level. Investment is accelerated in the recovery period, however, so that a total of 600 locomotives are purchased over the forecast period.

Expenditures for revenue equipment in this case are held at the real 1986 level for the duration of the recession. Beginning in 1989, investment is increased annually by \$6 million plus inflation. The rate of investment in revenue equipment is lower in this case because the total tonnage hauled over the period is approximately 7 percent less than in the base case (holding steady in the 1990s at about 180 million tons per year), and because the inflation rate is about half that in the base case.

Investment in subsidiaries such as Pennsylvania Truck Lines is primarily for equipment, such as semitrailers. In the base case, investment is held constant in real terms at the 1986 level. In the low case, the lower spending level of the 1984-1985 period is maintained in the recession. In 1989, spending returns to the 1986 level and increases with inflation thereafter.

CAPITAL CHARGES

Conrail's capital investment program is financed internally from current income and externally from the issuance of debt. After net operating income, depreciation is the principal internal source of funds. External financing can be in the form of capitalized long-term leases or long-term

debt. This section examines each of these sources and projects them based on Conrail's existing obligations and the capital programs outlined above.

Assumptions

The following assumptions were made in forecasting the financing of capital investment. First, all equipment and subsidiary investment is externally financed, while all additions and improvements and the discretionary track program are internally financed. This simplifying assumption is made to be roughly consistent with current practice within Conrail. Second, the external financing rate is one percentage point less than the rate on three-month Treasury bills in the relevant CBO macroeconomic forecast. The very low interest rate used here reflects the fact that the equipment financed externally is leased. Under these leasing arrangements, the lessee company realizes substantial tax benefits that allow the imputed interest rate calculated by discounting future lease payments to fall dramatically. The assumption used in this analysis, in fact, is a conservative one--many analysts foresee an effective interest rate two or more points below the Treasury bill rate. The cost to the government of these tax arrangements is not calculated in this report. Third, the half-year convention is used to calculate depreciation, debt installments, and interest payments.^{1/}

Depreciation

Depreciation is an annual charge a firm includes in its operating expenses for the consumption of part of its capital stock in producing output--an internal charge of the corporation for the use and deterioration of its own capital goods. The total cash flow obtained from operations is net operating income plus the amount of operating revenue that accrues to cover the depreciation portion of operating expenses.

CBO's calculations of depreciation charges for each category of capital goods (track, additions and improvements, and equipment) are based on Conrail's existing capital stock at the end of 1985 and on the net changes to that stock from yearly investments. The investment program in both the base and low cases therefore directly determines the value of future depreciation charges. The annual depreciation rates used in these calculations are 2.2 percent for track, 3.0 percent for additions and improvements, and 8.0 percent for equipment, as assumed by Conrail (see Tables 12 and 13).

1. Under the half-year convention, all equipment acquisitions, debts, and debt repayments occur in the middle of the fiscal year.

TABLE 12. PROJECTIONS OF CONRAIL'S CAPITAL CHARGES, 1986-1995: BASE CASE
(In millions of current dollars)

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
CBO Three-Month T-Bill Rate	0.068	0.067	0.064	0.061	0.057	0.054	0.054	0.054	0.054	0.054
Financing Rate	0.058	0.057	0.054	0.051	0.047	0.044	0.044	0.044	0.044	0.044
Total Depreciation	232	229	230	240	252	267	281	297	315	336
Discretionary Track	62	68	73	80	87	95	102	110	118	127
Additions and Improvements	31	31	33	35	38	41	45	48	51	55
Equipment	139	130	124	125	127	131	134	139	146	154
Total Debt Installments	126	116	113	119	126	135	151	160	163	175
Previous Debt	126	104	92	87	82	77	77	69	54	47
New Investment Debt	<u>a/</u>	12	21	32	44	58	74	91	109	128
Total Interest	80	84	80	79	78	78	78	77	80	82
Interest on Previous Debt	80	74	64	56	48	41	34	26	21	16
Interest on New Debt	<u>b/</u>	10	16	23	30	37	44	51	59	66

SOURCE: For 1986, Conrail; for 1987-1995, Congressional Budget Office.

NOTE: Includes Conrail and subsidiaries.

- a. Conrail's 1986 investment program includes new and previous debt installments.
- b. Conrail's 1986 investment program includes new and previous interest payments.

TABLE 13. PROJECTIONS OF CONRAIL'S CAPITAL CHARGES, 1986-1995: LOW CASE
(In millions of current dollars)

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
CBO Three-Month T-Bill Rate	0.076	0.077	0.059	0.056	0.049	0.043	0.043	0.043	0.043	0.043
Financing Rate	0.066	0.067	0.049	0.046	0.039	0.033	0.033	0.033	0.033	0.033
Total Depreciation	232	229	225	231	238	247	256	266	278	291
Discretionary Track	62	68	72	79	86	92	99	106	113	120
Additions and Improvements	31	31	32	33	35	38	40	43	46	49
Equipment	139	130	121	119	117	117	117	117	119	122
Total Debt Installments	126	115	111	113	117	123	134	138	135	141
Previous Debt	126	104	92	87	82	77	77	69	54	47
New Investment Debt	a/	11	19	26	35	46	57	69	81	94
Total Interest	80	85	80	76	72	69	65	60	58	55
Interest on Previous Debt	80	74	64	56	48	41	34	26	21	16
Interest on New Debt	b/	11	16	20	24	28	31	34	37	39

SOURCE: For 1986, Conrail; for 1987-1995, Congressional Budget Office.

NOTE: Includes Conrail and subsidiaries.

- a. Conrail's 1986 investment program includes new and previous debt installments.
- b. Conrail's 1986 investment program includes new and previous interest payments.

In the base case, the combined depreciation charges for track and for additions and improvements double by 1995. Equipment depreciation grows only slightly as additions to the capital stock are offset by the expiration of the depreciable lives (though not the useful lives) of previous investments.

The lower depreciation charges on track and on additions and improvements in the low case are a result of that case's smaller investment program and lower inflation. Equipment depreciation drops in this case, since the depreciation on the additions to the capital stock are more than offset by the expiration of depreciation on previous investments.

Debt Installments and Interest Payments

External financing consists of long-term debt obligations and capitalized long-term leases--that is, a firm may either borrow to purchase its capital goods, or may lease its equipment from others. The choice of leasing versus debt is generally one of tax consequences. In the absence of expected tax liabilities, leasing would generally be chosen and vice versa. The effect on required capital expenditures is approximately the same in both cases, though the effective interest rate will be lower through leasing. This study assumes that equipment is leased throughout the forecast period, and the financing rate reflects this assumption.

Capital charges arising from the financing of equipment and subsidiary investments include both principal payments to retire the current portion of the debt and the interest payments on the outstanding debt. The schedule of payments and interest for the debt existing as of the end of 1985 was provided by Conrail. Applying the assumed financing rate and a term of 15 years, debt and interest payments are calculated on the additions to the capital stock from the investment program in each case, and are added to these schedules to produce total debt and interest payments for each year.

In the base case, principal payments first dip and then rise as the steady rate of equipment investment increases the outstanding level of debt (see Table 12). Interest payments remain essentially constant, however, since the interest rates on new debt are lower than those on debt being retired. In the low case, principal payments dip and remain below the 1986 level until 1992 because of the restrained level of new investment during and after the recession (see Table 13). Interest payments decline steadily after 1987 because both debt levels and interest rates are lower than in the base case.

The capital programs projected here are designed to fulfill the capital needs generated by the predicted traffic in each case. For an average tonnage of 192 million tons in the base case, capital investment ranges from \$501 million in 1986 to \$942 million in 1995. According to CBO's projections, in 1995 Conrail will accrue depreciation charges of \$336 million and incur debt payments of \$175 million toward the financing of this capital program. In the low case, capital investment reflects the decrease in the ton level to 180 million tons, and ranges from \$501 million to \$712 million over the forecast period. The depreciation charges rise to \$291 million in 1995, and the debt payments incurred are \$141 million by that year.

In order to carry this traffic and maintain the quality of its capital stock, Conrail must be able to finance these required capital programs. Projections for Conrail's capital expenditures are incorporated into the cash flow analysis in the next chapter.

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