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MW

PRIME MINISTER

25 July 1984

ELECTRIFICATION OF THE EAST COAST MAIN LINE

The Policy Unit has spent some time with D/Tp and BR officials, testing the assumption behind this project. We have looked particularly hard at three elements:

- the maintenance savings, which account for over half the project's benefits;
- the energy savings; which account for another third;
- the volume of passenger business on ECML which BR can expect over the next 30 years.

There is no doubt at all that electric traction is considerably cheaper to maintain and more convenient to operate. Electric trains are cleaner, more reliable, do not require uncoupling and refuelling. The factual evidence bears this out. A University of Leeds' study indicates that BR's electric locomotives require 44% fewer maintenance staff for a given mileage than their diesel locomotives. This comparison is supported by data for six other European railway systems. Total train service costs on the electrified West Coast Main Line are 25% cheaper than on the East Coast Main Line. Electric locomotives offer operational advantages, which BR value. They are available

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for use more frequently, they break down less, and contribute to punctuality. Factors such as these explain BR's enthusiasm for electrification.

We asked if these benefits had been exaggerated because BR did not allow for the reduced maintenance costs of diesels which they could achieve anyway, by rationalising their facilities. BR have conceded this point and allowed a 10% improvement in maintenance efficiency (see the second line of the attached table, reproduced from the D/Tp officials' annex: if the project earns 5% in real terms, its net present value (NPV), discounted at 5%, is zero). In addition, we think it prudent to assume that the cost of maintaining a new generation of diesels would be 10% lower. Surely diesels can be designed better, learning from past mistakes?

#### Fuel Savings

The project achieves fuel savings from two sources. Electricity is cheaper for BR than oil, and BR assume oil will get much dearer than electricity (24% dearer by 2010 and 40% by 2018). Clearly, the project is less profitable if the two energy prices rise slowly, and more in line with each other.

BR have used the more conservative of the range of projections which the Department of Energy have provided to

the Sizewell Inquiry, involving a crude price of \$55/barrel in 2010. One cannot rule out an even more conservative assumption, namely, a crude price of \$33/barrel in 2010 and that electricity and oil will not change their relative price. If there is slow progress on nuclear capacity, a weakening in the OPEC cartel, and the continued restriction on coal imports, then oil and electricity prices would move pretty much in line. This scenario (Scenario C in the attached table) could reduce the rate of return of the project to less than 5%. This would be seen as an extreme assumption: it would be difficult to turn the project down on this hypothesis alone.

Passenger Traffic Forecasts

BR have assumed an unchanged passenger mileage for ECML. We think this is a defensible assumption. Inter-City traffic has held up for 30 years, despite growing competition from air, better roads, the growth in car ownership, and the growth in competition from long-distance bus. Of the 5 Inter-City businesses, ECML volumes are more likely to hold up than any other. It is a fast, popular and almost profitable line, considerably quicker than bus. Its volume has survived 4 years of unregulated bus competition and air fares which are as cheap, and sometimes cheaper. A price war between domestic airlines is a potential threat, but it is difficult to envisage a dramatic reduction in domestic air fares of the kind that we hope to see one day

on international routes. There is not a cartel on domestic air routes. BR is also better placed than airlines from the point of view of accessibility. The alternative assumption used by D/Tp to test the project - that passenger traffic will fall by 1% a year for 30 years - is in our view an extreme assumption for this particular route.

### Assessment

A fair test of the project is the 5% discount rate, which is used for other public sector investments. The more demanding 7% rate which BR apply to their own investment is designed to counter their own optimism. The assessment has dealt with this problem, so there is no need to do it again. (The private sector would typically use a higher rate.)

On a 5% test, the project can withstand no increase in oil prices relative to electricity, or some loss of traffic to competitors, or better maintenance of diesel. However, if several of these combine, they would take the project below the 5% real rate of return - the fairly undemanding test set for public sector investments.

### Conclusion

The appraisal of this project is now technically good. But BR has a history of disappointment on large projects.

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Commitment to this project will definitely worsen BR's cash flow position in the late 1980s, just when Inter-City is struggling to reach its target, and when the Government needs cash savings. BR has still to demonstrate that it can establish a viable Inter-City business, and changing the accounting base is no answer.

There are two options worth considering:

Either: delay the whole project further, on the reasonable grounds that the Government wishes to see more evidence of improvement in other aspects of Inter City business before backing it with more capital. Delay of the project improves the returns and gives you more time to see if the new management can deliver.

Or: approve London-Newcastle and await more evidence of success before approving the rest.

We reluctantly recommend approval of London-Newcastle.

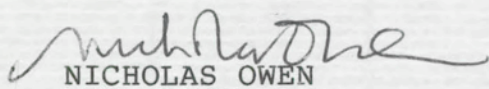
It is a marginal decision in terms of reward against risks, and a 5% return on this project is no better than the target for the whole Inter-City business. We would not like investment in London connecting links, improving passenger comfort and service on stations, and the construction of new stations, to suffer from this particular project; and would

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expect BR to deliver more on efficiency as they will see  
this as a morale-booster.

  
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TABLE 13 - CENTRAL ASSUMPTIONS

£m

	7% DR	5% DR
BR NPV estimate	2.9	50.4
NPV after allowing for 10% improvement in maintenance efficiency	-5.6	39.3

TABLE 14 - SENSITIVITY TESTS

Change in NPV (£m)

	7% DR	5% DR
<u>A. Service Levels</u>		
1. 1% per annum decline in passenger traffic 10% per decade reduction in service levels	- 18.9	-27.6
<u>B. Maintenance Costs</u>		
1. Reduction of 10% in costs of maintaining new generations of diesels	- 6.5	-9.5
2. 10% variation in maintenance costs of HST power cars	+ 6.2	+9.0
3. 10% variation in maintenance costs of Class 89 electric locomotives	+ 3.5	+4.9
4. Alternative ageing profile: 2½% per annum growth throughout vehicle life	- 12.4	N.A.
<u>C. Fuel Prices</u>		
1. Scenario C	- 27	-40.6
2. Scenario X	+ 26	+36.5
<u>D. Revenue Gain</u>		
1. Intermediate range of journey time elasticities	- 9.6	-12.6
<u>E. Capital Costs</u>		
1. 10% variation in capital cost of infrastructure	+ 14.2	+15.2
2. 10% variation in capital cost of electric locomotives	+ 4.0	+4.5
<u>F. Combined Test</u>		
1% per annum decline in passenger traffic plus scenario C fuel prices plus reduction of 10% in maintenance costs of new diesels	- 47.3	-71.1