

PUBLIC TRANSPORT  
PROVISION  
FOR  
DOCKLANDS

SUMMARY OF THE ASSESSMENT OF THE OPTIONS

Report of the  
Docklands Public Transport and Access  
Steering Group

Organisations represented in the Group:-

Greater London Council  
London Docklands Development Corporation  
Department of Transport  
Department of the Environment  
Department of Industry  
London Transport Executive

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## 1. INTRODUCTION

1.1 The successful regeneration of Docklands is accorded a very high priority by both the Government and the GLC. Consequently, proposals for the development of Docklands and the provision of the necessary transport infrastructure have been the subject of many studies and reviews over the last decade. Throughout there has been an acceptance that improved roads and public transport would both play an important part in achieving the right development.

1.2 The £100m package agreed by Government and GLC in 1980 contained several road schemes including Docklands Northern Relief Road (DNRR), Lower Road and Evelyn Street in Southwark, the Isle of Dogs Loop Road and the Docks Cut Route in Beckton. They have been steadily progressed but a number are still subject to public inquiry and any necessary detailed revision. The alignment of the western end of the DNRR is the subject of a detailed review which takes into consideration its relationship with the rail proposals discussed below.

1.3 The question of whether new rail rapid transit facilities have a part to play in improving public transport facilities, and if so what type(s) and route(s) would be appropriate, has proved more difficult to resolve.

1.4 Thus, the original Fleet Line proposal serving Surrey Docks and Lewisham was modified in 1975 to provide a link serving the whole of Docklands. However, by the late 1970s it was increasingly clear that funding for such a scheme at a present cost of around £450m was not going to be available in the foreseeable future, particularly as there were increased Government doubts about the pace of development in Docklands. A review of lower cost options for rapid transit and packages for road and public transport improvement was then undertaken. It concluded with agreement on the £100m package (see 1.2) but ruled out any of the rapid transit options because their still high capital cost (£120m minimum) and likely revenue losses made them difficult to fund or justify. It was understood however, that the London Docklands Development Corporation was to be set up with a source of finance for additional public transport projects.

1.5 It was in this context that in 1981 the LDDC commissioned LT to investigate more modest rail proposals and the GLC resolved, and later agreed with the LDDC, that probably the only means of achieving adequate public transport and road improvement for Docklands over the next decade was to aim at a joint package costing about £15m per annum over 10 years. The new lower cost public transport schemes have been selected to fit within that general constraint.

1.6 Work has been undertaken by the LDDC, LT and GLC with the involvement of the DTP, DOE, BR and the Docklands Boroughs to establish feasible schemes and assess their costs and benefits. This report sets out the results.

Docklands in relation to the Strategy for London

2.1 East London in general suffers major problems of having a large element of outdated industry, some areas of very dense housing and relatively poor amenities. Docklands presents these problems in their most extreme form. The freeing of substantial areas for redevelopment has been seen as offering an opportunity to ease some of the problems by providing new employment and housing, and by opening up the river and other facilities for leisure activities. This has particularly been the view of the local authorities.

2.2 Docklands is also seen as offering opportunities to accommodate some new strategic facilities either on a London-wide or national scale.

2.3 These views are not in conflict with each other. In a balanced approach the strategic facilities may be a key means of achieving an increased range and scale of employment opportunities for Docklands residents.

2.4 The London Docklands Development Corporation was set up in July 1981 to secure the regeneration of its area, in particular by bringing land and buildings into effective use, encouraging the development of existing and new industry and commerce, creating an attractive environment and ensuring that housing and social facilities are available to encourage people to live and work in the area. The Corporation is given wide powers to achieve its objectives.

2.5 Now that the Corporation exists and the intentions of the Port of London Authority in respect of its remaining land holdings in the area are clearer, more certainty can be attached to the development plan and programme than at the time of the formulation of the London Docklands Strategic Plan (1976) or during the review of the lower cost options for rapid transit. Substantial progress has been made in bringing forward development schemes and in determining the future use of and programme for the remaining areas.

2.6 A number of changes have already occurred to affect the original development strategy: the scale and intensity of development on the Southwark Site (Mariners' Wharf), the designation of the Enterprise Zone on the Isle of Dogs and the timing of the PLA's decision on the Royal Docks. These changes will positively influence the character and pace of development throughout the whole area.

The LDDC's Objectives

2.7 In order to achieve its objectives the Corporation is seeking to attract a broad range of industrial and commercial developments in the belief that diversity is the surest formula for economic stability and growth. It is also encouraging a broader range of housing development, with a shift of emphasis towards owner-occupation. By those measures it aims to make Docklands an attractive and convenient part of Inner London in which to live and work. Environmental quality, lack of congestion and access to a choice of housing, jobs, shopping and transport are the hallmarks of a successful area and one which can compete with attractive areas elsewhere which are less in need of stimulus.

2.8 The contribution of new transport links is important for meeting these objectives. A balanced road and public transport package is now needed to attract and serve the mix of development planned and to be in time for their

implementation. The choice of public transport improvements is important for matching and underpinning this development strategy. A rail link, as section 6 of the report indicates, is thought more likely to realise both the economic and the environmental objectives, in particular by attracting the scale and range of employment sought.

2.9 The Corporation's strategy seeks to improve access to jobs in the City, Central London and neighbouring Inner London for existing and potential Docklands residents. The present emphasis is to improve the transport links to the Isle of Dogs and to enable the development of the Enterprise Zone and the area in general to go forward as quickly as possible. The quality of the public transport access chosen for this area is likely to influence the type and intensity of development attracted to a number of key sites many with water frontages. Both these issues are discussed more fully under the section headed 'Development Impact'.

2.10 The development of the Royal Docks area will come later in the programme and has implications for possible extension of a rail scheme. This is discussed later in paragraph 7.6.

### 3 TRANSPORT NEEDS

3.1 All activities in Docklands depend on a mixture of public transport and private car and lorry access and all are needed for the success of the LDDC's development. The balance between them varies: thus, over 80% of access to Central London for work would be by public transport - predominantly rail if it were available. For access to work locally in Docklands less than a quarter of the journeys would normally be by public transport.

3.2 Any activity which had a wider catchment area such as a head office or a facility attracting visitors from all over London would probably attract half its trips by public transport, of which a majority would be over 4 miles in length. These longer trips would tend to be by rail if it were available.

3.3 Freight, on the other hand, will move primarily by road although the Government and GLC will encourage maximum use of rail. Freight represents some 10-20% of the demand for road capacity.

3.4 The increasing flows of people and goods through parts of the areas by road will make demands on capacity which if not met will result in increased congestion for travel to and within Docklands. The substantial road package already agreed is referred to in paragraph 1.2. All the schemes relate to providing access for goods, bus operation and car trips to specific development areas, though the Docklands Northern Relief Road and the Lower Road/Evelyn Street improvements in Southwark also serve traffic from a wider area.

3.5 The key role of public transport within this framework can be summarised as:-

- (1) providing access to and from employment in Central London, which employs 40% of Inner Londoners and provides an essential foundation and resilience to an Inner London economy;
- (2) providing access to and from local employment (including new jobs) in Docklands;
- (3) attracting development to Docklands;
- (4) providing residents with access to educational, shopping and leisure facilities in adjoining town centres and Central London.

3.6 Public Transport in Docklands is at present provided largely by various bus services, supplemented by BR's service from Camden Road to North Woolwich, (serving Canning Town, Silvertown and North Woolwich) and LT's East London line, serving Wapping, Rotherhithe and the Surrey Docks. Many of the bus services, however, run along the East India Dock Road and by-pass the main development areas. Public transport to and from the Isle of Dogs is provided by bus services which operate on the loop road and link with the underground at Mile End (Route 277) and Aldgate East (Route 56). Their frequency during the peak hours are 5 mins and 15 mins respectively. It is the unreliability of existing bus services with present road conditions, and the length of journey, that must be seen as the prime cause of dissatisfaction with access to the north and west. The feeling of isolation is reinforced by the barrier that the River presents to the south.

3.7 Over and above improvement to existing bus services, an express bus service and a number of rail rapid transit schemes have been considered and evaluated in order to meet the needs set out in 3.5. The rapid transit schemes (see LT report 'Docklands Rail Study - Sept. 1981') have been narrowed down essentially to two: a north-south route running from Mile End to the Isle of Dogs, and an east-west route from the City to the Isle of Dogs. These are detailed in Section 4.

3.8 The possibility of building branches to the existing East London line, serving the Surrey Docks under the River to the Isle of Dogs, was not pursued because of its high cost (over £100m). Improved public transport in the Surrey Docks area could nonetheless be achieved by improvement in the present East London line service, provision of new bus routes and improving the reliability of existing ones. Access to the East London Line via the East-West route at Shadwell would be possible.

4.1 It has been assumed that some improvements will be made to existing bus services in line with proposals being developed by LT and the LDDC. These improvements, with some bus priority provisions, are seen by residents as the most pressing need and as realistically achievable in the short-term. They would be introduced progressively over the next 5 years or so: in the early stages some financial support, similar to that given in the past from Urban Programme funds, would be required. This improved service constitutes the base case against which the schemes considered in this report have been evaluated.

#### Scheme I

4.2 The lowest cost scheme would be an express bus service linking the Isle of Dogs with Mile End. A critical consideration is the level of service and reliability that can be achieved because, although bus operation can theoretically be as reliable and as quick as a rail link over short distances, this depends on the availability of staff, the reliability of vehicles and a clear road. The first two problems also arise with rail although staff numbers are smaller but if an individual train fails to arrive there is a greater chance of the next train being able to carry the additional passengers (albeit uncomfortably) than would be the case with a bus service. The critical problem for buses, however, which cannot be resolved by the operator, is traffic congestion. Overcoming this requires bus priority measures and adequate margins in the operating schedule for recovering from delays.

4.3 LT have developed a proposal which they consider would offer a substantial improvement compared with existing services. This would be an express bus service running from Mile End tube station along Burdett Road and West India Dock Road and then through the Isle of Dogs development areas on roads to be improved. It would, however, appear that it will not be possible to provide bus priority measures, which would totally immunise the service from the effects of traffic delay unless and until a scheme on the scale of the present DNRR proposal is introduced to relieve congestion at the junction of the A13 with Burdett Road. The full benefits of the scheme would therefore not be achieved until the early 1990s when the DNRR was completed. It would cost about £5m and is described in more detail in Annex 1.

4.4 The final version of the scheme, assuming full bus priority measures and the road improvements referred to in 4.3, has been used in the evaluation. It would be perfectly feasible, however, to bring an initial service into operation within 12 months; as road improvements were implemented the performance of the service would also improve.

4.5 The express bus service could also be used to complement an east-west rail link (see paragraph 4.8) or as an interim measure while a north-south rail link was under construction.

#### Rail Schemes

4.6 Turning to rail schemes, two main possibilities have been considered: links from the Isle of Dogs to the City (the 'east-west route') and to Mile End (the 'North-South route'). These are complementary in functional terms and are best seen as a package though they can be phased separately should capital investment considerations make this necessary. These schemes would be equipped on a light rapid transit (LRT) basis, i.e., a system of small, quiet, lightweight electric trains most likely operating on steel rails and powered through overhead wires.

LRT trains can run alongside road traffic like trams, or they can run on completely separate track at higher speeds. In the latter case, the system can be automated, - this is discussed in Section 7. Because the trains are small and light the cost of the supporting structures and stations are lower and route costs can be reduced because the trains can run on sharper and steeper gradients than on a conventional railway. The schemes are shown on the map and are described in detail in Annex 1.

#### Scheme II

4.7 A north-south light rail link from the Isle of Dogs to the underground at Mile End. It would meet the needs of people coming to work in Poplar/Isle of Dogs, in particular on the Central and District Lines from north and north-east London and for people travelling from Poplar/Isle of Dogs to work in Central London. This scheme has not had a full technical assessment and it would not be possible to seek Parliamentary powers in the 1982/83 Session. It could be in operation by 1987 and would cost cf36m.

#### Scheme III

4.8 The provision of an east-west light rail link from the City and the Underground to the Isle of Dogs would meet the need for improved access from and to Central London, which is essential for some firms, and for improved access to the City and Central London for residents of Western Docklands. In addition, passengers could have only a short walk at Shadwell to interchange to the East London Line tube services to Surrey Docks. (In the longer term it would also offer the possibility of an extension to provide similar improved access to and from the Royal Docks and Beckton.) The basic scheme could be in operation by 1987 and would cost c. £55m.

#### Scheme IV

4.9 A combination of II and III could be provided (with a common section in the Isle of Dogs) at a cost of cf65m.

#### Feasibility and Estimates

4.10 All the major problems arising from the public transport schemes have been identified and allowed for in these preliminary studies and cost estimates and are based on a modified DNRR scheme. Subsequent estimates will be based on detailed design work and should not vary significantly if the least favourable outcome arose. The two main outstanding feasibility issues are the modification to Tower Hill station to cope with traffic generated by the east-west link and the layout configuration on the north-south route particularly where it leaves the Poplar Dock branch and joins Bow Road.

#### Other measures to improve public transport in Docklands

4.11 It is important that the transport package is seen to give due weight to the needs of all areas of Docklands. The schemes that are the subject of this report primarily deal with the area north of the River in Tower Hamlets. Other proposals to serve the remaining areas are being developed and can be summarised as follows:

Surrey Docks - improvements to the local bus services are likely to form the main part of any proposal but it may be possible to improve the service frequency on the East London Line and, if Shoreditch is closed, improve the interchange at Whitechapel. Transfer between the East-West light rail scheme and the East London line at Shadwell would be possible.

Beckton/  
Royal Docks - improved bus services to East Ham, Barking and Custom House to provide links with the Underground, the North Woolwich Line and major town centres are a possibility in the short term.

- The area is served by the BR North Woolwich to Camden Road service. The electrification of this line has been approved in principle by the GLC. This would cost about £9m, could be completed by 1985, and would allow through running to the North London Line. Evaluation has shown the electrification to be worthwhile in transport terms alone and a decision on whether to proceed is expected shortly. There would be a longer term option to extend either the BR line or LRT up to Beckton and the Royal Docks.

5.1 In evaluating the schemes it is necessary to consider both their transport benefits, most of which can be quantified by recognised and widely accepted techniques, and their wider impact on the scale and mix of development in Docklands, which is largely unquantifiable. This section goes on to consider the transport benefits; the development impact is considered in Section 6.

#### Demand Forecasts

5.2 Table 1 shows a forecast of the total morning peak hour trips by all modes of transport to and from the Isle of Dogs in 1991. This shows that of a total of about 11,000 journeys, about 2,000 would be by Express Bus, or 2,600 by the north-south rail link, or 2,400 by the east-west rail link. If both rail links were built, the share would rise to about 4,200. These figures are a mid-point of a range which reflects "with rail" and "no rail" population and employment projections.

5.3 The table also shows that the north-south and east-west links serve rather different markets. The north-south rail link and Express Bus play a larger role in bringing workers into the Isle of Dogs from the north and east, whereas the east-west link caters more for journeys to and from Central London.

#### Transport Evaluation

5.4 The schemes have been evaluated against the bus base described in paragraph 4.1. The results are summarised in Table 2, which shows the financial effects of the schemes and the economic evaluation.

5.5 In financial terms the revenue from any of the schemes would cover its operating costs (excluding depreciation) although most of this revenue would be transferred from the base bus services. Some savings would be achieved on the base bus network.

5.6 The economic evaluation takes into account journey time savings for existing and new public transport users (including increased traffic from the LDDC's estimate of the development impact of the new links), allowance for greater confidence in rail reliability, and the effects on road congestion and accidents. The evaluation also demonstrates that the overlap in the carryings of the two rail schemes is modest. The benefits of the north-south and east-west rail links are in large part cumulative while the marginal cost of adding the north-south link to the east-west is relatively small. Sensitivity tests have been carried out to measure the effects of changing various assumptions. These show that the benefits are more sensitive to differences in population assumed for the Isle of Dogs than to differences in employment. However, given that the benefits only cover half the costs, the basic conclusion of the transport evaluation is fairly robust to changes in assumptions about both employment and population.

5.7 The results of the evaluation in Table 2 show that in conventional transport cost/benefit terms only the express bus schemes earns an adequate rate of return. All the rail schemes have a substantial negative net present value. However, the rail schemes are more likely to attract jobs, economic activity and residents to the Isle of Dogs. The transport benefits of this additional employment have been included in the transport evaluation but the employment and development benefits have not. A judgement is therefore required about the extent to which these development benefits bridge the gap between the costs and quantifiable transport benefits of any of the rail schemes. The next section sets out to assess this.

TABLE 1  
MORNING PEAK HOUR JOURNEYS IN 1991<sup>(1)</sup>

	Carried by:						
	<u>Total</u>	Express or Bus	North- South Rail	or	East- West Rail	or	North-South East-West Rail
Between Isle of Dogs and Central London	2,260	600	850		1,270		1,520
From Isle of Dogs to Elsewhere	2,300	350	480		380		880
From Elsewhere to Isle of Dogs	6,740	1,050	1,270		750		1,800
<b>Total</b>	<b>11,300</b>	<b>2,000</b>	<b>2,600</b>		<b>2,400</b>		<b>4,200</b>
Range - no rail			2,400 to		2,300 to		4,000 to
- rail			2,700		2,500		4,400

(1) The total flows per day would be about 5 times the peak hour figures.

NOTE: The Isle of Dogs area includes part of Limehouse and Poplar

TABLE 2

TRANSPORT EVALUATION

	North-South Express Bus	North-South Light Rail	East-West Light Rail	North-South and East- West Rail
	fm	fm	fm	fm
<u>Financial Effects</u>				
Capital Cost of scheme	5 <sup>(1)</sup>	36 <sup>(2)</sup>	55 <sup>(3)</sup>	65 <sup>(3)</sup>
Annual Operating Cost of scheme	0.8	1.0	1.0	1.5
Annual Operating Cost of buses saved in the Base	0.6	0.6	0.5	0.8
Annual net Increase in Public Transport Revenue	0.1	0.3	0.3	0.5
<u>Economic Evaluation</u>				
Present value of the Capital and Operating Costs relative to Base	-6	-34	-51	-62
Present value of Benefits <sup>(4)</sup> relative to the Base	7 to 11	15 to 18	22 to 26	31 to 37
Net present value <sup>(5)</sup> relative to the Base	1 to 5 (2 to 8)	-16 to -19 (-13 to -18)	-25 to -29 (-22 to -27)	-25 to -31 (-20 to -29)

Notes: (1) Notional cost

(2) Up to £1.5m more if separate bridge at Millwall Cutting (preferred by LT)

(3) Up to £4.0m more if separate bridge at Millwall Cutting required see (2), and to provide increased capacity at Tower Hill (LT Underground)

(4) Range reflects "rail" and "no rail" development scenarios and high and low values for growth of time-saving benefits (DTP recommended values)

(5) Calculated using a 7% discount rate which is normally used for transport evaluation. For appraising non-transport projects 5% is normally used and this is therefore shown in brackets.

6.1 Section 5 summarised the transport evaluation of the schemes and Table 2 showed that the calculable transport benefits covered roughly 50% of the capital cost of each rail scheme. However, the schemes are not only to be justified in terms of their transport benefits but also by their contribution to the development of Docklands. In terms of the impact on development there are three main effects:

- (i) an impact both on the level of employment and the nature of employment and development attracted to the area served;
- (ii) an increase in the value of land to be served by the new link;
- (iii) it would enable the Corporation to achieve a broader population mix in Docklands which would support a wider variety of services and amenities.

#### Problems of assessment

6.2 By their nature each of these effects is extremely difficult to quantify. Moreover, insofar as they can be quantified they cannot simply be added to the transport benefits. The difficulties are outlined below:

- (i) increases in the level of employment which would otherwise not have taken place, and differences in the mix of development can be estimated (see paras. 6.3 - 6.8) but it is difficult to put a value on them or to say whether they represent new jobs rather than jobs attracted from elsewhere. It could, however, be argued that in setting up the development corporation and committing substantial public funds to it and in designating the Enterprise Zone in the Isle of Dogs the Government has effectively attached a premium to having jobs in Docklands rather than, say, in other parts of London or the south-east. On this reasoning, it would be legitimate to attach a premium to jobs which would be attracted by the provision of a rail link. This must, however, remain a political judgment and for this reason the employment generating effect must be kept separate from the transport evaluation.
- (ii) the increases in land values are due to the improved accessibility resulting from a rail scheme. It is difficult to separate out the proportion of such an increase attributable to a rail link and that attributable to other effects. Moreover, since improved accessibility is already included in the transport evaluation in terms of time savings to people travelling to and from the area by LRT, to include increased site values in the evaluation would constitute double counting of the transport benefits. However, the call on public sector finance could be reduced if LDDC were able to profit from improved accessibility by selling its sites at a higher price.

#### Employment and Development

6.3 Despite these difficulties, some worthwhile pointers can be derived from an examination of the two main effects of LRT:

- (a) the impact on the crude level of employment; and
- (b) the impact on the mix of development attracted and hence on the nature of that employment.

For the purposes of this examination, the approach adopted is that of focussing narrowly on some particular development sites and postulating different patterns of possible future development, with and without one or other rail link. The description of the sites selected, and of the possible different patterns of employment, is summarised in Table 3 and set out in full in Annex 2. Since this inevitably involves a subjective judgement, the LDDC have sought the view of the independent consultants, Drivers Jonas, who have endorsed the assumptions as reasonable.

#### 6.4 Two points need to be clearly understood:

1 The development impact of LRT would not be confined to the particular sites which have been selected for study. They are the ones most immediately and significantly affected and thus lend themselves to the preparation of fairly specific "with and without" scenarios. There would also be a "ripple" effect elsewhere in Docklands, probably less dramatic on any particular site but cumulatively important. Finally, there would be the general improvement to development prospects flowing from the clear commitment to the whole Docklands area represented by the link. These effects are quite subjective and wholly unquantifiable. That does not, of course, mean that they are unimportant.

2 There is no way of "demonstrating" that certain development patterns will flow from given infrastructure investment - comparable, for example, to the techniques available for forecasting the impact on demand of changes in journey times or fares. Each development pattern presented is judged to be plausible; but the judgement as to how likely it is that something like that pattern can be achieved or how dependent that achievement would be on the LRT has to be subjective.

6.5 Looking at the level of employment, the current number of jobs in the Tower Hamlets part of the LDDC area is estimated at 8,500. LDDC estimate that by 1991, if their development strategy is successful, a further 26,000 jobs will be attracted without any additional rail link but assuming the base case improvements outlined in paragraph 4.1. This figure is regarded by LDDC as a realistic target but possibly more vulnerable to shortfall or slippage than to being exceeded.

6.6 Over and above this figure the additional employment attracted by new transport links, is estimated as:

- + 4,100 for the north-south rail link
  - + 7,100 for the east-west rail link
  - + 9,300 for both rail links
- (The express bus scheme is not considered likely to make a significant difference to employment generation.)

These figures derive from an examination of the sites listed in Table 3 below. The estimates of increased employment in Tower Hamlets have been used when evaluating the transport benefits of each scheme. Clearly the value of those benefits, and hence the viability of each scheme, depends on the likelihood of these increases in jobs being achieved. This applies not only to the gains attributable to new links but also to the initial 26,000 which are expected to occur in any case. The chances of attaining the latter depend very much on the success of the LDDC's overall development strategy. In terms of the additional jobs, the Corporation's independent advisers consider that the property market will respond consistently to all the sites which are significantly helped by the rail link. That is to say that all the sites are likely to attract development and that the estimate of increased employment is extremely robust.

6.7 It is impossible to say with any certainty what proportion of these additional jobs would be genuinely 'new' (in the sense that they would otherwise not be provided) and what would otherwise be created elsewhere. However, LDDC's information from a survey of prospective developers suggests that a substantial majority would otherwise go to non-assisted areas. Table 4 indicates the premium which it would be necessary to attach to each new job in order to bridge the gap between the value of the transport benefits and the total cost of each scheme.

6.8 Apart from the effect on the numbers of jobs, LRT should also have the effect of attracting a mix of development (and hence of jobs) substantially different from that which would be attracted without rail. Thus, it must be remembered that the crude numbers of jobs discussed above conceal the fact that they will be different types of jobs depending upon which scheme is chosen. Essentially, either rail scheme would be expected to induce a better, more robust mix of development (i.e. more office, high technology, commercial and leisure employment) than an Express Bus, but the east-west scheme would be expected to do substantially better than the north-south in this respect.

#### Increase in Land Values

6.9 An important consideration in Docklands is the quantity of publicly-owned land and in particular the amount owned by the Corporation. For example the catchment area of the north-south scheme contains some 250 acres of publicly-owned land, of which nearly 200 acres belongs to the LDDC. The corresponding figures for the east-west scheme are 360 and 245 acres respectively.

6.10 Since the new rail links would be expected to increase the value of development sites, financial benefits should accrue - either by improving the return on the land grant from the DOE or by securing planning gain from development projects. This planning gain could represent private funding of projects the LDDC would otherwise have to have funded. Privately owned land would also increase in value. However, as explained in para. 6.2 (ii) above, these benefits are not included in the economic evaluation.

**TABLE 3: Forecast employment potential on nine selected development sites in Tower Hamlets 1981-1991. Base case compared with rail schemes (1)**

SITE (2)	BUS BASE	SCHEME II north/south	SCHEME III (4) east/west	SCHEME IV north/ south and east/west
East India Dock	200	300	200	300
North of Western Dock	50	50	200	200
Free Trade Wharf	50	50	500	500
Limehouse	500	500	1,000	1,000
Poplar High Street	450	450-1,450 (2) (mean 950)	1,450	1,700
Canary Wharf	1,600	1,600-4,200 (3) (mean 2,900)	4,200	6,000
Cannon Workshop	300	450	450	450
South Dock (West Side)	2,050	2,000-2,500 (3) (mean 2,250)	2,500	2,500
South Dock (East Side, incl. Olsen Sheds)	1,200	3,000	3,050	3,050
TOTALS	6,400	8,500-12,500 (mean c.10,500)	13,500	15,700
COMPARISONS		2100-6100 more than with base case.	7100 more than base, OR, 3000 more than mean N-S.	9300 more than base OR 5200 more than mean NS alone or 2,200 more than EW alone

**NOTES**

(1) Scheme I, the express bus, is not included since its impact on employment is not thought to be significantly greater than the base.

(2) Annex 2 contains site sheets detailing prospective development.

(3) The ranges reflect a judgment that the North-South alignment would be a less effective catalyst for development than would the East-West alignment. This is mainly because of the greater psychological appeal to potential developers of a more direct link with the City and Central London. Thus the north-south scheme would be likely to attract a lower density and less attractive mix of development, or even no additional development at all. Taking the mean of the range between the most and least likely levels will tend slightly to overstate the employment potential for the North-South link.

(4) The East-West alignment, unlike the North-South, would additionally make possible some leisure/tourist activities on the southern tip of the Island at Island Gardens, in the new conservation area containing listed historic buildings, in Limehouse, and in Wapping, but these have not been quantified.

TABLE 4 - Job premiums required to cover net cost of rail schemes [see para 6.2(i) and 6.7]

	NORTH-SOUTH EXPRESS BUS	NORTH-SOUTH LIGHT RAIL	EAST-WEST LIGHT RAIL	NORTH-SOUTH & EAST-WEST LIGHT RAIL
<u>TRANSPORT FACTORS</u>	£M	£M	£M	£M
Initial Capital Cost <sup>(1)</sup>	5	36	55	65
Net Present Value over 40 years at 5% discount rate	+8 to +2	-13 to -18	-22 to -27	-20 to -29
<u>DEVELOPMENT FACTORS</u>				
Additional Employment Generation over and above base	0	4100	7100	9300
Job Premium (£ per job) required to cover net cost over 40 years (Annualised cost)		3300 to 4400 (£200 to £270)	3100 to 3800 (£180 to £230)	2200 to 3100 (£130 to £180)
Range of Additional Jobs Attracted	Mainly local based manu- facturing and distribution.	Mainly manu- facturing and distribution with some service.	Mainly service sector, high technology and leisure related.	Full range attracted for broad and secure economic base.

(1) See notes for Table 1.

## Conclusion on Development Impact

6.11 This assessment of development benefits is necessarily imprecise but it does give a broad indication of the difference a rail link might be expected to make to the number and mix of jobs in Docklands, When arriving at a judgment about the schemes it must be taken into account with other non-quantifiable benefits such as the improvement to the image of Docklands and East London generally. Two important factors in this judgment are how large a premium is placed on attracting jobs to Docklands and what value is placed on achieving a better mix of development than that which would be achieved without rail. The gap to be bridged for each of the rail schemes is:

	<u>CAPITAL COST</u>	<u>NET PRESENT VALUE OVER 40 YEARS*</u>	<u>NET PRESENT VALUE ANNUALISED*</u>
North-South	£36m	£13 to £18m	£0.8 to £1.1m
East-West	£55m	£22 to £27m	£1.3 to £1.6m
Both Links	£65m	£20 to £29m	£1.2 to £1.7m

\* Over 40 years @ 5% discount

6.12 These figures need to be considered against the background of total public and private investment in Docklands (forecast to be £150 to £200m a year over the next 10 years or so), against which they afford the prospect of additional employment in the areas already immediately affected and against the other unquantifiable effects already described.

## 7 ASSOCIATED ISSUES AND IMPLICATIONS

7.1 A number of other issues, though secondary are nevertheless of importance.

### Development and Production by British Industry

7.2 Any system which might be installed would represent a new development for British industry, which is currently unable to offer any capability in the light rail field. Although Department of Industry finance would probably not be available for a low technology option, there are realistic export possibilities for any system. Docklands would provide a site for UK industry to demonstrate any new system and, in this way, would directly enhance its export potential.

7.3 It has been suggested that development of a new automated system by UK industry would be particularly beneficial for exports. In recognition of this the DoI might be prepared to fund part of the development costs - most probably a third of the cost of developing new elements in the system. The arguments against such a course are that there would be a minimum additional delay of two years and that, unless a system much cheaper than existing options were developed, there would be doubts about securing future markets.

7.4 Adopting an automated system would only be feasible with the east-west link which has a segregated right of way. It would add some £10m to the cost. Since either the vehicles or stations would need to be staffed and public pressure in any case may require the vehicles to be staffed, the saving in operating costs might be small. Nevertheless, for the present the option of automation is being retained.

### The Relationship to the Docklands Northern Relief Road (DNRR)

7.5 The DNRR is currently the subject of review within the GLC as part of their Highways Policy review and within the LDDC. These reviews will include assessing the implications of an alternative alignment compatible with an east-west LRT and also the adoption of more modest design standards to reduce the cost and environmental impact of the DNRR in general, though this would also result in reduced traffic benefits. There is a strong desire to see the DNRR proceed as quickly as possible and a change of route would delay the public inquiry by a year. However, if a lower cost scheme with less environmental impact were more likely to be endorsed by the inquiry and to attract Government funds, there might not be an overall delay.

### Possible Extension to the Royal Docks and Beckton

7.6 A preliminary analysis of a possible extension to serve the Royals and Beckton in the future suggests that with general development of the area its performance would be similar to the east-west link to the Isle of Dogs. If there were to be a strategic development attracting trips from a London-wide or national catchment area the performance would be substantially better. Such a development would be less likely to come about if a link were not provided. Though proposals for development have been mooted, it is too early to say whether they will come to fruition and the implications of such an extension have not therefore been examined.

### Environmental Impact

7.7 The environmental impact and other direct disbenefits of the schemes are modest compared with the existing problems in Docklands because of the use of existing rail rights of way for much of the routes or a new right of way through

undeveloped areas with little housing. Nevertheless, environmental impact would have to be considered and appropriate measures taken where necessary. Annexe 1 examines these considerations in more detail.

Need for a Decision Now

8.1 Though no study can be exhaustive or definitive in a changing situation we do believe that little purpose would be served by further study. Given the Government commitment to speedy development, as exemplified by the setting up of the LDDC, further delay in taking decisions would bring problems of cost and disruption to road schemes and development. Indeed, it is very doubtful that LDDC would wish or be able to safeguard an alignment.

8.2 At the same time much of the potential benefit would be dissipated by delay as development proceeded on the presumption that rail links would probably never be provided. The development of the Isle of Dogs is now proceeding with increasing momentum, particularly with the creation of the Enterprise Zone, and the intention is that a very substantial part will be complete or committed over the next five years. Work is going ahead on road schemes and bus improvements (as described earlier). Since the nature of development attracted will depend on whether other transport links are provided, now is therefore the time to take a decision on whether or not a rail link is to be built.

Possible Completion Dates

8.3 The completion dates indicated in Section 4 are based on powers being obtained in 1983 for the east-west link and 1984 for the north-south link. The difference arises because feasibility studies and referencing work have been concentrated on the east-west route and it would not be possible to deposit a Bill in November 1982 for the north-south route. If the north-south route were chosen powers could possibly be sought initially under a light rail order. If a Bill were not deposited for the east-west scheme in time for the 1982-83 session there could be the prospect of a two year delay in the event of a General Election. In the context of a scheme of this magnitude the alternative of a light rail order is untried, less predictable, and could involve greater delays than seeking parliamentary powers.

8.4 The timetable is based on design work being undertaken in parallel with the seeking of powers, with land acquisition and tendering following on immediately after powers are obtained. If a completely new system were to be developed it would add a further two years to the timetable for the east-west scheme, i.e., it could not open before 1989.

9.1 Annex 3 lists the annual funding which would be required for expenditure on road schemes already agreed and on the public transport options discussed in this paper. If a decision were taken to go ahead with one or both LRT options, some of the GLC's contribution (assuming for the sake of argument a fifty-fifty share of the cost with LDDC) could be accommodated in the GLC's TPP/TSG settlement, although other transport projects might be affected. However, the exceptional peaking which would occur in 1984-86 would require a sympathetic attitude from Government, as would the LDDC's contribution in those years.

9.2 The GLC would need to be assured that in supporting a rail scheme it would not be open to challenge in the courts. They would expect this difficulty to be overcome should their position be one of partnership in a scheme enjoying government support. The GLC considers that there would need to be a commitment to government capital spending authorisations sufficient to avoid substantial undermining of on-going transport programmes.

Summary of the Report

10.1 The report considers the ways in which public transport to, from and within Docklands could be improved. It sets out briefly the history of similar studies over the past decade, the broad strategy for Docklands being developed by LDDC and the transport needs which flow from that strategy. It describes the road improvements in hand and in prospect for meeting the forecast increase in demand and then identifies the key needs for public transport which remain to be met. These are chiefly:

- (a) the need to improve access to jobs in the City and Central London;
- (b) the need to attract business and commerce to locate in Docklands;
- (c) the need to provide access to and from jobs in Docklands
- (d) the need to provide access to educational, shopping and leisure facilities in adjoining town centres and Central London.

10.2 Since the LDDC's work is now under way, a decision on a rail link must be taken now if the development benefits which arise from it are to be achieved. Because both the major development programme and the major public transport requirements are concentrated in the Isle of Dogs, the proposals examined in this report are mainly concerned with this area of Docklands.

10.3 To meet these requirements within the constraint of the likely availability of resources, an Express Bus route and two possible alignments for a light rapid transit rail system have been identified and evaluated in standard transport cost-benefit terms. The results of that evaluation are set out in Section 5 and Table 2.

10.4 The report recognises that any scheme linking Docklands to the London Transport rail network needs to be evaluated in terms of the wider benefits - designated 'The development impact' - which are described in Section 6, as well as the transport benefits.

10.5 An attempt has been made to illustrate the likely order of magnitude of the development impact in the area most likely to be directly affected by the schemes: Poplar and the Isle of Dogs. The report suggests that these direct effects are by no means the whole of the development impact. There is also the 'ripple' effect in those areas less directly affected and the general improvement to development prospects flowing from the clear commitment to the whole Docklands area represented by a fixed link. These secondary effects, while they are subjective and unquantifiable, should not be seen as unimportant.

The Schemes Compared

10.6 Viewed strictly on transport benefits alone, Scheme 1 (an Express Bus from Mile End to the Isle of Dogs) is clearly the most cost-effective scheme. However, reservations must be expressed about its reliability, particularly in the short term, since full benefits are not likely to accrue until after the completion of the Docklands Northern Relief Road in the early 1990s. It would also have little or no impact on the nature of development and scale of employment and its impact on the image of Docklands must be strictly limited.

10.7 None of the rail schemes proposed can be justified solely on transport benefits, which cover about half the capital cost of each scheme. The schemes should, however, have a substantial - though differing - impact on development and employment and, moreover, would make an important contribution to the image of Docklands. Either or both of these schemes, therefore, can be justified if the non-transport benefits described above were regarded as sufficient to bridge the shortfall between the quantifiable transport benefits and the total cost. This must remain an essentially political judgment. (The importance for British industry of an order for LRT should also be remembered - see Section 7.)

10.8 The costs and quantifiable benefits of the rail schemes are as follows:

	<u>Present Cost</u>	<u>Present Value of transport benefits*</u>	<u>Net Present Value*</u>
	£M	£M	£M
SCHEME II North-South	-34	15 to 18	-16 to -19 (-13 to -18)
SCHEME III East-West	-51	22 to 26	-25 to -29 (-22 to -27)
SCHEME IV North-South and East-West	-62	31 to 37	-25 to -31 (-20 to -29)

\*over 40 years  
at 7% discount

figures in brackets: over 40 years  
at 5% discount

10.9 In evaluating these schemes it is of the first importance to remember that they are not alternative ways of achieving a common objective. The different schemes and combination of schemes cannot therefore be evaluated in simple terms of which is the cheapest way of achieving a set goal. Although there is some degree of overlap, most of the benefits - both transport and development, and both quantified and unquantified - are different in that they largely accrue to different people, meet different transport needs and help improve different development prospects.

10.10 The north-south LRT (Scheme II) from Mile End to the Isle of Dogs is the cheapest rail proposal and could be expected to have a greater impact on development than an Express Bus. It would meet a need by bringing people to work in the Isle of Dogs from north and north east London.

10.11 There are, however, a number of drawbacks. A north-south link would not make the same contribution as an east-west link to trips wholly within Docklands and it would have little or no impact on the general development scene beyond the Isle of Dogs. Unless the line of the east-west link were preserved, the choice of a north-south link would effectively close the option of an extension to the Royal Docks and Beckton. Also, as outlined in Section 7, there are a number of feasibility problems still to be resolved which make it impossible to seek Parliamentary powers in the 1982-83 session. This means that the north-south scheme could not be expected to open before 1987 at the earliest. This scheme is less likely to attract the robust mix of development which the Development Corporation see as necessary for success.

10.12 The east-west LRT (Scheme III), at £55m, is a more expensive scheme but provides quick, easy and reliable access from the Isle of Dogs and western Docklands to the City and Central London. It would:

- (i) capture virtually all the developments listed in Section 6 and should attract a robust mix of development;
- (ii) preserve the option of an extension to the Royals and Beckton, if that could later be justified;
- (iii) relieve traffic congestion along Commercial Road;
- (iv) represent an impressive commitment to Docklands as a whole.

If Parliamentary powers were obtained in 1982-3 the east-west scheme could be in operation by 1987.

10.13 The difference between the transport benefits and total cost of the east-west scheme is £22-£27m (at 5% discount). In order to justify the scheme it is, therefore, necessary to believe that the premium to be attached to the new jobs created (para. 6.2 (i)), the impact on the range and mix of development (para. 6.8) and the other unquantifiable benefits described can reasonably be judged to be sufficient to bridge this gap.

10.14 The only way of achieving all the transport and development benefits identified in this study is to build both the north-south and east-west links (Scheme IV). This would have the maximum impact on potential developers since it would represent a very high degree of commitment to the public transport infrastructure of Docklands and to the success of the overall strategy. In transport terms, introducing both schemes would optimise both access to the Enterprise Zone from north and north-east London and access to Docklands from the City and Central London. It would, largely, combine the benefits of the north-south scheme (listed in para. 10.10) and those of the east-west scheme (listed in para. 10.12). The transport benefits meet about half the cost of this proposal, although the "shortfall" occurs almost entirely on the east-west scheme and the cost of adding the north-south spur (£10m) is virtually matched by the additional transport benefits realised.

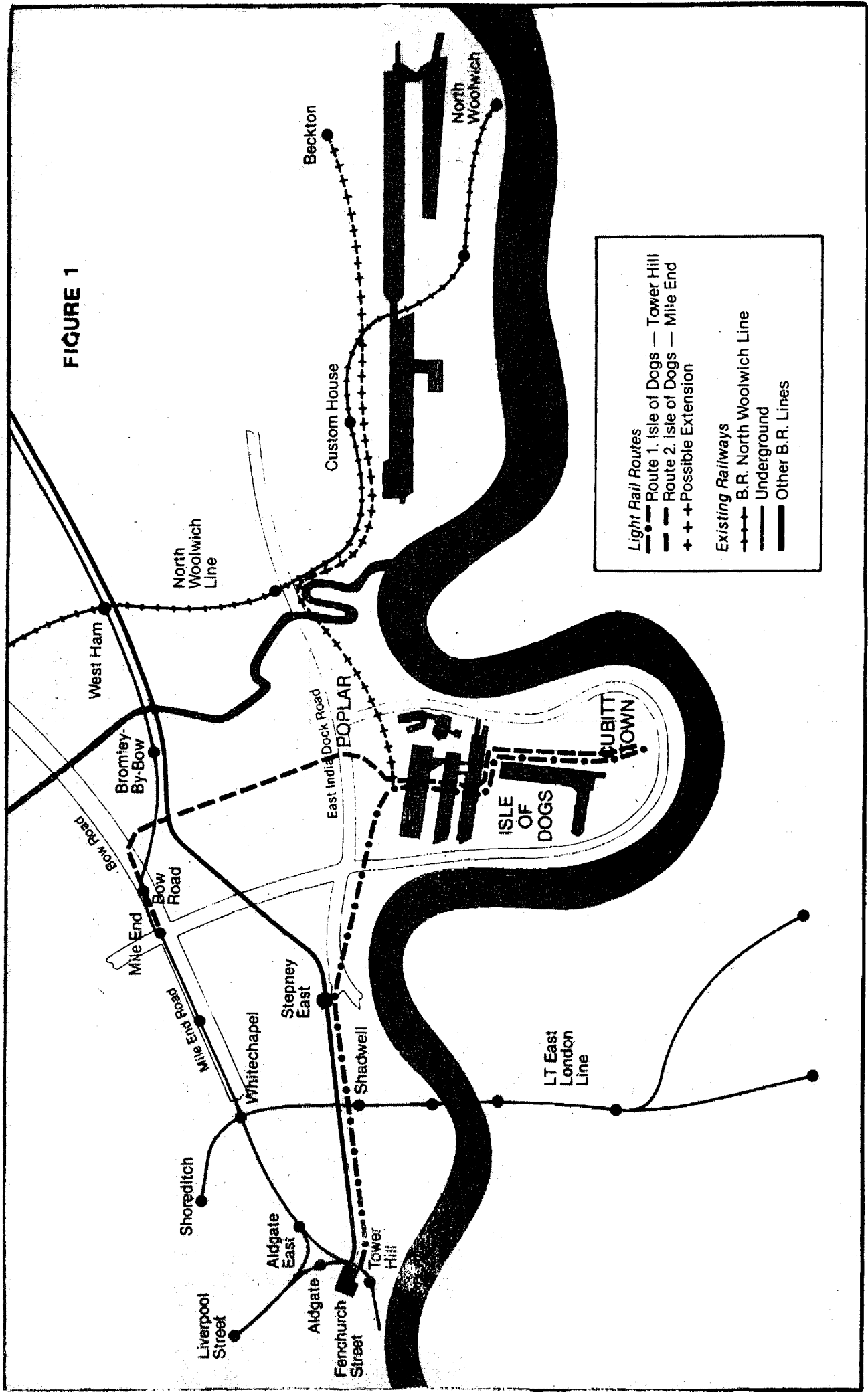
### Conclusion

10.15 There is a clear need for better public transport in Docklands, both to improve access to and mobility within the area and, as a consequence, to improve its attraction to potential developers. The first step is to improve existing bus services and that will be done when and where practicable. An express bus as described in the study is also a possibility. The immediate decision is whether a rail link of the type described in the report should be provided. That decision turns on a subjective judgement of the value to be placed on the unquantified benefits - mainly those affecting the probable pattern of development in Docklands - which the schemes would be expected to bring.

10.16 The north/south scheme described in "paras 10.10-10.11 above" is the cheapest rail option available, but as indicated it has some drawbacks. The east/west scheme is more expensive but produces greater benefits, particularly in its greater impact on the likely pattern of development. If this impact is judged to be sufficient to justify the higher cost of the east/west link, then the addition of the north/south to Mile End, viewed as an addition to the east/west scheme, could be justified in terms of its quantifiable benefits alone.

From the point of view of capturing all the transport and development benefits identified in the study, and the context of the overall strategy for Docklands, this is the ideal scheme.

FIGURE 1



- Light Rail Routes**
- Route 1. Isle of Dogs — Tower Hill
  - +— Route 2. Isle of Dogs — Mile End
  - - - Possible Extension
- Existing Railways**
- +— B.R. North Woolwich Line
  - — — Underground
  - — — Other B.R. Lines

THE PUBLIC TRANSPORT OPTIONS

Present Services to the Isle of Dogs

Public Transport to and from the Isle of Dogs is at present by bus services which operate on the loop road and link with the underground at Mile End (Route 277) and Aldgate East (Route 56). The frequencies in the peak are 5 minutes and 15 minutes respectively. It is the unreliability of buses and the length of journey, e.g., 1 hr to Oxford Circus from the south of the Isle of Dogs that must be seen as the prime cause of dissatisfaction with access to the north and west. The effect is reinforced by the barrier that the river represents to the south.

The Base - Improved bus services

In the absence of any new fixed track links conventional bus services will provide the basic transport network for Docklands. Services will be introduced as and when demand dictates, sometimes in advance of normal criteria so that usage can be encouraged as journey patterns develop. Existing services will have increased frequencies and new routes or extensions will be implemented. A network of improved services has been designed for the situation in 1991 to serve development as outlined by the Development Corporation.

The flexibility of bus operation means that detailed route patterns and frequencies do not have to be determined until about 12 months before introduction of the service. However, to establish a 'base' over which other improvements can be measured the general scale and performance of the future (1991) bus network has been determined.

Bus lanes or bus priorities will be introduced where possible along with these improved services. However, increased road traffic levels mean that it must be assumed that the reliability of general bus services is not improved over current levels.

The base bus network will provide adequate local transport services to and from residential areas, local employment and shopping centres and interchange with underground services. Although the level of service provided will be comparable to that in other similar areas of London, in terms of public transport accessibility several areas of Docklands will remain poor, particularly to Central London.

I. Express Bus

London Transport have proposed an Express Bus service from Mile End to the Isle of Dogs. A reliable and attractive high frequency, limited-stop service could be provided, given:

- a high level of bus priority measures
- adequate standing space at Mile End and at the southern terminus in Cubitt Town
- generous running allowance to ensure adequate recovery time.

## Priority Measures

Measures to minimise delays to buses would be needed at Mile End Road/Burdett Road, across East India Dock Road and in West India Dock Road - all points currently experiencing severe road congestion at certain times. On the island the route would follow the improved roads including a link from the west side of the three West India Docks, across Millwall Cutting via the lifting bridge and parallel with East Ferry Road to the southern part of the island.

With the full (Option 3) DNRR the junction with East India Dock Road is grade separated and it should be possible to provide the priority measures but if DNRR is moved to Option 2 or a variant, it will be very difficult to achieve the same scale of priority.

## Terminal Facilities

A proposal for a high quality interchange at Mile End has been outlined. However this would have an adverse effect on two adjacent residential blocks and, since property acquisition (a public house and an office building) is entailed, an inquiry could be necessary. Such a terminus might take three years to implement. A notional figure of £5m is suggested to cover the works including rebuilding the LT substation and extending the bridge over Central Line.

Although facilities would be needed at the southern terminus they would not need to be so elaborate or extensive as at Mile End.

## Service Frequency

The following buses per hour have been proposed:

Mondays to Fridays:	24 peak hours;	12 between peaks;	8 evenings
Saturdays:	12 during the day;	8 evenings	
Sundays:	8 all day.		

A bus option could be established before any fixed track system. Doubts remain, however, over whether a bus service can provide the image and sense of permanence that the Development Corporation are seeking.

Even if it is decided to proceed with a fixed track link it would be appropriate to introduce a special bus service following the same general route as the north-south rail link before the latter opened and complementary special services to areas not served by the rail link.

## II. East-West Light Rail

The basic route considered and put forward as the route for which London Transport should seek Parliamentary Powers would operate from the Minories (with interchange to Tower Hill) along the existing BR viaduct to Limehouse and then down the middle of the Isle of Dogs on a new elevated structure for the northern section and possibly at ground level for the southern part. A typical frequency would be 5-minute intervals.

To provide the necessary capacity at Tower Hill station for additional Docklands traffic (either with Minories or Underground interchange) London Transport consider it essential to construct a new exit to the station on the west side. Outline schemes have been considered but difficulties are anticipated in finding a solution which is environmentally acceptable.

Over the section from Minorities to Stepney East the light rail would run partly on new viaduct and partly sharing the existing the BR viaduct.

Over the Limehouse section from Stepney East to the southern end of West India Dock Road, the E-W LRT option conflicts with the previously approved scheme for Docklands Northern Relief Road which followed the disused railway alignment. An outline scheme has been prepared which shows the light rail in combination with a modified version of DNRR Option 2. In highway terms this would be feasible but detailed engineering, environmental and planning issues have not been studied. If a decision is made to go ahead with LRT on this route (the only route practical for an East-West light rail service) then a detailed design exercise will be necessary. Consideration is also being given to a low cost scheme for DNRR which involves only minimal change in the Limehouse area and need not conflict with the E-W LRT.

Within the Isle of Dogs the LDDC's preference is for a central route crossing existing water space several times. In their view this route although up to £2m more than a surface route would be justified by its contribution to development on Canary Wharf and avoidance of environmentally sensitive areas. In the Isle of Dogs, LRT would introduce disturbance to a limited number of residential properties at East Ferry Road and Manchester Grove. It would cross Millwall Park on an existing long-disused viaduct.

The cost of this option would be about £55m (excluding the cost of works at Tower Hill) and if Parliamentary Powers are sought this Autumn the system could open in 1987.

### III. North-South Light Rail

This option meets rather different needs to the East-West route and therefore is not necessarily a functional alternative.

The line would run from Mile End tube station to the Isle of Dogs. From Mile End the route involves about <sup>3</sup>/<sub>4</sub> mile of street running along Mile End Road/Bow Road. LRT would run on kerbside tracks in a lane reserved for LRT and buses. No physical separation from other traffic could be given. Some access problems to adjacent properties would be encountered and additional delays to general traffic on an already badly congested road would be created. Overhead wiring may be visually intrusive. Street rail tracks would also present unfamiliar hazards to cyclists and pedestrians.

From Bow Road to Poplar light rail would use the disused BR freight line and within the Isle of Dogs the same route as proposed for the East-West line could be adopted. The cost of the North-South route alone would be about £36m and could be operational by 1987. The incremental cost of adding the link to Mile End to the East-West alignment would be only £10m.

## Technical Issues Still to be Resolved

There are a number of points on the alignments where the best technical solution still needs to be resolved or its accessibility to the planning authorities still has to be established.

Tower Hill station - modification would be required and an environmentally acceptable solution has still to be found.

Use of BR viaduct - exactly how far this is possible from Fenchurch Street to Stepney East will be established by BR's timetabling feasibility study. It might prove necessary to increase the length of widened viaduct and this would have an environmental impact on one or two adjacent blocks of flats.

Bow Road - the operation of traffic and LRT on Bow Road to Mile End and the signal control of movements of east bound trains across traffic and the junction with the Poplar Docks line has still to be resolved.

Millwall Cutting bridge - form of road and rail crossing.

Siting of depot and junction of North-South and East-West routes in relation to DNRR.

## Environmental Design and Reinstatement:-

At the subsequent design stage, environmental design and reinstatement aspects will need to be given careful attention if the chosen scheme is to project an appropriate image for Docklands, and if adverse effects on adjacent areas are to be minimised. Some modest additions to current cost estimates could be involved. The question of powers to carry out environmental works and to acquire land must be considered in seeking Parliamentary powers.

The rail options involve re-opening of long dis-used, or previously very infrequently used sections of track, and thus the specification for any system should aim to meet the GLC guideline for noise from new railways of 65 dB(A) LEQ (24 hours) at the nearest dwelling facade. Sound insulation may, however, be required for a limited number of properties and if it does not prove practicable to limit system noise sufficiently, undertakings would need to be given by London Transport.

### East-West Route:

An environmentally acceptable solution has to be found for increasing passenger handling capacity at Tower Hill Station. Any structure within the landscaped gardens north of Tower Hill would be environmentally unacceptable, and any Parliamentary Bill including such a proposal would be unlikely to be sustained.

Trinity Square is protected by the London Squares Preservation Act 1931. Development here, or in other landscaped areas north of Tower Hill, would also conflict with policies for the Tower of London area of Special Character of Metropolitan Importance in the approved GLDP. The presence of the Roman Wall and Lutyens War Memorial would also make any station building within the landscaped areas unacceptable.

If a solution avoiding damage to the precinctual character of the Tower were not to prove feasible, the East-West Light rail option would need to be diverted to Aldgate East in tunnel, rather than terminating at Minories, and this would also avoid most of the difficulties associated with the  $\frac{1}{2}$ km. of new viaduct which would otherwise be needed east of Minories.

The section of new viaduct, probably between Minories and Cannon Street Road (some  $\frac{1}{2}$ km or  $\frac{1}{3}$  mile in length), would take properties including a short terrace of shops, with some residential accommodation over, a warehouse/office premises, a cold store, a Post Office, a small youth club, and a petrol filling station. Construction of the new viaduct would affect access to some 20 arches in the existing BR viaduct used by vehicle repairers, etc. The new viaduct would run through landscaped amenity areas over-looked by five and 27 storey blocks of flats on the opposite side of Cable Street. The 'barrier effect' and intrusion of the existing railway would be increased, and, where suitable uses cannot be found, under-viaduct areas could attract vandalism, etc.

Between Cannon Street Road and Stepney East, the use of the existing viaduct by the light railway as well as existing BR services would not be likely to involve significant additional disturbance to adjoining residents.

In the Stepney East Area, LRT would use the existing long-disused viaduct. This passes close to several mostly five-storey blocks of flats, involving some loss of privacy and noise increases in a presently quiet area. Overhead wiring might be considered visually intrusive.

Annexe 2

Development Impact of Selected Docklands Sites

DOCKLANDS RAIL STUDY - DEVELOPMENT IMPACT :

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SITE: Free Trade Wharf

REFERENCE: 7

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LOCATION DESCRIPTION: South of The Highway

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AREA (ACRES) 5.7 acres OWNERSHIP Private

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PRESENT USE: Vacant

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PROPOSED USE: ASSUMPTIONS	WITHOUT RAIL	WITH RAIL E/W ONLY
	Housing (300 Units)	Housing (250 Units)
	Shops, pub and Restaurant	No change
		Offices (1 acre 90,000 sq.ft.)

POPULATION TOTAL 600 500

EMPLOYMENT TOTAL 50 500

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ASSUMED DEVELOPMENT  
PROGRAMME

---

ADDITIONAL FACTORS

A small commercial element - shops, pub, restaurant, etc. is anticipated with or without rail given the attractive riverfront site and the proximity of the Limehouse Basin scheme; a notional employment of 50 has been assumed for this.

With rail it is considered that a site of about 1 acre at the eastern end of the site would be attractive for office development on the assumption that the Shadwell / Stepney East / LRT stations would then constitute a transport interchange.

Plot ratio 2:1 - 220 sq.ft. gross per employee.

Housing density and population is derived from Gable Cross proposals.

## DOCKLANDS RAIL STUDY - DEVELOPMENT IMPACT :

SITE: Limehouse

REFERENCE: 16

LOCATION DESCRIPTION: Between Commercial Road and Narrow Street

AREA (ACRES)	50	OWNERSHIP	BWB/CEGB/Private
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PRESENT USE: Part vacant, existing housing and industry.

PROPOSED USE:  
ASSUMPTIONS

WITHOUT RAIL

WITH RAIL  
E/W ONLYResidential (incl.  
existing) 800 units.Residential (incl.  
existing) 750 units.Shops (55,000 sq.ft.)  
marina and workshops.

No change

Existing Commercial  
Uses.

No change.

Offices (100,000 Sq.ft.)

POPULATION TOTAL

2,000

1,900

EMPLOYMENT TOTAL

500

1,000

ASSUMED DEVELOPMENT  
PROGRAMME

1983-88

1983-88

## ADDITIONAL FACTORS

Marketability and viability of scheme for Limehouse Basin would be significantly enhanced by LRT.

Proposals are derived mainly from Hunting Gate scheme for Limehouse Basin, but it is considered that the proposed office element is only viable if LRT proposals are implemented.

DOCKLANDS RAIL STUDY - DEVELOPMENT IMPACT :

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SITE: Cannon Workshops

REFERENCE: 17

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LOCATION DESCRIPTION: Between West Ferry Road and West India Dock Access Road.

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AREA (ACRES) 9 OWNERSHIP P.L.A.

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PRESENT USE: Vacant - workshops in course of erection on two-thirds of site.

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PROPOSED USE: ASSUMPTIONS	WITHOUT RAIL	WITH RAIL E/W OR N/S
	Workshops/Light Industry  (7.5 acres)	Workshops/Light Industry (6 acres)  Offices (1.5 acres)

POPULATION TOTAL

-

-

EMPLOYMENT TOTAL

300

450

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ASSUMED DEVELOPMENT  
PROGRAMME

1982-84

1982-85

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ADDITIONAL FACTORS

Industrial employment assumed at 40 jobs per acre.

Office block about 50,000 sq.ft; less than 2:1 plot ratio reflecting awkward shape of site and possible highway requirements; 220 sq.ft. per employee.

SITE: Poplar High Street

REFERENCE: 18

LOCATION DESCRIPTION: South of Poplar High Street

AREA (ACRES) 18 OWNERSHIP LDDC/BR

PRESENT USE: Largely vacant

PROPOSED USE: ASSUMPTIONS	WITHOUT RAIL	WITH RAIL		WITH RAIL
		N/S	E/W	E/W PLUS N/S
Residential 2.5 acres 60 units)		Offices (2.5 acres 220,000 sq.ft.)		Offices (275,000 sq.ft.)
Industry (11 acres 240,000 sq.ft.)		No change		No change
Open Space (4.5acres)		No change		No change

POPULATION TOTAL	150	-	-	-
EMPLOYMENT TOTAL	450	450-1450	1450	1700

ASSUMED DEVELOPMENT  
PROGRAMME

1984-87

1985-88

## ADDITIONAL FACTORS

Development programme will be strongly influenced by construction timetable for DNRR as well as LRT.

Residential development is assumed at 24 units per acre with an occupancy rate of 2.5.

Industrial development assumes 50% site cover including access roads etc. and 40 employees per acre.

Office development assumes 2:1 plot ratio and 220 sq.ft. gross per employee.

Quality of industrial development may be enhanced by LRT.

LDDC will review car parking requirements where access to LRT is possible. This is reflected in office floorspace but may allow more intensive use of industrial site.

SITE: Canary Wharf

REFERENCE: 20 (page 1)

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LOCATION DESCRIPTION: Between West India Dock Entrance and  
North side of West India South Dock.

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AREA (ACRES)	36	OWNERSHIP	LDDC/PLA
	without reclamation		

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PRESENT USE: Largely Vacant

---

PROPOSED USE: ASSUMPTIONS	WITHOUT RAIL	WITH RAIL
------------------------------	--------------	-----------

Industry/warehousing -  
existing buildings  
(16 acres: 750,000 sq.ft)

See page 2.

Industry - new  
(18 acres: 400,000 sq.ft)

Offices  
(2 acres: 50,000 sq.ft)

POPULATION TOTAL

-

-

EMPLOYMENT TOTAL

1,600

-

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ASSUMED DEVELOPMENT  
PROGRAMME

1982-87

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ADDITIONAL FACTORS

Employment density for industrial sites assumed at 40 persons per acre.  
Existing buildings have a higher plot ratio than new but are only capable  
of less intensive use.

New industrial floorspace assumes 50% site cover at 40 persons per acre.

Plot ratio for offices reflects car parking and landscaping requirements  
on site selected. Employment is 220 sq.ft. per person.

DOCKLANDS RAIL STUDY - DEVELOPMENT IMPACT :

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SITE: Canary Wharf

REFERENCE: 20 (page 2)

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LOCATION DESCRIPTION: Between West India Dock Entrance and  
north side of West India South Dock

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AREA (ACRES)	A. 36 acres	OWNERSHIP	LDDC/PLA
	B. 54 acres		
	(18 reclaimed)		

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PRESENT USE: Largely vacant

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PROPOSED USE: ASSUMPTIONS	A. WITH RAIL NO RECLAMATION		B. WITH RAIL AND RECLAMATION
	N/S	E/W	E/W PLUS N/S
	No change.		Mixed industrial/ commercial/ residential.
	High grade industry/ commerce (15 acres: 650,000 sq.ft.)		
	Offices (5 acres: 450,000 sq.ft.)		
POPULATION TOTAL	-	50 (notional)	50 (notional)
EMPLOYMENT TOTAL	1600-4200	4,200	6,000

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ASSUMED DEVELOPMENT PROGRAMME	1982-88	1982-89
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ADDITIONAL FACTORS

Alternative A.

New high grade industry/commerce is based on a 1:1 plot ratio; this embraces high technology/computer/media activities with a resulting employment density of 100 persons per acre.

Alternative B.

This is derived from the Thames Island submission but with the employment generation scaled down from 8,600 to 6,000 to reflect a more realistic assessment of the likely density of development. The residential element will be ancillary and reflect the exact combination of uses favoured.

DOCKLANDS RAIL STUDY - DEVELOPMENT IMPACT :

SITE: South Dock, South Quay West  
and former Lorry Control Park.

REFERENCE: 24

LOCATION DESCRIPTION: West side, Millwall Inner Dock.

AREA (ACRES) 57 OWNERSHIP LDDC/PLA

PRESENT USE: Largely vacant

PROPOSED USE: ASSUMPTIONS	WITHOUT RAIL	WITH RAIL	
		N/S	E/W
	Industry - south of new access road with a residential element around Glengall Bridge (44 acres; 750,000 sq.ft.)		No change.
	Industry/warehousing - existing building (6 acre site)		No change.
	Industry - north of access road (7 acres; 150,000 sq.ft.)		High grade industry/ offices (7 acres: 300,000 sq.ft.)
POPULATION TOTAL	100 (notional)		100 (notional)
EMPLOYMENT TOTAL	2050	2050-2500	2500

ASSUMED DEVELOPMENT PROGRAMME

1982-85

1982-86

ADDITIONAL FACTORS

New industry is assumed to have 50% site cover less (in the case of the site south of the access road) requirements for housing, open space, dockside access, etc; employment generation is 40 persons per acre (less 4 acres south of access road)

High grade industry/offices; is assumed to have a 50% office element and 50% industry/technology/media floorspace. Employment generation assumed at 100 per acre.

Existing building has limited conversion prospects reflecting large open type of structure; assumed at 30 jobs per acre.

DOCKLANDS RAIL STUDY - DEVELOPMENT IMPACT :

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SITE: South Dock South Quay (East)  
and Olsen Site (Sheds 1,2,3,17 & 18) REFERENCE: 25

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LOCATION DESCRIPTION: East Quay, Millwall Inner Dock.

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AREA (ACRES) 46 OWNERSHIP LDDC

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PRESENT USE: Largely vacant, LDDC Offices.

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PROPOSED USE: ASSUMPTIONS	WITHOUT RAIL	WITH RAIL N/S OR E/W
	Mixed industry/residential (4 acres: 95 units 80,000 sq.ft. industry)	No change.
	Indoor athletics track, sports centre, car parking and offices (7 acres)	No change.
	Industry (24 acres)	Industry (13 acres) High grade industry/ offices (7 acres) Offices (4 acres)
	Residential (5 acres: 120 units)	No change.
	Landscaping (6 acres)	No change.
POPULATION TOTAL	500	500
EMPLOYMENT TOTAL	1,200	3,050
ASSUMED DEVELOPMENT PROGRAMME	1983-87	1983-89

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ADDITIONAL FACTORS

Potential for indoor athletics track under investigation. Would benefit considerably from rail link. Employment assumed as 100 including offices of AAA.

Industrial employment 40 per acre.

High grade industry/offices is assumed to have a 50% office element and 50% industry/technology/media element. Employment generation assumed at 100 per acre.

Office development at plot ratio 2:1 - 220 sq.ft. per employee.

Mixed 4 acre scheme is Rosehaugh pilot project.

Residential development 24 units per acre 2.5 persons per dwelling.

FINANCING

The financing of improved access depends on whether:

- a) it is believed to be justified
- b) it is accorded the priority over other schemes, and,
- c) whether the funds can be allocated to it within the constraints that apply to the various bodies involved. This note indicates the position as it is understood at present.

The Greater London Council has indicated a willingness to fund a package of road and public transport improvements for Docklands jointly with the LDDC. This was envisaged as running at a rate of up to £15m p.a. on average with rather more than half being expended on roads. The progression of road schemes suggests that this is likely to be the situation if LRT was proceeded with.

If, as was postulated, the GLC funded half the cost of the package the average demand would be £7½m p.a. and this could not be accommodated at the present level of TPP/TSG settlement without severe containment of other programmes on road and public transport.

The phasing of expenditure if all the schemes are proceeded with as quickly as possible involves funding a substantial excess about £15m for the three years 1984/86. This is a problem which would have arisen for the GLC if there was no joint package in finding the DNRR.

Some major adjustment would have to be allowed for in the TPP settlement to recognise the concentration of the burden over the three years, if the Council is to support other road and public transport capital investment during the period. The alternative is that the main finance for such a project should be through special funds.

There remains a question of whether the LT operated LRT or improved bus operation can be justified within the law if it fails to meet its operating costs including D&R from revenue. In that this constraint is not in line with Government or GLC intentions it is arguable that either the constraint will be removed by a change in legislation or there would be agreement to an approach which did not breach the present law, e.g.

- i) the LRT could be funded by LDDC for capital and operating without involving the GLC
- ii) the possible deficit could be underwritten by the LDDC;
- iii) the scheme could be funded by GLC and run by an independent operate such as BR.

These approaches would only be feasible if they were acceptable to the LDDC and by implication DTp and DoE.

The LDDC's initial assessment suggests that only about £10m would be provided by present transport allocations within their budgets up to 1985/6. There would therefore have to be substantial augmentation to their funding or allocations within the budget if they were to make a substantial contribution to a package of improvements to Docklands Access.

POSSIBLE PHASING OF DOCKLANDS ROAD AND RAIL TRANSPORT SCHEMES

1. ROAD SCHEMES (NOV. 1981 PRICES) (LATEST AVAILABLE)	TOTAL PRE										POST 1990
	£m.	1982	1982	1983	1984	1985	1986	1987	1988	1989	
DNRR (OPTION 3) *	74.2	0.3	0.1	0.5	5.0	7.0	8.0	17.0	16.2	15.1	4.0
DOCKS CUT & CYPRUS BY-PASS	3.6	-	0.1	1.2	1.7	0.5	0.1				
LOWER ROAD	11.9	0.2	0.1	0.7	1.5	4.5	3.5	1.1	0.4		
EVELYN STREET	8.9	-	-	0.1	0.8	1.5	5.0	1.2	0.3		
ISLE OF DOGS LOOP ROAD	11.1	-	0.2	0.5	1.0	1.0	4.7	3.4	0.3		
2. MAJOR PUBLIC TRANSPORT SCHEMES (SPRING 1982 PRICES)											
EAST-WEST LIGHT RAIL	55	-	0.5	3.5	17.0	20.0	11.0	3.0			
NORTH-SOUTH LIGHT RAIL	36	-	0.5	3.0	16.0	13.0	3.5				
N.S. & E.W. LIGHT RAIL	65	-	0.5	3.5	23.0	23.0	11.0	4.0			
NORTH WOOLWICH LINE ELECTRIFICATION	9.5	-	0.5	3.5	4.0	1.5					

\* RELATES TO EARLIER (OPTION 3 DNRR PROPOSAL)  
LOWER COST SCHEME WHICH COULD RESULT IN REVISED  
PHASING IS BEING EXAMINED