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MINISTERIAL COMMITTEE ON ECONOMIC STRATEGY

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# FIXED CROSS-CHANNEL LINK

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Memorandum by the Secretary of State for Transport

## Purpose

1. The purpose of this paper is to bring my colleagues up to date on developments on the question of a Channel Link and to seek their agreement on my proposals for handling the next phase of discussions with the French.

## Introduction

2. Considerable progress has been made on the Anglo/French studies. The Joint Study Group is aiming to submit to me and my French colleague by the end of December an interim report assessing the various proposals and advising on a narrowing down of options for further study. This could lead to a further report at the end of February making recommendations on a preferred scheme. The option of relying on development of existing services would of course, be retained in the second phase of the studies.

3. I have now received the Report of my special adviser, Sir Alec Cairncross, and I am in the process of meeting personally all the promoters involved in the various schemes.

4. It is too early to suggest where, on a balance of financial, economic and other considerations, the final choice should rest. But it is now opportune to bring some of the key issues before my colleagues.

The various fixed link proposals

5. These are detailed at Annex A. Broadly, there are three main types of fixed link:

i. Bored tunnels

These would be operated as a railway. (A bored tunnel for "drive through" vehicles is not feasible because of the major ventilation problems involved). Such a tunnel or tunnels if constructed to a 6 metre diameter would cater only for through services of passenger and freight trains. A 7 metre tunnel could in addition provide a shuttle service for accompanied cars and lorries. The schemes before me provide variously for a single 6 metre tunnel, single or double 7 metre tunnels and a phased development from single to double 7 metre tunnels catering initially only for through rail traffic.

ii. Bridges

Two groups propose multi-span suspension bridges providing dual two or dual three carriageways and would be willing to complement these road bridges by a 6 metre rail only tunnel.

iii. Immersed tubes

There are proposals for immersed tubes for road only, rail only or combined road/rail. The first of these is probably not feasible, once again because of ventilation problems. Euroroute (backed by the British Steel Corporation) propose a throughout immersed tube for classic rail traffic together with road viaducts linking through two artificial islands into a combined road/rail immersed tube across the deep water channel.

Estimated costs range from £880 million, spread over about 6 years, for a 6 metre bored tunnel to over £4000 million for the most ambitious bridge and tunnel combinations.



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Technical considerations affecting choice

6. The only kind of scheme which we could hope to legislate for in the 1982-83 Session is one or other of the bored tunnel options. Only for these schemes is design sufficiently developed and land requirements sufficiently identified to allow the necessary hybrid bill to be drafted and deposited by the required date in November 1982.

7. The multi-span bridges involve a major technological leap. Techniques and equipment for laying segments of tube in the depths of water and subject to the tidal and weather conditions in the Channel have yet to be developed. Bridges and immersed tubes would also create serious obstacles to shipping during survey and construction and their piers, islands and ventilation shafts would create permanent hazards. Changes in international shipping regulations governing the passage of shipping through the Channel would need to be negotiated. Effects on the physical regime of the Channel would need careful study.

8. A decision to go for a bridge, immersed tube or a combination of these two would be a decision to move onto a totally different time-scale. It would be at least two or three years before legislation could be embarked upon for any of these schemes.

9. This being so, I propose to lead the next stage of discussions with the French towards clarification of three fundamental questions:

i. whether to go for a quick start on a rail tunnel, which could include provision for roll-on/roll-off vehicle traffic;

ii. whether to study bridges or tubes more thoroughly, implying a much longer timescale or

iii. whether to rely on development of existing services (on which I await an important contribution from Dover Harbour Board representing port and shipping interests).

A bored tunnel: financial, economic and other considerations

10. Various considerations point at present towards bored tunnels as the most probable choice. Of the fixed link options they represent the cheapest solution. They can be brought into operation





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most quickly. Work so far done on financial analysis suggests that they offer promoters a rate of return on capital as good as the more costly bridge and tube schemes. Sir Alec Cairncross estimates that on promoters assumptions the financial return might range between about 6.5% and 9% in real terms and is likely to remain positive on gloomy assumptions.

11. Calculations have been made of the transport costs and benefits of the various tunnel options compared with relying on development of existing services, against predictions that cross-Channel traffic will double in the next 20 years. The returns are positive, ranging from 0.6% on pessimistic assumptions to 10% on optimistic assumptions. Sir Alec Cairncross has suggested central figures of 7-8½% compared with a more cautious view from my Department of 4-6%. The case is not overwhelming, but the figures suggest that the investment could be a worthwhile one from the transport point of view.

12. We would need to be clear also that a tunnel would be a sensible development from an overall UK point of view, but we are not in a position now to draw firm conclusions. Annex B explains the further studies required.

Organisation, Financing and Guarantees

13. We have made it clear to promoters that investment in the actual link, including portal facilities, must be funded by private capital. We have not excluded a Government indemnity against cancellation for political reasons, nor acceptance of consequential public sector investment outside the tunnel. We have told promoters they should not assume that the Government would be willing to fund or guarantee cost over-runs. We have also made it clear that the railways would not be permitted to contract to use the tunnel on a basis which placed on BR a disproportionate share of risks arising from shortfall of traffic below reasonable estimates, so placing on the public sector a contingent liability to cover commercial risks.

14. All but one of the tunnel promoters are now prepared to dispense with Government guarantees against cost over-run, even on a long-stop basis. But they are still seeking guarantees of 80% or more of



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predicted traffic and revenue. I believe it should be possible to negotiate them down, particularly if the choice went in favour of a tunnel catering for roll-on/roll-off vehicle traffic which would reduce dependence on BR/SNCF as generators of through rail traffic.

15. Nevertheless there are certain facts of life which must be recognised. It has never been conceivable that a scheme for a cross-Channel link could go ahead without some measure of Government involvement. We have recognised from the start that the French would seek guarantees against political cancellation. It was only to be expected that they would also seek protection against the possibility that the British promoters might, for whatever reason, abandon the project. This attitude is now crystallising in discussions between officials. It is not an unreasonable desire. Our own private interests would want similar protection against a French default.

16. A further problem is that the French have indicated a wish for a measure of Government control over tariffs. This could intensify problems in attracting private finance.

17. These complications are formidable. But there are many permutations of organisation, financing and guaranteeing still to be explored. This would be helped by an early narrowing down of options on the lines suggested in paragraph 9 above. Clearly circumstances could arise in which if we wished to reach agreement with the French on a practicable scheme, we would be forced towards completion guarantees or undertakings that guaranteed a high level of revenue to a link from rail traffics. This could, in effect, put the project into the administered sector, although hybrid financing arrangements of the sort suggested by the recent Report of the NEDC Working Party on Nationalised Industries Investment, which the Treasury accepts in principle, might then be advantageous.

Conclusion

18. I should be grateful for colleagues' endorsement of the line that I propose in paragraph 9 above should be followed in the next stage of discussions with the French. I should be grateful also for preliminary views, in the light of the information set out in this memorandum, on which of the three possible outcomes I there envisage I should attempt to secure.

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Department of Transport
26 November 1981



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FIXED CHANNEL LINK OPTIONS (All costs at January 1981 prices)

BORED TUNNELS

a) Single 6m bored tunnel for conventional rail traffic

A single track 6m tunnel for passenger, freight and limited long distance motorail services.

The tunnel would be operated on a system of "flights" catering for between 120 to 190 trains per day.

An international station and freight sidings would be required near the portal (either at Cheriton or Saltwood) and terminal facilities would need to be developed in London. Some track improvements between Saltwood and London would be necessary.

Groups with an interest: BR and English Channel Tunnel Group (an international group led by Costains) are working on this scheme jointly. The estimated cost of the tunnel and facilities at portal is £879m spread over about 6 years.

b) Single 7m bored tunnel for conventional traffic

Fundamentally the same as a single 6m tunnel except that the 7m bore leaves open the possibility of a vehicle ferry service being introduced at a later stage if desired.

Groups with an interest: Channel Tunnel Developments 1981 (led by Tarmac and Wimpey) has put this option forward. The estimated cost of the tunnel and facilities at the portals is £982m.

c) Single 7m bored tunnel for conventional rail and vehicle ferry traffic

A single 7m tunnel catering for vehicle shuttle traffic carried on trains. Again the tunnel would be operated on a system of "flights". In addition to the conventional rail terminal facilities required, extensive shuttle terminals would be required. The latter and the tunnel itself could be built in such a way as to leave open the possibility of a second tunnel being bored at a later date if necessary.

Groups with an interest: Channel Tunnel Developments 1981 has put this option forward. The estimated cost of the tunnel and facilities at the portal is £1373m. English Channel Tunnel Group and Anglo Channel Tunnel Group (Taylor Woodrow, Balfour Beatty and Edmund Nuttall) have also shown an interest.

(d) Twin 7m bored tunnels phased for conventional rail/conventional and vehicle ferry traffic

A twin 7m tunnel scheme built in three stages over a period of about 20 years. The stages are:

i. construction of single 7m tunnel for conventional rail traffic;

ii. addition of terminal facilities for ferry service;

iii. addition of second 7m tunnel plus modification to terminal facilities.

Groups with an interest: Channel Tunnel Developments 1981 has put this forward as its preferred option. The overall estimated cost of the tunnels and facilities at portals is £1785m.

(e) Twin 7m bored tunnels for conventional rail and vehicle ferry traffic

Twin 7 m tunnels built ~~consecutively~~ CONCURRENTLY and offering conventional rail and vehicle ferry services from the outset (as proposed in 1974). Full terminal facilities would be required from the outset.

Groups with an interest: Channel Tunnel Developments 1981 has put this option forward. The estimated cost of the tunnels and facilities at portal is £1682m and would be spread over 6 to 7 years.

NOTE: The estimated UK public sector capital cost for facilities outside the portals is £250m for all rail tunnel schemes.



IMMERSED TUBES

(f) Immersed Tube for road traffic

An immersed tube on the sea bed (partially buried or covered) providing a road only link. Ventilation shafts/islands would be required at regular intervals (even so the feasibility of providing adequate ventilation of vehicle fumes is suspect). Terminals would be required at each landfall for toll, immigration and customs control facilities etc. Improvements to the local road network and the road links to London might be necessary.

Groups with an interest: Laing has put this scheme forward. The estimated cost of the link and terminal facilities at the coasts is £2345m. There are no estimates for UK public sector capital costs for road schemes.

(g) Immersed Tube for road and conventional rail traffic

As above but including a rail link (which would facilitate ventilation) in the tube. Rail terminal facilities would, therefore, also be required.

Groups with an interest: Laing has put this scheme forward. The estimated cost of the link and all terminal facilities at the coasts is £3391m.

BRIDGES

(h) Bridge for road traffic with optional 6m rail tunnel

Road bridges with optional 6m tunnel for conventional rail traffic. Terminal requirements as above for IT road link and 6m tunnel.

Groups with an interest: Linkintoeurope (group headed by Sir Ralph Freeman) and Eurobridge (international group of consultants) Estimates of the cost of the road bridge and road terminal facilities range from £1952m to £3556m, to which £879m must be added if a rail tunnel is to be included.

(i) Combined viaduct and immersed tube for road and conventional rail traffic

A road link partly on viaduct and partly in immersed tube with a rail link in immersed tube throughout. The roadways would descend to a central immersed tube section at artificial islands about 8-10 km from the coasts. Terminal facilities would be as for other road and rail links.

Groups with an interest: Euroroute (backed by the British Steel Corporation) has put this option forward. The estimated cost of the link and terminal facilities at the coast is £4056m spread over about 9 years.





ANNEX B

FIXED CHANNEL LINK

FINANCIAL, ECONOMIC AND OTHER STUDIES

Studies already carried out

1. The Department has, for the various tunnel schemes:

i. sought to verify their potential financial viability as measured by the real rate of return to the promoter;

ii. undertaken a resource cost study aimed at assessing whether the transport costs of handling traffic solely by development of existing (sea and air) services would be higher or lower than those incurred with a fixed link.

These studies have been duplicated by the work done by Sir Alec Cairncross, on slightly different assumptions from those used by DTp. His results are in the same general range, though rather towards its optimistic end.

2. The financial rates of return based on promoters' traffic forecasts and tariff assumptions are reasonably attractive but by no means outstanding. On a combination of pessimstic assumptions they remain positive.

3. The rates of return indicated by the resource cost studies are lower. But again they remain positive even on pessimistic assumptions.

4. No resource cost study of bridges or immersed tubes has so far been carried out. The practicality and cost of such schemes cannot be realistically assessed at this stage. From a financial point of view, they appear no more attractive than bored tunnels.

Further work

(a) financial and resource cost studies

5. The resource cost study of bored tunnel schemes will be refined with the French over the coming weeks. An important contribution will be a report awaited from Dover Harbour Board, representing both port and shipping interests developing the case for, and cost of, relying on development of sea services.

6. No attempt has been made to assess how the net benefits associated with a fixed link would be divided between French and British interests. This depends on such things as the division of ownership of the link and of existing services displaced, traffic origin and type and the financial arrangements to be concluded between the national railways and the link owners. Discussions between DTp and Treasury officials have however clarified a range of issues which might be important to UK interests if a fixed link scheme was to go ahead.

7. Government has a direct interest in ensuring that any related public sector investment would be adequately remunerative. DTp will be following this up with British Rail in respect of investment which would fall to be financed by them rather than the tunnel promoter.

(b) employment and other regional impacts

8. The French are conducting studies in association with regional and local authorities into the likely impact of schemes on the regional economy in NE France. Kent County Council are understood to be undertaking similar work. It is for consideration whether the Government should seek to participate in these impact studies and/or to undertake its own assessment.



9. While a tunnel could be expected to reduce costs of cross-Channel transport, the reduction would be small in relation to total end to end costs and the basic costs of production. For this reason it is unlikely that the tunnel would generate significant freight traffic which would not otherwise materialise. It follows that the impact on the level of industrial activity and on its regional distribution is likely to be small.

10. Effects on employment will arise:

a. during the construction stage

b. after it comes into operation as a result of the switch of traffic from ferry and airline services.

11. Rough estimates are that the scale of employment in the UK both direct and indirect associated with construction would range from about 90,000 man years for the smallest (single 6 m) scheme up to 150,000 for the twin tunnel. This represents some 15,000-20,000 jobs during the period of construction. Most would arise in the Dover area though the secondary expenditure would be dispersed more widely.

12. The economics of fixed links depend ultimately on reducing manpower requirements. Operation of the tunnel and associated rail services would probably employ between 1,000 and 2,500, depending on the scheme adopted, in place of 5,000 to 7,500 employed in ferry and airline operations. Once again the effects would be felt mainly in the Dover area.