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E(81)63

12 June 1981

COPY NO 57

CABINET

MINISTERIAL COMMITTEE ON ECONOMIC STRATEGY

CENTRAL POLICY REVIEW STAFF'S REVIEW OF
BRITISH RAIL'S COMMERCIAL BUSINESSES
AND ELECTRIFICATION PROPOSALS

Note by the Secretaries

Attached is the Central Policy Review Staff's Review of British Rail's Commercial Businesses and Electrification Proposals as requested by the Committee at its meeting on 14 April 1981 (E(81)15th Conclusions).

Signed ROBERT ARMSTRONG
P Le CHEMINANT
D J L MOORE

Cabinet Office
12 June 1981

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CPRS REVIEW OF BRITISH RAIL'S COMMERCIAL BUSINESSES AND ELECTRIFICATION PROPOSALS

SUMMARY

With the help of the Department of Transport and external consultants, the CPRS has undertaken a review of the prospects of BR's commercial businesses and electrification proposals. We conclude that, within the plans at present announced by BR,

a) Inter-City is most unlikely to meet its current commercial target;

b) freight services will make continuing losses at least until 1985.

2. It now appears that the financial results of the Inter-City and freight businesses will be around £100m worse in each year to 1985 than those given in BR's Corporate Plan. Overall the Plan figures were already about £50m worse than those in the last Expenditure White Paper (Cmnd 8175). Major decisions about the future of the railway are therefore required.

3. On the assumption that Ministers will want to try to avoid this additional public expenditure, we recommend:-

a) immediate reductions should be made to the frequency of Inter-City services;

b) in the medium term, plans should be implemented to redefine Inter-City services to form a commercially viable core: the remaining services should be operated under new criteria including lower standards where these would improve the financial performance;

c) freight should be reduced primarily to train load services, concentrating on bulk commodities.

4. Whilst we are satsified that there are positive benefits from some selective electrification, uncertainties about the size of the commercially viable network and also about energy costs are such that the Government should not be committed to an extensive electrification network programme. Instead, BR should be invited to submit electrification proposals for approval on a route-by-route basis, to cover ten years ahead.

5. Despite the limited time available, the remit has been tackled in depth. Parts of the report are inevitably technical, and readers may choose to concentrate attention on Section 6, which discusses the policy options.

Section 1

Introduction

On April 14 1981 the CPRS was invited by the Secretary of State for Transport to examine the prospects of the commercial businesses of British Rail with particular reference to the Electrification Report. The specification, agreed in subsequent correspondence, laid down that the study:

a) should be confined to the commercial businesses ie Inter-City passenger services and freight;

b) should establish the basis for assessing commercial viability;

c) should determine how far the commercial services meet and are likely to meet these criteria;

d) should consider what choices are open where the criteria are not met; and

e) should determine to what extent these choices would affect the case for further electrification.

2. The study has been undertaken with data and other supporting analysis provided solely by the Department of Transport. We were requested not to seek material or comments from elsewhere and, in the interests of speed and security, not to consult British Rail. We employed Coopers & Lybrand Associates as consultants because of their expertise in the transport field. We have drawn extensively on their report, which, though not for publication, contains much detailed analysis of value for any further work.

Background

3. The joint Department of Transport and British Railways Board Group published their final report 'Review of Main Line Electrification' in December 1980. The group analysed a number of options of extending electrification and concluded that the major programmes were financially attractive, giving a rate of return of around 11%. The Secretary of State for Transport has subsequently recommended a staged approach based on the fast version of Option III (IIIF). By adding 2000 miles,

42% of the present network would be electrified under this option; 75% of passenger miles would be undertaken by trains with electric traction at net capital costs of £570m (1979 prices).

4. The review was based on the assumption that the main commercial business of the railways, which would benefit most from electrification, would remain broadly at their present size and form. Moreover, financial performance would be improved by greater efficiency and adaptation to the market, thereby increasing traffic at higher real fare levels. It is the purpose of this CPRS review to appraise these fundamental assumptions.

5. This CPRS study concentrates exclusively on the commercial businesses. We have not considered the future of the so-called 'social railway', that is south east commuter services, PTE services* and other provincial services including rural branch lines. Because these services are not expected to cover their full costs they are already subsidised heavily by grants.

6. Passenger services are operated under a Government directive issued after the 1974 Railways Act that:

> 'the British Railways Board shall from 1 January 1975 operate its railway passenger business so as to provide a public service which is comparable generally with that provided by the Board at present'.

However the Act itself did not distinguish those parts of the passenger network which were expected to be run on commercial principles. Instead there was a general presumption that Inter-City services would cover their costs and it was subsequently decided to set specific targets. In March 1980 the Minister announced that he endorsed the Board's interim financial target, expressed as the contribution to the indirect costs of the railway to be achieved in 1982. It was also agreed that progress towards meeting this target would be set out in the Board's annual report.

*Passenger Transport Executive services comprise connurbation services outside [illegible]

7. The 1974 Act made no provision for support to the rail freight business. In March 1980 an interim target was set in terms of meeting its direct expenses and covering 66% of depreciation costs by 1982. The ultimate target of achieving full commercial viability remains; that is to cover all avoidable costs, full depreciation plus a return on capital employed.

8. As we have not examined the future financial prospects for the social railway, we are not able to give a view on the overall financial prospect for British Rail, in particular on the need for external financing. However the Department of Transport's latest forecasts indicate that there is little prospect of the commercial businesses meeting their targets in the foreseeable future. The result inevitably is that, unless major improvements are made to operating performance, British Rail will require a much higher level of subsidy than hitherto suggested by the British Railways Board or by the Department of Transport. Moreover, although BR has succeeded to date in operating within its financial limits, this has been achieved in part at the expense of essential maintenance and replacement of track and signalling. However if the present infrastructure is to be maintained intact, a considerable increase in investment will be necessary from now on.

Section 2

Criteria for Commercial Viability

There is no simple test to determine whether Inter-City services and freight are commercially viable. A large proportion, around 46%, of the total costs of the railway system are classified as joint; that is the facilities (including administration) are shared by a number of services. It is only by somewhat arbitrary rules that costs can be apportioned to particular services, even though a substantial part of these costs would be avoided if particular groups of services did not exist and should therefore be counted as the costs of those services. The difficulty is in quantifying this.

2. British Rail's present accounting system provides adequate analysis of the budgeted direct operating costs of train services. The relative performance of services can be measured only approximately by their ability to cover direct costs and to make a contribution to indirect costs.

3. The major problem lies in the allocation of indirect costs. In August 1980 the British Railways Board completed its long awaited 'Avoidable Costs Study' which was expected to cast new light on the problem. The technique was to break the railway into six sectors (Inter-City, London and Southeast services, PTE services, other provincial services, freight and parcels) and pose the question: 'If one of these had not existed, what savings in costs would have been achieved in running the other five sectors as before?' On this basis the Board found that the avoidable track and administration costs attributed to Inter-City were 8.6% of passenger joint costs.

4. However the Department of Transport are very sceptical of this approach because, for example, 32% of all costs remain unallocated throughout the process and while Inter-City services cover 10,285 miles of track only 945 miles were specifically allocated to that business. We agree that an 8.6% share of joint costs is too low. The BR Study has not helped in establishing a basis for assessing commercial viability.

5. As a start, Inter-City should cover:-

a) its own direct costs (rolling stock, fuel, train staff etc);

b) a return on the specific capital employed;

c) the full avoidable indirect costs eg track and administration costs which would not be incurred if the sector did not exist.

However even if all parts of the railway achieved such a minimum target, there would still be a significant balance of joint costs which would still have to be met. Whilst the most obvious possible source is a Government subsidy it is reasonable to expect Inter-City services to make some contribution. What figure that should be is a question of judgement. The higher the figure achieved by Inter-City, the less the required subsidy to maintain the network as a whole, and the lower the figure achieved, the greater the required subsidy.

6. In 1979 the Department of Transport and British Rail agreed a planning target, which though derived systematically, contains an inevitable element of judgement. For Inter-City the target was defined as a 25% share of 'passenger joint costs'.* (This can be compared against the 8.6% share mentioned in Para above.) We cannot say whether this target is sufficient in absolute terms. But it has the merit that it has been agreed as being reasonable by both the Department of Transport and the British Railways Board. We use it in the following section as a benchmark by which to appraise the effects of revised projections of traffic and costs.

*The contribution to 'passenger joint costs' is derived after providing for direct costs, current cost depreciation, the net cost of train catering, which BR considers a necessary promotional expense, and the RRR of 5% on new investment.

Section 3

The Prospects for Inter City Services

Financial Performance 1981-86

As discussed in Section two, the established target is that Inter-City passenger services should cover their direct train working expenses and contribute 25% of passenger indirect costs. However the recent record is not encouraging: in 1980 this contribution fell in real terms to 12%. Against performance to date, British Rail forecasts appear over-optimistic: the 1980 Corporate Plan predicts a contribution of 17% in 1981 rising to 21% by 1983 and staying at that rate to 1985. This forecast, though well short of the 25% target, is unlikely to be fulfilled.

2. In the course of our study we examined the assumptions behind BR's projections and the Department of Transport has supplied new forecasts based on fresh analysis and recent trading experience. These indicate a significantly worse financial performance to 1986. Taking account only of BR's current plans the contribution to joint costs is now expected to be only 10% in 1981, to rise to 13% in 1983 and then to fall again to 11% in 1986. This shortfall against target amounts to £115m (in 1980 prices) in 1986. The details are summarised in 1980 prices in the table below.

Table 1: Inter City Forecast Financial Performance

(£'m 1980 prices)

	1980	1981	1982	1983	1984	1985	1986
Receipts	462	452	456	460	464	469	474
Direct Costs	292	296	291	276	283	291	296
Gross Contribution	170	156	165	184	181	178	178
Current Cost Depreciation	61	62	62	62	63	64	66
Interest	13	14	13	13	16	18	19
Train Catering Loss	6	6	6	6	6	6	6
Net Contribution	90	74	84	103	96	90	87
Contribution as % of total passenger joint costs	12	10	11	13	12	11	11

Inter-City Traffic and Revenue

3. Inter-City passenger traffic expanded during the 1970s but in an unsta... fashion. Different figures for the average rate of growth can be derived acco... ing to the actual years chosen. For example, between 1968 and 1979, the avera... was 2.8% per annum whilst between 1970 and 1980 the average was only 1.3%. T... apparent variability makes it extremely difficult to predict future growth of demand over the medium term.

4. BR in its Passenger Business Strategy Study predicted an increase of ... of 20% between 1976 and 1991 which was derived by extrapolating the trend aver... growth of around 1.2% per annum. The new analysis of past trends and future prospects by the Department of Transport has resulted in significantly lower ... casts, giving an increase of traffic of under 1% pa up to 1986.

5. The key assumptions on which the revised forecasts are based are:-

a) A decline in passenger miles of about 4% in 1981 compared with 19... combined with an effective real price rise of just under 2%.

b) An assumed growth in economic activity which will generate a growt... in consumer spending of 1.5% per annum. On the basis of the respon... of demand to changes in income (income elasticity of 0.25) this im... a growth in constant price demand of 1.8% over the five years 198...

c) An assumed increase in fares of 1% per annum in real terms which wo... combined with a fares elasticity of -0.8 increases revenue by 1% an... reduces demand by 4%.

d) The net effect of speed improvements on overall demand following th... introduction of the final HST sets and the Board's proposed frequen... reductions will be broadly neutral.

e) An 'exogenous trend' in favour of increased Inter-City travel of 0.4... per year.

6. The main differences between this and the central forecasts in the Electrification Report are:-

a) Lower demand for 1981, giving a lower base for the forecast.

b) For the shorter term, the 1% pa 'exogenous' growth in traffic is revised down to 0.4% pa.

c) The fares elasticity of demand is changed from -0.65 to -0.8 thus reducing the potential for increasing total revenue by raising fares.

7. In general we accept the Department's estimates though with one reservation. We would prefer to use a fares elasticity of unity (implying that revenue cannot be increased simply by real fare increases). This would more realistically reflect longer term competition from alternative transport modes, in particular increased competition from express coaches. This changed assumption would reduce the revenue estimate in 1986 by 1.3%.

8. The main factor influencing Inter-City travel is competition from the private car. Rising consumer income would increase the demand for rail travel but, at the same time, it could bring about a rise in car ownership which causes the demand for rail travel to fall. Business travel is relatively insensitive to increasing car ownership. It is lower-priced leisure journeys which are most sensitive to the effect of increasing car ownership.

9. It is difficult to be certain about future demand. We broadly accept the Department's demand estimates, though observe that this results in traffic growth significantly lower than in the 1970s, and might be a little pessimistic.

10. Inter-City costs to 1986

British Rail's total costs per passenger loaded train mile rose by an average of 2.6% per annum in real terms between 1977 and 1979, and this rise applied to both direct and overhead costs. The Department of Transport, which exposed this development, have not secured from BR a full explanation for these increases in particular in so far as they apply to rolling stock maintenance and infrastructure (track and signalling).

11. Despite this poor record BR's latest Corporate Plan forecasts that this rising cost trend will be reversed between 1980 and 1985. Total costs per passenger loaded train mile are predicted to drop by an average of 0.7% per annum over the Plan period. All direct and indirect costs are expected to fall, except for infrastructure costs which will rise by 4.7% over the period. Again neither the Plan nor BR's subsequent work adequately explain this rise, although it may be partly due to rising investment in modern signalling.

12. The Corporate Plan assumes generally that BR wages will rise in step with GDP, except that there will be additional real increases of 2% in the years 1981 and 1985 to be financed by productivity improvements. If BR fail to achieve these productivity gains, which is partly assumed in our analysis, then we should not expect the additional 2% a year to be paid. If that happened there would be a reduction in Inter-City's direct costs by 1985 and a £5m reduction in its net contribution as a result of the fall in indirect costs.

13. Total BR administration and general costs are intended to be cut by 14% per loaded train mile, based on a reduction of 21% in administration staff and an 11% reduction in other costs. The forecast reduction in administration staff is much greater than in the past, but BR already have union agreement for withdrawal of 1,500 jobs in 1981, and the rate of withdrawal to 1983 is consistent with the projected manpower savings for the period.

14. Passenger train direct expenses are forecast to fall by 1.7% per loaded train mile from 1980 to 1985, partly because it is assumed that single manning will be accepted for drivers of over 100 mph trains.

15. These cost forecasts are acceptable provided the very substantial improvements in productivity required can be obtained. However, there must be reservations both because BR's record of productivity improvement during the 1970s was poor and because of the rising cost trend observed between 1977 and 1979. Appreciable cost reductions and the validity of the forecasts depend on determined management action.

16. Conclusions on Inter-City Prospects to 1986

The forecasts in Table 1 assume no change to services beyond those already agreed by BR for 1982: further developments are discussed in Section 6 below. In our view the Department may have now underestimated the underlying trend growth in demand slightly, though this is offset by our view that the fares elasticity is higher. Our greatest reservation, which makes us more pessimistic than the Department, is the extent to which their forecasts depend on securing productivity improvements. Thus while overall it seems reasonable to estimate that on the basis of existing plans, Inter-City will achieve not more than 11-12% of passenger joint costs in 1986 compared with a target of 25%, achieving even that target depends on very substantial management action.*

17. Longer Term Prospects

The longer term prospects depend upon movements in demand, real fares and costs. The external consultants prepared a range of estimates starting from the forecasts described above. With their most optimistic assumption, traffic growth of 2% per annum, and real cost increases of ½% per annum, the 25% target is just achieved in the year 2000. With their most pessimistic assumption, traffic growth of ½% per annum, combined with cost increases of 1½% per annum, the contribution steadily falls until by the year 2000 only 4% of passenger indirect expenses are covered.

18. We consider on the basis of the information supplied to us about past trends in Inter-City traffic and costs, that these two possible outcomes could reasonably be taken to represent the outer bounds of the range within which the final outcome is likely to fall. The most likely outcome seems to us to be a growth in traffic of 1% per annum with costs held constant or rising by up to 1% per annum. Given no changes in BR policies beyond those already agreed for 1982, this would imply a contribution in 1990 of between 11% and 14% with the further possibility of a contribution of between 11% and 20% by the year 2000. This provides a level of prospective performance against which changes in policy can be judged. Obviously such changes will be necessary.

* The Department considers that substantial further service reductions are possible but, as these are not in BR's current plans, we have treated them as policy option B in Section 6.

19. On the basis of the existing structure of the Inter-City sector, there would seem to be little prospect of achieving the present test of commercial viability. However a more detailed analysis would almost certainly show that some routes within the existing network are now meeting the target and will continue to do so. We consider this further in Section 6.

Section 4

Freight

In March 1980 an interim target for the freight business was set in terms of meeting its direct expenses and avoidable indirect expenses, and covering 66% of its depreciation on a current cost basis by 1982.* This interim target is below what would be required for full commercial viability. In 1978 a figure of only 30% was achieved and since then freight business performance has declined significantly. The businness is currently moving away from its financial target; after meeting 29% of its current cost depreciation in 1979, freight made a negative contribution in 1980 when receipts failed to cover direct and indirect expenses.

2. The Board's current Corporate Plan forecasts that due to the recession the freight business will only be able to achieve a surplus equivalent to 54% of depreciation costs by 1982, a shortfall of 13% on target. But the Board are now hoping that it might be possible to meet the interim target in 1983 largely through a reduction of some 20% in costs between 1980 and 1985. This is to be achieved by a policy of concentration on train load traffic and a reduction in wagon load business. This involves reductions in staff numbers, the closure of main marshalling yards (from 35 to 9) and 350 miles of track, and the reduction of the wagon fleet from 125,000 today, to 31,000 by 1990, concentrating on air-braked wagons and encouraging the ownership of wagons by customers.

3. Summarised below are the Department of Transport's forecasts of freight tonnage to 1990. The figures for coal and coke are the same as those in BR's Corporate Plan. The estimated iron and steel traffic has been reduced by 20% and other traffic by 10%, by 1985 and somewhat more by 1990.

*This includes ancillary income which is conventionally attributed to the freight business.

Table 2: Department of Transport Forecasts of Freight Tonnage

m tonnes

Commodity	1980	1981	1985	1990
Coal and coke	94	87	89	89
Iron and steel	13	17	16	13
Other	46	42	51	52
	153	146	156	154
of which:-				
Trainload	135	129	142	144
Speedlink*	3	3	9	10
Other Wagon Load	15	14	5	0

*A system of wagon load freight movements involving modern air-braked wagons over specific routes to a fixed timetable.

4. With the consultants we have reviewed the Department's forecasts for [illegible] traffic to 1990. We have no reason to question the Board's estimate of coal [illegible] traffic to 1990. The forecasts for other traffic represent a flattening out of [illegible] declining trend but are not unreasonable given that much of the contraction has [illegible] taken place as a result of the Board's policy to restrict wagon load and sundries traffic. The vast majority of the forecast traffic is concentrated on a few bulk commodities which are well suited to movement in full train loads. The railways forecast to obtain only a small proportion of the general freight market which is highly sensitive to road competition.

5. The increases in road haulage costs resulting from the reductions in drivers' hours have enabled BR to increase charges in real terms but it is unlikely to do so from now on without loss of traffic and in turn of total revenue. The Department suggest an increase in average revenue per tonne in 1985 of about 5% above the 1982 level, this being maintained until 1990.

6. On this basis, revenue is forecast to increase from £512m (in 1981 prices) in 1980 to £524m in 1990. The details are summarised in Table 3 below.

7. The main improvement in the financial prospects for freight is to be derived by cutting costs. The Board's Corporate Plan assumes that 9,000 jobs will be lost in the freight business. The Board's subsequent plan to withdraw from old-style wagon load by 1986 will increase this figure by 1,400. There are currently about 21,000 staff employed in the freight business, so that the Board's plans involve roughly halving employment in freight with a direct cost reduction of £80 million at 1981 prices. On the basis of these productivity assumptions the Department of Transport has adjusted the Board's figures to allow for their reduced traffic forecasts and have estimated a reduction in working expenses (before depreciation and interest) of 18.7% from £561 million to £456 million (at 1981 prices) by 1985. In the view of both the Department and ourselves the staff cost and other savings assumed by the Board are extremely ambitious, and may not be achieved in full before 1990.

8. We asked the consultants to comment on the individual elements in the freight business to see whether an improved financial performance was possible. Their view in summary is as follows:-

a) There is clearly some train load traffic which can operate commercially in 1990, covering its own avoidable costs and making a contribution to joint costs but this is probably of the order of 60-80% of services presently operating, and around 80-95% of total tonnage carried.

b) Even though the working expenses of the Speedlink operations can and should be reduced, it is doubtful if overall these services will actually cover their avoidable costs. though some individual services may do so.

c) Within the train load sectors, coal and coke and to a lesser extent iron and steel and aggregates are more profitable than other train load traffic.

9. The critical issue which will determine the future of a commercially v
freight business is the extent and pace at which excess capacity can be reduce
Even when the Board has succeeded in eliminating the wagon load business, many
the services will continue to be highly marginal if the manning levels remain
one of the highest in Europe as they are at present. We have doubts about the
ability to undertake labour shedding on such a scale at least in the period to
and, therefore, consider the bottom line of the financial forecast in Table 3 to b
more realistic. This is based on achieving half the cost savings predicted by
and means that in 1985 the freight will not be earning a real return on its ne
assets.

10. If, on the other hand, wasteful practices are eliminated then the Boar
ought to be able to retain, or even increase train load traffic, particularly
customers own the wagons and are committed to rail. The size of such a viable
system in 1990 could then be up to 150m tonnes of train load traffic of which
and coke might be 75–85m tonnes.

Table 3: BR Freight – Financial Prospects – Summary

£m 1981 prices

	1979	1980	1981	1982	1985	199
Freight receipts*	587	512	489	496	530	54
Expenses	579	561	515	504	456	42
Surplus before depreciation and interest*	8	–49	–26	–8	74	12
Current cost depreciation	113	100	99	99	99	9
Surplus as a proportion of depreciation	7%	–49%	–26%	–8%	75%	13
Surplus with effects of achieving only half of estimated cost savings to 1985			–49	–36	22	10

*Excluding ancillary income which is conventionally attributed to the freight business.

Section 5

Appraisal of the Electrification Report

With the help of the exernal consultants, we examined the Final Report of the Review of Main Line Electrification. We consider that the model upon which the report was based was properly structured and, subject to the assumptions, gave accurate predictions of the returns from electrification. We accept a number of these assumptions, or are satisfied that possible changes in them would on balance have little effect on the outcome. However, we have two main reservations:–

a) We question the traffic forecasts and energy costs assumed and offer estimates of the effect of alternatives.

b) We suggest that, for decision making, a route-by-route method of appraisal is more h elpful than considering, as the Report does, the three broad network schemes in the aggregate.

2. We also considered briefly the possibilit y of reducing the capital and maintenance costs of the existing diesel traction fleets in the base case. In fact the Electrification Report takes a robust view of likely improvements to the present diesel service, proposing improved utilisation and extension of fleet life. Nevertheless there may be scope for further marginal improvements. In particular the efficiency of British Rail Engineering Ltd, where traction and rolling stock are manufactured and maintained, is important to the efficiency of BR as a whole and there is considerable scope for improvement here. In the time available we have not been able to explore what effect any changes might have on the question of electrification since improvements should apply equally to diesel and electric traction. But we suggest that this part of BR's operations warrants a detailed examination at some future point.

3. Alternative Assumptions

Our view on the assumptions in the Electrification Report has been influenced by two factors:–

a) the revised traffic forecasts derived from our study of Inter-City and freight prospects reported in Sections 3 and 4 above:

b) alternative views on future changes in energy prices.

4. In Table 4 below we identify the effects of our alternative assumptions about traffic forecasts on the benefits from electrification. For illustrative purposes we took the benefits of 'Option III fast' (which is the option in the Electrification Report favoured by the Department of Transport). The Electrification Report gives the benefits in terms of a surplus Net Present Value (NPV) of £200m (after discounting at 7%). This is consistent with an internal real rate of return of 11%*.

5. Details of the alternative assumptions on traffic levels are given in the annex. Table 4 shows that the lower passenger demand, higher fares elasticity, reduced frequency of service and lower freight traffic reduce the NPV of £200m by between £117m to £147m. These figures are approximate since it was not possible to use BR's computer model upon which the original calculations had been made and also the reduction in train miles might enable some economies to be made to the capital costs of electrification.

6. In the Electrification Report, savings in fuel costs from using electric traction accounted for about a quarter of the benefits from the electrification programmes. These benefits are sensitive to forecasts of the increases in fuel costs, in particular the differential between diesel oil and electricity. In the annex we examine alternative projections to those used in the Electrification Report. There is very considerable uncertainty associated with energy forecasts and we have selected a set of predicted prices which provide a rigorous test for electrification. If the trend of the balance between diesel oil and electricity prices turns out to be more favourable to electrification it would be possible to advance electrification schemes. By contrast, if the balance moved unfavourably it would not be possible to undo electrification schemes.

7. As shown in Table 4, the effect of revised traffic and energy assumptions is to reduce the benefits of Option IIIF from an NPV of £200m to between £23m and £51m. Given the uncertainties involved this is a significant reduction

*The lower the NPV the lower the return; a zero NPV is equivalent to a return of 7%

though it does suggest that the Option should earn a 7% rate of return. However, this is an average return and some of the schemes comprising Option IIIF may not meet that test.

Table 4: Effect of Alternative Assumptions on the NPV of Option IIIF
(in this table the estimate of each item includes the effect on it of the previous items listed)

		NPV £m
Original NPV for Option IIIF in the Electrification Report (at 7% discount rate)		200
Revised forecast of passenger traffic and Fares Elasticities	- 30	
Reduced frequency of passenger services	- 52	-117 to -147
Reductions in forecast freight traffic	- 35 to - 65)	
Revised energy forecast		- 32 to - 30
Total reductions to NPV		-149 to -177
Revised NPV of Option IIIF		51 to 23

8. Programme Versus Route-by-Route Appraisal

The Electrification Report examined three alternative electrified networks and compared them with the base case (essentially the present network). The options contained successively more of the total route networks. The Report showed that the average rate of return increased with the larger options. This is a little surprising because one would expect the best routes to be included in the smaller options so that as more routes are added the average return falls. The Department argues that this feature occurs because of 'network benefits' which arise from the joint use of electrified track by two or more services and because the longer programmes take advantage of cost-reductions which occur in the more distant future.

9. The Department goes on to argue that further benefits arise from a long term commitment to an extensive electrification programme. For example, there are economies to be obtained from continuity of construction, benefits from the extensive development and construction of rolling stock and, moreover, the optimum planning of replacement equipment is made possible.

10. The returns calculated in the Electrification Report were not for individual schemes but for the broad options comprising many schemes. It was not possible in the time to work out the returns on separate schemes or to assess the value of the 'network benefits'. Even if the 'network benefits' were high, there are good reasons for not approving the broad options in their entirety, for example:-

a) The uncertainties, particularly on energy prices, make it sensible to approve first those schemes which offer a satisfactory rate of return on the basis of a small divergence between diesel oil and electricity prices, adding other schemes later if justified by subsequent changes in energy prices and greater clarity of future trends.

b) Within the broad options presented in the Electrification Report there may be some schemes which offer returns more favourable than average and other less favourable than average: now that the NPV for Option IIIF overall has been shown to be lower, it suggests that Option III includes some schemes which would not achieve a 7% rate of return.

c) On the timetable presented in the Electrification Report, some of the 'network benefits' may be deferred by pursuing separate electrification schemes simultaneously in different parts of the country; whereas concentrating on one route at a time, eg the East Coast main line, could offer better returns.

11. In the light of these points, we suggest that the Board should be invited to prepare a detailed programme of work, to cover a period ahead of, say, 10 years. Such investment would be considered in the context of the annual Investment and Financing Review and would depend upon the total claims for finance and prospects for improved performance. Within the work programme, projects would be ranked by their respective returns. In view of BR's record, it will be important to examine the details of the capital cost estimates and control the phasing and completion of the schemes. The programme need not be

based solely on the commercial network since cost savings may also justify the electrification of some non-commercial services, provided these have a sufficiently firm long term future. The schedule should be expressed to illustrate the additional benefits which accrue as the electrified network is increased in size. It is accepted that a possible weakness of this approach is that routes which generate the largest 'network benefits' would be left until later but this would, nevertheless, ensure that underused capacity is not installed too early.

12. Conclusions

Now that we have evaluated the latest forecast for the commercial businesses, we have come to the view that the benefits of the various options are a good deal less than previously claimed. The net benefits are positive and should justify some electrification schemes at a 7% discount rate. There is considerable uncertainty associated with the assumptions, particularly the energy forecasts. This leads us to conclude that, despite the existence of 'network benefits', proposals to electrify particular routes should be appraised separately. By way of example, the external consultants advise that there is probably a good case for starting with the electrification of the East Coast Mainline as far as Doncaster and probably to Newcastle.

Section 6

Policy Options

In the previous sections we came to the conclusions that:-

a) on the basis of the present pattern and frequency of services the Inter-City passenger business will not achieve the current financial target either in the immediate future or in the longer term;

b) the freight business will not reach its financial target in the period up to 1990 and only thereafter if the present excess capacity is cut back and the traffic is confined largely to carrying bulk commodities in train loads;

c) essential maintenance on track and signalling has been neglected: if the present infrastructure is to be retained intact increased expenditure will be necessary;

d) the electrification of some routes should offer cost savings and revenue benefits which justify investment: however the uncertainties, especially about energy prices, are so great, it would be unwise to be committed to one of the network options outlined in the Electrification Report.

2. One result of the above is that in the period up to 1985/6 the level of subsidy for passenger services and external financing requirements will be significantly higher than previously expected. Fundamental strategic decisions on railway policy are required.

3. Inter-City Passenger Services

As we described in Section 3 the revenue forecasts are subject to uncertainties and the associated operating cost forecasts are largely dependent on BR management's ability to secure cost reductions. We offer the following options for consideration, recognising that they would be difficult to implement because of resistance by consumers, trades unions and possibly management.

4. OPTION A: Increase the Subsidy

It was pointed out in Section 2 that the present target for Inter-City incorporates a measure of judgement. The government could decide that whilst a target is desirable to motivate management and workforce there is no point in continuing with a target of 25% which seems plainly unattainable and it should be set at a lower level, for example 15%.

5. However this would have one of a number of consequences, because additional funding would still be required: either

a) the government would be expected to increase the level of the subsidy (for example, a 15% target if achieved would be consistent with just under £100m extra grant in 1981 prices compared with achieving the 25% target); or

b) other railway services in the non-commercial sector would have to be cut back including closures (for example rural lines or commuter services); or

c) there would be further neglect of essential maintenance and replacement leading to a crisis at some point in the future; or

d) commuter fares would be pushed higher; or

e) more likely, a combination of these.

6. This option might appear to offer a short term solution. However it does not begin to solve the fundamental problems and at best is a delaying tactic. The new target would command little respect and the reduction would tend to undermine any understanding, particularly among the workforce that hard but necessary, changes are required.

7. OPTION B: Short Term Rationalisation of Services

Our appraisal in Section 3 that Inter-City passenger services would contribute only 11% of passenger indirect costs against the target of 25% was based on the assumption that there were no changes in services and costs beyond the 12% service cuts already planned by BR for 1982. The Department of Transport think there is considerable scope to optimise services while retaining the broad

pattern of routes. This would mean fewer services and increased train loads by matching supply more closely to demand. The Department of Transport has already prepared new load factor targets which would entail a further reduction of train mileage of up to 20% If these changes were combined with a further reduction in costs, which would need to include additional manpower cuts, it is estimated that the net financial improvement could be around £40m - £45m pa by 1986, equivalent to achieving 16-17% of joint passenger costs.

8. These changes would meet union and consumer resistance, but it may be possible to secure support of the present management. However they would not be enough to enable Inter-City to meet its current 25% target.

9. OPTION C: Restructure to achieve a Viable Commercial Core

The Inter-City network could be restructured to comprise a core of commercially viable routes.* Only on these routes would a fast, high quality service be provided. In the time available we have not been able to draw up a comprehensive plan of a viable core but, by way of illustration we offer the following observations:-

a) a core system would probably comprise about ⅓rd of the present Inter-City route mileage though it would still carry about 80% of present passenger miles and serve the major population centres;

b) the core would probably include:
West Coast Main Line (already electrified)
East Coast Main Line
London - Bournemouth (already electrified)
N East/N West - West of England/S Wales
London - Norwich via Ipswich
London - Bristol/S Wales
Midland Main Line (to Nottingham, Derby, Sheffield)
London - West of England;

*The consultants, Coopers & Lybrand Associates have undertaken a considerable amount of work on methods of assessing commercial viability. They suggest a possible method for defining a commercially viable network in terms of a hierarchy of services with the prime user of each route charged for the costs which would be incurred if they were the sole user of that route. This is described in their report

c) a number of existing services would be cut, in particular many seasonal sleeper and motor-rail services: some of these at present do not cover even their direct costs;

d) many marginal routes (e.g. Plymouth - Penzance, Perth - Inverness) would continue to provide a service, very probably at a lower standard: while this may not produce substantial immediate cost savings overall, there would be cost benefits when replacement and re-investment have to be undertaken;

e) in between the best routes and the clearly uncommercial services, there is a large intermediate group (e.g. Chester-Holyhead, London-Worcester): a great deal of detailed analysis would be required to determine where to draw the boundary of the core commercial sector.

10. This policy would involve difficult political decisions. It would meet with considerable consumer and union resistance and might not be acceptable to the present management team. New criteria would be required for those services relegated to the non-commercial sector. However this option incorporates decisions which almost certainly will have to be taken at some point in the future when replacement becomes necessary against a deteriorating financial situation.

11. OPTION D: Abandon the Commercial Remit

The Government could implement a complete change of policy for passenger services, abandoning the concept of a commercial railway. There are a number of possibilities. The Government could lay down the scale, nature and standard of individual services - identifying the contribution expected from fares revenues on the one hand and grant on the other hand to achieve those objectives. Some services might be expected to cover all or most of costs: others far less. One objective might be to scale down many of the current services to provide a cheaper alternative. This approach would involve considerable intervention in the operation of BR plus commitment to increase the grant when necessary.

12. Abandoning the commercial remit at the present time could add to the current confusion without significantly resolving the fundamental problems. It would be difficult to monitor and control. This option would be practical only if clear alternative criteria could be devised (various suggestions have been made in the past e.g. "maximise passenger miles per £ of subsidy.")

Recommendations on Inter-City Passenger Services

13. The CPRS view is that the measures to rationalise the frequency of services, improve load factors and cut costs, as contained in Option B, should be implemented as soon as possible. This should improve the short term results. For the longer term, Option C offers the best possibility for containing the losses. The Department of Transport should be asked, in collaboration with BR, to prepare detailed proposals:-

a) to define a viable commercial core offering high quality services;

and b) identify the options for those services outside the core.

14. Freight

Freight services are currently incurring heavy losses. Plans already exist to shed surplus labour and to close marshalling yards. As this excess capacity is cut back, so wagon load traffic will be reduced. Train load traffic should be concentrated on those bulk commodities best suited to railway transport, primarily coal and coke, and to a lesser extent aggregates. Whether the business achieves commercial viability by 1990, covering its avoidable costs, depends upon the success of management in reducing capacity and changes in working practices. The sooner this is achieved the greater the likely size of a viable business thereafter.

15. Electrification

The analysis above shows that important decisions on railway strategy are needed before the Government authorises a major programme of electrification. If the level of services is reduced as we recommend, not only are the benefits from electrification reduced but the existing diesel rolling stock will have a longer effective life and its subsequent replacement will be on a smaller scale.

16. In considering the details of the Electrification Report, there are considerable doubts about future energy prices – in particular the differential between electricity and oil costs. The narrower the differential, the lower the benefits from electrification. Indeed the uncertainties are so great that we recommend that the Government should not commit itself now to a long term programme. Instead we suggest that the British Railways Board should be invited to prepare a detailed programme of work to cover 10 years ahead, to be considered in due course within the context of the Investment and Financing Review. Projects should be ranked by their respective returns, identifying the so-called 'network benefits' which arise as the size of the electrified network is increased. Firm Government decisions can be made when this material is available.

17. Presentation and Motivation

Railways are an emotional subject, as is demonstrated by the depth of feeling about retaining quite uneconomic rural lines in the non-commercial sector (not covered in this report). The recommendations which result from our study such as reductions in services and moves to a core network, are likely to meet severe resistance both from railwaymen at all levels and from sectors of the public. They are, however, likely to become increasingly difficult to avoid as the rising costs of continuing with the present system become even more obvious. The Railways Board has a very difficult task in motivating the industry. The CPRS attaches great importance to leadership and successful motivation in all the nationalised industries, and holds the view that this has been one of the key problem areas. We believe that firm decisions on the lines we propose, followed by the prospect of a period of stability for the commercial sector of BR would provide, once the initial shock had been absorbed, a good realistic basis for the leadership and motivation that the industry needs.

ANNEX

Details of the Revised Assumptions Used to Appraise Option IIIF in the Electrification Review

1) Forecast of Passenger Traffic

In Section 3 we considered revised forecasts of traffic and also argued for a fares elasticity of −1, compared with −.65, for the longer term. Applying these to the forecasts in the Electrification Review, traffic growth will be 5% lower to 1986 and more or less static after 1986. Real fares would be 3% higher. The overall effect would be to reduce the NPV for electrifying Option IIIF by £30m.

2) Changed Frequency of Services

The Electrification Report assumed that the frequency of passenger train services would be adjusted proportionately to demand and that off-peak frequencies would be held constant at 1979 levels. The Department of Transport has argued that there is a good case for reducing the frequency of service in both the shoulders of the peak and off-peak. A 12% reduction in peak services and 20% reduction in off-peak services reduced the NPV by £52m. A further reduction, consistent with the suggested cuts in Option B in our section 6 would reduce the NPV further, by about another £20m.

3) Reduction in Forecast Freight Traffic

The Electrification Report showed that a considerable element of benefit (£133m in Option IIIF) was due to the reduction in the direct costs of freight. If, however, freight traffic is restricted to the commercially viable core of between 100–150 tonnes (of which a high proportion would be coal and coke) much of this service would not use the electrified network. The effect of this is to reduce the NPV of Option IIIF by £35 – 65m.

4) Energy Prices

Discussions have taken place with the Department of Energy on future trends in both oil and electricity prices. There is inevitably much uncertainty about prices in the longer term and the result of our work is a wide range of possibilities.

5) For future oil prices, we worked from the forecast endorsed by the official committee under Mr Byatt which suggests for the central estimate an increase of

95% between 1978 and 1990 and a further doubling between 1990 and 2010. This is a faster rise than was assumed in the Electrification Report and is also faster than most other published forecasts. We favour the lower estimate from the Byatt report though this is still higher than the standard case used in the Electrification Report.

6) Electricity prices will be determined by the balance between coal burn and nuclear power in electricity generation and the relative costs of the two. The energy forecast in the Electrification Report had been based upon a rapid build up of nuclear stations in the 1990s which on present evidence we felt was wrong to rely on.

7) In the period up to the year 2000, the price of coal will be the main determinant of the cost of electricity and since the Electrification Report, these costs have been revised upwards to bring them in line with the world price of energy generally (on the assumption that UK coal prices would not diverge significantly from world energy prices). At the same time the Department of Energy provided at our request estimates of the effects of different rate of installation of nuclear capacity. The result of the lower rate of installation is to increase the extent to which electricity prices rise at the same time narrowing the previous differential between electricity and oil.

8) We asked the external consultants to work to a set of forecasts which were both plausible and also provided a rigorous test of the electrification proposals. They chose the low oil option with a high electricity option to the year 2000 (dependent on the price of coal) plus a constant electricity price after 2000 (resulting from cheaper electricity from nuclear power).

9) The forecasts used expressed as an index (1978 = 100) are as follows:

	1978	1980	1990	2000	2010
Oil	100	145	175	250	330
Electricity	100	102	152	227	227

10) Alternative forecasts

Most favourable combination:-					
Oil	100	145	195	295	380
Electricity	100	102	140	210	195
Least favourable combination:					
Oil	100	145	175	250	330
Electricity	100	102	152	227	297

11) These various forecasts of energy prices result in a wide range of benefits from electrification. The most favourable combination increases the benefits by £54m to be added to the original £200m in the Electrification Report. The least favourable reduces the NPV by £105m.

12) Such a range of energy prices, when combined with the other changes in the assumptions can determine whether or not Option IIIF meets the 7% rate of return. The working assumptions used by the external consultants reduce the NPV by £46m. When combined with the revised traffic forecasts above, this means that overall the NPV for Option IIIF falls to between +£23m to +£51m. The most favourable energy assumptions would increase this to +£86m to +£120m. The least favourable results in NPVs of between -£16m to +£16m.

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