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PRIME MINISTER

MAIN LINE ELECTRIFICATION OF BRITISH RAIL

1. The attached paper is a critique of the Department of Transport/British Rail Review. It is not a convincing Review. Could the critique be sent to Norman Fowler and E Committee? When I last heard, Norman Fowler had not made up his mind on the issue.

2. It is alarming to find a Review of this kind supported both by Department of Transport and the British Rail Board which has not been subject to considerable scrutiny and examination. The Review had a Steering Group which included representatives from the Treasury and the Department of Energy. Thus the Review has the implicit support of both Treasury and Energy (from the Treasury I understand that they do not intend to dispute the general findings).

3. There is a danger that proposals like this could be "rail-roaded" through the decision-making procedure. The pressure of the spending departments and the Corporations is clearly considerable and they are probably convinced of their case. What is alarming is the asymetry between the powerful case made for spending and the much weaker forces that will check such steam-roller effects. Some structural change is required to put the balance right.

Aw

1 April 1981

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1 Memo for PM
AW 3/4

MR. LANKESTER

I attach:

- i. Memo for Prime Minister on British Rail's Electrification Review.
- ii. Some Further Notes on Electrification Review.
- iii. Notes on a meeting with British Rail and Department of Transport.

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MAIN LINE ELECTRIFICATION OF BRITISH RAILWAYS

I STRATEGY

The Issue

In this Review BR/Department of Transport suggest that a strategic decision in principle needs to be taken whether the main Inter City network should be electrified at a net additional cost of £775 million (as part of total claim of £5Bn) at 1980 survey prices spread over 20 years. The Review does not tell us the cost of deferring any such strategic decision. In fact the Review says that delaying the start of the programme would not affect significantly the financial results.

The Findings of the Review

The Review purports to show that investment in all electrification options would be profitable, earning a return of between seven and eleven per cent, with the most ambitious electrification programme earning the highest rate. All these electrification options are compared with the maintenance of the existing system (including the various investments approved). The Review does not examine the electrification options relative to what many experts regard as the more relevant alternative - namely a smaller, more concentrated and more efficient network. There is no thought that it might be much better and cheaper by road or air. The Review takes the existing size of the railways as a given inviolable constraint. In spite of the fact that British Rail is at present running at a substantial loss, the Review supposes that all options, including the do nothing option, will be generating very handsome profits over the next 30 years. This surprising financial performance is largely the consequence of a supposedly rapidly increasing demand for rail passenger travel.

II DEMAND

Passenger Assumptions and their Plausibility

The critical elasticity assumption that gives rise to the high profits is:

A 10 per cent increase in Inter City fares will reduce traffic by 6.5% and increase revenue by 3.5%.

Thus increases in fares to whatever level will always increase total revenue. Clearly if true the Inter City - and indeed British Rail - deficit could be eliminated at a stroke. The railways would be a 'money machine' not a public sink. And in the sensitivity tests this basic presumption, that increases, however large, in fares would always raise total revenue, is retained. However, British Rail could produce no systematic study to support this figure.

The other key assumption is that:

A 10 per cent decrease in journey time will increase passenger traffic by 8.5%.

Unlike the above, this value cannot be shown to be obviously flawed and there is some evidence in its favour - although it should be viewed sceptically.

The main reason for questioning both elasticities is the omission from the Review of any assessment of the progress of competitors, mainly air and road. Increased motorisation, the potential of competitive bus fares and air fares and their schedule improvements, and the deregulation of buses and airlines, have all proved to be important in eroding rail traffic. They are not mentioned.

Yet the Review assumes that there will be an exogenous increase in rail passenger traffic of one per cent per annum for more than 30 years, even with unchanged speeds. The basis for this finding is the residual trend of traffic from 1966 to 1980. Again it seems optimistic to project a rather dubious trend in the 1970s, which was much affected by the tenfold increase in oil prices, for another thirty years.

Fares and Profits

The presumed increasing passenger demand and the assumptions on elasticity enable British Rail to push up its real fares steeply and so become profitable. The Review anticipates:-

- i. 1% increase in real fares each year for 30 years;

plus

ii. 6% increase for electrification;

plus

iii. 6% increase for HST/APT.

Thus Inter City fares will increase by between 37 and 50 per cent in real terms over the 30-year period.

It is important to note that it is these traffic and fare increases that largely give rise to the financial return. Electrification adds only marginally (about 15% in preferred option VF case) to the net profitability. Thus these traffic and fare increases are critical to the viability of the present rail system, whatever is done about electrification.

Freight Demand

The essential assumption is the quantity of freight of BR will not continue its long term trend decline of 2 per cent per annum from 1969-79, but will increase from its present (1980) level value of about 152 million tonnes to 175 from 1989 to 2010. The real freight rates are constant (at 1980 values) for the thirty years. The Review does not consider the competitive lorry real costs (and rates) which have fallen considerably over the past years and how, if it continues, this will affect rail freight. Freight quantities were revised downwards in mid Review. It does appear that freight demand might be still too optimistic and values of 100 million tonnes or less should have been considered. Or alternatively lower freight rates should have been evaluated.

III COSTS

Wages and Productivity

The Review assumes that productivity gains will outstrip the increases in unit labour costs. Although the robustness of this assumption is not strictly relevant for the electrification decision, any shortfall will affect the EFL and so restrict investible funds. More important, any shortfall in the presumed productivity gains will drastically affect the profitability of

all options. The Review supposes that the increases in productivity of railway labour will be the same as that in the rest of the economy. This has not been the case in the past and the Review recognises that "there is no guarantee that such a level [it must mean growth rate] of productivity will in practice be achieved" (p.54). The Review did not report the sensitivity effects on BR profits nor did it consider the feedback and compounding effects of lower growth on demand for traffic.

Fuel Costs and Savings

The standard assumption is that from 1978 to 2010, the price of electricity increases by only 50% but the price of diesel almost trebles. It is claimed that, in the light of more recent Department of Energy studies, the potential for divergence is growing. There is no explanation for this divergence in the prices of different forms of energy. And such a large difference persisting for so many years is clearly inconsistent with recent history. In its sensitivity analysis the Review does not analyse the case where the price of diesel oil increases even slightly more (ie 10%) than electricity - presumably because the case for electrification, even with the optimistic assumptions about traffic and fares, would have been much eroded.

The fragility of the figures forecast is illustrated by the fact that by 1980, the forecast price of electricity in 1980 was already 18 per cent too low. If errors of 18% can be made one year or so ahead it seems likely that considerably larger errors can be made over a thirty year period. [It is believed that also the 1980 diesel price was forecast some 25% too high, but we are still awaiting Department of Energy figures.]

These assumed trends and the errors so far tend to bias the decision towards electrification. It is necessary also to warn that neither the level nor the relativities of fuel prices can be foreseen over a thirty-year, or even a ten-year, horizon. But investment in electrification is irreversible. The money is sunk.

Hardware Costs

Although there has been no time to assess the accuracy of the costs of electrification, it is known that considerable

failures were encountered with some recent electrifications - particularly the Great Northern line. It is not known whether there has been an allowance for future errors in the figures.

Export Potential for Electric Traction

The Review argues that the further electrification of British Rail would enable private industry to compete more effectively for orders from abroad. It is now understood that BR regard this point as merely a pour boire and not to be taken as substantive evidence.

Conclusions

The case for widespread electrification is not plausible since it is based upon assumptions which are not credible. The forecast profitability is unlikely to be achieved. There may well be good arguments for electrification of particular routes. But such cases cannot be adduced from the Review.

A strategic decision to go ahead with the high electrification programme would commit resources and would inhibit further slimming down of the railway network for many years.

Further Action

The Committee might wish to express its doubts and pass it on to the Chief Secretary's review of public expenditure. However, since the conclusions of the Review have such considerable support, it may be thought wise to have it examined further in some detail by an independent authority (or committee).

A feasible programme would be to institute an internal report by a small committee with CPRS, Treasury and others who are not *parti pris*. This group could then go on to examine the BR Corporate Plan 1981-5 in the light of the Electrification Review.

CONFIDENTIAL

SOME FURTHER NOTES ON THE ELECTRIFICATION REVIEW

The Rate of Discount

It is surprising to see a rate of discount of 7%. Presumably a value of 7% was chosen in order, so to speak, not to penalise projects which have very long lives. But the real issue is: is it appropriate for general decision-making about expenditure by public authorities?

I would have suggested that it is not appropriate. The present situation is one of quite severe capital rationing. In principle under conditions of capital rationing the appropriate rate of discount is that of the marginal project. Clearly the marginal product will have a rather high rate of return. I would have guessed that somewhere in the region of 15% would be appropriate. As a technical matter than it would be best if the electrification programme were reviewed with a 15%, or at least a 12% discount rate. At this rate, of course, the programme would not be viable.

I suspect that British Rail's answer would be to say that they anticipate the restrictions on public investment gradually falling over their 30 year period and consequently it is sensible to look forward with a rate at the steady state value of the marginal project in this 30 year period; this would then avoid the distortions due to our present limited means. Perhaps so. However most of us take the view that our present difficulties are largely due to the over-expansion of public expenditure which was sanctioned on somewhat similar lines. Growth begets growth, etc. And it would be most unwise to take a strategic decision which by its very nature would be largely irreversible, under conditions of hope for quite considerable growth and expansion of public spending in a period as much as 30 years ahead.

CONFIDENTIAL

CONFIDENTIAL

- 2 -

The Speed of Diesel versus Electric Trains

The Review assumes on p.40 para 8 that the electric locomotives will travel more than 10% faster than the diesel trains. This is certainly inconsistent with the assumptions which were made in Travers Morgan Australian study.

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NOTES ON THE MEETING WITH BRITISH RAIL AND MINISTRY OF TRANSPORT,
27 MARCH 1981

Need for a Strategic Decision

British Rail pointed out that they had made a rough assessment at a delay of 4 years for the larger programmes which reduced their present value by £60 million to £120 million. But they have not examined the disadvantages (or presumably the advantages) of deferment and in fact they could not say that delaying the start of the electrification programme would affect significantly the financial results. They were clearly concerned with keeping continuity of work for their skilled construction teams.

A Case for a Smaller Network

Neither British Rail nor the Department of Transport had considered as a possibility the much smaller network of British Rail services which was mooted as being desirable in the early 1970s. Indeed, they were very vague about those plans and appeared to have largely forgotten them. Few people round the table could recall any of their contents. I requested, however, that they send me these plans. They remarked that they were in the archives and would be difficult to get out.

I think it is very important to resuscitate once more the concept of a railway network which is much more concentrated and very much smaller than the existing one. The fact that they had not tested their electrification, or indeed their diesel programme, against a smaller network, seems to me a crucial omission.

The Assumptions about Profitability, Fares and Traffic

i. The increase in fares for electrification and APT/HSD of six per cent each was apparently based on the "normal practice" of British Rail in increasing their fares for what they regard as quality improvements. But apparently they did take account of the fact that that increase in fare, taken by itself, will reduce traffic.

ii. On the assumption that there is to be an exogenous increase of traffic of one per cent over the next 30 plus years, I could

CONFIDENTIAL

really get no convincing answer. The result was apparently based on an extrapolation from the end of the 1960s over the past 10 years or so. But it would have been as easy to fit a constant, or even a declining trend for this period. I adduce therefore there is no statistical basis for the endogenous trend.

iii. The fare elasticity of minus .65 and the time of trip elasticity of .85 were said to be based on experience. British Rail admitted, however, that they had no study that they could give me which established these values. Furthermore they argued that, contrary to experience in all other countries of which I have knowledge, as incomes increase the fares elasticity would decline - so that there would be better opportunities for raising fares and making additional profits. I pointed out that experience showed the contrary was true. That as motorisation increased with incomes the fare elasticity of rail tended to increase.

The low fare elasticity is, of course, also a cornerstone of their fares policy and the proposition that railways will be in substantial profit. This also is the rationalisation for the assumption that real fares will increase one per cent per annum.

I pointed out that if the fares elasticity was minus .65 then there was no problem of the railways recovering its deficit and indeed earning fat profits which could be used to either finance their investment programme or to support other public spending. For some reason this struck them all as being rather odd. But no explanation was vouchsafed and my arguments were not discredited by any rebuttal.

iv. The British Rail had clearly gone through the process of writing down assumptions about freight traffic. They now hoped to stabilise at 170 million tons per annum which is in excess of 1975, 1977, 1979 and 1980 which was 152 million tons. This looks a little optimistic to me since the railways lost about 20 per cent of its traffic over the decade 1969-1979 and it seems likely that they will continue to lose at something like this rate.

The Assumptions about Fuel Costs

Perhaps the most surprising information in the session was that the energy price for costs had been considerably revised. In table 39 on page 51 the electricity prices for 1980 are shown as the same as those for 1978. Now it had been agreed that prices had actually gone up 18 per cent from 1978-1980. One might well imagine that if they can be wrong to the extent of 18 per cent in one or two years ahead, it is conceivable that they could be more wrong ten, twenty or thirty years ahead.

Apparently British Rail, DoT group were still awaiting the price of diesel oil in 1980. It will be recalled that from 1978-1980 the Review had forecast a 45 per cent increase. From other data I adduced that there was only about a 10 per cent increase, net of tax, in the price of gasoline. The discrepancy remains to be explained, or explained away. The order of magnitude of the effect due to the change in fuel prices was put to me as follows. That at present it was efficient to electrify for about 40-45 locomotive journeys with current fuel prices, whereas for the fuel prices which were expected to rule in 2010 it was efficient to electrify for 10 locomotives.

Financial Results

British Rail were very pleased with the fact that they could obtain a financial return of 7-11 per cent in real terms but this is a small wave in a generally deep ocean. The presumption about the ability to increase revenues by increasing fares is built into all the options including the diesel option No. 1. The first issue really is whether this is realistic. To give an idea of the magnitude of this, the net present value of passenger revenue, under the diesel option, is 10.35 billion, under the standard passenger assumptions. Whereas the improvements in net present value from electrification, in total, comes to only 308 million, that is to say about 3 per cent, for the high electrification fast option. Indeed the whole programme hinges on the argument that the British Rail high fares strategy will work, that is to say there will be no large erosion of traffic and they will be able to raise fares by 50 per cent in real terms by the beginning of the 21st century.

CONFIDENTIAL

- 4 -

Similarly it is clear that the assumptions about improving productivity of railway labour are also critical for the success of the main profitable strategy.

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10 DOWNING STREET

Tim

You mentioned Alan
Walker's note on Britain's trade
for £.

This came up briefly at
Des's tea this evening. Robert
Armstrong was inclined to
think that the note might best
take the form of a minute
from AW to the Prime Minister
which is somewhat to E and
was of a note by the
Secretary. I agree.

Can you please see with
Robert if, since the Prime
Minister has agreed that colleagues
should have the paper. At 2.00