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“We are grateful for the financial support of the journal from the Dr Joachim und Hanna Schmidt Stiftung für Umwelt und Verkehr, Hamburg, Germany”

EDITORIAL

This issue is devoted to the work of John Roberts, the transport consultant who founded and managed the consultancy TEST in London for many years. John died in 1992 but his reports and publications where decades ahead of their time and deserve a wider audience. The world of sustainable transport has not yet caught up with the clarity, insights and policy suggestions that John Roberts included in his prodigious output of reports, books and articles in the 1970s and 1980s.

A full account of his life and achievements can be found here:

https://www.independent.co.uk/news/people/obituary-john-roberts-1532243.html

https://en.wikipedia.org/wiki/John_Roberts_%28urban_planner%29

These reports, as far as we know, were never made available in electronic form and over time are disappearing from bookshelves in personal collections and libraries. We are delighted to be able to carry out a project that involves assembling a selection of these reports, scanning them and preparing them for publication.

We are very grateful to the Foundation for Integrated Transport in London for funding this work and to Andrew Williams for attaching himself to scanning technology for hundreds of hours.

http://integratedtransport.co.uk/

This issue of World Transport Policy and Practice includes 6 of these TEST reports and others will be included in future issues:

1) Test Publications List
2) An Accessible City
3) All Change
4) Traffic Calmed Towns
5) Campaign To Improve London’s Transport
6) The 1992 Beckton Travel Survey

Most of the reports we will publish are over 30 years old. We have contacted those organisations, other than TEST, who have copyright and they have agreed to this publication project in World Transport Policy and Practice. If we have failed to identify a copyright holder we apologise and ask that you contact us as soon as possible and we will take steps to remedy that failure. We have not been able to identify the copyright holder for TEST and would very much like to hear from this person/these persons.
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57 1964 Large DIY Stores - project report - may be published by LRT 1965 / ISBN 0 905545 08 7
58 " The Company Car Factor / ISBN 0 905545 06 0
59 " After the Bus - social effects of rural bus service withdrawal / ISBN 0 905545 07 9
60 " The Dornoch Firth Rail Bridge
61 " Impact of Government Policy on US National Parks
62 " London - the Most Civilised City? 4-page leaflet
63 1985 Car Passenger Travel: An Alternative to Public Transport?
64 " The Commercial Sector as a Supplier of Leisure INLOGOV n.a.
65 " Goods and Services 1975-85

Retaining the Settle-Carlisle Railway (provisional title) for publication autumn 1985

SOME PRESS NOTICES AND REVIEWS

Publication
39 '...underlines the need to keep buses running to the heart of shopping centres in Greater London' TRAFFIC ENGINEERING & CONTROL Nov 81
40 'A book of this kind has been needed for decades - and now we have it!' HERITAGE OUTLOOK May-June 82
41 '...an invaluable reference source' RIBA JOURNAL Jan 82
42 '...packed with a wealth of data' THE PLANNER Mar-Apr 82
43 'A useful, succinct reference work...on pedestrian precinct developments' TOWN & COUNTRY PLANNING Jul-Aug 82
44 'The most damming survey yet of parking chaos in the heart of the capital' WEEKENDER 23 Oct 81
45 'An astonishing picture of lawlessness among London's motorists' SUNDAY TIMES 15 Nov 81
46 'The scale of the problem has been...illustrated vividly this week by an independent London survey' GLC PRESS RELEASE 13 Oct 81
47 'Cities are meeting places for people - not machines' Quotation from John Roberts in SUNDAY TIMES interview 15 Nov 81
48 'Parking in Central London has reached a state of near anarchy, according to a survey published today' THE TIMES 15 Oct 81
49 'The report is backed by research from an independent transport consultant and academics from a leading University and is likely to be dubbed the alternative Serpell report' GUARDIAN 10 May 83
50 'Investment policy is at the heart of the issues raised (in this) report on British Rail' CONSTRUCTION NEWS 23 June 83
51 'Why do we need BR? That is the first question asked and answered in the new report' COUNTRY LIFE 10 May 84
52 'BR's investment is lagging behind that of many European railways. And the gap is widening, according to a report which says (investment)should be increased and there should be more off-peak fare reductions' NEW STATESMAN Mar 84
53 'The report claims that BR's network is the poor relation of the Common Market' SUNDAY TELEGRAPH 25 Mar 84
54 'Fares on BR's off-peak trains could be cut by a third without loss of revenue...' THE TIMES 26 Mar 84
55 'Just over 21% of the BR routes are electrified compared with 39% for...France' THE DAILY TELEGRAPH 26 Mar 84
56 'Decisions on rail investment in most continental countries were apolitical, in contrast to the highly political debate about the future of BR' FINANCIAL TIMES 27 Mar 84
57 'This second volume devotes a chapter to each case study railway (reviewing) national transport policy, rail policy and management' TOWN & COUNTRY PLANNING Oct 84
Reviews in The Times, Guardian, Daily Telegraph and Daily Mail (among others) 17 Jan 85
"Probably not more than one in five "company cars" are genuinely used assuch, according to TEST, which estimates that two-thirds of all company car mileage is for private or commuting purposes" Adam Raphael, THE OBSERVER 17 March 85

"Well documented and reasoned, it looks at areas where bus cuts had hit hard...and finds that the pattern of life changed particularly for the non-driver and the elderly. It is constructive too." COACHING JOURNAL Feb 1985

"Amazingly, with the economic climate what it is, (the plan) hasn't been strangled at birth by the new cost-conscious LRT. Indeed some of LRT's planners have actually given...the plan a qualified welcome" TIME OUT 4-10 Oct 84

"(The) plan includes road closures, cul de sacs, selective one-way systems, and paving over some streets for authorised use only" THE STANDARD 5 Oct 84

"The draft proposals show two E-W and two N-S routes across London from which all traffic except buses and those requiring access would be banned, dramatically improving bus journeys and the environment, it is claimed" THE TIMES 5 Nov 84

"Any report which underlines...the miserable amount of pedestrianisation...not only in the City but in Greater London as a whole, deserves welcome, commendation and support" CIVIC TRUST 20 Sep 85

"...it represents perhaps the most important new thinking on the City's transport priorities in more than a generation" SMITHFIELD TRUST 17 Sep 85

"An inspiring piece of work. It is Utopian and at the same time practical" DR J ADAMS University College London 17 Sep 85

"A full report on a very important topic" INSTITUTE OF ACTUARIES 2 Sep 85

"We are obviously in favour of measures intended to facilitate the movement of buses and of pedestrians..." LONDON REGIONAL TRANSPORT 21 Sep 85

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THE ACCESSIBLE CITY
a report for the
CAMPAIGN TO IMPROVE LONDON'S TRANSPORT

ABSTRACT

This report is about the ability of people and goods to reach highly active areas of cities, quickly, cheaply and pleasurably while maintaining environmental quality in areas passed through and at the destination. This seemingly Utopian goal appears possible for the City of London and its surroundings if it accepts the diagnosis of its problems and the prescription offered here. Traffic reduction and increased pedestrian facilities not only enhance the environment in themselves, they also encourage further improvement.

It may be that the lessons learnt would apply to other parts of Central London; it may also be that a diminution of road traffic would lead not just to a better environment, but also to improved economic performance. The report stresses the need to accommodate essential movement - whether of people on foot, in public transport or in cars, or of goods - during the working day, and to discourage inessential movement. One finding is that 77% of cars entering the City in the morning peak, and terminating there, spend their day unused on a piece of very high value City land.

Strategically, a three-phase approach is suggested, for all of which the maintenance of high quality public transport is vital. Immediate improvement of pedestrian facilities and creation of environmental 'cells' within the City are recommended. Phase 2 reallocates movement space throughout the City and should proceed quickly in parallel with progressively lower levels of traffic restraint from City core to outer suburbs. Phase 3, some years off, advances this concept still further. There are compelling reasons to move ahead along these lines.

prepared by
TEST (Transport & Environment Studies) 177 Arlington Road London NW1 7EY
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This report tackles a perennial problem of cities: how to encourage people and goods to reach highly active areas like city centres, easily, pleasantly, cheaply and with minimum congestion, while maintaining - preferably enhancing - environmental quality. It approaches the problem from the inside and works outwards in contrast with most traffic restraint proposals that are centripetal.

The study follows from a leaflet prepared for CILT (Campaign to Improve London's Transport) by TEST (Transport & Environment Studies) in 1984 which looked briefly at problems and solutions for the traffic problems of Central London as a whole. A more detailed study was necessary to explore these concepts in depth and the study reported here in fact meets three requirements. Apart from being the first detailed study, it also provides a critique of the City's Draft Local Plan, and starts the investigation of an hypothesis which states 'a good physical environment is a good economic environment.'

This study was commissioned by CILT in March 1985; the final draft went to the printer on 9 August. In the intervening time a great deal of searching, fieldwork, analysis, computerised assignment and writing up was achieved. The TEST team was:

Mike Carragher BSc
Simon Dunn-Levin BSc
Alan Jessop BSc MSc MIHT FRSS
Emily Kasriel
John Roberts BA DiplArch RIBA MCIT
Teresa Ryszewska BA
David Taylor BA MSc
Ann Whipp DipAD

Adviser, City offices
Research assistant
Transport analyst
Research assistant
Project director
Urban planner
Transport planner
Graphics

Ann Whipp prepared the pedestrianised street sketches. Photographs by John Roberts and Teresa Ryszewska.

TEST is very grateful for the help given by Gavin Smith and his colleagues at CILT, by officers in the Corporation of London and City Police, and by many GLC officers. The report would have been impossible to produce without their continuing and patient response to requests for information and advice.

Report Structure

Chapter 0 presents a summary and main conclusions of the study. Chapter 1 states the hypothesis, aims and objectives, and outlines the methodology used; it is primarily about London's and other cities' traffic restraint policies and achievements. Chapter 2 discusses the physical and working environments of the City of London, while Chapter 3 looks at its movement patterns in more detail. Chapter 4 makes proposals for a new solution to the City's movement, and therefore environmental, problems. There are three Appendices. 'A' details study methodology; 'B' outlines the state of office location and employment within the City, and 'C' lists the references used in the text.

Conventions

Four conventions are observed. The first concerns the subdivision of numbers with a space between blocks of three digits, to avoid the confusion between the British commas and continental European full stops in such locations; a full stop is only used as a decimal point. Thus, one million reads 1 000 000 though four numbers (1234) are undivided vi
except in Tables. Sometimes the word-processing printer wilfully puts more than one space between the blocks! The second is to number paragraphs with a dash between chapter number and para number, thus 1-10 rather than the oddity of 1.10. The third is to number figures and tables consecutively, thus (in the list of tables and figures) T3-6 is followed by F3-7, T3-8 and F3-9. The final convention is to use metric dimensions except where a quoted source uses imperial measure and it would be perverse to convert it. So, one...

metre=3.28 feet; kilometre=0.621 miles; m²=10.764 ft²; hectare=2.471 acres; km²=0.386 miles².

One billion = 10⁹
SUMMARY & CONCLUSIONS
0-01
This study's motivation was twofold. The first requirement was provision of a detailed critique of the City of London's Draft Local Plan incorporated with which was to be an alternative transport plan for the City: this was required so that an informed response could be made to the Draft by this report's sponsor, the Campaign to Improve London's Transport. The study is also part of a research programme intended to validate or refute a simple hypothesis which states 'A good physical environment is a good economic environment'. While this programme has only just started, the research undertaken so far in the City shows that the underlying concept is valid and attainable.

0-02
Both elements of the study are closely related to the state of London's transport, and of that in the City of London. The report shows that much of London's transport is inefficient, biased increasingly toward a car and HGV that its streets cannot properly accommodate, inequitable through the large-scale use of company cars (much of whose use is unrelated to business), more highly priced than many other large cities' public transport, dangerous, and in many respects illegal. Central and Inner London's economy suffers as a result and there are significant moves of firms and employees toward suburban and exurban locations.

0-03
These facts are widely known but all too often ignored. The above transport facts bear heavily on what the study is about - inessential traffic in Central London, more particularly the City of London, the City's environmental improvement, and proper provision for the modes of transport that a city centre can sensibly accommodate.

0-04
The study starts with a comparison between the transport policies of London and other cities. The other cities are smaller than London, but there are many lessons to be learnt from them. Comparing London with some other cities on the basis of km of streets converted for pedestrian use per km² of CBD shows that Munich's ratio was 1.96, Vienna's 1.53, Leeds' 1.1, the Cities of London & Westminster combined (approximating to a CBD) 0.05, and the City of London 0.0.

0-05
More recently the GLC has produced a draft 1986-87 TPP which clearly states a package of restraint policies and suggests they could lead to a 40% reduction in traffic in Central London. This approach is so much more positive, it is a great pity that the GLC is unlikely to be able to implement it. Several of the policies coincide with TEST's independent suggestions in this report.

0-06
After closely examining the City's proposals for the future, TEST surveyed environmental quality and traffic in all the streets of three study areas. One was at the core of the City, east of the Bank plus the main insurance area south of Lloyds, another was the Fur Trade area west of Southwark Bridge and the third was the Liverpool Street station area. Pedestrians were counted and 'levels of service' established for every street, apart from the alleyway network, in the three study areas. The levels ranged from 1=jammed to 7=open. Results from the Bank and main insurance areas showed that very few of their streets rated higher than 5=impeded.
This must rank among the most comprehensive studies of pedestrian activity undertaken, and with good reason. Pedestrian flows in the City are not only the highest in London and possibly in Britain, they are also the worst provided for. The City has provided very few at grade controlled road crossings and no pedestrianised streets. Its answer is an upper level walkway system which, where it exists, is little used, because pedestrians object to being required to climb to footbridges, or descend to subways. Many people are physically incapable of these exertions; others fear attack.

On the basis of a much improved provision for pedestrians, cyclists and public transport, and a major reduction in inessential traffic (76.8% of cars terminating in the City in the morning peak spent the entire day unused, before the evening return home) a hierarchy of six street types was conceived. Importantly, it actively encourages essential vehicle users to do what they have to do and discriminates between the through traffic (60% of all the City's traffic) and access traffic. The types are:

- **THROUGHWAY** Provides for longer distance journeys, public transport and links with the local access network
- **LOCAL ACCESS** Essential access traffic at all times, buses allowed to travel through but other traffic stopped from doing so
- **GO SLOW** Similar to Dutch 'woonf', all traffic permitted but at maximum walking speed
- **BUS MALL** Space shared by buses (and taxis experimentally), cyclists and pedestrians in peak times. Managed access traffic additionally out of peak
- **PEDWAY** Exclusively pedestrian (and cyclist where wide enough) at all times
- **PEAK PEDWAY** Exclusively pedestrian (and cyclist where wide enough) at peaks; managed access traffic additionally out of peak.

Reallocation of movement space then grew out of these types, and from all the research undertaken. The context for the proposed scheme was a City whose apolitical constitution is unique in Britain. It has 31% of the Central Area's commercial office floorspace against very low proportions of housing and open space. Almost as much space is devoted to roads as to offices in the City, the highest proportion in Central London.

The City's economy appears to be healthy, though there is some movement of financial enterprises toward its fringe or more distant locations. Other land uses - some newspaper production and markets in particular - are moving away beyond the fringe. There are trends toward greater space per individual office worker, more sophisticated office technology, and a discernible shift (associated with technological innovation) toward more professional and managerial jobs and fewer clerical and administrative ones. Demand for offices shows no signs of abating, and demand for movement to, from and within the City is not expected to reduce in the near future.

Noise levels are high, and some air pollution concentrations excessive. There is no clear pattern in traffic accidents. In terms of injury accidents per km of road, the City had the second highest rating (to Westminster) in Greater London in 1977. More positively, the City has a large number of listed buildings including most of Wren's output, the spectacular new Lloyds Building, the Barbican, substantial conservation areas and heritage walkways, and many environmental (if tiny) gems to offset against the unpleasantness of many of its streets.
There is a high level of use of public transport to reach the City and improvements are in hand - Snow Hill Tunnel, Docklands Light Railway, Liverpool Street redevelopment, for example. These have to be set against the loss of Broad Street Station and thus the North London Line’s terminal, of some bus routes, and of reduced frequencies on others. However, while BR and Tube maintained their combined proportion of the modal split, 1971 to 1981, bus use declined from 12.5% to 9.8%. The City has the 7th busiest road in Greater London in Victoria Embankment outside the Temple, and car use has gone up from 8.3% of journey to work trips in 1971 to 11.5% in 1981, both percentages being 5% lower than their equivalents for Central London. Heavy goods vehicles are actively discouraged in most parts of the City.

The phenomenal pedestrian activity has already been mentioned. 64% of those arriving at Liverpool/Broad Street BR Stations and 84% of those arriving at Cannon Street Station completed their journey on foot in 1977, while only 25% did this from Euston and 36% from Waterloo. A sample of 8 sites with heavy road crossing flows in the study areas not only showed no provision, but had a flow justification between twice and 12 times that required by the Department of Transport for a controlled crossing.

Although buses did not constitute a large proportion of travel to work in the City, they have large potential in terms of short trips, particularly from most of the BR termini, and use by tourists. LRT have recognised the latter by their marketing of route 15 to the Tower. Their attractiveness could be significantly improved by faster journey times achieved through less traffic congestion and more bus lanes (there is only one in the City), cheaper fares, and bus stops in convenient places, mainly at intersections as in US cities. When the proposals in this report were being worked up, it quickly became apparent that the City’s very dense network of bus routes required special solutions to be suggested for the Bank junction and the tourist area around St Paul’s. At Bank, buses and taxis on the one hand, and pedestrians and cyclists on the other, share the intersection’s space in alternate minutes. The parts of Threadneedle Street and Lombard Street within 25-50 m of the intersection are pedestrianised at all times, or ‘Pedways’. Ludgate Hill is also proposed as a bus and pedestrian only street at peak times.

Having prepared the alternative scheme, three further questions remained. First, how did it compare with the City’s proposals in their Draft Local Plan? It is undoubtedly more attuned to human needs, and would ‘cost’ about £16m to implement in its entirety; however, the report argues that this would in reality be a benefit to the City, with immediate economic returns to pedestrianised shopping streets, for example, and a range of other likely ones, for which there was insufficient resource within this study to investigate. Second, what would happen to essential traffic that could no longer pass through the City? A policy package for restraining traffic in the whole of Central London was devised, and assignment undertaken on this basis, with a shortest-distance model, which made no allowance for a likely equilibrium that vehicle drivers would achieve for themselves.

Four assignment scenarios are displayed. The first is where the proposals for the City have taken place, but is otherwise ‘do-nothing’: not surprisingly, many surrounding roads become overloaded. The second restrained 50% of City terminating and through car traffic in the morning peak while doing nothing to the surrounding area: this was also unsatisfactory. The third and fourth retained the 50% City restraint and added a 40% reduction in the rest of the Central Area, 20% in Inner London
and 10% in Outer London for the fourth, and half these - 20%, 10% and 5% respectively - for the third. Clearly the fourth came out best (probably echoing the GLC's predictions when they postulated the 40:20:10 percent reductions) though the third appeared quite adequate to cope with the assigned traffic while not overloading the surrounding roads.

0-17

The third question on implementation was answered by a phased programme. Phase 1 could be implemented quite quickly and would bring immediate and major improvements for pedestrians, while retaining the City's four through routes. While this was being done, Phase 2 could be worked up and a London-wide public consultation exercise embarked upon. (Phase 2 is effectively the alternative transport plan referred to in paragraph 0-01 above, Phase 1 being a kind of pilot study, and Phase 3 a culmination). In parallel with this, major traffic restraint policies could start to be introduced in London, upon which Phase 2 is to some extent dependent. The study recognises that ambitious projects of this nature sometimes have a long gestation period. Beyond Phase 2 the scheme's performance in relation to the original (and future) objectives would continually be monitored. Ultimately a Phase 3 would be introduced, whose function is to advance these concepts to their ultimate conclusion.
RESTRAINED APPROACH

London suffers more than most British cities from traffic congestion, largely caused by inessential vehicles and a disproportionate allocation of movement space to people in vehicles rather than on their feet. It is shown, from a number of examples, that other world cities cannot accept this irony, acting resolutely to cure it, with distinct benefits to inhabitants, visitors and economic performance. While there have been many proposals for curing London's traffic chaos, much still rests on restraint by congestion and inadequately enforced parking control. One policy has been remarkably successful, however: reduction of bus and tube fares and introduction of a Travelcard. However, now that London's transport is under central government control, this success is being overtaken by a reduction in public transport service, and increases in fares. The GLC, while facing abolition on 1 April 1986, has produced a strong restraint strategy (not unlike what is proposed in this report) whose primary aim is a 40% reduction in Central London traffic.

This Chapter also contains the study's aims and objectives, and an hypothesis which this study helps to investigate.
Central London of the Future

Key
- Street reserved for buses and access only
- Continuous bus-lane
- Interchange between central buses and suburban buses and trains
- Pedestrians only

Central London replanned for bus- and pedestrian-priority.
 Oxford Street and Tottenham Court Road and Victoria Street are reserved for buses, pedestrians and access only.
 Whitehall, Leadenhall Hill and the Haymarket are traffic-free.
 New, simplified bus routes and transferable tickets make travel easy.

Figure 1-2: Central London, City of London and the City core

Borough boundaries ◯ Rest of Central Statistical Area ☑ City Core
Genesis of This Study

1-01
Two articles in Town & Country Planning (Smith 1983a,b) attracted attention among those concerned with the appalling street environment of London’s Central (and other) Areas. High levels of congestion resulted among other things in poor surface transport service quality, yet little seemed to be being done about this. Smith (of Campaign to Improve London’s Transport, or CILT) drew up a plan of part of Central London (Figure 1-1 shows the latest version) among whose measures was a significant level of bus priority. In 1984, TEST were invited to help progress the concept.

1-02
A leaflet was produced (TEST 1984a) which quoted a number of disturbing facts about the effects of an over-commitment to private road passenger transport, highlighting the fact that the inessential use of vehicles (when buses, tubes or taxis could do the job more efficiently) appeared to be contributing to economic malaise. The leaflet then illustrated a version of Smith’s map and suggested a street hierarchy which could be applied to the whole of Central London and other congested parts of the metropolis. The types of street were: all traffic, with continuous bus lanes where appropriate; buses, pedestrians, cyclists and access vehicles only; pedestrians only; Dutch ‘woonerf’ type where all traffic is permitted, whose maximum speed would be that of walking. A number of measures already implemented in Central London which aimed to reverse the trend on private transport reliance were noted. The leaflet finally asked for financial and/or moral support for a larger study in Central London, which would carry these concepts much further.

1-03
There was considerable support for the ideas expressed in the leaflet. It then appeared sensible not to look at the whole of Central London, but to try and progress the study through an investigation of a smaller area. A number of areas in Central London were looked at, and the City of London – see Figure 1-2 – was finally chosen, to some extent influenced by its recently published Draft Local Plan (City of London 1984a). The Research and Resources Unit of CILT commissioned TEST to carry out the present study in March 1985.

1-04
The broad aim of the study is to suggest ways of catering for essential movement of people and goods in the City of London in an efficient way, i.e. in a way which does not impede any user group’s movement, and also in a way which enhances the living, working and leisure environments of the area. In addition, the study is required to provide both CILT and the GLC with material which can be used in their responses to the City of London’s Draft Local Plan. The study’s ambitious objectives were to:

* estimate the present demand for the movement of people and goods to, from and within the City
* define the needs of all essential transport user groups;
* assess, in terms of space utilisation, travel time and environmental impact, the most efficient form of transport (including walking) for different user groups or movement types;
* assess the amount of space needed to accommodate the different modes of transport; in the case of public transport, assess the need for additional services or their improvement;
* allocate space to the different modes of transport while taking into account the needs of access of people and goods;
comment on the City's proposals for overhead walkways, road widening lines, and a new river crossing, together with other transport policies in the Draft Local Plan.

All these objectives were met, though the third and fourth ones deserve much more work in later studies: one is currently being considered.

Hypothesis

1-05
The study reported here also forms part of the work being undertaken to test an hypothesis of considerable importance to large urban areas. The hypothesis states:

A good physical environment is a good economic environment

Testing this fully will require one or more demonstration projects, which are well beyond the scope of this study. Nevertheless, the current study has contributed toward an understanding of the highly active areas of cities; it has also reinforced the theory that economic activity and growth are inhibited by a poor physical environment.

1-06
The physical environment consists of many factors and attributes. Before this study got underway it quickly became apparent that it had to be contained within a reasonable budget and staff outlay, and that local authorities' and other agencies' goodwill could be strained if too much was asked of them. It was therefore decided to restrict the investigation of 'a good physical environment' essentially to that of the street and to the movement of people, in and out of vehicles. Chapter 3 examines this subset of the physical environment, while Chapter 2 glances at the larger environment of the City of London.

1-07
The motor car, while opening new vistas to some, and enhancing the lives of others, may well be seen by future historians as a net disbenefit to society. The euphoria surrounding this technological fix (fundamentally unchanged over 100 years, the timespan in the 19th Century when three major shifts in transport took place: canal/horsedrawn carriage to railway to car) distorts rational thinking. It tends to be forgotten how a very high proportion of journeys in cars could equally well be made on foot, on a bicycle, or in some form of (perhaps high technology) public transport - more equitably, more efficiently in spatial, time and energy terms, and with much less damage to all living species and built fabric. The car, with its low worktime occupancy, performs worst in areas like Central London which attract a large number of other visitors, because one congests (or collides with, or pollutes, or delays) the other.

1-08
This current study makes a clear distinction between essential and inessential vehicle users, supporting the needs of the former group. In that context the study suggests no reduction in vehicle-km of buses, taxis or local-destination commercial vehicles. It encourages disabled people to reach in their own vehicle what is important to them, and does not constrain emergency vehicles. Cyclists and walkers are considered particularly important, because of their intrinsic benefits to individuals and to society at large.

1-09
What evidence is there to show that a good (traffic) environment is a good economic one? In a rather restricted sense - of the pedestrianised street or small pedestrian network - there is much to show that retail turnover has increased after a street has been converted primarily for pedestrians (see Chapter 7 of Roberts 1981). However, this is not conclusive for a
larger area, for the single street or small network is still accessible by car, inessentially or essentially, to a point quite close to the pedestrianised part. Not only this, but access by car is often given preference over access by public transport or on foot, noted in TESS's three year study of Sutton High Street (TEST 1980), and despite a Department of Transport (1978) statement 'in shopping areas access to buses should be at least as convenient as to car parks.'

1-10
The largest area to be subjected to restraint measures is probably Singapore. However, that city is considerably smaller than London, in area and population, and events since introduction of the Area Licensing Scheme in 1975 have not been conducive to an attribution of turnover changes to the restraint measures. In other words, the significantly improved environment of downtown Singapore is not the only factor working on spending patterns: the central area was overshooped, and a number of shopping centres outside the central cordon also opened in the mid-1970s (Yee 1984).

1-11
A somewhat smaller area where land values have risen substantially in the two years immediately following major environmental improvement, is London's Covent Garden. It now has 50,000 visitors a day, increasing with tourists at the height of the season to 100,000 and these large numbers could lead to further traffic restraint measures in the area (Steening 1984). Furthermore, in three years, Greater London Council office rents in Covent Garden increased by 50%, indicative of market trends at the time (Ryszewska 1984). In downtown Boston, USA, area-wide traffic restraint has led 80% of businesses to experience increased sales. Rents for retail space there rose 40% in the 1978-80 period immediately after scheme implementation, although some of this was attributable to inflation and tax increases. Office rents increased 1978-81 beyond the effects of inflation (US DoT 1982).

1-12
Among the rather sparse evidence elsewhere on the relationship between the physical and economic environments, not unnaturally the British New Towns have suggested there is a strong correlation between the clean air, low densities and natural surroundings of industry and commerce in their towns and the economic success of such activities. However, while this is probably true, there is little hard evidence to support it - another reason for carrying out this study. The Centre for Interfirm Comparison (1976-77) studied the performance of industry in inner and outer areas of conurbations, in new towns and in other towns. It noted the difficulties in making comparisons: in new towns machinery was usually newer and labour costs somewhat lower than elsewhere, but for all locations the determining factors of performance were more related to the general economic climate, to markets and their buoyancy, and to quality of management than to location per se. However, it was thought that new towns' somewhat better performance than elsewhere might relate to worker satisfaction, better quality housing and so forth.

1-13
Le-Las (1985) makes some comments about the London Borough of Hackney's policies which have relevance to this report. A survey of firms in manufacturing and service industries showed that of 33 companies interviewed 12 intended to leave the Borough when circumstances allowed, and seven of them wished to leave primarily for environmental reasons. Le-Las says the companies 'hoped that the Council could do something about the dereliction, give permission for shops and somehow create open space, a greenery in the concrete jungle of South Shoreditch. All these activities were of fundamental importance because they affected the day-to-day running of the business, its ability to attract and keep good staff, and their image in the eyes of these vital customers.'
It is clear why most major, and many smaller, world cities have attempted to grapple with the problem of the motor car in and around their areas of highest commercial activity: congestion was adversely affecting trade. These cities have had varying degrees of success, as we shall see in the brief review below.

Curtailing Excessive Car Use

Most cities have concentrated their attempts to control excessive use of cars on their central business districts and inner cities - they both had the highest congestion and the greatest concentration of commercialism, in the shape of shops, entertainment, bars and restaurants, and office employment. However, now that decentralisation is proceeding in many of these cities, congestion and activity concentration are taking place at ever increasing distances from the centre - first to inner and then to outer suburbs of these cities, more recently to out of town subcentres.

Britain is experiencing this outward move, with its concomitant superstores and hypermarkets (and southern England much later than northern England) many years after they happened in the US; in fact the US trend is for extremely large centres to be established in the outer regions of the largest cities, sometimes employing as many as 60,000 people (Orskv 1985). The important point to note is that wherever such centres are established, they tend to create their own congestion and are as ripe for an investigation of the type reported here as are traditional city centres. Even the much more modest British outer centres (Wood Green, Brent Cross and Croydon for example as new or largely rebuilt centres, and a selection of those that have not been redeveloped) deserve study. However, TEST has concentrated on London's statistical Central Area, as have a majority of congestion studies.

However, to turn to attempts to curb traffic excesses in central areas, Singapore constitutes one of the best known and thoroughgoing examples, covering a larger proportion of the city, at a high level of restraint, than anywhere else to date. An autocratic government facilitated introduction of an area licensing scheme (ALS) in 1975 (see Roberts 1977 and Watson & Holland 1978) in this city of 2.1 million people and a CBD of about two square miles. Exempted were buses, commercial emergency and military vehicles, motorcycles, and cars and taxis carrying at least four people. The restricted time started at 07.30-09.30 but was extended to 10.15. Parking fees were increased in public car parks and a surcharge was applied to private car parks. 11 shuttle bus services operated from car parks just outside the cordon and an air-conditioned coach service and express coach were introduced at peaks. Intense discussion followed introduction of the scheme as to whether a metro should be built.

The number of cars entering Singapore's restricted zone between 7.30 and 10.15 fell 73% from 43,000 in March 1975 to 11,000 in October 1975. Cars with four or more occupants rose from 10% to 44% (after a short period when drivers carried full size dummies to appear full). In fact, cars with four or more occupants rose from 10% to 53% by November 1978 (National League of Cities 1980). 23% more cars entered before 07.30, but traffic volumes in the evening peak only fell by 2-3%. Speeds in the restricted zone increased 10% to 33 kph and goods movement within the restricted hours was greatly improved.

As noted above there were complications which make clear-cut effects difficult to state. Another of these concerns trip-making by vehicle-
owning households to destinations in the restricted zone. While these fell by 17% (8% for trips outside the zone) and work trips fell by 11% - less than the reduction in shopping, personal business, social and recreational trips - other factors contributed to the effect the Area Licence Scheme had on movement in the city. Pedestrian activity in the zone increased and there was a significant reduction in those having to take evasive action when crossing roads, though reduction in delay to those crossing was not proven.

1-20
Five years after introduction of the ALS it was noted that the patterns established at the outset had remained stable and that the rate of growth in car ownership had slowed down (National League of Cities 1980).

Other Cities' Restraint Policies

1-21
A number of other cities, most with rather less dramatic restraint policies than Singapore's, are reviewed alphabetically below. These are only a sample of world cities that have taken strong action against excessive traffic in their centres, in the general belief that the resultant congestion is inimical to economic success, and that the 'solution' of road building in and near their centres is no solution at all, as it tends to destroy the very area it is desired to conserve. This section ends with a discussion of traffic restraint policies suggested for Central London.

1-22
Bologna
125ha were reserved exclusively for pedestrians in this city of 500000 people. Other actions include reserved bus lanes, free public transport in peak hours, private vehicles restricted from certain zones, and commercial vehicles permitted access only at certain times. These actions were to meet two objectives: to establish a ranking order for streets according to type of traffic flow (as is done in this study - see Chapter 4 below) and to establish bus lanes, linked together to form a network of routes. There was a 13% reduction in number of vehicles in the centre from January 1972 to May 1974, an increase in bus patronage of between 30% and 66% according to route, and an average bus speed increase about 15-20% of the 1972 average speed. (Bureau of Traffic & Urban Road Network 1975).

1-23
Boston
In the CBD of this city of 562 000 people, all traffic was eliminated from some downtown streets, and private cars from a few others while retaining taxis and delivery vehicles only. Area wide there was a 5% decrease in traffic volumes 1978-80, mainly attributed to a modal shift from auto to transit among office workers and visitors; the rest of the decrease was due to cars avoiding the entire area (US DoT 1982). Para 1-09 above discusses economic effects of these policies.

1-24
Curitiba
This city is the capital of the State of Paraná in Brazil, and is about 400 km southwest of São Paulo, with a population nearing one million. Its centre was girdled by a ring road inside which traffic is strongly discouraged and where pedestrians have priority. Since for every user of a car two travel by bus, another priority has been to transfer the greatest possible number of car users to buses, and an integrated public transport system was devised. A high capacity bus service with a three minute frequency was introduced along a number of primary routes, and in the central area along an exclusive route; the original bus lines were converted into feeders that terminated at trunk line stops on the primary routes. (Curitiba has also been studied by the World Bank, which invites
speculation as to whether they influenced Washington DC's almost identical bus system). At the junctions between feeder and trunk lines park and ride facilities and some shopping are also located. The net result of these activities has been a boom in public transport use and a greatly improved 'downtown' environment (Dely 1979).

1-25
Gothenburg
A scheme was devised which combined traffic management, parking restraint, improvement of public transport and pedestrianisation. The Central Area was divided into five sectors each of about 20 km². The inner ring served as a bypass for through traffic and allowed entry and exit to and from the sectors. Private vehicles were prohibited from crossing sector boundaries though these could be crossed by public transport, emergency vehicles and pedestrians. Most central streets were made one-way to minimise conflict at intersections. Parking charges were increased and number of spaces reduced. The tramway system was being planned to operate in reserved lanes and a personal rapid transit system was contemplated. Three major shopping streets were pedestrianised, and linked with covered streets in new developments to form a network. Arge et al's (1979) study for OECD assesses the cell system and lists the following positive effects:

- no interest group seems to be worse off; taxi drivers were the only ones who protested but their problems today seem negligible
- the Municipality has given the CBD a distinct new image...such clear signals seem to be very well received by the CBD merchants
- the environment for people living, walking and working in the CBD has improved considerably, particularly concerning noise and pollution from car traffic and conflicts between cars and pedestrians
- traffic accidents have been reduced by 36% for CBD + ring road
- traffic has been rerouted to the ring road without causing problems of any size
- travel speed of cars has improved on CBD and ring road.

1-26
Leeds
This city of 500 000 people has one of England's most extensive pedestrian networks which originated in 1970. For some time it had a minibus service which connected railway and bus stations via the precinct, but this was taken out after opinion surveys showed that shoppers preferred precinct streets to be as traffic free as possible. This is interesting for the streets still had service vehicles on them: would there be disapproval of minibuses if there were no service vehicles? (GLC n.d. and DoE 1975a).

1-27
Munich
Munich's city centre pedestrianisation coincided with rapid growth of the city (now approaching 1.5 million population) and its principal highways, the 1976 Olympics, and expansion of the public transport systems. The latter comprise national railway (DB), S-Bahn, a local rapid rail system operated by DB, U-Bahn or Underground, trams and buses. Interchange between these modes is an important aspect of the system, with metro and rail connecting directly with the bus and tram stops (National League of Cities 1980).

1-28
The large pedestrian network started at Karlsplatz near the main railway station west of the centre, proceeding 1 km to the east at Marienplatz from which a further major route to the north of the centre was pedestrianised. Another southwest of Marienplatz was scheduled for completion by 1981. Those are the main arteries - another 40-odd streets and several squares were scheduled for the same time. Munich's historic centre was a high quality environment marred by traffic; much of the
traffic has now been removed. Apparently 92% of businessmen expressed unqualified approval for the scheme and, according to the GLC study 'profits have risen spectacularty and therefore adjoining areas are pressing for extensions.' Indeed, an OECD study says 'some politicians plead for the further extension of the pedestrian zone as an aim to stop natural decay of the city because of the tremendous success of the hitherto completed part (while) other politicians complain that public funds should no longer be invested in pedestrianisation since a high increase in private profit has been observed in the areas completed.' Notably one problem which remained in the early 1970s was that of keeping residential uses in the city centre in the face of pressure from competing commercial uses. (GLC n.d., Monheim 1974, Meighörner and Doleschal 1975).

1-29
These comments on Munich of the mid-70s now require some additional commentary. West Germany has what is probably the greatest extent of pedestrianisation of any OECD country, and its achievement has been to some extent at the expense of adjacent access by car. It appears (Bullinger 1985) that car users, in some German cities, are reacting against this modest curtailment of their freedom.

1-30
Nottingham
While its city population is 300 000, there are 550 000 people when the immediately surrounding urban area is added. Vincent and Layfield (1977) (see also Waller 1975) assessed Nottingham's short-lived zones and collar experiment, whose aims were to make travel by bus more attractive and discourage travel by private car. Traffic entering the inner city was controlled by signals, designed to limit the rate at which traffic could enter. In order to prevent public transport delays, bus only lanes were incorporated. The scheme reduced bus journey times from the residential areas to the City Centre by an average of only one minute during the morning peak, while delays to other traffic averaged 1-2.5 minutes. No significant modal shifts took place for the journey to work; in fact it seems as though the benefits and disbenefits cancelled each other out, the bus time savings being counteracted by a fares rise, while the increased car journey time coincided with a reduction in petrol prices. Furthermore, most of the city centre commuters coming from the controlled zones had free or subsidised parking. The experiment was abandoned after one year, some say prematurely and because of undue political bias against it: it does appear that the 'fine tuning' available to the transport operators was not adequately exploited.

1-31
Vienna
Many people think Vienna has one of the most civilised city centres in Europe; it certainly has one of the largest pedestrian networks of a capital city, along which are distinguished shops bars and restaurants, and many of the adjuncts of Vienna's musical life. The GLC studied it in 1972 at which time there was a very low car ownership and plans for a metro and many new roads; it was explicit in the plans that all public transport systems would be coordinated. At that time 1.5 km of streets within the Ringstrasse, that is the core of the city, had been pedestrianised, a figure which has since been exceeded. The initial pedestrianisation was able to proceed rapidly because it had the approval of the Chamber of Commerce. They were proved right in that '60% of the merchants noted a 20% increase in turnover'. Environmental improvements went along in parallel.

Traffic Restraint Policies for Central London

1-32
Figure 1-3 shows car arrivals in Central London in the morning peak from 1970 to 1984 (London Transport Annual Reports 1974-1983 and GLC 1985d).
Throughout the 1970s, control of parking spaces by the GLC and London Boroughs was the primary weapon used to limit the amount of traffic entering Central London. From the Figure it can be seen that this was not particularly successful up to 1980, especially when the level of illegal parking is taken into account. (Test (1981) suggested there were 208,000 non-compliant parking acts each working day 09.30-16.30). Car arrivals steadily increased over that period, though a modest energy crisis-caused setback occurred in the mid-70s. As a result of the Fares Fair policy, later fares reductions, and introduction of Travelcards (and to some extent use of wheel clamps) more significant reductions took place in 1981 and 1983/4, culminating in a provisional 1984 figure as low as 1971.

Figure 1-3: Car arrivals in Central London during the a.m. peak 1970-1984

In 1974 a comprehensive plan was prepared by the Greater London Council together with the Department of the Environment, the Metropolitan Police and the London Boroughs Association, for public consultation. The document accepted the limitations of parking controls. It proposed that an area of eight square miles in Central London should be subject to a supplementary licence between 08.00 and 18.00 on weekdays. Few exemptions were to be granted: only buses, taxis, emergency vehicles and possibly motorcycles (GLC 1974). The scheme was calculated to reduce the volume of traffic in Central London by about one third and the expected benefits, according to a cost/benefit analysis, could exceed the scheme's costs by about £25 million a year (at that year's prices). It was not implemented on the grounds that it would be too complex to enforce, hard on poorer motorists who had to use their cars in Central London during the working day, and difficult to provide for people with special needs (GLC 1979).

The failure to agree on fresh solutions to the traffic problems of Central London was reflected in the Greater London Development Plan of 1976. It stated that the Council’s aim of reducing the use of private cars was to be achieved by restraint policies and the improvement of public transport.
However, parking control remained the centrepiece of the restraint policy, however ineffective that might be (see GLC 1976 and TEST 1981).

1-35
The idea of regulated entry into a central zone was revived by the GLC in 1979 in the form of 'Area Control'. It too recognised the inadequacy of parking controls, stating as evidence that one third of vehicle-miles in Central London was through traffic, while over one half of the cars parked in Central London during the morning peak were not used again until the evening return journey - in other words, they were inessential users. The main differences between this scheme and the 'supplementary licence' scheme were that a lower charge was proposed and the exemptions were wider. Exempted vehicles would include buses, taxis, commercial vehicles over 1.5 tons unladen weight (with the exception of lorries over 40 feet long which were banned), disabled badge holders, bicycles, police and emergency vehicles, public utility and service vehicles, motorcycles and high occupancy cars. People working unsocial hours and business motorists would be able to buy the license at a reduced price. It was estimated that the scheme would divert through traffic and reduce the number of car trips terminating in the controlled area by about one fifth (GLC 1979).

1-36
The public consultation document received few responses: 98 in all. The attitudes expressed in these were apparently not as strongly opposed as those to the 1974 proposals (GLC 1983a). The scheme was not progressed any further. The proposed alterations to the Greater London Development Plan of June 1984 contained no major revisions as regards traffic restraint. It was merely noted that area control had been studied and that methods of restraining traffic will be reviewed from time to time in the light of changing circumstances. While this might have been a convenient political withdrawal, it tacitly ignored the fact of the problem that would not go away: massive congestion caused by a relatively small number of inessential car users whom, in any enlightened city, would be made to feel decidedly unwelcome anywhere near its central area during daytime of the working week. In fact, a range of such cities is listed above, and they by no means represent the total: several of those not mentioned are in North America, supposedly the apotheosis of automania.

1-37
Some mention should be made of the LT/GLC policies of reduced public transport fares. They were effective during the Fares Fair period October 1981 to March 1982, and the subsequent reduction from May 1983 to January 1985. Although the policy was not primarily aimed at reducing car traffic, it did have this effect. The short-lived 'Fares Fair' reduction produced a 6% decrease in car travellers to Central London in the morning peak. A 14% increase followed the reversal of the policy (GLC 1983b). The second fares reduction produced more dramatic results, probably because of its longer time span and the cumulative gains arising from this; it also coincided with introduction of the Travelcard, which proved enormously popular. We should not be too surprised about this - other cities which introduced integrated fares policies years ago detected similar gains. However, the results were dramatic: the December 1984 figure for private vehicles commuting into Central London was 21% below the 1982 level. Thus, an improvement in public transport can be seen as a very valuable component in a package of measures to reduce inessential traffic in Central London.

Current GLC Thoughts on Traffic Restraint

1-38
Most recently, the GLC has produced a draft consultation document on the 1986-87 TPP (GLC 1985d). This includes a strategy for traffic restraint
with several components:

* a general improvement to public transport, including reduced fares
  improved services and their integration
* reallocation of roadspace to most efficient essential users (a concept being fortuitously and independently developed by TEST!): introduction of bus lanes is one way of doing this and the bus is an efficient mode
* replacing the company car 'perk' with equivalent value of take-home pay (see TEST 1984b)
* reduction of illegal parking through more effective enforcement
* controlling the use of HGVs

1-39
The combined effect of these measures is estimated to reduce traffic in Central London by about 40%. Any gains in road space achieved through such measures are proposed to be used to give priority to buses, pedestrians and cyclists, and for environmental improvements. It is interesting to note that the GLC's draft proposals are not conceptually dissimilar from those being pursued by TEST, as outlined in the rest of this report.

1-40
Further emphasis has been placed by the GLC on parking enforcement in another recent consultation document (GLC 1985e). This suggests that the traffic warden force should be more than doubled, and the fixed penalty notice fine increased from £10 to £25. Wheelclamping, which has proved an effective deterrent, should be extended, the document says. More generally, the GLC is to continue researching the possibility of cordon restraint or area control as well as investigating methods of controlling private non-residential parking - there are estimated to be 58 000 spaces in Central London at the present time. However, given the short life-span remaining for the GLC, there is insufficient time for these wider schemes to come to fruition. It is important, nevertheless, to present alternative options to future decision-makers.

Study Methodology

1-41
Methodology is discussed in full in Appendix A, and only briefly outlined here. Variations were made at a number of points in the study. They were caused by lack of time or financial resources to carry out overambitious original concepts; by lack of data or staff in organisations assisting with the study, such as the City of London and the GLC; and by the experience gained in field work that showed on occasion that a different methodology would be advantageous.

1-42
The study proceeded from the general to the particular. Thus, a literature review showed what had been achieved in other major cities and the effect that traffic restraint had upon physical environments and local economies. Restraint measures for Central London, in force or proposed, were considered, and their impacts noted. At City level, a range of issues was reviewed, largely related to the Draft Local Plan and observations upon it (by for example the Smithfield Trust 1985 and CILT 1984). Data were obtained on listed buildings; on major planning applications; on street traffic Orders; on bus routes, bus stops, bus lanes, occupancy and service frequencies; on numbers leaving underground station exits, and so on. Broad transport strategies were devised for the entire City for an alternative option. Only through routes, bus routeings, the local distributor network, and a few strategic long-distance pedestrian routes, were considered City-wide.
Three sub areas were selected for detailed study: using GLTS Zones corresponding to the areas around Liverpool Street Station, around the furthest area west of Southwark Bridge and near the River, and the main banking area near to and east of the Bank Station together with the insurance area stretching nearly to Fenchurch Street Station. In these pedestrian densities were calculated during the morning peak for all streets where pedestrians shared space with vehicles - alleys and courtyards were excluded. Levels of service codes were then allocated to all these streets, and this formed the foundation for a later reallocation of movement space between all essential movers on the City's streets. A number of suggestions by CILT for street categorization for through traffic, bus and access traffic, and local distributors formed part of the 'reallocation' process. Furthermore, decisions on what category to allocate to a particular street were also influenced by injury accident, air and noise pollution data for that street; by bus routes and accessibility; by particular access needs (eg of a postal sorting depot, market or hospital); and by the number of listed buildings and a street's existing environmental quality and extent visited by tourists.

Six street types emerged from this analysis, one for through traffic, and five for access, with priority given to people on foot during peak hours. The restricted timings would probably be 08.00-10.00; 11.45 to 14.15; 16.00-18.00 Monday to Friday. Weekends and Public Holidays would either be free of restriction in areas of no tourist significance or with longer periods of restriction than during the week in areas popular with visitors. Emergency vehicles able to negotiate a street would have unrestricted access to it, though not necessarily in all cases as a through route. Disabled people's vehicles (with some tightening up against those who infringe the regulations) would have unrestricted access to all streets except narrow alleyways. Taxis, experimentally, could use all types of route except the alleyways and other restricted routes.

The reallocation of movement space was discussed with officers of the City Corporation, the GLC, and LRT. The GLC prepared an origin and destination matrix from the Greater London Transportation Survey, and traffic was crudely assigned to the network outside the City (using a shortest-distance assignment) on the assumption that Bishopsgate-Gracechurch Street, and the northern East-West through route ceased to be through routes. This rather rigid procedure (in that it disallowed for shifts to public transport, for reductions in company car use, for using anything other than the shortest route from A to B, and for other restraint measures that might be introduced) was then 'softened' by use of a more realistic and complex scenario which incorporated changes that commuters would spontaneously make in the face of a new set of 'rules'.

The measures proposed in the alternative option were compared with those proposed in the City's Draft Local Plan. Some suggestions about implementation of TEST's proposals were devised. This report was then prepared and printed, and distributed either in full, or in a shortened version, to a large number of agencies and individuals. Their comments are given in the supplement accompanying this volume.
While 300 000 enter the City each working day, and many more in the tourist season, less than 6000 live there. Its environment is therefore unusual. To phrase it differently, there are the strangest bedfellows: financiers and clergy, journalists and archaeologists, academics and transport workers, musicians and nurses, lawyers and barges. They are all kept warm by furriers, fed by fish and meat markets, and watered by innumerable innkeepers.

The City has over 30% of Central London's offices and a much higher proportion of its wealth. 29% of its own land is devoted to offices and 27% to roads, the highest proportion in Central London. A steady expansion of office space within and surrounding the City is taking place, and individual workers are gaining space. Professional and managerial staff are forming a larger proportion of the City's office employment while administrative grades are decreasing. At the same time, manual employment City-wide is decreasing substantially. The net result of these changes is predicted to be a greater demand for movement within the City.

Noise and air pollution from motor vehicles are higher than might be expected in an area dominated by office work and historic environments.
The City's Constitution

2-01
The City's constitution is unique in Britain, and its powers are greater than those of most other Boroughs; in fact, it is a County, with many of the functions of a County Council. A Court of Common Council has 25 Aldermen (including the Lord Mayor) who represent the 25 Wards. They and the 136 Common Councilmen are elected by those eligible to vote in the Wards - the Aldermen for life, and the Common Councilmen annually. The City has no party politics, and it can remodel its own constitution. The Lord Mayor is nominated (for one year) by the Livery Voters of the City Guilds and elected by the Court of Aldermen. There are 17 000 Liverymen, and 11 000 on the electoral register. (Municipal Yearbook 1985 Edition).

2-02
It was estimated that the Livery Companies and the City Corporation each owned approximately one fifth of the land area in the City in 1967 (Marriott 1967). A recent survey using a sampling procedure suggested that Livery Companies owned 13% and the City Corporation 10% of land in the City today. (Savills, 1985).

The City Economy

2-03
The City of London is the geographical centre of control and management of Britain's financial system. It is one of the principle centres of commodity dealing, insurance and banking in the global system. Through the two broad types of operation - exchange and borrowing/lending - the financial institutions seek to secure profitable accumulation.

Land Use in the City

2-04
The City of London, with an area of 2.74 km², occupies approximately 10% of London's Central Area, and is wholly within it. The other eight Boroughs which comprise the Central Area are only partly within it, in various degrees (see Figure 1-2). The City is not, however, typical of Central London as a whole. Table 2-1 shows the City's share of floorspace for commercial and industrial uses, of that in Central London.

Table 2-1 : Commercial and Industrial floorspace in the City as a percent of that in Central London

<table>
<thead>
<tr>
<th>Industry</th>
<th>Warehouses</th>
<th>Shops and restaurants</th>
<th>Commercial offices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covered</td>
<td>18.1</td>
<td>10.6</td>
<td>8.3</td>
</tr>
<tr>
<td>Open Land</td>
<td>0.0</td>
<td>0.0</td>
<td>31.1</td>
</tr>
</tbody>
</table>

Source: DoE 1985

Comparing this with the City's 10% of Central Area land area, it is apparent that the City has a disproportionately high share of the Centre's office and industrial space (although the percentage for industrial floorspace conceals a low overall figure for Central London).

2-05
Table 2-2, on the next page, compares land use in the City with other Central Area Boroughs. The latter are not wholly comparable with the City as their area spreads outwards into Inner London, Westminster being the Borough with the largest segment in the Central Area. As with Table 2-1
the high proportion of office space is notable, and the fact that almost as much land is dedicated to roads. Also striking are the extremely low proportion of residential areas and open space when compared with the other Boroughs (although the Barbican development has slightly increased the residential proportion since).

Table 2-2 : Land use in Central London by Borough in 1971, % for selected categories

<table>
<thead>
<tr>
<th>Borough</th>
<th>Offices</th>
<th>Commerce</th>
<th>Industry</th>
<th>Shops</th>
<th>Residential</th>
<th>Open areas</th>
<th>Roads</th>
</tr>
</thead>
<tbody>
<tr>
<td>CITY</td>
<td>29</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>27</td>
</tr>
<tr>
<td>Camden</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>35</td>
<td>20</td>
<td>18</td>
</tr>
<tr>
<td>Hackney</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>39</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>Islington</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>39</td>
<td>4</td>
<td>22</td>
</tr>
<tr>
<td>Ken.&amp;Chelsea</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>39</td>
<td>13</td>
<td>23</td>
</tr>
<tr>
<td>Lambeth</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>47</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>Southwark</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>35</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>Tower Hamlets</td>
<td>2</td>
<td>14</td>
<td>5</td>
<td>1</td>
<td>21</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>Westminster</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>24</td>
<td>20</td>
<td>24</td>
</tr>
</tbody>
</table>

Source: GLC 1980  
Note: Selected categories only, so rows do not add to 100%

2-06
Recent trends show that where redevelopment is taking place in the City, office floorspace has been increasing at the expense of all other uses. Thus, while office floorspace increased by approximately 320 000 m² 1981 to 1984, other uses decreased by approximately 160 000 m², accentuating even further the dominance of offices. An examination of new building and refurbishment completions 1 July to 31 December 1984 shows that 1700 m² of shop floorspace and 3 300 m² of industrial floorspace was lost over what was there before redevelopment, while 12 900 m² of office floorspace was gained (City of London 1984b).

2-07
The City's resident population numbered 5 900 in 1981, three quarters of these being concentrated in the Barbican and Middlesex Street (City of London 1984a). Only 2 070 of these residents worked in the City, contributing to a workforce of 284 700 according to City of London (1982) or 299 000 according to the 1981 Census' 10% sample (OPCS 1984a). As is to be expected from the land use data, the share of office employment as a proportion of all employment has been increasing - see Appendix B. This is despite the fact that absolute office employment has been decreasing, but to a much lesser extent than for other types of employment (see also Appendix B).

2-08
The daytime population is further boosted by tourists visiting the City's attractions. St Paul's Cathedral had an estimated 2.5m visitors in 1983 (ETB 1985), averaging approximately 7000 a day, although in the peak season this figure might be double or more, adding a further 14 000 to the daytime population, or 5% of the workforce.

Employment in the City

2-09
Some comments follow on the City's employment, office location and demand, new technology, and the spatial and movement implications of these factors. A fuller discussion is in Appendix B. The office sector is the major source of employment in the City, and its share is rising. While overall employment declined by 26% from 1961 to 1981, non-office employment decreased by 64% and office employment by only 16%. Thus, over this period the office:non-office employment mix has significantly
altered, the percentage or total workforce engaged in office employment increasing from 67% to 77%. Of the larger office employment sectors, banking accounted for 31% in 1981, insurance 18%, other finance 9% and post/telecommunications 7%.

2-10
The 1981 Census (OPCS 1984a) 10% sample reveals that although the City offers employment in a wide range of industrial classes, there are few single non-office classes which account for more than 1% of total employment. They are, in order (change from 1971 where available in brackets): transport and communications 13.5% (-25%) mainly postal and telecommunications workers; paper, printing and publishing 8.4% (-40%); distributive trades 8.1% (-12%); construction 1.6% (+13%) and health services 1.2%. Substantial decline in non-office employment can be seen above.

Office Location and Demand

2-11
Since the 1960s there has been a limited extent of decentralisation of offices from the City to regional and provincial centres, and a more significant spread from the City core area to City fringe areas and beyond to the surrounding Boroughs. The large banking and insurance organisations retain a major presence in the City core area. This combined with the growing number of foreign banks requiring space in the area has enabled dispersal to continue without having any great impact on vacant property levels. Since 1978 both the City and Central London have experienced an office development boom. There are few signs of this abating. Reflecting the trends in location, gains to the existing stock of office space have been particularly high in the City fringe areas and surrounding Boroughs.

2-12
In terms of the UK economy, total office employment is expected to remain static or expand marginally by 1991, with the reduction in clerical / secretarial grades being offset by an increase in professional and managerial staff, both resulting from new technology. Because of the types of business located in the City, it is probable that professional and managerial staff will have increased their share of total City employment at a rate higher than the overall London figure of +8% (1971-1981).

2-13
The trend toward higher office floorspace:worker ratios is related. The City registered an annual increase of 2% between 1971 and 1974, the latest available information. It is explained partly by the increased proportion of professional and managerial workers and partly by the increasing application of new technology.

2-14
A report by ORBIT (1983) notes that the frequency of external contact – face to face contact outside the workplace – was correlated with staff grade. The higher the grade, the greater the propensity for external contact. Further, while electronic communications will accommodate formal interaction (particularly when voice mail and ultimately video conferences are introduced) many managers stress that in decision-making there is no substitute for face to face meetings. Increasing sophistication of formal systems is therefore likely to highlight rather than detract from the importance of informal, unofficial and non-routine communication channels. Thus, while Goddards (1973) study of Central London is somewhat old, its findings that two thirds of meetings took place outside his respondents' places of work, and 75% of business trips in the City were made on foot, may still be applicable in the era of high technology.
Spatial and Movement Implications

2-16
While it is impossible to predict with any certainty the changes in demand for movement arising from the office developments noted above, several trends are apparent.

* Although the workforce within the City’s geographical limits is decreasing, that of the financial and commercial sectors which make up the City market has probably remained constant over the last 10 years, when those employed in the fringe Boroughs are taken into account.
* Thus, rather than the demand for movement decreasing, two factors suggest it could increase. First, the increase in professional and managerial jobs, which have a particular propensity for face to face meetings. Second, the spatial expansion of commercial and financial activities which result in greater distances travelled to reach meetings. In the absence of other alternatives, (efficient and attractive bus services on uncongested streets for example) reliance may increasingly be placed on the private car for the longer journeys: under present arrangements, the majority of these cars would have to be parked illegally. Walking, however, should retain its significance for journeys within the City's literal boundary.

* It therefore seems that extra traffic will be generated and will further congest the City’s roads, making car, taxi, van and bus travel less time-efficient and walking more dangerous and unpleasant. Chapter 4 shows how these problems could be resolved.

The Quality of the City’s Physical Environment

2-17
The physical environment has many components: buildings, open spaces, vegetation, things that move such as pedestrians and vehicular traffic; and impacts from these moving elements such as air and noise pollution. Research has shown that conflict with vehicles ranks highest in pedestrians' perception of their environment, with crowding being the next most important factor (Elkington et al 1976 and Cashmore 1981). These aspects will be dealt with in Chapter 3. However, '...when traffic is removed, people seem to perceive visual aspects of the street more and to attach more importance to aesthetics, in particular to the aesthetics of the original street features such as its buildings' (Cashmore 1981). Many elements of the City's environment are discussed below.

2-18
The low proportion of public and private open spaces has already been noted: 5% of the City area, compared with 20% in Westminster. The open space that does exist is fragmented into many tiny areas, more than 140 in all. Some, like churchyards, are no more than a few square metres, while the largest public space – Finsbury Circus – is no bigger than a typical London Square (City of London 1979).

2-19
The City notes that '...their (the open spaces') total area does not fall far short of the standard suggested for the present resident population.' However, this ignores the unusually large daytime working population which too makes use of any open spaces, and the abnormally low resident population. A survey carried out by the City Corporation in 1969 found that out of 22,000 respondents (all City workers), 8888 stated they used an open space 'in the course of their day in the City.' However, the survey also found that open space usage was greatest by those workers closest to the larger areas of open space, such as Finsbury Circus and the Tower, which were also the most frequently used and the most preferred open spaces. This suggests that there is suppressed demand among those...
who work away from these larger open spaces. Whether it is the poor quality of the smaller open spaces which suppresses demand, or the fact that they are insufficient in area to meet the demand, is unknown, although the City's report states 'churchyards provide popular public open spaces throughout the City and are packed with people in fine weather', suggesting that it is the latter reason.

2-20
Benches, flowers, grass and trees certainly seem to be the most important things sought by City workers with a little free time. The River Thames, the largest open space by far, has virtually none of these things, and is little visited as a result. Progress with the proposed riverside walk could change this.

2-21
The built environment is equally, if not more, important than open spaces, since it cannot be avoided whether walking to work from a station or browsing at lunch time. Much has been said and written on the changing architecture of the City (see for example City of London 1985, SAVE 1983, and the recent Mansion House Public Inquiry). It is beyond the scope of this report to evaluate the quality of urban design, a process which, in any case, defies objectivity. It may be enough to say that studies of the perception of the built environment have found 'a liking for things at a human scale' (see Goody 1971 and Elkington et al 1976) though even that is an ambiguous phrase.

2-22
One measure of the interest value of a street might be the proportion of listed buildings (ie buildings of special architectural or historic interest), although this is by no means an overall evaluation of urban design. There are now about 450 secular listed buildings in the City, in addition to the many churches. Conservation areas, of which 21 have been designated, cover over one quarter of the City's land area. These are '...areas of special architectural and historic interest, the character and appearance of which it is desirable to preserve and enhance.' The City have also identified buildings which, although not listed, make a positive contribution to the character or appearance of conservation areas. Figure 2-3 shows the location of all the buildings and areas mentioned above. From this, it is apparent that there is a wealth of historic and architectural value in the City.

2-23
Figure 2-3 also shows the designated walkways in the City. Two Heritage Walkways were established in 1975 by the City Corporation and a Silver Jubilee Walkway by the Trust of that name in 1977.

2-24
Large parts of the City have been redeveloped since the Second World War, when almost one third of the built-up area was bombed. The output has been of varying quality, and has supporters and critics in similar numbers. Some condemn the decision to rebuild on the old street lines, while others criticise the rebuilding on new lines, as with London Wall and the high capacity Southern Route following the River. Not only do these roads form a physical barrier to pedestrian movement, the walls and buildings associated with them are visually obtrusive. Redevelopment of the Barbican by the City Corporation was a massive gesture toward the Arts and residential accommodation, for neither of which was the City previously renowned. Lloyds of London and Palumbo are also promoting significant modern buildings.

2-25
The City, partly because of dominance of its streets my moving and parked vehicles, has diminished the value of its great monuments, most of which are lost to sight. They are shown on Figure 2-3: the open spaces beside
St Paul's, Old Bailey, Smithfield, and the Monument have unrealised potential. Only in its treatment of the pleasant square before Guildhall, and to a lesser extent the space in front of Royal Exchange, has the City yet grasped this potential. Proposed action is discussed in Chapter 4.

Noise and Air Pollution

2-26
TEST supplied the GLC's Scientific Services Branch with the classified traffic counts undertaken at nine locations in the City, and the GLC then made noise and air pollution estimations for those locations, attributable to road traffic. Excessive noise can harm human hearing, though that is a problem more of discos than of city streets. There is an extensive literature on attitudes to noise (defined as unwanted sound) which have culminated in legislation to protect those newly exposed to levels beyond a fixed criterion of 68 dB(A) (see the footnote to Table 2-4). The City's dominant employment in the service and information sectors, with the majority working in offices, can be adversely affected by excessive noise. This can be prevented at source by reducing noise levels of individual vehicles or removing them from the scene; or it can be cured at the point of receipt by double windows, air conditioning, heavily insulated work stations and so forth. The latter are more expensive, and energy-intensive, than the former, supporting the old adage 'prevention is better than cure.'

2-27
The GLC estimated the one hour noise value L10 dB(A) (1 hour) for the sites in accordance with DoE (1975b). A reference distance of 10m from the nearside carriageway edge and a traffic speed of 50 km/h were assumed.

Table 2-4: Noise levels at nine City sites

<table>
<thead>
<tr>
<th>Site</th>
<th>L10 dB(A) 1 hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bishopsgate</td>
<td>77.7</td>
</tr>
<tr>
<td>Camomile Street</td>
<td>76.3</td>
</tr>
<tr>
<td>Cannon Street</td>
<td>74.4</td>
</tr>
<tr>
<td>Cornhill</td>
<td>74.7</td>
</tr>
<tr>
<td>Eastcheap</td>
<td>73.3</td>
</tr>
<tr>
<td>Gracechurch Street</td>
<td>75.7</td>
</tr>
<tr>
<td>Queen Street</td>
<td>73.0</td>
</tr>
<tr>
<td>Queen Victoria Street</td>
<td>76.7</td>
</tr>
<tr>
<td>Upper Thames Street</td>
<td>78.4</td>
</tr>
</tbody>
</table>

2-28
It is difficult to say how significant these figures are, as the 1-hour designation is dissimilar from the 18-hour L10 noise level used in the Noise Insulation Regulations 1973 (Statutory Instrument 1973 No 1363). However, those Regulations prescribe that compensation is payable in the case of buildings alongside a new or improved road where the 18-hour L10 of at least 68 dB(A) is exceeded by at least 1 decibel. The dB(A) levels are on a logarithmic scale where the perceived loudness of a sound doubles for each 10 dB(A) addition - in Table 2-4 Upper Thames Street would sound twice as loud as the Noise Insulation Regulations' threshold of 68 dB(A).

2-29
Air pollution presents many problems, depending on the pollutant, effects of two or more in combination, dispersing winds and microclimate, quantity, intensity, and so on. Because traffic originating air pollution is difficult to disentangle from that originating from other sources, commentaries on traffic-originating nuisance are cautious. Nevertheless it is likely that human health is adversely affected, bronchially, from carcinogens, and in relation to heart disease, among others; certain
The combination of pollutants cause smog and acid rain; other pollutants attack buildings; smoke and dust are unpleasant and dirty. Prevention is far less expensive than cure.

2-30

Predictions of air pollution by the GLC follow the methods suggested by Hickman and Collwll (1982) and Waterfield and Hickman (1982). A reference distance of 12m from the carriageway centre was assumed. (Predictions are given in Table 2-5.)

Table 2-5: Air pollution from road traffic at nine City sites

<table>
<thead>
<tr>
<th>Site</th>
<th>CO₂ ppm</th>
<th>Pb micro g/m³</th>
<th>Pb85 ppm as Pb</th>
<th>HC ppm</th>
<th>NOₓ ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bishopsgate</td>
<td>7.9</td>
<td>1.6</td>
<td>0.6</td>
<td>5.6</td>
<td>0.4</td>
</tr>
<tr>
<td>Camomile Street</td>
<td>7.5</td>
<td>1.6</td>
<td>0.6</td>
<td>5.5</td>
<td>0.4</td>
</tr>
<tr>
<td>Cannon Street</td>
<td>4.1</td>
<td>1.2</td>
<td>0.5</td>
<td>4.8</td>
<td>0.2</td>
</tr>
<tr>
<td>Cornhill</td>
<td>5.3</td>
<td>1.3</td>
<td>0.5</td>
<td>5.0</td>
<td>0.3</td>
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2-31

The CO₂ is the 8-hour Carbon Monoxide concentration likely to be exceeded once a year, and should be compared with the 9ppm GLC guideline value. Only Upper Thames Street exceeds this. The Pb value should be compared with an EEC criterion of 2 micrograms/m³. Upper Thames Street therefore equals this value. The Pb85 is the expected concentration of lead in 1986 and onwards as a result of legislation to reduce lead in petrol - all the values are less than the EEC criterion. No satisfactory criteria can be given for hydrocarbons (HC) or all Nitrogen Oxides (NOₓ). Finally, it should be noted that noise and air pollution from other roads have not been considered, though they would contribute to the values in Tables 2-4 and 2-5.

City Roads Studied

2-32

Table 2-6 lists some of the environmental characteristics, apart from noise and air pollution (and accidents whose pattern is inconclusive) of the roads incorporated in the four GLTS Zones which comprised the three study areas. The three study areas figure more strongly in Chapters 3-4.

The column numbers stand for:
1. Individual streets, sometimes subdivided by the surveyor because of their length; N = north side of street, for example
2. Highway width in metres
3. Pedestrian level of service, under which is density in m² per pedestrian (1=most dense, 7=least dense)
4. Primary land uses, included to indicate access requirements
5. Number of buses, two-way, per hour
6. % listed and historic buildings within the street, or section of it
7. No. of times PV² threshold (the level which justifies a controlled pedestrian crossing) is exceeded
8. Tourist attraction
9. Conservation area?
10. Shopping facilities
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</tbody>
</table>

**KEY TO COLUMN HEADINGS:**
- **2**: highway width, m
- **3**: pedestrian level of service, density in no./pedestrian below
- **4**: primary land use
- **5**: no. of buses, 2 way/hr
- **6**: % listed and historic buildings
- **7**: number of times PZ exceeded
- **8**: touristic attraction
- **9**: conservation area
- **10**: shopping facilities

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50 World Transport Policy and Practice
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CONFLICTING MOVEMENTS

For its size, the City is probably the area most intensively served by public transport in Britain. 83% of journeys to work are by rail, tube and bus (81% Central London) and 11.5% by car (16% Central London). The car users include 77% whose vehicle is not used the whole day before returning home in the evening. While terminating cars in the morning peak are a smaller percentage than for Central London as a whole, during the day the City's streets are more densely occupied than any other Central London Borough's. In comparison with the numbers of pedestrians, vehicles still remain a relatively small number, but they exert a disruption out of all proportion.

Pedestrian activity in the City must rank among the highest anywhere. The reasons are easy to find: a tiny proportion of residents among City workers; a dense urban fabric close to rail termini, tube stations and bus stops; and a scarcity of on- and off-street parking places. While there is this major flow of people walking, facilities for them are inept: narrow footways, few controlled crossings, few pedestrian phases at traffic signals, and some overhead walkways which are little used. The City has no streets converted from all-traffic streets purely for pedestrian use, but it does have some historic alleyways which have managed to escape development. All streets in the three study areas were surveyed to derive pedestrian levels of service, and very few of the streets in the banking and insurance study areas had more space than rating 5 (= impeded).

LRT buses are not as popular as other modes, probably because they spend much time in the congestion caused by inessential road users. Commuter and tourist coaches contribute much to the City's traffic chaos and little to its economy.

The Chapter ends with a critique of transport aspects of the City's Draft Local Plan. It concludes '..while in principle private vehicles are to be restrained, public transport and bicycles encouraged, and the pedestrian environment improved..it is private vehicles that appear to benefit most from the Plan.'
Transport and the City

3-01
Several of England's major trunk roads originate within the City boundary - the A1, A3, A4, A10, A11 and A40. There are seven British Rail termini of varying importance - Blackfriars, Broad Street, Cannon Street, Fenchurch Street, Holborn Viaduct, Liverpool Street and Moorgate. British Rail trains also serve Barbican Station, and BR operate the Waterloo and City railway, terminating at Bank Station. There are 11 LRT underground stations and 47 LRT daytime red bus services, as well as a number of night and Green Line services, and commuter coaches of independent operators. The Docklands Light Rail service will terminate at Tower Hill, on the City boundary, but may be extended to Bank station (Huntley 1985). Connection of Farringdon BR Station with the Holborn Viaduct-Blackfriars route, via the Snow Hill tunnel, enabling north-south through running of some BR services, has recently been approved by DTp.

3-02
Apart from the trunk roads (not all are mentioned in para 3-01), the City has designated four through routes: the Northern Route of Fleet Street/Holborn-London Wall-Houndsditch-Whitechapel High Street; the Southern Route of Victoria Embankment-Upper and Lower Thames Streets and Edward Street; and two north-south streets, Farringdon Street-Blackfriars Bridge, and Bishopsgate-Gracechurch Street-London Bridge.

3-03
Some of the GLC's '50 busiest regular counting sites' (GLC 1985f) are within the City: those ranked 7 (Victoria Embankment with a 24-hour 2-way total of 74,000 vehicles in 1984 as against 68,000 in 1982), 25 (Blackfriars Bridge with 59,000 against 57,000 in 1982), 39 (London Bridge, 49,000 against 47,000 in 1982). Some shorter lengths of road yield higher counts, as is shown on Figure 3-1, though Southwark Bridge, with 24,000 vehicles, has a much lower flow than the other two City road bridges (Tower Bridge, City-owned, is outside its boundary).

Journey to Work

3-04
How do City workers get to work in the morning? High public transport use is a direct reflection of the excellent service provision; because public transport arrival points are relatively close to final destinations, high pedestrian flows are experienced between them. A fairly small proportion travel by car. The 1981 GLTS origin and destination data show that 20,511 motor vehicles (not just cars) either had a City destination or were passing through (60% passed through) in the morning peak hour. This is 10.8% of the 189,000 motor vehicles inbound across the Central Area cordon. What these data seem to suggest is that the City's superb public transport provision acts against car use. The Greater London Development Plan (GLC 1976) encourages office development near public transport stations, and this has also been a strong influence against car use.

Inessential Car Users

3-05
Which of these car user trips are essential? What proportion are company car users, often with no need whatever to be using the car to get to work? TEST's (1984b) work on the company car notes that they are a substantial cause of congestion toward and within Central London. Hayes (1983) has shown that of those motorists crossing the Central London cordon in the morning peak in 1982, no less than 79% of those saying they were
travelling for work purposes were receiving some form of assistance from
their employer; 36% of the total actually had company cars; 47% were
provided with a parking space.

3-06
'Essentiality' is a difficult concept to define. The West London Study
(GLC et al 1978) considered that 33% of traffic in Central London was
essential while Bayliss et al (1979) suggested 40%. It will be seen in
the next paragraph that TEST suggest 35% of car traffic terminating in the
City is essential. Bayliss defined essential users as: disabled car
drivers or passengers; where more than one child under three was being
carried; journeys involving the carriage of goods; journeys made when
public transport did not operate; journeys made from areas with
infrequent, indirect or overcrowded public transport services; and
instances where several journeys were made in one day.

3-07
While having reservations about some of these categories, TEST asked the
GLC to run the GLTS model to show what happened to car users who entered
the City during the morning peak hour. The results are extraordinary. Of
11.7% cars terminating in the City, 76.8% left them in a car park all
day. 6.5% used them on employer's business, 11% on personal business,
3.9% on other business, and 1.8% on combined employer's, personal and
other business. It is possible that a small proportion of the 76.8% could
be carrying goods to work or be unable for some reason to make the journey
by public transport. 65%, or about 7600 cars, have therefore been
estimated as being imessentially used. Their exclusion would allow less
congested travel by those who have to use buses, taxis or private cars.

Parking

3-08
Where do these car users park? Because of the narrowness of many City
streets, there are fewer on-street controlled parking spaces than
elsewhere in Central London - 1400 on street, or 536 per km² in the City
1978, compared with 32 000 on street, or 1140 per km² in Central London
1976. The breakdown of the City's parking spaces in 1978 was as follows:

Table 3-2: On- and off-street parking in the City of London 1978 and 1985

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Off street</td>
<td>1 230</td>
<td>200</td>
<td>Public off street</td>
<td>5 697</td>
</tr>
<tr>
<td>On street</td>
<td>0 200</td>
<td></td>
<td>Private off street</td>
<td>8 108</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Meters</td>
<td>1 400</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Smithfield pay/display zone</td>
<td>450</td>
</tr>
<tr>
<td>Totals</td>
<td>1 230</td>
<td></td>
<td></td>
<td>15 205</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16 706</td>
</tr>
<tr>
<td>Sources: City of London 1978 and Havers et al 1985</td>
<td>* 1982</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3-09
The City actually reduced its metered spaces from 1800 in 1971 to 1400 in
1978 (increasing once more to 1556 in 1985) and yet the total number of
spaces increased from 15 818 to 16 435 in that period. (City of London
1978). There was a 10% increase in legal non-residential spaces 1978-85.

Modal Split

3-10
A more conventional view of journeys to work is provided by modal splits,
which can be compared for 1971 and 1981 from the population Censuses, and
for the City and Central London. Table 3-3 makes these comparisons for
morning peak arrivals.
Probably because the City has very high pedestrian flows, road traffic accidents there which involved death or injury were second only (among all London Boroughs) to the City of Westminster in 1977.

Table 3-5: No. of road traffic accidents involving death or injury to pedestrians and vehicle occupants per km of Borough road, 1977

<table>
<thead>
<tr>
<th>Borough</th>
<th>Injury accidents/km of Borough road</th>
<th>Borough</th>
<th>Accidents/km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner London:</td>
<td></td>
<td>Outer London (cont):</td>
<td></td>
</tr>
<tr>
<td>Westminster</td>
<td>11.64</td>
<td>Hackney</td>
<td>5.89</td>
</tr>
<tr>
<td>CITY OF LONDON</td>
<td>10.06</td>
<td>Southwark</td>
<td>5.62</td>
</tr>
<tr>
<td>Kensington &amp; Chelsea</td>
<td>8.80</td>
<td>Wandsworth</td>
<td>5.39</td>
</tr>
<tr>
<td>Camden</td>
<td>7.42</td>
<td>Tower Hamlets</td>
<td>4.93</td>
</tr>
<tr>
<td>Lambeth</td>
<td>6.73</td>
<td>Lewisham</td>
<td>4.60</td>
</tr>
<tr>
<td>Islington</td>
<td>6.53</td>
<td>Haringey</td>
<td>4.12</td>
</tr>
<tr>
<td>Hammersmith &amp; Fulham</td>
<td>6.03</td>
<td>Newham</td>
<td>3.96</td>
</tr>
<tr>
<td>Outer London:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hounslow</td>
<td>4.43</td>
<td>Harrow</td>
<td>2.27</td>
</tr>
<tr>
<td>Greenwich</td>
<td>4.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waltham Forest</td>
<td>4.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ealing</td>
<td>4.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brent</td>
<td>4.03</td>
<td>Greater London</td>
<td>4.10</td>
</tr>
</tbody>
</table>

Source: GLC 1980
Note that Greenwich is classed as an Outer Borough, though it is a member of ILEA, whereas Haringey and Newham are Inner Boroughs but outside ILEA.

It is remarkable how closely Table 3-5 corresponds to activity patterns, with the two Cities with the highest pedestrian densities, themselves related to the very large number of work and leisure attractors, heading the list. Then follow all the remaining Inner London Boroughs (with the exception of Haringey and Newham, which perform better than some Outer Boroughs). Inner Boroughs (see also Table 3-4) have to accept the burden of traffic from Outer Boroughs travelling to the Central Area or beyond. A review of pedestrian accident data for the City over a fifteen year period was done for this study, but it shows no consistent pattern.

Freight

The City’s policies discourage heavy goods vehicles, so their proportion in a classified count will be lower than normal. To obtain some idea of the make-up of traffic within the City, TEST did classified vehicle counts at nine locations during the morning peak, in April. At only one location were any HGVs recorded - the junction of Upper Thames Street and Queen Street, part of the southern east-west through route. During a 25 minute count 7 HGVs were recorded out of a total flow of 1254 vehicles. Medium goods vehicles were in evidence at all sites, as were light vans. The GLC’s Traffic Monitoring Review (GLC 1984b) shows the highest percentage of HGVs in the City to be on Southwark Bridge (9.2%; 2200 vehicles); east of the bridge on Upper & Lower Thames Streets the percentage is 7.1%, or 3400 vehicles. West of the bridge on Upper Thames Street it drops to 3.0% and there are 2.3% on New Bridge Street and 2.1% on Farringdon Street.

Rail & Tube

Table 3-6 shows BR arrivals in the morning peak 07.00-09.59 and for 24 hours for the seven termini at three points in time.
Table 3-6: Arrivals at City BR Termini

<table>
<thead>
<tr>
<th>Terminus (Region)</th>
<th>1971 Peak</th>
<th>24hr</th>
<th>1977 Peak</th>
<th>24hr</th>
<th>1983 Peak</th>
<th>24hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blackfriars (S)</td>
<td>11 100</td>
<td>12 650</td>
<td>7 240</td>
<td>8 370</td>
<td>6 200</td>
<td>7 600</td>
</tr>
<tr>
<td>Broad Street (E)</td>
<td>2 390</td>
<td>2 400</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(LM)</td>
<td>2 800</td>
<td>3 990</td>
<td>1 430</td>
<td>2 420</td>
<td>1 100</td>
<td>1 800</td>
</tr>
<tr>
<td>Cannon Street (S)</td>
<td>40 930</td>
<td>43 790</td>
<td>37 850</td>
<td>40 820</td>
<td>33 800</td>
<td>36 700</td>
</tr>
<tr>
<td>Fenchurch Street (E)</td>
<td>28 210</td>
<td>33 950</td>
<td>27 790</td>
<td>31 790</td>
<td>28 400</td>
<td>32 600</td>
</tr>
<tr>
<td>Holborn Viaduct (S)</td>
<td>13 890</td>
<td>15 820</td>
<td>10 390</td>
<td>11 690</td>
<td>8 700</td>
<td>9 600</td>
</tr>
<tr>
<td>Liverpool Street (E)</td>
<td>69 990</td>
<td>91 970</td>
<td>58 340</td>
<td>74 040</td>
<td>58 200</td>
<td>75 400</td>
</tr>
<tr>
<td>Moorgate (E)</td>
<td>-</td>
<td>-</td>
<td>6 700</td>
<td>8 200</td>
<td>7 400</td>
<td>9 200</td>
</tr>
</tbody>
</table>

Source: GLC 1980, and communication from GLC Research Library

3-17
Table 3-6 shows the gradual decline in rail commuting (more pronounced between 1971 and 1977 than between 1977 and 1983) in part explained by jobs moving out of the City. Moorgate's BR arrivals have increased since service introduction, and there have been modest increases at Fenchurch Street and Liverpool Street 1977–1983. The impressive numbers arriving by train would be still greater if those arriving at Bank via the Waterloo and City Railway were added. The Table also shows the extreme 'peakiness' of arrivals, where those arriving 07.00–09.59 are not far short of the total arrivals over 24 hours; Liverpool Street reflects this least.

3-18
Figure 3-7 shows morning peak arrivals at the seven termini, together with their onward mode, demonstrating the high proportions walking to their ultimate destinations. Some persons walked long distances (Plates 1-4 and 1-5) connected with overcrowding on the tube and congestion on streets delaying buses. If Underground and Bus conditions were improved, a smaller proportion might walk. A quite different picture emerges from the onward modes of Euston and Waterloo, for 1971 morning peak arrivals:

Table 3-8: Onward modes, Euston, Waterloo and Liverpool/Broad Streets

<table>
<thead>
<tr>
<th>Terminus</th>
<th>Passenger arrivals</th>
<th>Onward mode to Central Area destination %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tube</td>
<td>Bus/coach</td>
</tr>
<tr>
<td>Euston</td>
<td>8 700</td>
<td>64.6</td>
</tr>
<tr>
<td>Waterloo</td>
<td>69 600</td>
<td>49.9</td>
</tr>
<tr>
<td>cf Liverpool St/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broad Street</td>
<td>66 400</td>
<td>28.9</td>
</tr>
<tr>
<td>Cannon Street</td>
<td>39 300</td>
<td>10.6</td>
</tr>
</tbody>
</table>

Sources: GLC 1975 and Parker 1977.

3-19
Figure 3-9 shows arrivals by Underground at the City stations; figures for Moorgate include BR services terminating there (see Table 3-6 above), but the Bank figures exclude Waterloo and City arrivals. No comparable data are held for bus arrivals, either by LRT or private coach.

Bus

3-20
While Table 3-3 shows that buses in the morning peak carry nowhere near as many passengers as BR or Underground, their importance as a mode of transport continues through the day, is significant for tourists, and appears to be full of promise, if operating conditions and fares were right. Figure 3-10 shows accumulated frequencies of all bus routes along particular corridors. London Bridge has the greatest concentration, and
Fleet Street/Ludgate Hill the second greatest.

3-21
Operating conditions show how insignificantly buses are regarded in the City: there is only one short stretch of bus lane and bus stops are placed where they cause least inconvenience to other forms of transport, not greatest convenience to bus users. This is not to say that all the City bus services ideally serve their respective 'markets'. When reconsidering the traffic crossing the various arms of the Bank junction TEST questioned whether the routes from London Bridge to Moorgate in fact met a particular demand for passengers wishing to reach Bank. Three routes - 21, 43 and 133 - run over the whole route via King William Street and Princes Street, and the 501 runs along King William Street, turning left at Bank to progress to Holborn and beyond. Appendix A describes the survey that was undertaken of bus usage on these routes. In brief, the finding was that only a small proportion of passengers alighted and boarded the four routes near the Bank junction.

Coaches

3-22
Since the 1980 Transport Act, privately operated commuter coach services have started operating from Kent and elsewhere to the City, and appear popular. From the TEST classified counts at nine sites, coaches were evident at all of them, though sometimes only one or two over a 25-minute period. The observed sites where they were most evident were Queen Victoria Street (37 during 25 minutes from 08.30 to 08.55); Upper Thames Street (40 from 09.00-09.25); and Cannon Street (32 from 08.00-08.25 - see Plates I-6 and II-4). A study which is currently underway at Polytechnic of Central London observed 366 coaches at 11 key Central London sites between 16.15 and 18.30. 52% were from North Kent and Essex, and all passed through or terminated in the City. The study finds that the most significant stops are at London Bridge, Cannon Street, Queen Victoria Street, St Botolph Street, Moorgate and London Wall.

3-23
The City, GLC, and LRT all have misgivings about coaches. The City is concerned that they set down and pick up either at unauthorised places, or at LRT stops, creating congestion and danger (Plates I-6 and II-4). The GLC make similar complaints, saying the coach operators are not paying for parking and stopping facilities. LRT have similar concerns to the City. The GLC also point out that coaches are taking traffic away from the more environmentally acceptable rail system and adding to the demand for roadbuilding. These effects of the 1980 Act do seem incongruous when today's transport networks for commuters are probably adequate (if upgraded in ways described elsewhere in this report) and when the population of London, and number of Central Area jobs, are in decline. These coaches are well suited to an irrational transport system.

3-24
There is also some doubt about the validity of tourist coaches. While it may be argued that they provide a service that would be difficult to achieve through scheduled public service vehicles, it would clearly be possible for LRT to initiate such special services - its exercise in selling route 15 as the bus connecting with the Tower confirms its marketing ability. A study by the City of London (1971) on tourist coaches to St Paul's showed that the tourists had insufficient time to visit those parts of the Cathedral requiring money to be spent, and to use the local shops on Ludgate Hill. The buses therefore park, and contribute to congestion and environmental pollution, and their passengers gradually wear down the routes they follow on foot, without there being any specific payment toward these incurred costs.
Interchange Between Modes

3-25
Although a large proportion of passengers walk from City BR station to their final destination (see Figure 3-7), many change to another mode. At Liverpool Street BR Station, with the largest number of arrivals of all the City stations, almost 30% transfer to the tube, and Fenchurch Street is similar. Other proportions are smaller, with about 10% transferring to the more limited tube facilities at Cannon Street. Transfer to buses is low in the morning peak - 6.4% of arrivals at Liverpool Street and only 1.6% at Moorgate. Less congested buses might be better used.

3-26
As noted above, Liverpool Street BR has much more non-commuter traffic than the other City stations, with 30% of arrivals outside the morning peak, and presumably a similar level of departures. These passengers are much more likely to have origins and destinations outside the City, and therefore can be expected to interchange more than commuters. Whatever the nature of the journey, ease of interchange is an important factor in the overall performance of public transport, with safety, convenience and speed all being important to commuters. Table 3-11 shows interchange times for rail to rail and bus to rail, rail being BR and tube combined. These data need treating with caution as they derive from 1967, though few significant changes have taken place since then apart from the addition of BR services to Moorgate station. All other data in the Table are current. The letters in the right hand column refer to the following problems:

- a) Slow interchange times. Insufficient lifts and escalators with queues forming at peaks (extra lift for Northern Line being installed). Unpleasant subways, poor signing, too narrow. Bus stops away from Bank junction, very inconveniently located. Difficulty crossing road at ground level.
- b) No pedestrian crossing to reach eastbound buses. Commuter coaches stopping near station cause danger and confusion around LRT bus stops.
- c) Slow interchange times.
- d) Slow interchange rail to tube.
- e) Crossing facility inadequate to reach southbound buses.
- f) Eastbound bus stops badly located in relation to station. Difficulty crossing at ground level.
- g) Slow interchange times, but probably because of escalator to Bank.

Table 3-11: Rail/Bus/Tube Interchanges in the City

<table>
<thead>
<tr>
<th>Station</th>
<th>BR Y(es)</th>
<th>Tube Lines</th>
<th>No. of bus routes</th>
<th>Buses/hour</th>
<th>Time(mins) for pass. interchange</th>
<th>Problems (see para 3-28)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldgate</td>
<td>Bank Y</td>
<td>Circle+Met</td>
<td>15</td>
<td>100</td>
<td>2.3-10</td>
<td>a</td>
</tr>
<tr>
<td>Barbican</td>
<td>Y*</td>
<td>Central+Northn. 13</td>
<td>108</td>
<td></td>
<td>3.5-5.7</td>
<td></td>
</tr>
<tr>
<td>Blackfriars</td>
<td>Y</td>
<td>Circle+District 6</td>
<td>83</td>
<td></td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>Cannon St</td>
<td>Y</td>
<td>Circle+District 2</td>
<td>35</td>
<td></td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td>Fenchurch St</td>
<td>Y</td>
<td>Near Tower Hill 3</td>
<td>39</td>
<td></td>
<td>6.8-7.5</td>
<td>c</td>
</tr>
<tr>
<td>Holborn Via.</td>
<td>Y</td>
<td>None nearby</td>
<td>7</td>
<td>132</td>
<td>8.2</td>
<td></td>
</tr>
<tr>
<td>Liverpool</td>
<td>Y</td>
<td>Central+</td>
<td>11</td>
<td>146</td>
<td>2.8-6.6</td>
<td>e</td>
</tr>
<tr>
<td>Street</td>
<td>Mansion Hse</td>
<td>Met+Circle 11</td>
<td>74</td>
<td></td>
<td>2.2</td>
<td>f</td>
</tr>
<tr>
<td>Monument</td>
<td>Y</td>
<td>Circle+District 13</td>
<td>224</td>
<td></td>
<td>3.0-10</td>
<td>g</td>
</tr>
<tr>
<td>Moorgate</td>
<td>Y</td>
<td>Northern+</td>
<td>6</td>
<td>86</td>
<td>1.0-4.2</td>
<td></td>
</tr>
<tr>
<td>St Pauls</td>
<td>Central</td>
<td>Met+Circle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Central London Planning Conference 1974 + this study's data

* Waterloo & City

48
Walking in the City

3-27
Pedestrians in the City seem to attract attention in inverse proportion to their great significance as a transport mode. Whatever the explanation, this view seems at odds with general societal goals because of...

* the very large number of short distance trips made on foot
* the correspondingly great reduction in trips by mechanised modes
* the potential for reducing vehicular trips still further, if walk trips were properly accommodated: Lovemark (1972) found that walk trips were 30% longer in an attractive environment. He also said that good townscape encouraged high pedestrian activity
* beneficial effects on the traveller's health from the above comments
* the high proportion of walkers who are also vehicle users, and who therefore are aware of the claims of both camps...

All of which should be of vital interest to transport planners, casualty departments, politicians, and society at large. Time and again the case has been made for improved pedestrian environments (by, for example, Pushkarev & Zupan 1975, Test 1976, Hillman & Whalley 1979, Todd & Walker 1980, Mitchell & Stokes 1982, Parker & Catchpole 1983); time and again, these advocates of walking have made less impact on the transport infrastructure than their work deserved.

3-28
Nationwide, the National Travel Survey of 1978-79 (DTP 1983) shows the percentage of walking trips of all trips by purpose, on two bases: first, judged by distance travelled, and second by number of journeys undertaken:

Table 3-12: Percentage of walk trips (over 50 metres) of all mode trips, by purpose, judged by distance and frequency of trips

<table>
<thead>
<tr>
<th></th>
<th>J-t-work + in course of work</th>
<th>Education</th>
<th>Shopping/ personal</th>
<th>Day out/ Eat+</th>
<th>Sports</th>
<th>Escort</th>
</tr>
</thead>
<tbody>
<tr>
<td>By distance travelled</td>
<td>4</td>
<td>18</td>
<td>8</td>
<td>8</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>By number of journeys</td>
<td>39</td>
<td>61</td>
<td>46</td>
<td>58</td>
<td>47</td>
<td>39</td>
</tr>
</tbody>
</table>

Source: DTP 1983
Joseph (1985) draws on the GLTS 1981 Transport Data for London to show that walk trips in Greater London were 36.3% of all trips and 16% of work trips; average distance travelled for each trip on foot was 1.09 km for all types of trip (average 5.39 km by all modes) and 1.42 km for work trips (average 7.81 km by all modes).

3-29
The major data sources lack information on public expenditure on walking. This applies both to the DTP's 10-year Transport Statistics and to the GLC's Transport Policies and Programmes. The 1975-80 TPP devotes 10 lines of a 68-page document to pedestrians, with no financial information, while the 1984-87 TPP expands the text to three paragraphs, reflecting the Council's much greater involvement in pedestrian measures, even though there are still no financial data.

3-30
It should be clear by now how important walking is as a mode of transport both for journey to work, and for in course of work purposes, in the City. This introduction to the topic, and the proposals in Chapter 4, relate to a greatly improved provision for pedestrians and to a likely increase in pedestrian movement in the City. Next, the provision for pedestrians in London is examined in comparison with some other world cities.

49
The comparative measure devised is km of pedestrianised street (ie, those converted from previous all-traffic streets; the City's alleyways and the Barbican walkways are excluded from the calculation because they are neither conversions, nor places of high pedestrian activity) per km² of CBD.

<table>
<thead>
<tr>
<th></th>
<th>Approx. total length km</th>
<th>km/km²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Munich</td>
<td></td>
<td>1.96</td>
</tr>
<tr>
<td>Vienna</td>
<td>2.35</td>
<td>1.53</td>
</tr>
<tr>
<td>Leeds</td>
<td>1.7</td>
<td>1.1</td>
</tr>
<tr>
<td>Central London</td>
<td>1.1</td>
<td>0.04</td>
</tr>
<tr>
<td>Cities of London &amp; Westminster*</td>
<td>1.1</td>
<td>0.05</td>
</tr>
<tr>
<td>City of London</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Source: Munich & Vienna Tourist maps, GLC (nd), Parker & Catchpole 1983
* Perhaps a closer approximation of a CBD than Central London

Table 3-13 demonstrates the poor performance of the various areas of London in terms of pedestrianised street. While Leeds was selected as a provincial English example, there are several other cities with a similar relationship of length of pedestrianised street to area of CBD - Exeter, Birmingham, Norwich, Newcastle-upon-Tyne, for example. These cities' CBDs perform at a level about 20 times better than London's.

Demand for pedestrian movement in the City of London can partly be discerned from Figures 3-14 to 3-17. They show passengers arriving at some BR and Underground stations who then walk to TEST's three study areas. The largest flows to Bank are (ranked) from Bank Underground, Cannon Street BR, Liverpool Street, London Bridge and Fenchurch Street. The largest flows to the Insurance area south of Leadenhall Street are from Fenchurch Street, London Bridge, Bank Underground, Liverpool Street and Cannon Street. The Liverpool Street area has quite modest flows except from Liverpool Street station. The Fur Trade area has its largest flows from Cannon Street BR and Bank Underground stations, and Mansion House Underground. These flows form important inputs to the strategy propounded in Chapter 4.

Pedestrian facilities in the three study areas are shown on Figures 3-18 to 3-20: provision of facilities falls below both accepted flows for controlled crossings (see DoE 1974 and Table 3-22 for detail), and what is provided in other parts of Central London. Regrettably, a facility universally provided in most European and North American cities - 'walk' signal phases on all arms of road junctions - is rarely to be found in the City. Motorists scarcely recognise, when turning into a side road, the rights of pedestrians, unlike the high level of respect given by New York motorists to pedestrians in such circumstances. Several of the Plates show difficulty in crossing roads: III-2 and 1, queuing for the subway; III-7, conflict with car on a zebra crossing; III-4, avoidance of a high bridge; II-8, even with a pedestrian phase a truck blocks the crossing. Perhaps the only solution is to don shorts for a fast crossing (III-3).

Parker & Catchpole's (1983) work lists problem areas for pedestrians within the City. The TEST surveys endorse most of these, and little has changed since the data for Table 3-21 were assembled, some years ago. The authors say that the Liverpool Street BR and LRT stations are the largest generator of pedestrians in London.
Figure 3-14: Passengers arriving at BR and tube stations, walking to the Bank area.

Figure 3-15: Passengers arriving at BR and tube stations, walking to the Insurance area.
Figure 3-16: Passengers arriving at BR and tube stations, walking to the Fur Trade area.

Figure 3-17: Passengers arriving at BR and tube stations, walking to the Liverpool St area.
Figure 3-18: Pedestrian provision in the Fur Trade area

Figure 3-19: Pedestrian provision in the Bank and Insurance areas

Figure 3-20: Pedestrian provision in the Liverpool Street area
### Table 3-21: A GLC view of problem sites for pedestrians in the City

<table>
<thead>
<tr>
<th>Site</th>
<th>Problem</th>
<th>1977 pedestrian flow (08.30 - 09.30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liverpool St/BR</td>
<td>Heavy flows over street/vehicle conflict</td>
<td>10,000</td>
</tr>
<tr>
<td>Bishopsgate/BR</td>
<td>Pelican inadequate for flows</td>
<td>6,000</td>
</tr>
<tr>
<td>Old Broad St/LRT</td>
<td>Crossing not protected</td>
<td>2,000</td>
</tr>
<tr>
<td>Lombard St</td>
<td>Very narrow footways</td>
<td></td>
</tr>
<tr>
<td>Gracechurch St/Fenchurch St</td>
<td>Crossing of Fenchurch St not protected</td>
<td>2,500 across</td>
</tr>
<tr>
<td>Eastcheap/Monument</td>
<td>Severe bunching in centre of street</td>
<td>6,800</td>
</tr>
<tr>
<td>London Bridge by Monument</td>
<td>Subway narrow and inconvenient to peds.</td>
<td>2,000 from</td>
</tr>
<tr>
<td>Cannon St/BR</td>
<td>Severe bunching in centre of street</td>
<td>10,000</td>
</tr>
<tr>
<td>St Swithin's Lane</td>
<td>Heavy flows along narrow Lane + vehicles</td>
<td>4,400</td>
</tr>
<tr>
<td>Pope's Head Alley/Cornhill</td>
<td>Crossing of Cornhill not protected</td>
<td>1,300</td>
</tr>
<tr>
<td>Bucklebury</td>
<td>Heavy bunching in centre of Q Vict St</td>
<td>3,000</td>
</tr>
<tr>
<td>Moorgate LRT</td>
<td>Crossing not protected</td>
<td>2,500</td>
</tr>
<tr>
<td>Holborn Viad.BR</td>
<td>Congestion at bus stops nr station entrance</td>
<td></td>
</tr>
<tr>
<td>Holborn Circus</td>
<td>Crossing of Shoe Lane and New Fetter Lane south side</td>
<td>1,700</td>
</tr>
<tr>
<td>Bow Lane</td>
<td>Narrow alley shared with vehicles</td>
<td>300</td>
</tr>
<tr>
<td>Middlesex St at Gardiners Corn</td>
<td>Subway unattractive</td>
<td>200 crossing</td>
</tr>
</tbody>
</table>

3-36

Appendix A gives the methodology employed in the three study areas: results are described below. Three study areas were randomly selected, comprising four GLTS Zones: they are outlined on Figures 3-14 to 3-17, and individually detailed on Figures 3-18 to 3-20. One of the first studies to be undertaken was of pedestrian:vehicle conflict points, using the official DTp formulae of $P^2$ equal to or greater than $10^8$, justifying a crossing without a refuge, and $2 \times 10^9$ justifying a crossing with a central refuge. The 9 sites observed gave the following results: the Table's right-hand column shows the number of times the pedestrian flows, in relation to vehicle flows, exceed the justifying figure: either nothing has been done in the way of providing a controlled crossing, or it is inadequate, as in the case of the Bishopsgate Pelican Crossing.

### Table 3-22: $P^2$ data for nine City sites and the extent to which they exceed the threshold justifying a controlled crossing

<table>
<thead>
<tr>
<th>Location</th>
<th>$P^2$ without refuge</th>
<th>$P^2$ with refuge</th>
<th>Exceeds</th>
<th>Justification by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheapside/Queen Street*</td>
<td>3.874</td>
<td>3.818</td>
<td>3.4</td>
<td>1.9</td>
</tr>
<tr>
<td>Queen Victoria Street/Cannon St</td>
<td>1.161</td>
<td>1.190</td>
<td>11.6</td>
<td></td>
</tr>
<tr>
<td>Upper Thames Street/Queen St*</td>
<td>6.154</td>
<td>3.571</td>
<td>6.2</td>
<td>17.9</td>
</tr>
<tr>
<td>Cornhill/Pope's Head Alley (see Plate III-5)</td>
<td>1.190</td>
<td>3.571</td>
<td>11.9</td>
<td></td>
</tr>
<tr>
<td>Camomile Street</td>
<td>1.190</td>
<td>3.571</td>
<td>11.9</td>
<td></td>
</tr>
<tr>
<td>Bishopsgate (Pelican)</td>
<td>1.190</td>
<td>3.571</td>
<td>11.9</td>
<td></td>
</tr>
<tr>
<td>Cannon Street/St Swithin Lane (see Plates II-4,5,6)</td>
<td>1.190</td>
<td>9.899</td>
<td>4.9</td>
<td></td>
</tr>
<tr>
<td>Eastcheap/Fish Hill Street</td>
<td>1.547</td>
<td>1.5</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Gracechurch Street/Lombard St*</td>
<td>6.968</td>
<td>7.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Junction with traffic signals, but no pedestrian phase
Every street in the study areas was surveyed, with the exception of the alleyway network, which is clearly quite unsuited to vehicular traffic. Derived pedestrian densities were then translated into 'levels of service', following from the work of Fruin (1971), shown on Figures 3-23 to 3-25. On the basis that action is increasingly necessary from say level 5 (impeded) to level 1 (jammed), opportunity for improving these pedestrians' environment is abundant, and would lead to increasing numbers of pedestrians using them. Less would need to be done to attract more pedestrians to streets with levels of service 6 and 7. If walking as a mode of transport is to be taken seriously, some or all of the following street improvements are imperative:

* trees, shrubs and flowers; good lighting; litter bins, clear signing, etc are provided
* building facades are rehabilitated; flowers placed on window sills
* land uses change so that shops, restaurants, cafes, and bars appear
* pedestrianisation, with wall to wall paving and some or all of the facilities mentioned above
* safe crossing to other streets to form longer-distance routes
* linking isolated stretches of pedestrian streets to others to form networks.

A small amount of surveying was also done at lunch time. This was in the Leadenhall Market and in Bow Lane, an attractive street with many shops and cafes. This left no doubt that these streets should be pedestrianised during, at least, morning, midday and evening peaks. It is satisfying to note that the City plans to pedestrianise Bow Lane and St Swithin's Lane.

**SUMMARY OF MAIN POINTS ON THE CITY'S TRANSPORT ENVIRONMENT**

* The City of London ranks as Britain's main transport node, with many trunk road origins, 7 BR termini, 11 tube stations and 47 red bus services.
* The great majority travel to work by public transport (82.8% in 1981 - BR 54%, unusually high for Central London, tube 27%).
* 60% of vehicles entering the City during the morning peak passes through and 40% terminated. 77% spent the day in a car park; this is almost entirely inessential traffic.
* The City had the second highest number of pedestrian injury accidents in London 1977, road traffic noise levels exceeded official compensation levels, but air pollution from traffic largely kept within GLC standards.
* The City has the highest concentration of traffic on its roads of any Central London Borough.
* Buses perform a useful role when not stuck in traffic jams, but their share of the commuting modal split is low; for intra-City trips they are constrained by other traffic, by the near total absence of bus lanes and other priorities, and by bus stops being located in the wrong places.
* Benefits of commuter and tourist coaches seem to be greatly outweighed by their disbenefits, and their roles could be better played by BR, Underground and special LRT buses.
* Walking in the City results in greater flows than elsewhere in Central London. Flows to and from BR stations in the peak are particularly heavy, and yet the provision for safe and pleasant walking is radically deficient.
* In terms of km of pedestrianised street (converted from all traffic street) per km² of CBD, the City rates zero. The Cities of London & Westminster together rate 0.05, while Munich rates nearly 2.0.
* The Department of Transport's criterion for a controlled street crossing is exceeded by 2 to 12 times on a sample of eight important locations.
* Within the three study areas, all streets except alleyways were ranked according to pedestrian density from 1=jammed to 7=open. Very few of the banking and insurance areas' streets rated higher than 5=impeded.
Critique of Transport Aspects of the City of London Draft Local Plan

3-39
Now that we have a better understanding of movement issues within the City of London, to what extent are they answered by its Draft Local Plan? The remainder of this chapter is devoted to that. The first point to be made is that the City are evidently trying to introduce remedial policies, if on a small scale, but sometimes their proposals are inhibited by other authorities. For example, the setting down points of commuter coaches are apparently determined by Traffic Commissioners located outside Greater London, not by the City as local planning authority, or the GLC as strategic planning authority. The City apparently has tried to introduce more pedestrian phases at traffic signals, and a Pelican crossing on Lower Thames Street, but it is said these ideas have been blocked by the GLC on the grounds that they would unnecessarily delay vehicular traffic.

3-40
Although transport issues are predominantly covered in the 'Movement' chapter of the Draft Local Plan (City of London 1984a), they cannot be seen in isolation. Rather they should be viewed as a key component of the overall strategy, which have strong impacts on other parts of the Plan. Environmental quality is to a large extent dependent on the volume and nature of traffic passing through the area. An enhanced physical environment, it has been contended, in turn favourably affects economic health through increased tourism, greater shopping turnover, and the desirability of the area as a place in which to work. Residents also benefit from the improved environment. Leisure opportunities increase for all who work or live in, or visit, the City.

3-41
While the City is keen to improve its environment, its global movement aims could easily be in conflict. They are:

* 'To achieve the efficient movement of people and goods'
* 'To restrict the adverse effects of motor traffic on the environment'
(paragraph 11-14)

'Efficient' is not defined in the Draft Plan, though it could refer to use of energy, time, monetary costs to the user (fares or vehicle costs), land consumption, axle loading, freedom from stress; minimising accidents, air and noise pollution...etc. Pursuit of individual efficiency goals will generally incur additional net costs to the community. A single aim could encapsulate what is evidently desired by the City; it would read: 'To achieve the efficient movement of people and goods by transport modes that have the least adverse effect on the environment.'

3-42
Minimising these adverse effects lead the Plan to make many statements which would require traffic restraint as a precondition of their fulfilment. For example, and explicitly, in the following policies:

* 'To seek the improvement of the general residential environment' (5.47)
* 'To accommodate tourism by the provision of suitable amenities to meet the needs of tourists' (5.18)
* 'To encourage the widest possible use of all open spaces' (7.13)
* 'To resist the loss of retail uses' (8.10)
* 'To preserve and enhance the character and appearance of conservation areas...' (12.29)
* 'To designate environmental areas where priority will be given to schemes improving ease of local movement and the quality of the townscape' (11.39)
* 'To encourage the provision, and to resist the loss, of activities which contribute to the variety, scale and character of the City.' (12.120)
The City Corporation intends to pursue the aims of reducing inessential traffic, restricting the impact of through traffic, and reducing the adverse effects of motor traffic in general on the environment (paras 11.5, 11.14 and 11.25). Traffic is to be restrained by:

a. 'Diversion of traffic onto specific routes away from areas less suited to accommodate through movement'
b. 'Localised traffic management: the designation of one-way streets and junctions, weight and size restrictions, bus lanes, road closures, and pedestrianisation'
   and

c. 'Parking policy can be used to discourage unnecessary journeys by car to the City.'

Regarding items a) and b) the Plan does not contain specific proposals showing the extent of such schemes, nor does it give any indication of their likely impact. Instead, it proposes various highway improvements, mainly in the form of road widenings, to cater for the diverted traffic. Given successful traffic restraint, this measure should not be necessary; it also conflicts with other aspects of the Plan. Commenting on one of these, Route 11, the Smithfield Trust's (1985) response to the draft local plan says '...the policy has become increasingly irrelevant to the realities of traffic in the City. The blight and destruction already caused by the route is severe...and now (in) Newgate Street...the proposal will result in the eviction of 12 or so assorted shops and restaurants.' According to the GLC (1985a), 'the intrusion of extraneous traffic (ie that which has no origin or destination in the immediate area) is probably the most powerful influence inhibiting the development of a satisfactory environment.'

Regarding item c), the Plan advocates the transfer of some on-street parking to off-street parks through the introduction of pricing policies that encourage short-stay users. Improved parking provision for special groups such as the disabled and essential business users is also advocated. Unfortunately the Plan misses two crucial targets: the definition of 'essential', and the control of on-street parking, for a characteristic of Central London is that illegal parking acts greatly outweigh legal parking acts (for the evidence, see TEST (1981) - the better introduction of wheel clamps has had some effect on illegal parking, though its magnitude is still great). The proposals in Chapter 4 of this report substantially meet the criticisms of this paragraph.

The Corporation says it would support studies into the need for another river crossing. This is because safeguarding the structure of Tower Bridge indicates that there should be a further restriction of traffic on it, beyond present restrictions, and because through traffic (which the City does not want, in common with other Boroughs) travels through the City because of the location of bridges crossing the Thames. Any proposal for a new river crossing presupposes a continuance of existing traffic levels or their enlargement; it should be possible to design restraint measures that do not lead to additional river crossings. There is therefore an inherent conflict in considering a new crossing and Chapter 4 of this report shows how this can be avoided.

Pedestrian activity, the Draft Plan notes, '...has always been of great importance to the City's activities.' Indeed, the City had recognised this in its plan to develop an upper level walkway system of enormous scope and, no doubt, cost (see Official Architecture and Planning 1968). Fortunately, the planned network has been greatly reduced. Fortunately?
For pedestrians, footbridges are cumbersome, and for the disabled impossible to negotiate. The proper place for pedestrians is at ground level; vehicles are the proper mode of transport to negotiate major changes in level. Indeed, the City's own survey (City of London 1970) showed that the footbridges were little used, pedestrians preferring to risk crossing a heavily trafficked street with fast moving vehicles (see Plates III-4, 6, 8). The Smithfield Trust (1985) noted that '...walkways are always unattractive, damaging to street views, unpopular with pedestrians, and poor value for money.' It is quite disheartening to find that although the overall walkway network has been abandoned, remnants of it still remain in the proposals for new bridges and subways.

3-48
It is, however, surprising to find that, although the needs of pedestrians have been recognised for some time, and have not diminished in more recent times, the walkway system has not been replaced with anything near its scale at ground level. If pedestrians are to achieve the priority which is implied in the Plan, a few improvements to road crossings are not sufficient. What is required is large-scale pedestrianisation and footway widening in the area. The GLC (1985a) also suggest the possibility of arcading footways within the facades of buildings, a possible way of minimising the impact of road widening lines, as the original footway could be taken over by the widened carriageway, and a distinct benefit for pedestrians. Major improvements for pedestrians have been introduced in other cities, as was demonstrated in Chapter 1, to their great benefit; it remains ludicrous that toward the end of the twentieth century a relatively small number of vehicle users can cause great disruption to a very large number walking, because of a gross misallocation of movement space. While the City's Draft Plan does not anywhere near meet the requirements of pedestrians, Chapter 4 below shows how this can be done.

3-49
While the Draft Plan contains a general policy to '...encourage the provision of facilities and amenities (including access) for the disabled in all new developments', there is no reference to their specific needs in the 'Pedestrian Movement' section. While able-bodied walkers may dodge in and out of traffic (not without risk), for the disabled this is an impossibility. Footbridges and subways are inaccessible to most disabled people, and conflict with other pedestrians on the crowded narrow footways can also be a problem for the disabled: there are no specific proposals in the Draft Plan to combat these difficulties. The TEST proposals in Chapter 4 go some way toward meeting the needs of disabled people when not in motorised transport - pedestrianised streets, widened footways, many more 'walk' phases at traffic signals, and no more upper level walkways.

3-50
Bicycles and public transport also receive scant treatment in the Draft Plan. While provision is to be made for bicycle parking places, there is '...no mention...need to take into account requirements of cyclists when considering highway improvements and traffic management of environmental improvement schemes' (GLC 1985a). Public transport is to be promoted, according to the Plan, but no specific measures are proposed: bus lanes could be introduced to reduce bus delays, but are not mentioned.

3-51
In conclusion, while in principle private vehicles are to be restrained, while public transport and bicycles are encouraged and the pedestrian environment improved, in terms of the detailed and specific proposals it is private vehicles that appear to benefit most from the Plan. It is hoped that the proposals in Chapter 4 are adequate to reverse the inefficiencies of policies favouring private vehicles, and that they will be seen as meeting the needs for access by the majority of travellers, using public transport, walking and cycling, and of essential vehicle use by a distinct minority.
ESSENTIALITY > EFFICIENCY
ENVIRONMENT > ECONOMY

By this point, readers of this report will have concluded that the City's transport is sick, and that it is infecting its environment, and probably its economy. This Chapter seeks a remedy, whose emphases are high quality access for people and goods, and a consequential major improvement for its environment. While not wholly proven, it is suggested that the City's economy could only benefit from these actions. The cornerstones of improved access are a redistribution of movement space in favour of pedestrians, cyclists, public transport and taxis and, therefore, removal of inessential vehicles.

Phase 1 proposes immediate action to provide better conditions for walking. Phase 2 is elaborately displayed as it forms the alternative to the City's Draft Local Plan's transport policies. Phase 3 is seen as a long-term culmination of Phase 2 policies. Phase 2's 'lost' traffic was assigned to the larger network outside the City and a scenario constructed that was both less demanding in restraint terms than the GLC's latest proposal, yet appeared not to overload the larger network. Phase 2's cost of about £16m was in fact considered to be a benefit to the City for the massive environmental uplift and economic advantages it would bestow.
Introduction

4-01
From the discussions in Chapters 1-3, it will be clear that the City of London’s traffic environment is not only chaotic, it probably helps to diminish economic performance. It discriminates negatively against the pedestrian and public transport, and positively toward the private car. It compares very badly with certain large continental European cities, British provincial cities, and the remainder of Central London (though the latter hardly makes a good comparison).

4-02
The reasons for change are certainly compelling. In an area having among the highest pedestrian flows anywhere in Britain and the least provision for safe and pleasant walking, where essential travellers cannot reach their destination because of inessential users, where the streets themselves are often unattractive places to move about in (no trees, few flowers and shrubs, high levels of air and noise pollution, risk of accidents, etc), and where the City’s splendid architectural heritage is often obscured by a maelstrom of motor vehicles...corrective measures are vital.

4-03
This chapter demonstrates that forthright change is possible, affordable, and capable of phasing so its achievement is accompanied by understanding and acceptance. Following a summary of this change, the general strategy is outlined. A discussion on policies toward each transport mode comes next, with proposed new categories of City roads and the criteria for establishing them. The detailed transport and environmental proposals for the City are then explained. As the number of motor vehicle trips passing through the City is reduced, their assignment to the surrounding area road network is described. Financial costs of the scheme, and its implementation programme, complete the chapter, apart from some concluding remarks.

4-04
The theme of this chapter is the 4Es: Essentiality, Efficiency, Environment and Economy. A linear flow from Essentiality to Economy can be surmised, as an extension of Chapter 1’s hypothesis. Thus, it suggests that defining essentiality and then applying its principles to influence the modal split of work journeys to and from the City (a concept formulated in Chapter 3 and developed below) is the first group of tasks. This can then lead to definitions of efficiency - or the best use of the City’s surface movement space given an understanding of the space-time relationship. Applying the lessons so far learnt will profoundly improve environmental quality, and that, we argue, can only lead to an improvement of the economic environment. The fourth ’E’ receives the least attention in this report, and must await further work before the hypothesis is shown to be right or wrong.

Summary of the Proposals

4-05
The ultimate, third phase, of the proposals is to clear the City (or at least its core) of all traffic, except pedestrians, cyclists, buses and minibuses, disabled persons and emergency vehicles from say 07.30 to 18.30 each weekday, with special arrangements at weekends. Servicing would be done from 18.30 to 07.30. This third phase, while completely attainable, could not be achieved for some years. A pragmatic approach is therefore required for the first two phases of the implementation programme.
Phase 1, which could be operational within a year, retains the City's four through routes and all existing bus routes, while introducing a high degree of improvement for pedestrians. Phase 2 should be initiated in parallel, and implemented on a step-by-step basis while policies for the restraint of workday inessential traffic throughout inner and outer London get under way. Phase 2 places all the City's streets into six categories, the fundamental idea being to make access on foot and for essential vehicles safer, easier and more pleasant. Ease of access underlines the whole concept. It permits simultaneous street environmental improvement and, if the hypothesis is correct, enhances the City's economy. (Figures 4-3 to 4-5 show phases 1 and 2: phase 3 can follow straight on from phase 2, for the change is temporal rather than physical.

**Evolution of the Strategy**

The hypothesis in Chapter 1 'A good physical environment is a good economic environment' is considered in this report only in relation to the street environment, and that in its turn needs elaboration. Environmental capacity, rather than the quantity of vehicles which a street can physically accept, is a more useful indicator for defining its use, for it is based on the physical structure of the road, the use and character of flanking buildings, the amount of pedestrian traffic and the street's potential as an attractive place to be. Implicit in the concept is a reduction in the unpleasant aspects of vehicular traffic which all tend to be health hazards - accidents, noise and air pollution, obesity and heart disease from vehicle occupants' lack of exercise, etc. The concept has a respectable history behind it: it underlay many aspects of the Garden City movement; it was developed by Stein (1958) in his Radburn Layout; it was advocated by Sir Alker Tripp (1942) and adopted in the Buchanan Report of 1963.

Of course there was much concern among the authors in para 4-07 for living environments, places where people had their homes, as well as for more 'downtown' locations. In fact, little of the City, and practically none of TEST's three study areas, is dominantly residential. What the City does have in common is a multitude of people trying to move around on foot, work in a quiet office where they can concentrate, or relax in a small 'pocket park'.

**Efficiency**

Good physical environment is not, however, the only requirement for a sound economy. In formulating the proposals, efficiency has also been considered as a vital element. The City Draft Plan fails to define this term when stating its movement aims. Given constraints within the City, and the demands of its economy, space and time are particularly scarce resources. If these two variables could be encapsulated in one measure, efficiency would be defined as a function of space consumed and journey time per person used in travelling a given distance. Public transport is often quoted by its operators as an efficient space user, whereas motorists and their supporting organisations point to the time savings achieved by private cars (presumably out of peak and congested areas). The measure proposed integrates the collective goal of efficient space utilisation, with the individual goal of a speedy arrival at one's destination.

To demonstrate this graphically, let us first consider the two separate components. For the sake of simplicity, only surface land modes are shown, although the high occupancy modes of tube and train would perform
similarly to the bus in space terms, and better in time terms, particularly over longer distances. This has affinities with the work of Bouladon (1970) and later analyses by BR's InterCity Director, C. Bleasdale (1983). Bouladon was mainly concerned with gaps in transport technology, but showed the appropriateness of different modes to travel over given distances. Bleasdale suggested that the threshold between car and train, for inter city purposes, lay at around 200 km. What he did not say was that if roads were congested, that distance could reduce substantially. Much the same argument can be applied to urban situations.

4-11
Figure 4-1 A shows space consumed/person by mode and distance, while graph B shows journey time by mode and distance.

Figure 4-1 : Graph A - Space consumed/person

Graph A simply shows the amount of space per passenger consumed by each mode. The car takes up most space because it has a low occupancy, particularly for journeys to, and in course of, work. The bus makes up for its additional spatial needs by its high occupancy, though of course this varies according to time of day.

In plotting journey time, for graph B, access to a vehicle at start and end of a journey is included. Bicycle includes chaining and unchaining. Car includes the walk to parking space at each end of the journey, start of engine, etc. Bus includes walk to the stop, waiting time, and walk at the other end. The slope of the curve is related to the speed of the mode. Central London traffic conditions are assumed, with constant speeds over the journey length and no bus or cycle priority. Graphs A and B can be combined to produce graph C:

Figure 4-1 : Graph C - Space-time/person against distance for four modes
The relationships are depicted in a simplified form. Many variables are involved and these require calibration under different sets of conditions. For example, while the graphs have assumed constant speed over the journey, it will change according to traffic conditions. Space consumed will also vary at different speeds, as stopping space requirements, and therefore effective space consumed, are related to speed. Claxton (1972) elaborates on these concepts. Priority measures, such as bus or cycle lanes, would also enhance the relative attractiveness of these modes. However, despite this rudimentary presentation of a concept to be developed later, certain basic characteristics of the modes are apparent.

Policies Toward the City's Transport Modes

Acknowledge the concept of environmental capacity requires a limit to be placed on levels of certain types of traffic within the City, a limit which at present is exceeded. Within the City itself, essential traffic has been allocated to the least environmentally sensitive streets, and at the least sensitive times in relation to pedestrian flow. Putting in pedestrianisation first will cause removal of inessential traffic. 60% of its traffic is going through, some essential, some not. This through traffic therefore needs to be removed, but within a set of policies for London as a whole that ensure surrounding Boroughs do not act as environmental sinks for the displaced traffic. In fact, it is timely to recall that the study reported here is a contribution toward a Central Area free of inessential traffic.

Acknowledging the space/time efficiency concept leads to a strategy which gives priority to the optimum mode which, as illustrated by Figure 4-1C, changes with distance. Trips within the City fall within the short- to medium-range, suggesting that walking, cycling, bus and occasionally tube are the most appropriate modes. In fact, this emphasis on public transport is reinforced by a clearly expressed draft report (GLC 1985h) which projects policies toward the next ten years. If further support for public transport is needed, consider that the freeing up of land through the use of space-intensive modes (in an area of extremely high land values) permits far more profitable uses than temporary storage of cars. We can now turn to policies for individual modes.

WALKING

Already accepted as a suitable mode by the City's Draft Local Plan. Figures in Chapter 3 show very large flows from stations, as do modal splits for onward modes from stations. Goddard's 1973 study shows 75% of intra-City business trips are made on foot. This report's policies toward walking should be apparent by this stage: walking should be safe, expeditious and pleasant throughout the City.

CYCLING

Not taken advantage of - for safety reasons, lack of cycle ways, lack of bikes? Encouraged by TEST in most of the City's street network, sharing space with pedestrians where the street is wide enough, but with their space defined. When mixing with vehicular traffic some form of segregation is desirable; as are bike parks.

BUSES

Not taken advantage of because individual goal of speed overrides collective goal of efficient space utilisation. Need to be considered in terms of route, type of service, location of stops, fares policies and the vitally important concept of comfort. Whether long-haul routes as now or a combination of shorter routes and feeder services is appropriate outside the City is not an issue which can be solved here (see CILT 1985 for extensive discussion). Long distance commuter buses are inappropriate when rail could...
do the job better given some investment. It is worth recalling that the mean length travelled by bus in London was 3.43 km in 1963, and was scarcely changed at 3.61 km twenty years later. Within the City some continuous bus lanes, running up to stop lines, would be needed. Bus stops need relocating where people need them. At Stage 3 of our proposals trunk buses would stop at the boundary of the City giving way to a network of special city-centre buses — a policy followed in downtown Denver, Colorado. Should be no deterioration of services. Expansions in their systems should take place, as suggested in GLC (1985h). Fare subsidy policy should be examined carefully: inner city residents and long-distance commuters from the Home Counties can both benefit the total community through consistent use of rail transport to and within the more congested areas. This will also enable more roads to be devoted to pedestrians, cyclists, play...

**Taxis**

Taxis seem to flourish at times of low fares, probably because of greater disposable income. To make them cost-effective and equitable requires much higher load factors than now, which may require sharing to become the norm. Perform a useful service as long as buses are insufficiently fine meshed and of inadequate frequency and safety late evening and during the night. They have an advantage over private cars in that they are used more intensively and therefore have the potential to reduce the total vehicle stock. There is no explicit taxi policy in the City: this study suggests that they share bus routes, and travel along other routes with the freedom or restriction that applies to other road users. This policy should be reviewed periodically.

**Private Cars**

Reduce commuting journeys, provide more ease of movement for essential vehicles. Limit through traffic. Reduce on and off street parking. Observe findings of study which confirms that new roads = newly generated traffic (Purnell 1985). Legislation should transfer company car subsidy to public transport, and employers should receive tax relief on Travelcard and season ticket provision to employees.

**New Categories of City Roads**

4-15
Partly incorporating the City's designations of road types, the following categories were devised primarily for Phase 2 of the implementation programme, though some would be introduced during Phase 1.

**Through Traffic**

**Throughway**
Provides for longer distance journeys, with provision for public transport, and for entry onto the local access (qv) network.

**Access Traffic**

**Local Access**
Allows movement at all times of essential access traffic between 'cells'. Accommodates buses, other traffic managed so the local access route cannot become a throughway.

**Go Slow**
Similar to the Dutch 'woonerf' or German 'Verkehrsberuhigung' (literally 'traffic calming'). Allows access at all times, and for all types of traffic, whose speed is restricted to walking pace, or 6 km/h. Landscaped, carriageway made winding, some on-street...
parking, substantial allocation of space to walkers. There are a large number of woonerven in operation, while in Stuttgart alone there are reputed to be over 200 streets which are in the Verkehrsberühigung category. Central London has 1 in Covent Garden; there may be others in Greater London.

**BUS MALL**

Space shared by buses, pedestrians and cyclists only at peak times. Out of peak, essential access traffic also permitted in some bus malls, managed as 'local access'. At the Bank road intersection buses, taxis and pedestrians/cyclists would alternate, each having one minute on, one minute off.

**PEDWAY**

Exclusively pedestrian, at all times. Includes the City's network of alleyways (Plates I-1 and II-3) and also those overhead walkways that have been built. During peaks, space given over entirely to pedestrians and, where wide enough, cyclists. Between peaks, essential access traffic also permitted.

All types would accommodate emergency traffic and the disabled. Peaks are initially considered to be 08.00-10.00, 11.45-14.15, and 16.30-18.30, Monday to Friday. There may be special need for restriction at other times at certain locations. A taxi network needs to be devised, and then reviewed after some months of operation.

4-16

Implicit in the proposed redistribution of movement space is that parking facilities would be reduced. Apart from the fact that there would physically be less space on the streets for inessential vehicles, they would also need to be discouraged by reductions in on and off street parking. (It would be wrong, in our view, to lengthen the peaks, as was done in Singapore when cars started coming into the City before the Area Licence Scheme started each morning. An important aspect of the proposal for the City of London is that essential users can get access before 08.00 and after 10.00 to the time-restrained streets).

4-17

The simplest way to make efficient use of remaining parking space is for employers to give permits to those staff who are considered to be essential car users, up to a maximum to be decided by the local authority, of x parking spaces per 1000 m² of floorspace ('x' would be much less than 1, as the standard for Central London, quoted in GLC (1985g) is 1 space to 1115 m²). The allocation could include a space for the chance visitor, who also was an essential user. If this voluntary system was abused then, as frequently happened with innovative health measures in the nineteenth century, legislation would have to be introduced.

4-18

The entire concept, City-wide, would need extensive media treatment so that it was made clear to all City workers, residents and visitors, the opportunities and constraints that faced them under the new system. For those with essential access needs, until they became used to the system, information technology should be sufficiently advanced to deal with queries. For example, it should be possible to interrogate a central computer via an in-vehicle VDU, modem and telephone, for the best route from A to B taking into account both congestion and traffic management schemes. A new system of signing would need to be designed, using the best graphic techniques available to present an instantly assimilable message of what can be done (not what cannot be done, as with current British road signs) in relation to each particular street at a particular time.
Characteristics of each of the streets within the three study areas were noted in Table 2-6. These were used to arrive at the new designations above. Table 4-2 shows the guidelines used for this assessment: some subjective judgments had to be made where conflict over possible uses occurred. For example, a street might have high environmental quality and pedestrian flows, yet its physical capacity and absence of a suitable alternative suggested its use as a local access road.

Table 4-2: Guidelines for street type classification

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Throughway</th>
<th>Local Access</th>
<th>Go Slow</th>
<th>Bus Mall</th>
<th>Pedway</th>
<th>Peak Pedway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical capacity to accept general traffic</td>
<td>H</td>
<td>H</td>
<td>H</td>
<td>H-M</td>
<td>H-L</td>
<td>H-L</td>
</tr>
<tr>
<td>Physical capacity to accept buses</td>
<td>H</td>
<td>H-M</td>
<td>H-L</td>
<td>H</td>
<td>H-L</td>
<td>H-L</td>
</tr>
<tr>
<td>Bus servicing requirements</td>
<td>H-L</td>
<td>H-M</td>
<td>M-L</td>
<td>H</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Servicing requirements at off-peak times</td>
<td>H-L</td>
<td>H-L</td>
<td>H</td>
<td>M-L</td>
<td>L</td>
<td>H-M</td>
</tr>
<tr>
<td>Quality of built environment</td>
<td>L</td>
<td>M-L</td>
<td>H-M</td>
<td>H-M</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>Peak time pedestrian flows (current/potential)</td>
<td>L</td>
<td>M-L</td>
<td>H-M</td>
<td>H-M</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>Off-peak pedestrian flows (current/potential)</td>
<td>L</td>
<td>M-L</td>
<td>H-M</td>
<td>H-M</td>
<td>H</td>
<td>H-M</td>
</tr>
<tr>
<td>Possibility of link into pedestrian network</td>
<td>L</td>
<td>L</td>
<td>H-M</td>
<td>H-M</td>
<td>H</td>
<td>H</td>
</tr>
</tbody>
</table>

H= high  M= medium  L= low

The Proposed Scheme: Phases 1 and 2

Phase 1 (see Figure 4-3) must have immediate benefits for the financiers and other employers, and their employees, but not appear too radical in the changes it imposes on the street system. The most important achievement of Phase 1 must be to improve conditions for pedestrians, throughout the City, and generally at ground level. This will mean controlled crossings everywhere where there are substantial pedestrian flows, widened footways wherever this can be achieved, and as much pedway (or peak pedway) development as finances permit. These actions will necessitate a reduction in vehicular traffic, because delays will occur with at-grade crossings. Movement space for vehicles - resulting from the establishment of pedways and widened footways - will be reduced. Gradually, such measures will take effect, and ease the way into the fuller application of the principles of a dramatically improved street environment that Phase 2 represents. Phase 1 could fairly simply be achieved before progressing, as soon as practicable, to Phase 2. Phase 1 retains the City Plan’s four through routes. There is also a network of access routes which effectively create ‘cells’ in which vehicular movement is curtailed. Within those cells, some pedestrianisation would take place, foreshadowing the pedestrian networks of Phase 2.

Phase 2

Several maps are necessary to explain Phase 2. The first ones cover the entire City under peak and off-peak conditions (Figures 4-4 and 4-5). They show a coarse network which includes throughways, local access routes, bus malls, and a few examples of long-distance peak pedways. Detailed categorisation of every road in the City was just not possible within the study constraints; this level can only be shown for the three study areas.
Routing of buses is clearly of great importance, so a specific City scale map (Figure 4-6) is provided to show this. Buses are the only mode not subject to time restraints, so only one all-time map is needed. Bus routing followed extensive discussions with LRT HQ who in their turn consulted District and Area staff of London Buses Ltd. It is hoped that the resulting diagram satisfactorily accommodates the demands of bus users. These demands, in terms of routing, relate to distance from journey origin (normally not greater than 500m), and location of bus stops. Further requirements would be concerned with frequency, speed, interchangeability with other bus routes and other public transport nodes, safety, cleanliness, out-of-hours travel, and so forth. Most of these considerations appear to be outside the brief, but the TEST proposals include bus stops at road intersections and conveniently spaced in between these. Bus lanes would be incorporated wherever they improved speed and reliability of the service, and they would continue to stop lines. There would also be bus-actuated traffic signals in most locations, transponder-operated.

Each of the three study areas has two maps. One shows the pedestrian network and the other vehicular access, both in and out of peaks. These are Figures 4-7 to 4-12. The three pedestrian maps are discussed first, followed by a briefer discussion of the three maps showing vehicular access. Reference back to Figures 3-14 to 3-17 will show the intensity of pedestrian flows to each of the study areas.

Pedestrian Movement

Figure 4-7 shows the proposals for gaining access on foot, at Phase 2, to places east of the Bank and within the main insurance area, and for crossing these areas to other destinations. Unhatched streets are either local access or privately owned; the public streets would retain normal footways and would have special crossing facilities, while the private streets and courts permit pedestrians under certain conditions. There are several major pedestrian routes: Fenchurch Street-Lombard Street (recognising high flows from Fenchurch Street BR toward the Bank); Cannon Street BR northward toward Bank via St Swithin's Lane and Walbrook; Nicholas Lane-Birchin Lane-Finch Lane (Old Broad Street-Liverpool Street); London Bridge-Monument-Philpot Lane-Lime Street (St Mary Axe-northwards); and the route from Liverpool Street via Old Broad Street to Throgmorton Street-Stock Exchange-Bank. Fenchurch Street is a 'Go Slow' street, as is Mincing Lane. Cornhill and King William Street are 'Bus Malls' though special conditions obtain at the Bank junction. Fenchurch Street as now and as it could look is shown on Figures 4-13A and 4-13B. Two London Planes and two flowering Almonds are shown, with ivy encouraged to grow across the face of a building and many shrubs at street level.

At Bank, buses and (experimentally) taxis, share four spokes of the junction with pedestrians; spokes without buses are exclusively for pedestrians. At this location only, and within about 50m from the centre of the junction, no other normal traffic is allowed at any time. Traffic signals on each road all change simultaneously giving one minute for buses and then one minute for pedestrians and so on. Pedestrians can move anywhere across the junction when the signals are in their favour. At each signal there would be a device showing time elapsed within the minute so that a lengthy diagonal crossing, for example, could not safely be attempted with only 15 seconds to go. This solution, arrived at after much deliberation, would:

* minimise use of the very unpleasant and narrow subways by pedestrians
* cater for the very large numbers still crossing at the surface, for
Figure 4-7: Pedestrian network, Bank and Insurance areas

Figure 4-8: Vehicular access, Bank and Insurance areas
Figure 4-11: Pedestrian network, Liverpool St area

Figure 4-12: Vehicular access, Liverpool St area
example from Pope's Head Alley to the Royal Exchange, and across Lombard Street - and permit direct diagonal crossings for those whose destination can now only be achieved by crossing several streets
* satisfy LRT and bus operation, and relieve Bank Station of some of its pedestrian congestion
* not require any building works which could visually intrude on the streetscape of this famous location.

A 'before' photograph and 'after' sketch are shown on Figures 4-14A and 4-14B. The trees include two Swedish Birch in the foreground and a London Plane; a certain degree of formality seemed appropriate.

4-26
Figure 4-9 shows the Fur Trade area. Of the three study areas this is the only one with a portion of riverside walkway. This will connect, past the new City of London school, up the hill to Queen Victoria Street and should then form a major link between the river and St Paul's. Other peds have been shown on the Figure connecting Upper Thames Street with the river: both connect with footbridges which cross that Street and link with Queen Victoria Street. The one from Queenhithe links with Cheapside by alternative routes - via Bread Street on the west, and via Giltspur Hill and Bow Lane on the east. Cheapside ('High Street of the City') is one of the key pedestrianised streets (a peak pedway) in the TES proposal: Figure 4-15A shows it as it is in 1985, while Figure 4-15B shows it as it might look post pedestrianisation. It is a broad street with potential for elegance. The proposals here and elsewhere might even encourage City workers to stay a while into the evening, having a drink and chat in pleasant surroundings, then catching an uncrowded train home.

4-27
Figure 4-11 shows the Liverpool Street area. This study endorses the plans for walking in the redevelopment plan of this and Broad Street BR stations, but stresses the need for pedestrians to continue on the concourse level toward the underground station and onwards to escalators linking with the peak pedway of Old Broad Street, and on to the Bank. Special facilities for pedestrians in this area tend to concentrate east of Bishopsgate (which requires greatly improved facilities for safe crossing from Liverpool Street station). Houndsditch is shown part 'go slow', part peak pedway; it connects, via St Mary Axe, to the major north south route continuing via Lime Street. Industrial buildings, a post office depot and police garage limit some of the measures for pedestrians in this area, though one achievement is all time pedestrianisation of the attractive and historic Devonshire Row and Square and 'go slow' status for the Square's continuation east toward (and including the eastward part of) Cutler Street.

Access Traffic

4-28
The three maps showing facilities for access traffic, during the time that Phase 2 is in operation, are Figures 4-8, 4-10 and 4-12. They all show that the areas they serve can be reached by essential vehicles quite closely out of peak, and on a broader mesh within peaks. All of these access routes except the 'throughways' of Upper & Lower Thames Street and Farrington Street-Blackfriars Bridge, are subject either to traffic management (which means they cannot be used for through traffic) or to 'go slow' regulations, which means vehicles cannot move at greater than walking speed, or about 6 km/h. Those streets where access vehicles, apart from buses and taxis, are not allowed (for example in the immediate vicinity of the Bank intersection) would have to be serviced by trolley.
Management

4-29
The four parts of Figure 4-16, and Figure 4-17 which combines them, show an example of traffic management, which would be necessary during Phase 2 to prevent through traffic, on access streets within the main insurance area. The area selected is bounded by Leadenhall Street, Mark Lane, Eastcheap and Gracechurch Street, and a few surrounding roads are included to explain entries and exits to and from this area. As with most legislation, there may well be one or two loopholes in what is presented; the system would need to be monitored and changes made to 'debug' it as far as possible. But then, review is an essential principle of the whole movement space reallocation scheme shown in this report. Four maps show entry from north, south, north-east and south-east; exit in all cases is by the same route as the one used for entry.

Interchange Proposals

4-30
BR proposals for redevelopment of Liverpool Street Station will greatly improve interchange facilities. The London Underground station will be improved to bring the decoration up to the same standard, and it will connect directly with the BR concourse as noted above. BR proposes pedestrianisation of the eastern part of Liverpool Street connecting with a new bus station to the west. If Bishopsgate were to become a local access route, as proposed here, crossing from the Station to the east would be much less of a problem than now. If it stays as a through route, the pedestrian phase at the pelican crossing needs to be much longer.

Bank Station at the heart of the City, has over 15 000 arrivals in the morning peak. As well as serving those travelling to work, it is a tourist focus which is perhaps not fully exploited. Present facilities for passenger movement below ground are distinctly unpleasant and incoherent. However, new ticketing machines and ticket offices are shortly to be installed, passages and platforms retiled, and the four lifts replaced with electronically operated ones (though not mainly by escalators which are sorely needed, though presumably difficult to install). The TEST proposals at ground level would greatly ease bus interchange with tube and other buses.

4-32
Other rehabilitation is proposed for Mansion House station, and Cannon Street needs a major controlled pedestrian crossing both to reach buses on the northern side, and to link with St Swithin's Lane.

Assignment

4-33
Assignment was undertaken to determine the traffic consequences, on areas peripheral to the City, of reallocating movement space within the City on the precepts established for Phase 2. It was not the aim to model exact flows on specific links, nor to provide a full representation of changes to the entire surrounding system. Rather, the model was used indicatively to show the practicality of the suggested changes in the City. Resource constraints led to the use of a relatively simple shortest route, all or nothing, assignment mechanism, and its output should be interpreted bearing in mind the inherent weaknesses of this technique.

4-34
Further detail on the assignment model may be found in Appendix A, but two points need emphasising. First, only flows along those links included in the network (see Figure A-4) could be modelled; second, all traffic between zone centroids is assigned to the shortest route whereas in
reality as one route's congestion increased, some traffic would divert to an alternative, if slightly longer, less congested route. For both these reasons the changes on peripheral routes, as outlined below, are likely to be overestimates. This must be borne in mind when considering Figures 4-18A to 4-18D. A further point is that the four Figures show existing traffic only on routes where counts were available: single lines between nodes do not show no traffic.

4-35

Impact of the suggested changes to the City network on the surrounding areas is presented as four scenarios, in which different assumptions are made about levels of traffic restraint:

**Table 4-19 : The Four Scenarios**

<table>
<thead>
<tr>
<th>Area</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td>0</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Central Area less City</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>Inner London</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Outer London</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

In all cases, the percent changes illustrated in Figure 4-18 relate to existing traffic levels.

**SCENARIO 1 : No Restraint**

4-36

A scenario assuming no restraint at all on City-bound traffic, accompanied with the changes to the City's streets advocated in this report, is highly unrealistic, but it serves as a useful base. A basic pattern emerges which is common to all scenarios: flows increase peripherally on certain routes, while they reduce on others. These are the extensions of the City's through routes that TEST discontinued - an example with a 35% reduction is London Bridge, which was the continuation of Bishopsgate-Gracechurch Street. See Figure 4-18A.

4-37

The two outer eastern approach corridors receive respective increases of 44% and 23%; however, in absolute terms, the 52% reduction to the middle corridor is greater than the combined increase on the outer two. Ultimately a new equilibrium would be achieved, with some traffic from the outer corridors taking up the surplus capacity on the middle one. However, this scenario has at least three major problems: the river crossings, particularly Tower Bridge; the Inner Ring Road east of the City; and the E-W route to the north.

**SCENARIO 2 : Restraint of 50% City, No Restraint Elsewhere**

4-38

The 50% restraint in car trips to the City is common to scenarios 2, 3 and 4 and it is a very conservative derivation from the 76.8% of car commuters who do not use them again until returning home in the evening. Figure 4-18B shows some affinities with the first scenario's diagram, though the severities are reduced. The problem areas remain, indicating that some form of system-wide restraint is needed in parallel with the City proposals. The GLC (1985d) have recently suggested a restraint package which could meet this need: it suggests reductions of 40% in Central Area traffic levels, 20% in Inner and 10% in Outer London. The package needed to achieve these reductions contains some or all of: reduction of parking space and enforcement of existing regulations; company car legislation; improved and cheaper public transport, perhaps aided by a transfer of the...
company car 'subsidy' to public transport; employer subsidy of Travelcard
and season tickets; and increasing fuel costs. Restriction beyond the
City, at the GLC's levels, and at half of them, is the key to scenarios 4
and 3.

SCENARIO 3: Restraint of 50% City, 20% rest of Central Area, 10% Inner
and 5% Outer London

4-39
Figure 4-18C summarises the effects of this scenario. The three eastern
corridors combined would tend to experience a 16% reduction. Of the three
main problem areas previously identified, that of the river crossings
largely disappears, with only Tower Bridge experiencing any significant
percentage increase, though it is small in absolute terms and could be
accommodated on the other bridges, which have experienced a decrease. The
Inner Ring Road east of the City could experience an additional 26% in the
peak hour (1000 vehicles) and the east-west route north of the City an additional 30% (1000 vehicles) in the peak hour. While significant, both would reduce through a spread of the traffic onto
intermediate routes not recognised by the model, though those within
environmental cells (a concept well represented in many of the Boroughs
surrounding the City) would automatically be excluded.

SCENARIO 4: Restraint of 50% City, 40% rest of Central Area, 20% Inner
and 10% Outer London

4-40
Figure 4-18D shows a pattern of impact similar to that of scenario 3, but
to the least extent of all the scenarios. A modest increase on Tower
Bridge would, as with Scenario 3, easily be accommodated on other river
crossings, which by this time experience substantial reductions over their
base traffic loads. Increases on the Inner Ring Road and the east-west
route to the north of the City, can be accommodated on adjacent parallel
roads, producing an equilibrium traffic level resulting from each
motorist's re-evaluation of the trade-off between minimizing journey
length and minimizing journey time.

Conclusions to the Assignment Exercise

4-41
A degree of restraint on routes surrounding the City is necessary to
ensure they do not experience worse conditions than those of today.
Restraint specific to the City - and allowing for the limitations of the
assignment model - is not in itself sufficient to ensure that external
traffic conditions do not deteriorate. If the maximum restraint as
envisioned in scenario 4 were to be implemented, the great majority of
areas peripheral to the City would not experience traffic levels worse
than they are today. If restraint at half the level proposed (as in
scenario 3) became reality, only minor increases would be experienced on
a few routes: the reality of a multiple choice, rather than a shortest
distance, assignment process would probably make these changes
unnoticeable. Results from the assignment show that reductions in traffic
levels go a long way toward demonstrating the great environmental
improvement that could be achieved.

Benefits and Costs

4-42
Total costs of achieving Phase 2 were established by quantifying the
extent of the proposals in the three study areas. It was calculated that
these formed approximately 30% of the total City area having potential for
the type of improvements suggested. Liverpool Street Station, in one of
the study areas, the Barbican, the Temple, and the Smithfield Area (the
Figure 4-19A: Scenario 1

Figure 4-19B: Scenario 2
Figure 4-19C: Scenario 3

Figure 4-19 D: Scenario 4
latter being outside the scope of the City's Draft Local Plan) were excluded for this reason. The major cost would be the 'wall to wall' paving of the Pedways and Go Slows.

4-43
Several recent London examples of pedestrianised streets were used to arrive at a unit cost: Tower Hill and Peckham Rye Lane, £100/m² and Stratford High Street at half that cost. Costs included planters, seating and lighting, as well as heavy duty paving, which allows for delivery vehicle access along the central section. The higher figure was used though Stratford's does not imply lower standards, simply different street conditions. The total length of both types of Pedway totals about 5.5 km. For the whole City this would mean:

\[ 5.5 \text{ km} \times 3.3 = 18.15 \text{ km or } 18 \text{ 150 m} \]

Assuming average width of street to be 8 m, the area would be 145 200 m², which represents a cost of £14 520 000.

4-44
The cost of Go Slows was based on a unit cost of £15/m² for footway widening, derived from the GLC. The proposals contain about 2.5 km of Go Slows which, for the whole City, represent 41 250 m², costing £618 750, with £200 000 for street furniture. Thus, total cost of these proposals City-wide would be £14 520 000 plus £618 750 plus £200 000 = £15 338 750.

4-45
The discussion above has used the word 'cost' extensively. In fact, what is proposed is a benefit to the City. It would lead to the better physical and mental health of residents and daily workers; it would encourage tourists to wander widely within the City and not just to the honeypots of St Pauls and the Tower; shopping, restaurant, cafe and pub turnovers would rise (on the basis of a substantial quantity of evidence from other places - see Roberts 1981); and, in our view, it is very likely that demand for office space would increase while employer and employee satisfaction with their surroundings would also rise.

4-46
In contrast, Figure 4-20 summarises the City's proposals, for which we have no costs. It is probable that the City would seek to achieve the pedestrian bridges as 'planning gain' though we question whether this would be gain, and for what it would be exchanged. The actual cost of bridges is about £1200/sq m. Apart from the two East-West and two North-South through routes and the three bridges being designated Secondary Roads, there are several other streets in this category - Aldersgate, Moorgate north of Route 11, part of Fleet Stret, New Fetter Lane and Shoe Lane are among them. About 14 km of secondary road need upkeep. Furthermore, there are suggestions about a new river crossing.

4-47
Figure 4-20 also shows the 27 new walkway footbridges, none of which TEST endorses, as a general principle, for people should walk at street level. However, some are in areas which were not studied in detail and might have a special justification. Within the three study areas, all can be rejected for the following reasons. Cannon Street: rail passengers have already descended from concourse level, and there is little space to bring the steps from a bridge down on the northern side of the road: needs to be a very broad controlled crossing across Cannon Street. Liverpool Street: movements should be below, or at, street level. Camomile Street - not a through route in the TEST scheme. The two over Queen Victoria Street: people have already climbed a considerable height to reach the bridges over Upper Thames Street. Traffic on Queen Victoria Street should give way to pedestrians at controlled crossings of the same width as the approach routes.
The other major cost of the City's Plan would be for proposed road widenings: approximately 1.3 km in front of building lines, and approximately 0.7 km behind existing building lines. The City also propose to pedestrianise Bow Lane and St Swithin's Lane, (not contained in the Plan) presumably with wall-to-wall paving, vegetation, seats, and special lighting.

**Implementation**

The most important concept to grasp in terms of implementation is the passage of time. The pedestrianisation of Sutton High Street, in south London, was first mooted in 1930; a new gyratory system was built to surround the High Street's immediate area and one would imagine there was nothing to prevent completion of pedestrianisation. The gyratory was completed about 1978; in 1985 only about half of the High Street has been pedestrianised. This report is talking about substantial measures to improve the City's environment on a scale that makes Sutton High Street appear insignificant: there is an urgency about completing the City programme, but this has to be coupled with realism. If the political climate becomes right, then much could happen. If not, a thorough renascence of the City's environment will take a long time, if no external influences operate. However, let us turn to Phase 1. There are no great problems in implementing this (see Figure 4-3) and it could be achieved within a year or two. As it is not particularly dramatic in its demands on the cityscape or its inhabitants, it has not been dwelt upon.

While Phase 1 was being implemented, not only would a construction and information programme be drawn up for Phase 2, but important changes would be taking place throughout Greater London, and in other parts of Central London. The concept of restraint of inessential traffic, certainly during the most congested times of day, would be taking root, as it has to do if London is to keep moving; there would be a parallel move to a public transport which was not only efficient, but had an attractive fares structure which effected transfers from private vehicles, in much the way that happened during Fares Fair and its repeat two years later. Usually when saying 'if London is to keep moving' a caveat is introduced along the lines of 'unless London's built environment is to be destroyed by road building.' This caveat appears unnecessary, for road building on that scale would achieve virtually nothing (see Purnell 1985).

So, the groundwork for Phase 2 would be going on. When a restraint package (including those policies advocated by the GLC in its 1986-87 TPP draft consultation paper, discussed in Chapter 1 above) had been established, Phase 2 could be implemented. If it were the first in Central London, it would also be the first of such magnitude in the world, a considerable achievement for the City. It is not impossible to believe that, coupled with similar achievements in other core areas in Central London, entrepreneurs, and the highly skilled staff they need, would soon be demanding space in Central London — particularly the City. They would counter trends of outward movement to inner and outer areas, and even beyond the confines of London.

Phase 3 is the ideal, unattainable for some years without a (rather unlikely) radical City Corporation. But, after the dust of Phase 2 had settled down, its benefits — and its undeniable yet unavoidable complexity, if all interests are to be served — for the City would be realised and there would be clamours for the more incisive approach of Phase 3. No detailed proposals have been made for it here.
Level of Service Methodology

A-01
Fruin (1971), writing about design standards for pedestrians, put forward a 'Level of Service' concept, determined by the area of footway per pedestrian. Following this, for the City study, two inputs were required: information on the number of pedestrians in each street (excluding alleyways that were clearly pedestrian ways) in the three study areas; second, the area of footway in each street.

A-02
Counts were in the main only made during the morning peak, 08.00 to 09.30. Where pedestrian activity was greatest at lunch time, some additional counts were made then (eg Leadenhall Market from 12.00 to 14.00). Perhaps the ideal way of counting the number of pedestrians in a street (or a section of it) at a given time would be to mount a camera high on a building directly overhead; however, finding suitable buildings and then getting permission to use each one were beyond the scope of this project. Instead, the Moving Observer Technique (MOT) was used. The observer traverses the street in one direction counting all the people s/he passes, in whichever direction they are moving, and deducting any who overtake him or her. The process is then repeated in the opposite direction, moving at the same speed, and counting as before. The mean of the two traverses gives an estimate of the average number of people in the street during the time of the two traverses. The mean is necessary to take account of the continuous entry and exit of pedestrians into a street, and also assumes that the rate of entry and exit remains constant during the time of the counts (for more detail on MOT see Mellor 1976).

A-03
Unless all streets are measured simultaneously (requiring a small army of observers - 32 would have been needed for the Bank/insurance area alone), observations are distorted by the fact that pedestrian densities within the peak are not homogeneous, but vary significantly with time. A method was therefore devised to standardise the counts based on observed variations in pedestrian flows at a number of sites throughout the peak. Four streets were randomly selected in each area (giving a 12.5% sample) and 15 five-minute stand counts were undertaken 08.00-09.30. The busiest 5-minute interval was also identified in this way. This enabled the specification of ratios relating a chosen reference level (90% of flows observed in the peak 5-minute period) to all other time periods.

A-04
The model of intra-peak variation in pedestrian flows assumes that this variance remains constant for all morning peaks throughout the week, and was built by collating the ratios relating the reference level to the remaining time periods for each individually sampled street. The result was an average pattern of variation applicable to all the sampled street, and therefore to all streets in the three study areas. The results are outlined in Table A-1.

A-05
To increase the reliability of the model predictions, two counts were made in each street at different five-minute periods. The model is so structured that more weight is attached to the predictive flow derived from the time period with the lower variance associated with its ratio to the peak five-minute period.
Table A-1 : Ratio of Reference Level to Pedestrian Flow

<table>
<thead>
<tr>
<th>5-minute interval</th>
<th>Ratio of reference level to flow</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>08.00-08.05</td>
<td>3.227</td>
<td>0.91</td>
</tr>
<tr>
<td>08.06-08.11</td>
<td>2.977</td>
<td>1.51</td>
</tr>
<tr>
<td>08.12-08.17</td>
<td>2.539</td>
<td>0.86</td>
</tr>
<tr>
<td>08.18-08.23</td>
<td>2.467</td>
<td>1.60</td>
</tr>
<tr>
<td>08.24-08.29</td>
<td>2.161</td>
<td>1.58</td>
</tr>
<tr>
<td>08.30-08.35</td>
<td>1.717</td>
<td>0.71</td>
</tr>
<tr>
<td>08.36-08.41</td>
<td>1.387</td>
<td>0.67</td>
</tr>
<tr>
<td>08.42-08.47</td>
<td>1.266</td>
<td>0.37</td>
</tr>
<tr>
<td>08.48-08.53</td>
<td>1.065</td>
<td>0.19</td>
</tr>
<tr>
<td>08.54-08.59</td>
<td>1.802</td>
<td>1.65</td>
</tr>
<tr>
<td>09.00-09.05</td>
<td>1.695</td>
<td>1.67</td>
</tr>
<tr>
<td>09.06-09.11</td>
<td>1.341</td>
<td>0.55</td>
</tr>
<tr>
<td>09.12-09.17</td>
<td>1.582</td>
<td>0.45</td>
</tr>
<tr>
<td>09.18-09.23</td>
<td>2.250</td>
<td>1.65</td>
</tr>
<tr>
<td>09.24-09.29</td>
<td>2.253</td>
<td>1.56</td>
</tr>
</tbody>
</table>

A-06
For the area of footway, first of all the streets in the study areas were divided into homogenous lengths, where different parts of the streets displayed obviously different pedestrian densities. Second, footway width was defined as 'effective footway width' and therefore excluded that proportion of footway which is not used by pedestrians - ie parts close to buildings, fences, railings, other impediments. Most work seeking to define this area of dead width has been done on shopping streets where studies such as DoE (1966) and O’Flaherty & Parkinson (1972) have suggested that 2-3 feet should be deducted from the footway width. However, after field observation, a reduction of 0.25m appeared more appropriate to the city’s generally busier, and largely non-retail, streets. Further, even when pedestrians were consistently walking in the carriageway (St Swithins Lane, for instance) only the footway width was measured, not the whole highway (footways + carriageway). The area of footway on each street, or each homogeneous length of street, must be defined as the average effective footway width multiplied by the footway length.

Table A-2 : Pedestrian levels of service

<table>
<thead>
<tr>
<th>Level</th>
<th>m²/ped</th>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0-1.0</td>
<td>JAMMED</td>
<td>Only shuffling possible</td>
</tr>
<tr>
<td>2</td>
<td>1.0-1.5</td>
<td>CONGESTED</td>
<td>Less than normal pace, bodily contact</td>
</tr>
<tr>
<td>3</td>
<td>1.5-2.2</td>
<td>CROWDED</td>
<td>Choice of speed restricted, high probability of conflict</td>
</tr>
<tr>
<td>4</td>
<td>2.2-3.7</td>
<td>CONSTRAINED</td>
<td>Choice of speed occasionally restricted, passing possible but likely to cause interference</td>
</tr>
<tr>
<td>5</td>
<td>3.7-12.0</td>
<td>IMPEDED</td>
<td>No physical contact, but frequent interaction</td>
</tr>
<tr>
<td>6</td>
<td>12.0-50.0</td>
<td>UNIMPEDED</td>
<td>Speed unrestrained, infrequent interaction</td>
</tr>
<tr>
<td>7</td>
<td>50.0+</td>
<td>OPEN</td>
<td>Pedestrians move independently of each other</td>
</tr>
</tbody>
</table>

Source: Pushkarev and Zupan 1975

A-07
Using the above techniques, the level of service of a footway is defined as the effective footway area divided by the number of pedestrians on that
footway, expressed in m$^2$ per pedestrian. Rather than have a discrete level of service for each street, more appropriate and more readily comprehensible results would be achieved by grouping the levels coherently. Instead of merely adopting the categories put forward in Fruin's original paper, the categories which best reflected the diversity observed in the City's streets were those suggested by Pushkarev and Zupan (1975). These both incorporate and expand upon previous work to produce seven distinct levels of service (see Table A-2 on the previous page).

A-08
The model to standardise density counts was constructed in the following way. Since variation in density during the peak had the same cause at each sample site, namely people going to work, it was felt reasonable to assume that the flow profiles would be of similar shape everywhere. Although the profiles appeared similar, the magnitudes of the densities were different. A reference value $Q$, where $Q=90\%$ of the density which would have been recorded if the count were taken between 08.46-08.53 was chosen (as noted above), and for each 5-minute period the ratio between flow in that period and the reference value was found. Aggregating it over all sites and considering typically the $k$th period ($k=1, 2...$) the mean of this ratio $R_k$ is found. The variance of the values is $V_k$.

A-09
For sites other than the sample streets it was only possible to make an observation in some 5-minute periods. From each observation an estimate of the reference value for that site is made using the appropriate $R_k$. A combined estimate is obtained by taking the weighted average of the estimates using $1/V_k$ as the weight so that estimates from time periods count for more than those where the variance is high. Algebraically, if there were $n$ observations of $q_1, q_2, ... q_n$ occurring in time periods $p(1), p(2), ... p(i), ... p(n)$, an estimate of the reference value for the site is

$$Q^* = \frac{\sum_{i=1}^{n} \frac{q_i R_p(i)}{V_p(i)}}{\sum_{i=1}^{n} \frac{1}{V_p(i)}}$$

An estimate of the density in the $k$th period is then $Q^* R_k$ which enables an estimated density profile for the peak period to be obtained.

Assignment Methodology

A-10
Having chosen an assignment mechanism - shortest route, all or nothing - appropriate to the objective of merely summarizing traffic impact on adjacent areas, resulting from the reallocation of City movement space, a number of steps were taken to set up the assignment model:

a. A zoning system was required incorporating the origin and destination of all trips to or through the City. The role of the zones is to act as spatial aggregates, where the zone centroid acts as a surrogate for both origin and destination of all movements to or from any location within that zone. Because of their aggregate nature, it is essential to minimise zonal size in areas where changes occur to the highway network. Thus, a fine network of zones is required to cover the City and its immediate surroundings; however, as one moves away from the City, the level of precision required declines, enabling a coarser zoning system. The actual
zoning system used, shown in Figure A-3, and based on GLTS traffic
districts, comprises 52 zones. Fine zones cover the City, then zone size
increases until the five outer zones represent trips to or through the
City from the outer suburbs and the rest of the UK.

b. An origin and destination matrix was obtained from the 1981 GLTS
giving, by traffic district, the O&D of all peak hour vehicle trips
(except buses) which either passed through or had their final destination
in the City. Clearly, all that can be modelled from this matrix is City-
bound traffic; nothing can be said about total link flows on routes
outside the City. Where necessary, the traffic districts were then
aggregated until the final matrix represented all trips to or through the
City from each of the 52 zones.

c. A network must be specified which incorporates both streets in the
City and those in the surrounding network likely to absorb traffic
displaced from the City as a result of changes to its network. The
network used, shown in Figure A-4 (excluding centroid connectors) is made
up of 338 links and extends from Woburn Place/Kingsway in the west, to the
Blackwall Tunnel in the east; and from Euston Road through to Hackney
Road in the north to Elephant & Castle/Old Kent Road in the south. Only
the major links in the area surrounding the City are included in the
network, thus nothing will be known about the flows along the numerous
minor links not specified in the model. In the light of this, the most
realistic way to interpret the model-generated flows is to view them as
maxima, and bear in mind that increases on specific routes will, where
desirable, be spread onto their adjacent, unspecified, links.

d. The spatial separation of zones was expressed in terms of roadway
distance, justifiable given the specified objectives of the assignment
exercise. Clearly if a more sophisticated assignment technique were to be
used, then a measure based on time or generalised cost would be more
appropriate.

e. Before modelling the impact of reallocation of City movement space it
is important to ensure that the model-generated flows reasonably simulate
the actual flows. To this end, 24 hour 2-way ground counts were obtained
from the GLC's 1984 Monitoring Review and an assumption made that 10% of
these flows occurred in the peak hour. Because only a partial matrix was
used, full comparisons between the model-generated base flow and the
ground counts could only be made on streets entirely in the City. The
best fit was then identified by summing the squares of the differences
between 10% of the ground counts and the model-generated base flows.

Bank Junction Bus Survey

A-11
The mean journey time of 8 trips sampled was 8 minutes from London Bridge
to Bank, with a range of 3-22 minutes according to congestion on London
Bridge. 344 started the journey at London Bridge station; at Bank there
were 351. 20 had alighted in Princes Street, Poultry or between stops at
signals, etc. 42 had boarded. The conclusion drawn from these findings
was that the services were rather insignificant for Bank, but very
significant for the overall trip London Bridge to points beyond Bank:
this could have been achieved by a route which did not cross the Bank
junction. Next, routes 21, 43 and 133 were traversed from London Bridge
station to Finsbury Circus, via King William Street, Princes Street and
Moorgate. For the 6 trips sampled the mean journey time was 11 min 20 sec
within a range of 5-26 minutes. 17 alighted and 29 boarded, of 251
passengers, at Bank. 62 alighted and 10 boarded in Moorgate, while 94
alighted at the Station; the remaining 11 alighted at Finsbury Circus.
Finally, of the 100 route 501 passengers (in a survey of that route
through to Waterlo) at Bank, 3 alighted and 13 boarded - the bulk of the
passengers continued beyond Holborn. For the entire survey of two trips
on each of four routes the mean occupancy was 68.5%.

A-12
Routes 9, 11 and 76 travelling the SW-N direction across the Bank, ie from Mansion House Station to Moorgate via Princes Street, had much lower usage. A higher proportion of a low total alighted and boarded at Bank, but the bulk still continued to Moorgate Station. Mean occupancy was only 9.2%, and mean journey time was 5 min 20 sec. All routes were surveyed on a weekday in May between 08.30 and 09.30.

Classified Traffic Counts

A-13
Classified traffic counts were undertaken at nine locations in total, within the three study areas, and the results are portrayed in Tables A-5, 6 and 7.

Table A-5 : Classified Counts in the Bank Area, number and (percent)

<table>
<thead>
<tr>
<th></th>
<th>Cornhill 8.00-8.25</th>
<th>Eastcheap 8.30-8.55</th>
<th>Gracechurch Str. 9.00-9.25</th>
<th>Cannon Street 8.00-8.25</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cars</strong></td>
<td>256(54)</td>
<td>92(35)</td>
<td>275(50)</td>
<td>149(39)</td>
</tr>
<tr>
<td><strong>Motorcycles</strong></td>
<td>67(14)</td>
<td>27(10)</td>
<td>71(12)</td>
<td>46(12)</td>
</tr>
<tr>
<td><strong>Coaches</strong></td>
<td>5 (1)</td>
<td>5 (2)</td>
<td>1 (0.2)</td>
<td>31 (8)</td>
</tr>
<tr>
<td><strong>Taxis</strong></td>
<td>26 (5)</td>
<td>39(15)</td>
<td>61(11)</td>
<td>58(15)</td>
</tr>
<tr>
<td><strong>Buses</strong></td>
<td>20 (4)</td>
<td>5 (2)</td>
<td>37 (6)</td>
<td>10 (3)</td>
</tr>
<tr>
<td><strong>Vans</strong></td>
<td>74 (16)</td>
<td>71(27)</td>
<td>94(16)</td>
<td>66(17)</td>
</tr>
<tr>
<td><strong>Medium goods veh.</strong></td>
<td>21 (6)</td>
<td>21 (8)</td>
<td>35 (6)</td>
<td>20 (10)</td>
</tr>
<tr>
<td><strong>Heavy goods veh.</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table A-6 : Fur Trade Area

<table>
<thead>
<tr>
<th></th>
<th>Queen Street 8.00-8.25</th>
<th>Queen Victoria Street 8.30-8.55</th>
<th>Upper Thames Street 9.00-9.25</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cars</strong></td>
<td>277 (69)</td>
<td>290 (44)</td>
<td>697 (60)</td>
</tr>
<tr>
<td><strong>Motorcycles</strong></td>
<td>31 (8)</td>
<td>57 (9)</td>
<td>84 (7)</td>
</tr>
<tr>
<td><strong>Coaches</strong></td>
<td>1 (0.2)</td>
<td>35 (5)</td>
<td>38 (3)</td>
</tr>
<tr>
<td><strong>Taxis</strong></td>
<td>12 (3)</td>
<td>93(14)</td>
<td>72 (6)</td>
</tr>
<tr>
<td><strong>Buses</strong></td>
<td>-</td>
<td>23 (4)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Vans</strong></td>
<td>63 (16)</td>
<td>119 (18)</td>
<td>180 (13)</td>
</tr>
<tr>
<td><strong>MGV</strong></td>
<td>18 (4)</td>
<td>37 (6)</td>
<td>114 (10)</td>
</tr>
<tr>
<td><strong>HGV</strong></td>
<td>-</td>
<td>-</td>
<td>7 (1)</td>
</tr>
</tbody>
</table>

Table A-7 : Liverpool Street Area

<table>
<thead>
<tr>
<th></th>
<th>Bishopsgate 9.05-9.30</th>
<th>Camomile Street 8.35-9.00</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cars</strong></td>
<td>362(46)</td>
<td>393(53)</td>
</tr>
<tr>
<td><strong>Motorcycles</strong></td>
<td>71 (9)</td>
<td>82(11)</td>
</tr>
<tr>
<td><strong>Coaches</strong></td>
<td>3 (0.4)</td>
<td>3 (0.4)</td>
</tr>
<tr>
<td><strong>Taxis</strong></td>
<td>66 (8)</td>
<td>73(10)</td>
</tr>
<tr>
<td><strong>Buses</strong></td>
<td>73 (9)</td>
<td>11 (1)</td>
</tr>
<tr>
<td><strong>Vans</strong></td>
<td>154(20)</td>
<td>109(15)</td>
</tr>
<tr>
<td><strong>MGV</strong></td>
<td>50 (6)</td>
<td>64 (9)</td>
</tr>
<tr>
<td><strong>HGV</strong></td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
B-01
This Appendix discusses the very foundation of the City's economy - financial dealings - and its accommodation in offices. After a brief overview of the main financial activities and employment sectors, the spatial distribution of organisations is considered. This is followed by a description of the location and demand for new office floorspace, floorspace:worker ratios, and the impact of new office technology, in order to understand the extent to which these factors could affect demand for movement to, from, and within the City.

B-02
The City of London is the geographical centre of control and management of Britain's financial system. The core of the City's economy rests on two broad types of operation, shown below:

---

<table>
<thead>
<tr>
<th>Exchange</th>
<th>Insurance and reinsurance contracts; listed securities trading; shipping contracts; commodity trading; money broking; financial futures trading; foreign exchange dealing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borrowing/</td>
<td>Attracting savings; issuing loan advances; creation of credit.</td>
</tr>
<tr>
<td>lending</td>
<td></td>
</tr>
</tbody>
</table>
---

The activities noted above are the ways in which financial institutions seek to secure profitable accumulation. The financial activities practiced in the City are to varying degrees interconnected, and many of its organisations depend for their economic existence on the revenue generated from more than one particular financial market.

B-03
For centuries the City has been an international centre of commerce and finance. Today, it is one of the principal centres of commodity dealing, insurance and banking in the global system. Post-war growth of the City was due mainly to expansion of international banking and insurance, the single most important source of growth being development of the Eurodollar market after 1958 (Coakley & Harris 1983).

B-04
The City's securities industry is presently engaged in a major restructuring process. Deregulation of the Stock Market - the removal of fixed commission scales, lifting of some of the restrictions of entry and introduction of the 'dual capacity' system entailing merging of jobbing and broking functions - has triggered off a spate of merger and takeover activity. The process has mainly involved banks acquiring stockbroking and jobbing firms and some Discount Houses. These changes in the structure of the Stock Market could lead to a new type of financial conglomerate and break down many of the established barriers between different types of financial activity. Deregulation, in short, is expected to serve as an additional stimulus for the concentration and centralisation of finance capital - a process which rapidly developed in Britain during the postwar period.

B-05
The principal financial markets in the City are serviced by a number of agencies in the private and public sectors. In the former, the main groups are legal services and accountancy practices. In the latter, post and telecommunication services provide essential communications with other national and international centres of commerce and finance.
Employment in the City

B-06
Total employment in the City declined by 26% from 1961 to 1981, as shown in Table B-1. Non-office employment experienced the greatest decline of 64%, and showed continuous decreases 1961 to 1981. Within a period of 20 years, the office/non-office employment mix has significantly altered, the percentage of total workforce engaged in office employment increasing from 67.5% in 1961 to 77.2% in 1981.

Table B-1: Employment trends in the City of London 1961 to 1981

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-office employment</th>
<th>Office employment</th>
<th>Total employment</th>
<th>% office employment of total employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961</td>
<td>125.5</td>
<td>261.2</td>
<td>386.7</td>
<td>67.5</td>
</tr>
<tr>
<td>1966</td>
<td>93.4</td>
<td>267.3</td>
<td>360.7</td>
<td>74.1</td>
</tr>
<tr>
<td>1971</td>
<td>79.7</td>
<td>261.1</td>
<td>340.8</td>
<td>76.6</td>
</tr>
<tr>
<td>1981</td>
<td>44.7</td>
<td>220.0</td>
<td>284.7</td>
<td>77.2</td>
</tr>
<tr>
<td>% change</td>
<td>-64.3</td>
<td>-15.8</td>
<td>-26.4</td>
<td></td>
</tr>
</tbody>
</table>

Source: City of London 1982

B-07
The ten major office employment sectors in 1981 are shown in Table B-2. The sectors listed account for 83% of total office employment (City of London 1982). The four most important sectors were banking (31%), insurance (18%), other finance (9%) and post/telecommunications (7%).

Table B-2: Major office employment sectors in the City of London, 1981

<table>
<thead>
<tr>
<th>Sector</th>
<th>Employment</th>
<th>% total</th>
<th>Sector</th>
<th>Employment</th>
<th>% total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banking</td>
<td>67 394</td>
<td>30.6</td>
<td>Transport</td>
<td>7 132</td>
<td>3.3</td>
</tr>
<tr>
<td>Insurance</td>
<td>30 412</td>
<td>17.5</td>
<td>Printing</td>
<td>6 740</td>
<td>3.1</td>
</tr>
<tr>
<td>Other finance</td>
<td>18 667</td>
<td>8.5</td>
<td>National govt.</td>
<td>6 244</td>
<td>2.9</td>
</tr>
<tr>
<td>Post/telecommun.</td>
<td>14 627</td>
<td>6.7</td>
<td>Business services</td>
<td>5 346</td>
<td>2.4</td>
</tr>
<tr>
<td>Accountants</td>
<td>8 783</td>
<td>4.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal</td>
<td>7 812</td>
<td>3.6</td>
<td>Total</td>
<td>181 157</td>
<td>82.6</td>
</tr>
</tbody>
</table>

Source: City of London 1982

Location of City Financial Activities

B-08
Firms in each of the main financial sectors traditionally locate near their market centre (Jones Lang Wootton 1980). This is particularly the case for stockbrokers and jobbers, and organisations associated with shipping. The former groups are found mainly in and to the north of the Stock Exchange, while shipping companies, brokers and agents locate near the Shipping Exchange. Banks, insurance companies and commodity dealers show less concentration. Banks are widespread, centred on the Bank of England, while insurance companies, underwriters and brokers are mainly based around and to the east of Lloyds of London. Commodity dealers, brokers and agents locate near the Tower of London. Legal and accountancy firms servicing these sectors are distributed throughout the City.

B-09
There has been a long term spatial expansion of financial activities from the core of the City. In terms of banking and insurance, the extent of outward movement has been considerable. Figures B-3 and B-4 illustrate...
the locational trends up until 1979. During the 1980s, the dispersal process has continued as Figure B-5 shows. It is in the fringe areas beyond the City core and the fringe Boroughs that a major component of growth in office stock has been accommodated. In the City core area, the large banking and insurance organisations retain a major presence. This, combined with the growing number of foreign banks requiring space in the core area, has enabled the dispersal process to continue without having any significant impact on vacant property levels in the centre. It is in this sense that the drift to the fringe is considered a relative process.

B-10

It is in the fringe areas beyond the City core that a major component of growth in office stock has been accommodated. In the City core area, the large banking and insurance organisations retain a major presence. This, combined with the growing number of foreign banks requiring space in the core area, has enabled the dispersal process to continue without having any significant impact on vacant property levels in the centre. It is in this sense that the drift to the fringe is considered a relative process.

B-11

Decentralisation of offices from the City to regional and provincial centres has taken place since the early 1960s, a process common to all British conurbations (Daniels 1977). However, in recent years the scale of decentralisation appears to have decreased (Jones Lang Wootton 1983 and 1984). For relocations involving 100 or more jobs, the average annual Central London loss 1970–76 was 28 moves; For the period 1979–85, the annual rate fell to 15 (1985 is estimated from moves scheduled to be completed in that year). While the process of decentralisation is expected to continue, there is no evidence to show a significant increase in major relocations by banks and insurance companies from the City over the next five years. The process of relative dispersal to City fringe areas, as distinct from the decentralisation of office functions away from the City, is expected to remain as the dominant locational process affecting the City.

B-12

Marquand (1979) has shown that certain office functions are much more likely to be decentralised than others. These are accounting, data processing and administrative departments. As a recent report by the GLC (1983c) noted, these functions usually consist of routine internal work requiring limited external contact with other office workers, and which were '...those...most readily systematised and subjected to technological change.' Most past City relocations tended to be incomplete moves entailing the relocation of clerical and administrative functions. However, the relocation of headquarter and investment/financial dealing departments is the exception to the rule.

Location and Demand for New OfficeFloorspace

B-13

Banking, insurance and the 'exchange' sector accounted for 60% of the total office floorspace takeup in City and City-fringe boroughs during 1981–84. 4.4m sq ft (396 000 m²) of new office floorspace was occupied in the City and 2.8m sq ft (252 000 m²) in parts of the City fringe boroughs (see Jones Lang Wootton 1985). The takeup beyond the City is a very significant proportion of the whole.

B-14

1978, both the City and Central London experienced a major office development boom. Available evidence indicates that there are few signs of this abating. Office rents in the City have continued to increase in real terms (Debenham Tewson and Chinnocks 1985). Empty office space on new developments remains low (Jones Lang Wootton 1985) and estate agents report favourable letting market conditions (see eg Richard Ellis 1985).
Table B-6 shows the construction of office floorspace in the City and adjoining areas since 1981. The gross totals over the period are high and the proportion in the City-fringe boroughs is substantial. In the main financial areas of EC2, EC3 and EC4 the percentage net-gain-to-stock (i.e. the proportionate increase of additional relative to existing floorspace on development sites) is comparatively low, indicating the importance of refurbishment and redevelopment of existing floorspace. There are also relatively low net-gains-to-stock in Camden and Westminster, but they are considerably higher in other fringe areas of EC1 and E1, and in Islington, Hackney, Tower Hamlets, and Lambeth and Southwark – this indicates greater relative importance of new office construction on sites not previously used in this way.

The gain-to-stock for developments under construction at December 1984 indicates a general continuation of the trend described above. From Table B-6 the gain for the City as a whole is 1.3m sq ft (36.2%) while the figure for adjoining districts is 2.6m sq ft (77%). (Note that 1 sq ft = 0.09 sq metres).

Table B-6: Construction of office floorspace in the City and adjoining areas since January 1981 (thousand square feet)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CITY</td>
<td>7 500</td>
<td>3 400</td>
<td>3 650</td>
<td>1 320</td>
<td>45.3</td>
<td>36.2</td>
</tr>
<tr>
<td>Camden</td>
<td>1 620</td>
<td>750</td>
<td>360</td>
<td>50</td>
<td>46.3</td>
<td>13.9</td>
</tr>
<tr>
<td>Islington</td>
<td>1 620</td>
<td>930</td>
<td>350</td>
<td>220</td>
<td>57.4</td>
<td>62.9</td>
</tr>
<tr>
<td>Hackney / Tower Hamlets</td>
<td>1 560</td>
<td>1 260</td>
<td>330</td>
<td>360</td>
<td>80.7</td>
<td>67.9</td>
</tr>
<tr>
<td>Lambeth / Southwark</td>
<td>1 740</td>
<td>1 510</td>
<td>1 780</td>
<td>1 780</td>
<td>86.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Westminster (WC2)</td>
<td>1 380</td>
<td>440</td>
<td>350</td>
<td>170</td>
<td>31.9</td>
<td>48.6</td>
</tr>
<tr>
<td>Fringe total</td>
<td>7 920</td>
<td>4 890</td>
<td>3 370</td>
<td>2 580</td>
<td>61.7</td>
<td>76.6</td>
</tr>
<tr>
<td>Grand total</td>
<td>15 420</td>
<td>9 290</td>
<td>7 020</td>
<td>3 900</td>
<td>53.8</td>
<td>55.6</td>
</tr>
</tbody>
</table>

Source: Jones Lang Wootton 1983-85
Notes: 1 Defined as gross floorspace to become available minus gross floorspace on the site prior to development 2 The fringe Borough quantities are in those parts of each Borough within the Central Area

Floorspace:worker Ratios

B-17
Most analysts agree that the amount of space per office employee has been increasing in recent years. Daniels (1975) estimated an increase in office floorspace:worker ratios (OFWRs) of 1.6% per annum for Greater London since 1961. In the City, the Corporation registered an annual increase of 2% 1971-74 (Jones Lang Wootton 1980). Part of the explanation lies in the increased proportion of managerial and professional occupational groups within office employment. Another reason is the increasing application of new office technology. Two major studies which examined the relationship of office technology to property requirements noted that the introduction of more electronic equipment tends to increase the amount of ancillary and support space relative to desk space (Centre for Advanced Land Use Studies 1983 and ORBIT 1983). Both concluded that the amount of office floorspace required to sustain a given level of employment will continue to increase over the next decade in view of the expected increase in and widespread use of new office technology.
While there are no time series data on OFWRs, Table B-7 shows the wide range applying to a variety of employment sectors in 1981.

Table B-7: Floorspace-worker ratios in the City, 1981

<table>
<thead>
<tr>
<th>Size band gr.sq.ft</th>
<th>Sector</th>
<th>Gross sq ft/worker</th>
<th>Size band gr.sq.ft</th>
<th>Sector</th>
<th>Gross sq ft/worker</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than 300</td>
<td>Other services</td>
<td>495</td>
<td>200-300</td>
<td>Advertising</td>
<td>233</td>
</tr>
<tr>
<td></td>
<td>Electricity</td>
<td>363</td>
<td>continued</td>
<td>Post/Telecom</td>
<td>231</td>
</tr>
<tr>
<td></td>
<td>Property</td>
<td>353</td>
<td></td>
<td>Commodities</td>
<td>229</td>
</tr>
<tr>
<td></td>
<td>Central offices</td>
<td>309</td>
<td></td>
<td>Insurance</td>
<td>225</td>
</tr>
<tr>
<td>200-300</td>
<td>Periodicals</td>
<td>289</td>
<td>Less than</td>
<td>Other wholesale</td>
<td>224</td>
</tr>
<tr>
<td></td>
<td>Other professnl</td>
<td>285</td>
<td></td>
<td>Transport</td>
<td>218</td>
</tr>
<tr>
<td></td>
<td>Local government</td>
<td>250</td>
<td></td>
<td>Wholesale</td>
<td>181</td>
</tr>
<tr>
<td></td>
<td>Natnl government</td>
<td>245</td>
<td>200</td>
<td>Printing</td>
<td>175</td>
</tr>
<tr>
<td></td>
<td>Legal</td>
<td>245</td>
<td></td>
<td>Business services</td>
<td>172</td>
</tr>
<tr>
<td></td>
<td>Sea transport</td>
<td>242</td>
<td></td>
<td>Accountants</td>
<td>145</td>
</tr>
</tbody>
</table>

Source: City of London 1982

New Technology and the City

In terms of the UK economy, total office employment is expected to remain static or expand marginally by 1991. The GLC (1983c) noted two opposing tendencies. First, the trend for numbers of clerical jobs to be reduced as productivity increased. Second, a trend for job creation in response to new labour requirements for processing information using office technology. Indeed, most office employment forecasts predict substantial secretarial and clerical displacement during the 1980s (eg Bird 1980). The Institute for Employment Research (1982) argued that the reduction in clerical/secretarial grades has been evident for many years and concluded that new office technology is unlikely to cause marked changes in overall employment trends, with a trend toward a higher proportion of professional and managerial employees. In fact the 1971-81 percent change in London's labour force (according to the 1981 Census of Population) has been +8 for professional and managerial. No change for semi-skilled manual; reductions in other occupational sectors - that is, -11 for non manual, -12 for skilled manual, -25 for unskilled manual. By virtue of the types of businesses located in the City, it is probable that professional and managerial employees increased their share of total City employment during the past decade at a rate greater than for London as a whole.

The report by ORBIT (1983) considers that new communications technology will facilitate spatial mobility. It will enable a greater level of decentralisation from central urban areas, something which has been happening in office functions from Central London since the 1950s. As far as inter-office communications are concerned, Goddard (1973), in a study of Central London, found that two-thirds of meetings took place outside his respondents' places of work and therefore involved travelling. 75% of business trips in the City were made on foot. The more recent ORBIT report noted that the frequency of external contact - face to face contact outside the workplace - was correlated with staff grade. The higher the staff grade, the greater the propensity there is for external business contact. The ORBIT report notes "...while electronic communications will provide the media for formal interaction, particularly when voice mail and ultimately video conferences are introduced, many managers stress that in decision-making there is no substitute for face to face meetings. Increasing sophistication of formal systems is therefore likely to
highlight, rather than detract from, the importance of informal, unofficial and non-routine communication channels.

B-21
The ORBIT report finds that the spatial implication of advanced information technology is that the office will be even more of a meeting place than before. The City has moved further along these lines than other places because of its past decentralisation of routine functions, and its present increased proportion of professional and managerial staff. External, face to face, contact is probably as important today as it was in the past, and this need for external business contact is reflected in the locational distribution of most of the City's financial sectors.

B-22
General conclusions to this Appendix are:

* location of financial activities is expanding outwards from the established core area to the City fringes
* floorspace-worker ratios are increasing
* growth of office activities in the fringe and increased floorspace per capita are expected to continue over the next decade - there is no evidence to show that recent trends will be significantly altered
* outward expansion is partially countered by redevelopment and refurbishment of existing office premises
* the long term effects of new office technology are uncertain: while it increases scope for relocation, this potential has not been realised in recent years
* to the extent that new technology deskills or reduces office employment, it is likely to affect clerical and administrative grades more than professional and managerial ones
* a number of tendencies combine to maintain the traditional need for external, face to face, contact between organisations and individuals.
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Washington
Department
ALL CHANGE

Demand Management Case Study

NORWICH

Report by the Metropolitan Transport Research Unit for the Institute for Public Policy Research and Transport 2000
# Norwich Case Study

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6. Conclusions

Appendix A: Extract from Chapter 3, All Change, A New Transport Policy for Britain

Appendix B: The Milan Permit Scheme

Appendix D: Preparing Revised Traffic Forecasts

Appendix C: Extract from MTRU Proof of Evidence

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Legal Advice on the scheme by Peter Bibby, Barrister at Law.
1 INTRODUCTION

Background

1.1 At first sight, a public inquiry may not seem the most likely setting for a research project, but in the case of the Norwich Inner Ring Road, a unique opportunity arose to explore the "objectives led" approach set out in general terms in the first "All Change" research report (IPPR/Transport 2000 1992).

1.2 First, MTRU had already been involved in a critique of the Norwich Area Transport Study (NATS), from which material, including objectives, was being drawn as a policy context for the Ring Road proposal. The traffic modelling had been updated by the County Engineers, and they had in-house expertise available to operate and manipulate the model. Elements of management and restraint such as park and ride, restricting through traffic in central Norwich (through a "Ring and Loop" system), and data on private and public parking, were already included in the model. This meant that the basic information and planning tools for a case study exercise were readily available.

1.3 Together with Ring and Loop, Norfolk County Council were proposing a new section for the Norwich Inner Ring Road (see Figure 1), and this was ready for its Public Planning Inquiry. Norwich City Council, together with local residents, were objecting. The City proposed an alternative, smaller road enlargement further from the City centre. The residents had formed an umbrella organisation (the "Norwich Road Action Group" - NRAG) and wished to explore a non-road building alternative.

1.4 In this context the residents were willing to co-fund a case study, providing the results could be fed into the Inquiry process. In this context, the County would undertake modelling work as part of testing objectors' proposals for the Inquiry. The sponsors of the "All Change" project are grateful to the local objectors, especially Denise Carlo, both for their help, and for their willingness to embark on a more research oriented path for their traffic work. The results of the modelling work were not known in advance, and in fact the County knew them before the objectors!

1.5 Thus this case study was launched in a somewhat unusual context.

The Current Report

1.6 This report describes the research element of the work done in Norwich (a full set of Proofs are also available). It avoids as far as possible any controversial aspects of the evidence presented, and where relevant describes both viewpoints as dispassionately as possible. Without in any way associating them with the findings, thanks are also due to the engineering team at Norfolk County Council, especially Brian Stead and Laurie Egan, for their invaluable help.
Inspector’s Report

1.7 As this case study was being completed, the Inquiry Inspector’s report, and the Secretary of State’s decision letter were published.

1.8 The Inspector rejected both the Inner Ring Road proposal and the City’s smaller scale alternative. The Secretary of State agreed, drawing particular attention to the fact that demand management measures would be needed in any case quite soon after either road scheme was completed.

1.9 As regards the MTRU option, this was reported in very positive terms, although it was recognised that additional work was required. Key quotations from the Inspector’s report and the decision letter are reproduced below.

1.10 As the Inspector himself remarked, this decision points the way to future town centre strategies based on demand management. It also marks the end of an era for the old style packages based on meeting demand by road building.

Extracts from the Inspector’s Conclusions:

Para 38.4 -

“It may be that building a new urban road to provide road space for traffic displaced from another part of the urban area does not fit closely with the spirit of the White Paper’s (This Common Inheritance) aim to civilise urban traffic by easing congestion, helping to improve the local environment and reducing air and noise pollution”

“By failing to effect an overall improvement of the local environment, I consider that IRR III fails to meet the aim expressed in the White Paper”

Para 38.5 -

“The City Council also referred to para 5.31 of PPG12. The guidance states that in the case of local authority road schemes of a strategic nature shown in the structure plan, consideration in the local plan process should normally be limited to detailed alignment, because the need will have already been examined. In view of the scale of objections to IRR III, I think it right to examine the principle not just the detail of the scheme”

“As the planning policy guidance indicates, if detailed consideration of the scheme reveals it would cause unacceptable damage to the environment, consideration should be given to its deletion or relocation. It follows that deletion of a scheme shown as a specific proposal in an approved development plan may be the appropriate course”
Para 38.148 -

"The NRAG traffic restraint option was offered as a non-road building alternative to traffic congestion in the city centre. It was an interesting, low capital cost alternative to the highway and local authorities solutions to improving conditions in the city centre"

"Apart from the restraint option's obvious merit of low initial cost, it may be pointing the way to a form of future methods for tackling city centre congestion"

Para 38.158 -

"The Road Action Group's traffic restraint option is in its infancy, but it was not an option favoured by either the County or City Councils, the bodies most responsible for determining future strategy. But increased restraint of vehicular traffic in the city centre appears inevitable and desirable"

Extract from the Secretary of State's Decision Letter:

Para 10 -

"However, the Secretary of State shares the Inspector's concern that the traffic projections put forward by the Council appear to point to the need for additional measures by 2006 if unacceptable congestion is not to occur"

"The provision of additional road capacity through these proposals is expected to be limited in the benefits provided to a relatively short timescale"
2.1 Before describing the demand management approach developed for Norwich, a brief summary of the objectives led approach to transport planning, and the context within which "All Change" has been undertaken, is set out below.

Movement and Motivation

2.2 There are two main types of benefit which can be derived from the transport of people or goods. First there are direct benefits such as the pleasure of touring, the privacy and personal space sometimes available in motorised forms of transport, the choices created by the availability of travel opportunities, feelings of freedom and independence and the status derived from using a particular form of transport.

2.3 Secondly there are the benefits which transport creates by allowing other things to happen. Examples are getting to work, going shopping, visiting the doctor, going to theatres, cinemas and sports centres, and generally meeting other people. The transport of raw materials to factories, and of finished products from shop or warehouse to home are parallel examples for freight transport of this essentially enabling role.

2.4 The first group of benefits are hardly ever considered in transport planning or assessment by local and central government. They are, however, well known to airlines, car manufacturers, British Rail and throughout the advertising and marketing businesses.

2.5 The second group have been at the heart of public policy, but only very indirectly. This is because the measurement of travel and its cost is relatively easy compared to assessing the non-transport costs and benefits which are allowed or created by different levels of travel. This is now changing, thanks to an argument which has now lasted over two decades between policymakers who have aimed for more, easier and faster movement (more mobility) and those who ask what all the movement has actually achieved (how much access to goods, services or other people).

2.6 In the former case, a "good" transport scheme might allow people to save time per mile travelled. For the latter, a "good" scheme is more likely to save time by ensuring that a wide range of shops and jobs are available within walking distance of where people live, or close to efficient transport networks.

2.7 It should be noted that despite the widespread acceptance of the accessibility objective, most tools used in transport planning, such as traffic models, are still mobility based.
The Costs of Transport

2.8 Parallel to the primary and secondary benefits from transport there are two basic types of cost. The first group of costs fall on the travellers and providers themselves, including the time they spend travelling, and cash costs which reflect other resources needed to supply the form of transport being used. In transport, these cash costs can be very poorly related to the resources used. For example, one off payments, whether for season tickets or car purchase, will cause the marginal cost of travel to fall below the average cost. This runs the risk of generating more travel, whether by goods or people.

2.9 In addition, many forms of travel are directly and indirectly subsidised. Publicly planned and funded infrastructure for competing modes is assessed and paid for using different methods and different budgets. The levels of personal, commercial and public organisation and involvement vary widely between and within modes. There is no free “market” for the provision of transport and thus no allocation of resources by market forces. On the other hand, neither is there any public planning for transport as a whole.

2.10 Within the “user” group of impacts safety is an important factor, and one which is sometimes seen as an external cost. This is because the users of one mode may harm users of another, a clear example being pedestrian casualties caused by motor vehicles. Pedestrians are, however, such passive recipients of injury and death that safety effects are sometimes considered to be secondary.

2.11 Secondary or external costs fall outside the immediate users and providers of transport. However, they may well exceed the direct costs. Included in this group are environmental effects, from local traffic noise and air pollution, to the destruction of irreplaceable natural resources and global warming. The latter point to an objective which is closely related to environmental issues - the question of whether present transport activity is sustainable in the long term. The wisdom of investing in a system which is consuming finite resources at a rapidly increasing rate must be seriously in doubt.

2.12 As mentioned earlier, transport is a major influence in many other fields of human activity, for example strongly influencing land use decisions. In addition, as in the case of car and public transport users, the growth of one mode may well reduce the availability of another. This will in turn influence everyone’s employment opportunities, as well as those employed in the transport industries.

2.13 Transport has become so interwoven with all aspects of a complex society such as Britain that these external costs are extremely widespread, and have profound effects. They have been at the heart of much public dissatisfaction and technical criticism of the way both transport policies and individual transport projects are designed and assessed.
What are the Objectives?

2.14 If the current system is to be improved, it is important to find a comprehensible starting point for assessing transport policy and practice. The one adopted here is that all transport activity must ultimately lead to some quality of life improvement. It would be hard to argue against this, but it is equally hard to see how this can lead to practical decision making. To do this, quality of life elements which are most relevant to transport need to be identified, and these in turn used to produce more specific transport targets, and the constraints within which they can be pursued. Using these targets and constraints, transport policies, projects and organisational processes can be designed, costed, implemented, monitored and revised. This approach is usually called "Objectives based", and a simplified version of the process is shown in Figure 2.

2.15 This provides a new basis for public policy formulation, and in the implementation of transport projects by Government and local authorities. Personal choice will continue to operate within any framework put forward here. However, individual and company decisions are strongly influenced by public policy, both financial, such as vehicle taxes and capital grants, and by regulations, for example limiting the noise from aircraft, trains, cars or lorries. They are equally influenced by the lack of any specific policies (for example on transport and the greenhouse effect) or by policy "accidents". An example of the latter is the way in which motorways were (and still are) justified by car traffic, but also had the effect of encouraging a new pattern of warehousing and distribution based on heavy lorries, and completely undermining competition from non-road modes in the inland long distance freight market.

Objectives in Practice

2.16 General objectives are frequently not made explicit, or tend to get lost in the nitty gritty of the assessment techniques used by transport engineers and planners, but they are the actual means by which people judge success or failure. Examples are "improving the environment" "helping the economy" or "making transport safer".

2.17 However, these "first order" objectives are often dismissed as being too vague or too removed from reality to be of practical use. Thus the next step is to translate these generalities into specific and measurable targets. Examples would be "reduce the total amount of carbon dioxide from motor vehicles by 30% by 2010" or "reduce urban street noise to 60 dB(A) by 2020". There are only two relevant examples in Britain: the Government's overall target to reduce carbon dioxide to 1990 levels by 2005 (however in the mean time they will rise), and secondly to reduce road casualties by a third by the year 2000. Further targets may arise from the Government's follow up work to the World Summit in Rio.
Figure 2

Set Quality of Life Objectives

Derive Targets and Constraints from Objectives

Produce detailed options (including policies, projects and processes) to pursue the targets

Identify conflicts between different objectives and targets and reconcile them wherever possible

Assess the level of achievement and cost of the options (and what will happen if current policies continue)

Undergo formal public participation and choose between options

Policy and Programme Implementation

Monitoring and Programme Revision
2.18 Desirable targets can be identified, such as stabilising CO₂, but these need to be further translated into implementable or "operational objectives", and when they have been set planners and engineers can go away and think of action programmes to achieve them. At this stage conflicts between objectives can be identified, and either reconciled or made explicit in any assessment. Value for money is measured by comparing the cost of alternative schemes or programmes (and present day policies and programmes) with how far they meet the objectives. When schemes or programmes are put to the public, costs, benefits and conflicts can be made clear, without obscuring assumptions or judgements in impenetrable technicalities.

Defining Problems

2.19 Such an approach is very different from the usual transport study, in which a series of problems is identified, often determined by what data are available or easy to collect. Instead, problems are defined as obstacles to the achievement of an objective, or when the achievement of one objective makes it more difficult to achieve another.

2.20 In the first approach a problem may be defined as not enough road space to cater for the traffic. In the second it may be defined as people having difficulty in getting to work, school or the shops. However, the description of the problem may well prejudice the choice of solution. For example, in the first case a road capacity increase seems the obvious solution. In the second, planning policies, public transport improvements, safe routes to school and shopper buses may seem more direct methods of solving the problem. It should be noted that road improvements are not ruled out by this process, simply put on a more equal footing with other solutions.

Transport as a Whole

2.21 Another current problem is that different modes of transport are treated separately from each other right at the start of the analysis. The use of complicated (and often inaccurate) techniques to assess road traffic costs and benefits while other modes have less favourable systems (or none at all) is a clear example of this fragmentation. The use of objectives must always treat transport as a whole, rather than an uncoordinated collection of individual modes or options.

Whose Objectives?

2.22 Within the overall quality of life aims, it is also useful to divide objectives between the users of the transport system (internal) and non-users (external). Non-users have very few benefits from transport, apart from passing attractive buildings or infrastructure (such as stations) or vehicles (such
as steam trains or the London to Brighton rally). This is important because in many cases the internal benefits can be maximised at the expense of external costs. For example, travel can be made cheaper by not spending anything on reducing the external noise from trains, aircraft or motor vehicles. A parallel example would be improving safety for some users by making cars safer and introducing seat belts. Any accompanying increase in risk taking would lead to conditions for other users, especially pedestrians and cyclists, becoming less safe.

All Change: The UK “Travelling Clean”

2.23 This project was originally inspired by the Dutch "Travelling Clean" study, which set out what it called a "trend break" scenario for transport in Holland. This idea of producing a detailed alternative future for personal travel was based on a strong desire to improve the environment. However, its most striking feature was that it did not seek to reduce the number of people's journeys, rather it sought to encourage them to make shorter journeys, and to make them by different modes. It also set targets for all modes (including non-motorised) in a comprehensive way.

2.24 "All Change" does not seek simply to repeat "Travelling Clean" in Britain, but to build on its ideas, and to combine them with the work in progress here on quality of life, objectives based, methods. This can provide a new framework to replace the existing patchwork of predictive methods and financial tests applied in British transport policy. Some of these would, however, be revised and included in the new system.

2.25 The first report set out some general quality of life objectives for transport, and exemplified how these could be translated into practical targets with timetables for achievement. The overall objectives identified are set out in Appendix A to this study.

2.26 The next stage is to take the approach and test it in a range of case studies. Starting in February 1994, in partnership with a local authority, a more wide ranging area case study will be undertaken. Meanwhile, this report describes the application of the principles, in some detail, to the development of a fresh solution to the problems identified in Norwich, in particular those which seemed to justify an environmentally damaging inner ring road.
The Public Planning Inquiry

3.1 In the first submission to the Public Inquiry by MTRU, a set of objectives and their justification was included as the starting point for the case study. This included drawing attention to the need to distinguish between mobility and accessibility. The existence of the 'All Change' project, and the intention to undertake case studies, and the suitability of Norwich, was made clear to the Inquiry. In paragraph 2.7 of the MTRU Proof the position was summarised as follows,

"The work being undertaken for this Inquiry thus provides an opportunity both to inform our research study, and to make a positive contribution to the current discussions over the future of transport in Norwich."

3.2 From this point the Proof describes how the objectives, many of which were present in the Structure and Local Plans, could be implemented in a way which did not involve road building. It should be noted that no-one was claiming that the Inner Ring Road was environmentally insignificant in terms of the damage and severance which would be caused. It was presented as the only way to allow traffic reductions in part of the central area, while avoiding a huge increase in congestion. The principle of controlling traffic was not an issue, the question was when, where and how.

3.3 To provide some contextual information, the principles of traffic restraint, and some examples of how this had been achieved were submitted to the inquiry.

3.4 The MTRU conclusion was that the objectives pointed to at least testing an option based on restraining traffic rather than re-routing it. Methods which were completely outside the present legal framework, such as road pricing, were excluded. A "first draft" scheme was prepared and tested using the County’s traffic model (SATURN). The results were presented in November 1992.

The Norwich Demand Management Scheme: Version One

The Scheme in Essence

3.5 While planners are now beginning to control the number of parking spaces in new developments in order to reduce traffic demand, the problem of all the existing private non-residential (PNR) car parking, such as that found in the basements of office blocks, is rarely considered. As in many towns in the UK, in Norwich this parking pool is bigger than all the parking in public car parks and at parking meters put together. Thus PNR parking is an obvious target for any restraint scheme.
Voluntary Demand Management

4.1 The method of restraint applied for the purposes of testing Draft 1 could be supplemented by improvements for cycling, walking, and public transport. In addition, the modelled impact of the rush hour car control scheme could be achieved entirely by agreement between businesses and the local authorities. The latter could encourage agreement by offering fast track permission to redevelop car parking spaces.

4.2 Such agreements seem unlikely at present, but may change in the light of a commitment by the local authority to implement a mandatory scheme unless voluntary agreements are in place. One unfortunate outcome of the Public Inquiry context was that several businesses refused to be interviewed on their attitude to demand management agreements. Experience both from other countries and in some UK boroughs suggests that such partnership arrangements can have a very positive outcome.

4.3 Even with voluntary demand management, the question of through traffic would then have to be considered separately. The centre itself would be protected by a revised “Ring and Loop” system. However, some form of additional routeing deterrent may be required within that part of the City outside the centre. It should be noted that a new outer bypass running parallel to the proposed IRR extension was opened just prior to the Public Inquiry. Relatively small scale calming could encourage traffic to use this route.

4.4 Such a package would be likely to match the performance of the MTRU Option One (+Loops) and a separate test was therefore not appropriate. However, it would be possible, in view of the additional use predicted for walk and cycle, to simulate new crossing facilities at key junctions on the existing inner ring road. This would be done by creating all red phases at existing Ring Road junctions which already had traffic signals. After discussions with local residents, cyclists and County officers, three sites were chosen and these were then available for the MTRU Option Two test carried out subsequently.

High Occupancy Vehicle Priority

4.5 It is also apparent that some form of vehicle occupancy scheme could be used to manage demand. In the US many traffic lanes are set aside for cars with a prescribed number of passengers. These are known as HOV (High Occupancy Vehicle) lanes.

4.6 In an urban area such as Norwich, there are not the same number of lanes available as on US highways, but the scheme
could simply apply to an area instead. A high occupancy scheme would limit vehicles during congested periods to those containing 2 or 3 people. This could be applied throughout the City, and not just in the centre. The most likely application would be for vehicles entering the City at a cordon or cordons, but it could be applied in the form of a ban on cars driving on any street in the area unless carrying the prescribed number of people.

4.7 As with any scheme there would have to be clear and simple exceptions. The main drawback would be if such a scheme attracted people from walking, cycling or public transport as well as cars. However, the impact would be very substantial, and well in excess of the restraint scheme tested here. It is effectively a very strong incentive for car pooling and sharing. It seems odd that no-one has proposed such a scheme as an alternative to more complex approaches such as road pricing.

4.8 Nevertheless, this approach has no obvious precedent or parallel, and would have been slightly more complex to model. Given the time constraints of the Inquiry, it was not considered in detail in the case study. It should be taken as another example of how a positive approach to demand management offers great potential.

Freight Controls

4.9 Although an earlier study (NATS) had undertaken a desk top study of freight transport, no work was available on rationalising deliveries, for example through a transhipment depot. The only account taken of heavy vehicles in the County traffic model was that their journeys were run through twice, in order to represent their greater road space requirements.

4.10 Resources did not allow MTRU to undertake a full freight study for Norwich. However, it was clear from an initial examination of the survey data that a rush hour ban on HGVs, diverting them to less congested periods of the day, would bring some relief. This would still permit all HGVs based in the area to drive to destinations outside the controlled zone. Such a control which covered the City area (including that beyond the Inner Ring) would reduce pcu trips by 1,984 during the am peak. This would enhance the impact of the MTRU proposal by almost 30%.

4.11 Such a scheme was extremely easy to represent in the model, by simply removing the HGVs which were driven to City centre destinations from the peak hour traffic. These vehicles could then be reallocated into the off peak. The latter was not modelled directly by the County, but the percentage increase in traffic caused by adding HGVs was insignificant (about a quarter of one per cent). A rush hour HGV control was therefore brought forward for testing in Restraint Option Two.

4.12 A more detailed study of freight movement which considered the scope for increased efficiency, and the use of
smaller vehicles would have to be undertaken if the Norwich transport studies were to be complete. MTRU considers that the lack of freight study was a serious omission in the County's work for NATS. The greater environmental impact of such vehicles in terms of noise and pollution is widely accepted, but less well known is the importance of these vehicles in relation to fatal accidents. Figure 5 shows how they are four to eight times more likely to be involved in fatal accidents than cars.

Pricing

4.13 The final group of schemes which are worthy of consideration are based on charging people to enter the City. This would require new legislation, although not necessarily as complicated as the "pay when you are caught in a traffic jam" system proposed for the City of Cambridge. Much simpler methods can be very effective, for example the "pay and display" system in Singapore (MTRU 1991, 1993). The effectiveness of this scheme, now planned to go electronic in 1996, is shown in Figure 6.

4.14 Even with the new road, traffic growth would soon begin to cause severe congestion beyond 2006, although the County did not present a long term forecast. Road pricing was included in the County Inquiry Proof as a long term solution. One of the questions asked was why, if pricing was seen as the preferred option for solving congestion in the medium term, it could not be brought forward and avoid the need for the road.

Conclusions, Recommendations and Restraint Option One

4.15 The tests showed that the first draft restraint option was very worthwhile. This was reinforced by the fact that the minimum option (see 3.7 above) was being tested, and no fine tuning had been applied following analysis of the flows on individual roads. The scheme, combined with further encouragement to public transport, walking and cycling, would achieve superior road traffic and environmental conditions to the Inner Ring Road.

4.16 Our recommendation to the Inquiry was that effort should therefore be concentrated on a demand management approach rather than the Inner Ring Road proposal. The "Ring and Loop" scheme, suitably revised, should be implemented without waiting for the IRR. The final recommendations from MTRU's Proofs of Evidence are reproduced in Appendix D.

4.17 In addition, because the Inquiry adjourned in order to model an alternative road proposal, there was just sufficient time to undertake further testing of restraint options. MTRU therefore prepared a model run which included three new pedestrian/cycle crossings, a rush hour ban on HGVs, and a
6.1 Using the County’s traffic model, considerable progress was made towards defining non-road building options which would achieve environmental and time saving benefits. Given further resources these could be developed as part of an overall strategy for transport and land use planning in Norwich and the surrounding area. This would certainly include reducing the existing severance caused by the Inner Ring Road, and improving both the environment, and conditions for all non-motorised travellers.

6.2 Taking the congestion levels predicted after the Inner Ring Road Stage III is built as a base, and including implementation of Ring and Loop in the City centre, this could be achieved by traffic stabilisation plus a peak hour HGV ban, or traffic stabilisation plus a restriction on the use of private commuter parking (in this case through a ban with exemptions for residents and local businesses).

6.3 It was plain to all participants at the Inquiry that further demand management would be needed at about the time of the forecast year (2006). Pricing was mentioned by the County and their consultants in their Proofs. The work done in this case study shows that there are several other options which could be explored and implemented well before that date.

6.4 The County did not agree that the one option explored in detail would be straightforward to implement. Their initial objection to its legality was not pursued (MTRU had taken advice), and another was based on a mis-reading of the regulations concerning heavy vehicles.

6.5 There were two further objections. The first, that there would either have to be, or at least should be, a Public Inquiry, was accepted by MTRU as a fact, and indeed welcomed. It was more difficult to understand why this was an objection. The second was that the commuter restraint scheme would be much more difficult to enforce than MTRU stated. As well as MTRU disagreeing in detail, the same arguments put forward by the County would apply to any traffic management scheme. In this case, nothing would be done. This issue could not be resolved at the Inquiry, and must remain a difference of judgement.

6.6 Despite such differences, MTRU considers that demand management options were available, that they could be tested, and that were sufficiently promising to assessed in more detail.

6.7 Above all, the objectives led approach encouraged a concentration on the real problems in the City, and revealed the car based planning assumptions which underpinned some of the transport forecasts. The City and the County had already made several positive commitments to controlling parking and setting up park and ride. What was required was a more targeted and structured approach leading to a full demand management package.
All Change
Demand management case study: Norwich

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Traffic Calmed Towns

An Alternative to the East Grinstead By-Pass Proposals

A Report by TEST for RSNC, The Wildlife Trusts Partnership as part of their study of the By-Pass Programme: Impacts and Alternatives
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Summary

0-1
The Department of Transport mainly justifies the current by-pass programme in terms of the quality of life whereby the removal of heavy through traffic reduces accidents, noise and air pollution in the villages and towns which are by-passed.

0-2
This report, commissioned as part of RSNC, The Wildlife Trusts Partnership's study of the By-Pass Programme, uses the case of the proposed East Grinstead by-pass to examine these issues in detail. In assessing the strengths of the arguments put forward to justify this by-pass, the report finds them weak, inappropriate and short term in emphasis. It concludes that the majority of traffic would not be diverted from East Grinstead and questions the nature of the improvements to East Grinstead that would accrue given the Government's own forecasts of traffic growth. It also identifies some of the wider motives behind the current proposals; the two most significant of these are the assumed strategic value of such a route between Kent and Hampshire and the partly-private funding of the route by developers of a proposed new estate of 2,400 houses.

0-3
If by-pass construction is an inappropriate solution to the traffic problems of East Grinstead, what alternatives may be suggested? This report shows how the application of traffic calming measures would bring positive benefits to East Grinstead without the environmentally destructive consequences associated with road construction. This alternative policy, in reducing both vehicle speeds and numbers, the promotion of public transport alternatives and in changing priorities towards pedestrians and cyclists, has a more general application. Such a policy can make our towns and villages safer and more pleasant places in which to live, work and shop.

Introduction

Background

1-1
Proposals for the construction of a by-pass of East Grinstead have a long history. In 1979 West Sussex County Council abandoned a plan for an East Grinstead by-pass on the basis that it was too costly. Recently, the plans have been resurrected with support from Surrey and West Sussex County Councils and less than total enthusiasm from East Sussex County Council, local groups and residents. Costs are now estimated at between £53 and £125 million (WSCC 1990).

1-2
In May 1991, TEST were commissioned by Royal Society for Nature Conservation (RSNC), The Wildlife Trusts Partnership to assess the current by-pass proposals in East Grinstead. This assessment was to include:

- the identification of the main elements of the case for the proposed by-pass
- the examination of the proposed by-pass as a solution to the traffic problems affecting East Grinstead
- the suggestion of a practical alternative to the by-pass proposals which would lead to improvements in safety and minimise environmental impacts.

These were likely to involve town-wide traffic calming measures.
This report forms the second part of a wider study by The Wildlife Trusts Partnership on the By-Pass Programme: Impacts and Alternatives. The TEST report therefore illustrates a practical alternative to by-pass 'solutions' of traffic problems of towns and villages. It may provide a powerful tool in the growing national debate over by-pass construction.

Report Structure

1-3
Following this introduction, Section 2 examines the East Grinstead proposals in their national context. Section 3 describes the case study in detail. This outlines the by-pass proposals, details some of their impacts and outlines the cases for and against the by-pass. Finally Section 4, using international examples, reviews the practice and benefits of traffic calming. These are then applied hypothetically to East Grinstead to illustrate how a package of traffic calming measures may be developed as a practical alternative to by-pass 'solutions'.

2 : Context: The National By-Pass Syndrome

2-1
The construction of by-passes is a major part of the present government's trunk road construction programme (23 bypasses were constructed between 1985 and 1987 and 175 are currently planned: HMSO 1987). The Department of Transport believes that by-passes improve the quality of life of people living in towns and villages by removing heavy through traffic and reducing noise and air pollution. Efforts are made to 'minimise the impact of road schemes on the environment.' However, the current 'Roads to Prosperity' proposals (1989) will affect 161 SSSIs, 1 national nature reserve, 3 local nature reserves, 5 county sites of special wildlife interest and 2 trust reserves (NCC cited by Hopkinson et al 1990). The sister report 'Death at Pooh Corner: The Impacts of By-Passes in Ashdown Forest and Other Wildlife Sites' (1991), details further the impacts of the by-pass on the environment.

2-2
The Government believes that the 'main' way to relieve growing road congestion is 'by widening existing roads and building new roads' (DTp 1989). However, as long ago as 1960, Buchanan was doubtful about such unrestrained road building-'it might make matters worse by stimulating travel.' Since the revised road traffic forecasts were published, the new consensus of opinion is that there is no possibility of increasing road supply at a level which approaches the forecast increases in traffic (Transport Studies Unit 1991). Whatever road construction policy is followed, the amount of traffic per unit of road will increase. Unrestricted growth in traffic poses serious threats to our urban and rural environments. Therefore demand management will become the essential feature of future transport strategy.

3 : The East Grinstead By-Pass

Outline of Proposals

3-1
Seven alternative routes have been proposed (eight if the private sector proposal by the Travers Morgan Consulting Group is included). These are illustrated, in conjunction with the existing main roads, in Figure 1. The impacts of these route proposals vary in nature and extent. The 'Green' route, the one 'most likely to find a place in a programme' (WSCC 1990) due to cost...
considerations, has for example 'serious effects' on the residential areas of East Grinstead and Felbridge. In common with the other schemes, it also involves considerable loss of the surrounding countryside and valued nature conservation features. Landtake ranges from 15.8 to 69.6 hectares for the seven schemes. Their relationship to areas of designated conservation interest ie SSSIs, AONB etc, is also illustrated in Figure 1. In addition to Ashdown Forest and Kidbrooke Park SSSIs, the proposals threaten sites of wildlife interest at Fairlight Wood, Coombers Wood, Weir Wood Reservoir (SSSI and LNR), Imberhorne Farm and 13 other ancient semi-natural woods (Edwards 1988, RSNIC 1991).

3-2 Currently the European Communities are considering legal action against the UK government for failing to apply environmental impact assessments to road proposals at Oxleas Wood and Twyford Down. Both these proposals threaten SSSIs. It is hoped that the authorities involved in the East Grinstead By-Pass will commission an independent environmental impact study, in line with the EC Directive, to assess the impacts on the environment of any of the by-pass proposals.

Assessing the Case for the By-Pass

3-3 WSCC summarise the traffic problems affecting East Grinstead in familiar and predictable terms. Thus, in perhaps a strange hierarchy of importance, 'traffic speeds are slow, accidents occur and life is made unpleasant for residents, shoppers and pedestrians' (WSCC 1990). However, while these are relatively easy to identify, an actual coherent case for the by-pass 'solution' is more difficult to locate.

3-4 Ever since the 1980's when the suggestion of a by-pass was underpinned by the private sector, discussions about it have gone hand in hand with that sector's planned development of 2 400 houses at Imberhorne, just outside the town's western boundary. Paul Channon, when Secretary of State for Transport, heralded the idea as a 'pioneering venture in transport-and-linked-housing' development as some 50% of the total cost would be borne by the housing developers. However, commercial aspirations are clearly in themselves not enough to justify road building and its well documented environmental impacts (TEST 1991).

3-5 The case that the by-pass will ease congestion is at best unproven. East Sussex CC (Highways and Transportation Committee 6.6.90) has estimated that only 25% of traffic currently using the High Street 'could be described as long distance.' If this is the case, then the reasoning that the by-pass will ease congestion in East Grinstead is weak. By the design year 2006, traffic demand will in any event have grown by between 36% and 61% (Department of Transport 1989 Low and High Traffic Forecast - WSCC 1990): thus, the requirement is to reduce car use rather than try to accommodate its expansion.

3-6 It seems therefore that one of the main justifications for the by-pass is the desire to create an alternative route to Eastbourne and relieve congestion on the M23 and A27. Given that the evaluation of alternative bypass routes found only small savings in total vehicle-hours and vehicle-kilometres, it is still difficult to justify the case for the M23/A27 link which the by-pass would
represent, on traffic planning grounds, unless the merits of a strategic route
eventually connecting Kent and Hampshire are being considered. This of course
is not an argument used to justify a local by-pass.

3-7
One of the general policies of the West Sussex C.C. is a commitment 'to protect
and improve the county's environment' (Structure Plan 1988). This is hardly
compatible with the plan for a by-pass as the area in East Sussex that would be
affected is within the High Weald AONB and includes Ashdown Forest and
Kidbrooke Park SSSIs (Figure 1). Preservation of these ancient woodlands and
the wider historically important Weald landscape is vital, given the former's
strategic importance in terms of UK nature conservation policy and the latter's
wider landscape, cultural and scientific interest.

3-8
East Sussex CC could not recommend an acceptable route out of the many on offer
in terms of environmental impact. In fact the by-pass route comparisons made
little mention of minimising such impacts. The other Councils failed to give
adequate recognition to the consequential land use implications of the by-pass.
This failure to regard land use planning and road planning as part of a common
process will only lead to further destruction of the countryside in the future.
Only East Sussex CC have recognized the contradiction between land use planning
and transport planning objectives and stated that the by-pass was not
compatible with its strategic planning policies.

3-9
Assessment of the environmental impacts of the proposals has been limited to
the more easily definable factors such as land take and effects on houses. For
example in the case of East Sussex, land costs were not included as it was too
difficult to evaluate the value of land in Ashdown Forest. The by-pass itself
was promoted as leading to an improvement in the quality of East Grinstead's
environment, through the alleviation of noise and air pollution and congestion
in the town. This however is difficult to substantiate given the arguments in
paragraph 3-5 that about one quarter of the High Street's current traffic would
be diverted onto the by-pass and that by the design year traffic demand will
have grown by at least 36%.

3-10
In summary, why should there be an East Grinstead By-Pass? The main arguments
appear to include:

* There is congestion in the town with associated environmental problems.
   Yet 75% of this stems from short-distance movements, for whose solution a
   by-pass is irrelevant; the town already has a relief road (Beeching Way).
   Neither the A22 nor the relief road were at all congested during a Saturday
   mid-day visit in May.
* Traffic is going to increase.
   Not necessarily - it depends on transport and environmental policy. There
   may, as in the Netherlands and elsewhere, be policy measures which aim at
decreases in car based traffic. If however traffic does increase in line
with the current Government's predictions then the by-pass can only be
considered at best a short term solution. This is clearly illustrated by
the first relief road which, after only 12 years of use, has reached its
design capacity (Traffic Study Vol 1 page 8). Can such short-term, high
cost road-based solutions be justified in terms of their longer-term, and
often irreversible, impacts on the environment?
* Commuters from Forest Row and Wych Cross congest the A22 travelling to and
from East Grinstead railway station.
   This is no argument for a by-pass through an AONB. Better to consider
whether these towns/villages could be reconnected to the railway.
The by-pass would form 'an attractive link' (Traffic Study Vol I page 1) from the M23 to Wych Cross; connection with the M23 is 'assumed' (page 2). Why is it attractive? In whose value system? In fact it would be environmentally destructive and help perpetuate, indeed encourage, the use of motor vehicles when it is widely recognised we must cut back on their use.

There is private capital available to pay for part of the by-pass

A new housing development has been proposed at Imberhorne, and this has been used as a primary supporting argument for construction of the by-pass, as the housing developers would contribute £20 million toward a by-pass somewhat less grand than the County Councils appear to want. This argument appears specious on two counts: if there were a real case for the road then the necessary funds would probably be forthcoming. Secondly, if there is demand for the housing, perhaps it should be sited where existing roads have sufficient capacity. If there has to be developmental support for the new road, then it is hard to claim a prime need for that road.

Finally, it is worth noting the response of the local residents to the proposals. Although it is their environment that these proposals directly affect, the first time the public's opinion was tested was over alternative routes for the by-pass, not whether it was desirable or not. However at an East Sussex CC Committee meeting in June 1990 it was noted that East Grinstead residents (in a town poll) were found to be emphatically against the by-pass and were calling for alternative solutions to the traffic problem in the East Grinstead area.

A Basis for an Alternative Approach

There is a current bias in favour of road-building. This is in part due to the technical evaluation processes used by County Councils which give prominence to the supposedly measurable costs and benefits of road construction, while the social and environmental costs and benefits which are much more difficult to quantify are pushed to one side. The inbuilt and patently incorrect assumptions that roads do not generate traffic, and that improved public transport does not ease congestion, renders such methodology very one-sided.

It is clear that road-building solutions to a problem need always to be compared to non-road-building options. This can be justified on environmental grounds alone. We also have to consider that road transport may soon reach its limit in this country. We need to look to the future with an open mind and examine alternative solutions to the problem of congestion on our roads and then these alternative policies need to be tried and tested before decisions are taken to provide increased road network capacity. However this more rational approach to decision making rarely takes place, especially in the case of by-passes.

If there is no demonstrable case for a by-pass, what alternative solutions may be applied given the need for relieving the locally-originating congestion within East Grinstead? Lessons may be learnt from abroad. Denmark and West Germany are leading the way in considering alternatives to road-building, based on traffic restraint policies. Could such an approach work in Britain?

Discussion of the principles of traffic restraint and their potential application, both as a general policy concept and as an alternative approach for East Grinstead, will occupy the remainder of this report. Before
proceeding we should say that 'traffic calming' is interpreted broadly, to include: reductions in vehicular traffic, slowing of such traffic, providing public transport alternatives, and better relating land uses so that facilities needed day to day are generally within walking or cycling distance of home.

4: Alternatives to By-Passes - Traffic Calming

The Practice of Traffic Calming

4-1
The concept of traffic-calming is slowly gaining acceptance in the UK. Traffic calming is described by Monheim (1990) as 'an environmentally and socially more compatible traffic policy,' whereby instead of adapting our towns to the needs of cars, the traffic itself needs to be adapted to the structure and forms of towns. In the UK the reverse is often the case. 'Transport' policy has become preoccupied by the perceived need to build more and more roads to cope with increasing demand. New roads however will often cause more congestion due to the release of suppressed travel demand and their contribution to the longer term restructuring of the economy towards increasing car dependence (Robert 1988).

4-2
Alternative transport restraint policies can actually reverse these trends in traffic generation by decreasing road capacity, discouraging unnecessary car trips and providing alternative modes of transport. Traffic calming forms an integral part of such an approach. Although a diverse grouping of traffic measures, traffic calming aims to redress the balance of road space in favour of pedestrians and cyclists. This can entail both the reduction in vehicle numbers and speeds and leads to improvements in safety and the environment. In the longer term it may also reduce car dependence.

4-3
Different applications of traffic calming may be identified. The most extreme treatment is to pedestrianise an area and remove traffic altogether. This can be necessary in shopping streets where the volume of people justifies their use of all the available road area. In quieter mixed residential and commercial areas where reduction in traffic speed is the main aim, traffic entering the area can be slowed by rumble strips, chokers and pinch points. Chicanes, table junctions and islands, and planting and narrowing along the length of the road, can then maintain low speeds within the area as the less space traffic has to manoeuvre, the more slowly it will travel.

4-4
Traffic restraint policies have increasingly been moving toward area-wide traffic calming which includes the main roads. This reflects the recognition that these roads often have the greatest need to be calmed. For example, 70% to 80% of road accidents in built-up areas occur on main roads. They also tend to have the greatest levels of noise and exhaust emissions (Monheim 1988). The road network should however remain both accessible and porous. Therefore individual measures will vary in application and intensity depending on the function of the road across the traffic calmed area.

4-5
For car dependence to be reduced without a negative impact on accessibility, an alternative mode of transport must be provided. This alternative needs to be reliable and convenient if it is going to influence the modal split in a positive way. This has occurred in Hanover, Western Germany, where the number of public transport passengers has increased by 22% since 1970 due to considerable public transport promotion and investment (TEST 1988). Where space permits, public transport should be given priority over privately owned cars.
The Benefits of Traffic Calming

4-6
The application of traffic calming techniques leads to measurable improvements in safety and the environment. Examples can be taken from Germany, Denmark and the UK.

4-7
Results from Germany show that decreased road capacity does not result in traffic chaos. In Nuremberg when the downtown pedestrian precinct was extended and heavily-trafficked roads were closed, 70% to 80% of the former traffic did not show up on the alternative roads. Car traffic is therefore diminished and not diverted (Monheim 1990). There were similar findings when London's Oxford Street had its private car traffic removed. In the German schemes, speed has been typically reduced to 30km/h. This has produced reductions in serious casualties of up to 50%. Lower traffic speeds have achieved noise reductions equivalent to a halving of traffic volumes, and calmer driving styles have reduced both emissions and fuel consumption. The total number of traffic calmed or pedestrianised town centres in Germany now numbers above 1 500 (Monheim 1990).

4-8
An evaluation of 600 Danish schemes showed a 45% reduction in casualties and a 78% reduction in the serious injury rate (Pharoah 1990). In a study of the effects of traffic calming on the main road in Vinderup, a town with traffic problems similar to East Grinstead, it was found that high speeds had disappeared and intermediate speeds were substantially reduced. Speed reduction had not caused flow or delay problems. The vast majority of the residents now feel that it is easier for pedestrians to cross the road and the feeling of security was considerably improved (Danish Road Directorate 1987).

4-9
In the U.K. too there has already been some success with traffic calming. In the environmentally sensitive New Forest area, escalation in traffic and increased accessibility had threatened the ecology of the area with at least one large forest animal being killed each day (Penny 1990). Hampshire C.C. decided that the traffic needs were subordinate to the need to conserve the Forest and accordingly calmed the roads by creating a road hierarchy with increasing vehicle and speed restrictions. The speed restraints included pinch points, chicanes, surface undulations and passing points. At all times emphasis was placed on generating public support for the scheme.

An Application of Traffic Calming Practice to East Grinstead

4-10
TEST's aim is to illustrate the main elements of an alternative approach to by-pass construction in East Grinstead. This approach will improve the conditions in the area using the traffic calming techniques discussed. To be of maximum effect, this 'package' of measures should be applied across the East Grinstead urban area. Other elements, for example the provision of alternatives to car based transport, are more extensive and require regional co-ordination. The main elements of this approach are illustrated in Figure 2. Each is discussed in turn.
Pedestrianisation of London Road between Railway Approach and the High Street

4-11 Pedestrianisation directly decreases road capacity. Removal of traffic from the centre of East Grinstead will make it considerably safer for pedestrians and cyclists. This in conjunction with landscaping (i.e. the planting of trees and placing of benches) will make the area a more attractive place in which to shop and meet people. It has been shown that shops fronting newly pedestrianised areas normally benefit from increased turnover (for example, see TEST 1988). An example of a pedestrianisation scheme in part of London Road is illustrated in Figure 3.

4-12 Pedestrianisation between Railway Approach and the High Street would create a continuous pedestrian thoroughfare between the station, the market and the London Road area. All the roads leading onto the pedestrianised area would have alternative access, with the possible exception of Rices Hill. Parking is available nearby at present and additional disabled parking space could be made available in Dallaway Gardens and Queens Road, adjacent to the pedestrianised area.

4-13 Traffic would be rerouted along West Street, West Hill and Brooklands Way for access to the station, rejoining London Road either at Beeching Way or via Station Road. Through traffic on the A22 would be rerouted along Beeching Way. Since there is no rear servicing for shops, deliveries would be allowed in the pedestrian area at restricted times (i.e. between 1900 and 1100, as is common in Germany where rear servicing is far from universal) and following the example of other pedestrian areas such as Frankfurt, cyclists would be permitted.

Reducing Vehicle Speeds and Numbers through Traffic Calming

4-14 Less severe traffic calming techniques would be applied to the High Street. A low speed limit (i.e. 20 mph) would be enforced on traffic entering the area by means of chokers and humps or tables. As the road is currently 3 lanes wide, one lane could be given over to pedestrians and cyclists and the road narrowed at regular intervals by pinch points. Less space for cars to move in means they travel at slower speeds, making the area safer for shoppers (Pharoah 1990). Landscaping could then improve the visual qualities of the street. Some of the possible measures are illustrated in Figure 4.

4-15 Traffic calming would be applied to West Street, West Hill, Brooklands Way and Station Road as appropriate to the mixed residential and commercial uses. Tables at road junctions and residential road entrances can be used as pedestrian crossings as well as helping to slow traffic.

4-16 Moderate traffic calming on the A22 approaching the town would slow down and even the flow of traffic. This would improve both the safety aspects and general environment of these roads. Traffic entering the High Street would also be slowed in advance of the lower speed restrictions ahead. Traffic calming could take the form of rumble strips and the narrowing of the road. Signposting would alert people to the fact that they were entering a traffic calmed area. Traffic could also be slowed on Beeching Way with the use of islands and tree-planting.

4-17 The A22 and A264 outside East Grinstead experience high traffic speeds and
accident rates. It would therefore be beneficial to reduce speeds on these, especially as many of them pass through villages. This can be achieved by narrowing, or by making the road more sinuous in appearance by blocking the vista with planting or other means. Even better, some car trips from surrounding villages into East Grinstead could be transferred on to a bus service (see paragraph 4-19).

Reducing Vehicle Numbers through Alternative Routing

4-18
Current improvements to roads on the outskirts of the East Grinstead area will increase the alternatives to the A22. The M23 and A27/A259 (Eastbourne to Brighton) are being improved, the latter brought up to dual carriageway standard. Appropriate signposting on these roads could induce traffic to use these newly improved roads as opposed to travelling through the East Grinstead area. HGV and commercial vehicle restrictions in East Grinstead and surrounding towns would also help alleviate some of the through-traffic, as has been successfully practised in Chichester.

Reducing Vehicle Numbers through the Provision of Alternatives

4-19
To improve public transport in the urban area and encourage residents to leave their cars at home, it would be possible to implement a number of busway priority measures which do not entail high expenditures. Allowing buses sole access to the pedestrianised area of the London Road would be a possible alternative to complete traffic calming and alleviate access fears. Given the changing attitudes towards cars, the need to save energy and the environmental costs of a by-pass, it would seem vital that public policy becomes committed to improving public transport services. Implementation of traffic calming measures would complement the reorganisation of bus services to connect the railway station, schools, hospital and shopping area with residential areas and the surrounding villages.

4-20
Other possible longer term solutions include the reopening of the disused railways in the East Grinstead area. The Secretary of State for Transport, Malcolm Rifkind, announced on 28 May 1991 an 'integrated' transport policy in which rail would play a much greater part than in the last ten years. The following proposals illustrate what could be achieved if these words lead to positive Government action.

4-21
Substantial parts of the former Three Bridges-East Grinstead line are currently rights of way, such as Worth Way, and appear intact. If these could be retracked, light rail would then connect East Grinstead residents with jobs at Gatwick Airport, via Three Bridges. Although the disused part of the railway passes through some residential areas, it is probable that greater relief to local traffic would be achieved at less expense than most of the proposed routes for a by-pass. The railway to the south-east (now called Forest Way) could also be reopened creating an alternative method of transport between Forest Row and East Grinstead. However, it would be difficult to connect it with East Grinstead station given the aptly named Beeching Way.

4-22
The proposed takeover, by the Bluebell Railway, of the disused railway southwest of East Grinstead, would not reduce commuter traffic in the same way as the other two proposals above. It could reduce leisure traffic on the roads and
make the railway directly accessible by train from London. It would therefore reduce the fields of cars around that railway's Sheffield Park station.

The Need for Public Involvement

4-23
What TEST proposes are suggestions for an alternative package. TEST is in no doubt that East Grinstead needs an alternative to the proposed by-pass, but a lot more detailed study and on-site testing would need to be undertaken before the exact details of such an alternative package could be decided upon. There is a need to draw on the experience of other European countries when introducing such radical alternatives, because traffic calming will only have a chance of success if it can build on a high degree of political and administrative consensus (Monheim 1988).

4-24
Careful attention therefore needs to be devoted to public participation in the form of advanced information, consultation and discussion. Special attention must also be directed towards convincing institutions and groups who hold traditional prejudices, e.g. shopkeepers, taxi drivers and the building industry, of the potential benefits. For example, construction of traffic calming measures is labour intensive. Employment is therefore four to five times higher than on conventional and large-scale road-building schemes (Monheim 1988). Shopkeepers need to see that opportunities are being created; traders greatly underestimate the importance of shoppers on foot and bikes, and of public transport (TEST 1987,1988).

5 : Conclusion

5-1
Hass-Klau (1990) states that 'the time to solve transport problems with large road building programmes is surely over.' We hope we have shown that a bypass for East Grinstead is not only unnecessary, but that there is an alternative. Traffic calming is about reducing vehicle speeds and numbers, changing priorities and making the towns and villages safer and more pleasant places in which to live, work and shop.

5-2
However, traffic calming is only a part of a new, national transport policy which needs to be adopted. The problem has to be looked at as a whole and the solution must encompass demand management, long term land use planning, public transport provision, environmental impact minimisation, demographic change and encouragement of other greener modes of transport.

5-3
Given these changes, East Grinstead and the three Counties have an unparalleled opportunity to be in the vanguard of new ways of conserving valued environments and heightening quality of life. The new consensus suggests that we master the private car rather than being its slave.
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TEST (1987) Big Spenders By Bus London
WSCC (1988) East Grinstead Area Traffic Study
(1990a) East Grinstead Area Traffic Study
(1990b) WSCC Transport Policy and Programme
21 August 85

Dear Londoner,

We are writing to you as someone who has an interest in the City of London and its physical environment, of which the street environment is a crucial part. You are doubtless aware that the City, as the historic centre of London with its great architectural heritage, centres of commerce and finance and focus of tourism, is being submerged by the adversities of excessive road traffic.

The City of London's Draft Local Plan contains little in the way of concrete proposals to reverse this trend. The enclosed report, commissioned by CILT and produced by TEST, examines the City's pattern of movement and concludes that it is not well managed. A relatively small number of cars, taking up large amounts of space, come into conflict with many public transport users and pedestrians. It was found that half of all cars terminating their journeys in the City at the morning peak hour were not used again till the journey home, suggesting that these car journeys were, on the whole, unnecessary. Essential vehicles compete for roadspace with advisory vehicles and other essential traffic, which thus gets caught up in congestion and suffers as a result.

The TEST report seeks to redress the balance. It contends that a better physical environment can mean better business - better because more tourists are attracted to the area, workers are happier and shops, restaurants, bars and pubs thrive. This report is designed to improve the street environment, allowing more space for people to walk, shop and enjoy the surroundings, while maintaining easy access for public transport users, who begin and end their journeys at positions, for servicing vehicles and essential car users. The cornerstone of the proposals is an efficient public transport service.

We hope that the enclosed report, 'The Accessible City', will sufficiently stimulate your interest for you to respond. We have distributed copies to major administrative, transport, academic and commercial bodies for comment (full list attached). The observations received will be published as a supplement to the report, to be released in October. Please send us your observations by 16 September. We will assume that we may quote your comments without further recourse to you.

We look forward to your response.

Yours sincerely,

[Signature]

John Roberts / TEST and Gavin Smith / CILT

TEST is the acronym for Terrestrial Environment Studies and Transport & Environment Studies, directed by John Roberts
Almost 100 copies of the report were sent to 85 agencies and individuals in August 85, with a request for comment. 18 responded in writing and 3 commented briefly by phone. CILT and TEST are most grateful to all who took the trouble to reply. The written responses are reproduced alphabetically on the following pages.

There are three types of comment: supportive, constructive criticism, and those where the reader had evidently misread the report. All are valuable. Those criticising show that certain aspects were inadequately considered during the five months from commissioning to report printing. Where misreading occurs this usually shows a lack of clarity in the way the concepts were presented. A limited number of responses to the comments is given below, with the intention of improving on clarity.

The Civic Trust appeared to favour minibuses within the City, a point made in the report and critiqued by LRT. Their suggestion of a resumé has been implemented. The Trust's comments about weekend activities in the City are apposite, for little was incorporated on this aspect in the report.

The English Tourist Board referred to reasons for commuting by private car in the face of excellent public transport. It should be realised that a high proportion of these are company provided or subsidised cars; in some cases the company requires their use, in others the subsidy clearly makes them cheaper to the user than public transport. Furthermore, many companies provide free parking facilities. A thorough reform of company car taxation and of free parking could change this overnight.

The Licensed Taxi Drivers' Association not unreasonably felt threatened by the proposals. Essentially we feel that the position of taxis, within the proposals we make, needs much thought and apologise for not having done so sufficiently in this report. We have to be careful that taxis do not conflict with the environmental, economic and social objectives we sought to meet; the LTDA response is in conflict with some of these objectives, while containing some very interesting observations (which, nevertheless, we would like to have the opportunity to verify).

In discussion which amplified their printed comments, London Amenity & Transport Association (LATA) pointed to a poorly explained section which may have troubled other readers. Paragraph 3-04 quotes 20 511 motor vehicles having a City destination or travelling through the City in the morning peak. This refers to the three-hour period 07.00-10.00. Paragraph 3-07 talks of 11 717 terminating in the City in the morning peak hour; the data are derived from a 10% sample household survey in the 1981 GLTS. Table 3-3 on the other hand shows 34 440 people travelling to work by car: of course, this can take place at any time of the day. LATA also expressed concern about the hypothesis ('a good physical environment is a good economic environment'), and suggested further research was required. They proposed a 'round the City' bus service. They noted the report contains 'no evidence of damage to the City's economic performance from poor traffic environment' (in fact it is stated in the report that this could not be considered at that stage of the research).

London Regional Transport were concerned that there would be additional congestion on the approaches to the City: our assignment exercise demonstrated that this would not be a major problem. Furthermore, to ensure the efficient movement of buses we argue for continuous and enforced bus lanes on all routes, particularly those on the approaches to the City. Phase 3 could be a long way in the future, and our suggestions for that time would doubtless have gone through many reconsiderations. On the streets from which we propose exclusion of buses, Cheapside/Poultry
only requires a minor diversion via Queen Victoria Street - if this really were unacceptable Cheapside is broad enough to blend buses and pedestrians. Removal of buses from Fenchurch Street was LRT's own suggestion. Removal from Threadneedle Street is essential to allow our proposals for the Bank junction to work satisfactorily. Broad Street pedestrianised allows a direct pedestrian link between Liverpool Street and Bank - one of the heaviest flows of walkers in the City. Finally, Barbican was not covered in any detail as it was not one of the three study areas.

Dr Turner of Polytechnic of Central London offered some useful comment on the economic aspects of the study and the morass that will appear, in planning terms, when the Greater London Council disappears next April Fool's Day. He rightly notes that the enforcement of parking regulations is an absolutely key issue, as is the ability of low public transport fares to achieve restraint. If both of these policies could be promoted strongly, many congestion problems would disappear; under the present political climate neither seems remotely likely. This climate can be expected to change with a change in government, particularly one that identifies with European urban transport practice. He criticises TEST for being 'a little obtuse and technical at times...' and he would 'like to have seen more on financial appraisal'. We can only offer our apologies.

The Smithfield Trust talked of complacency within the City; in an earlier letter (not reproduced here) they said 'At first sight the report seems to be a very thorough analysis of the problems of the City, and makes sound suggestions which in any rational world ought to be accepted. The snag is that the City is not such a place...the City Corporation's policies are uniformly 30 years behind the times because of the political unaccountability of its members and the fact that they represent the very section of the community which has most to gain from property development and most to lose from restraints on private cars (note that the Guildhall has a huge underground car park for members of the Corporation!).' This earlier letter also recommended discussions with big financial institutions within the City, something which regrettably did not take place. The Institute of Bankers, Livery Companies, Institute of Chartered Accountants...were all asked to respond but none did.

Finally, the City of London did not have time to respond (though the Transport Committee may do so in due course), but ordered two more copies and felt the TEST report might influence revisions to the Local Plan taking place at that time. The Dean & Chapter of St Pauls appeared not to be interested in what went on outside the Cathedral. And, the GLC noted that the '76.8% of car users entering in the morning peak who did not use their vehicles again during the day' was from the 1981 GLTS household surveys, not the GLTS model, and it was offered to, rather than commissioned by, TEST. Figure A4 in the TEST report 'is no more detailed than the STEM network' whereas the GLC would have liked to have seen their work more developed.
COMMENT ON

THE ACCESSIBLE CITY

- An inspiring piece of work. It is Utopian and at the same time practical.
- It shows that if a relatively small number of people could be persuaded to forego the privilege of driving to work, the city could become a much more attractive place for everyone.
- The city is clearly a place where there is not the faintest hope of ever meeting the demand for road space. It can choose the level of suppression it wants. The present level of suppression (achieved primarily by congestion) benefits no one. A higher level of suppression, accompanied by measures to improve public transport would present opportunities for improving the environment dramatically. These opportunities are persuasively presented in a series of 'could be' illustrations.

[Dr John Adams, Department of Geography, University College, London]

17.9.1985

THE BRITISH TRANSPORT OFFICERS’ GUILD

Room 204/205, East Side Offices - Kings Cross Station - London N1 9AX - Tel: 01-837 0782

Ours: C11/2162
Your: 11 September 1985

John Roberts
[David Smith (CILT)]
177 Arlington Road
London NW1 7EY

Dear Mr. Roberts,

"The Accessible City" Report

Thank you for the report, which we read with great interest.

As a transport management staff trade union, we welcome any move which seeks to rationalise the transport problems of London, and which advocates the replacement (in some respects) of the motor car by public transport, either bus or rail.

It has long been our views that the capital needs an efficient and effective public transport system, and your report very adequately addresses the problem.

We sincerely hope it is taken seriously by the relevant authorities.

Yours sincerely

[Signature]

Graham Briggs
Assistant Secretary
CIVIC TRUST

17 Carlton House Terrace London SW1Y 5AN 02/09/1985

20 September 1985

John Roberts Esq BA Dip Arch RIBA MCIT
TEST

Dear John

THE ACCESSIBLE CITY

I’m sorry we haven’t written before to thank you for our ’consultation’ copy of this report, but we are understaffed.

The new provisions do not have time to read the report but we do know this in mind, please, when you read what I have to say. The comments are more in the nature of informal, personal than formal ones.

1) Provisions for pedestrian traffic

No doubt it says somewhere in the report that far more journeys in the City are undertaken on foot than by any other mode. Any report which underlines, as yours does, the miserable amount of pedestrianisation or pedestrian-priority designation which has taken place not only in the City but in Greater London as a whole, deserves welcome, commendation and support.

Though conditions in London make pedestrianisation etc. difficult, so did they in other large cities where it took place long ago without apparently paralysing business and trade.

2) Vehicular traffic

At the same time I think I detect a slightly idealistic and impractical approach to the problem of car traffic. We all know how absurd it is that so much roadsapce should be taken up by vehicles often carrying only one passenger but some, possibly most, of these have very good reason to be where they are. Certainly if attractive public transport is provided, the number of cars may be reduced, but it is difficult to see how it can ever be eliminated entirely in certain main arteries, which the report appears to suggest.

3) Buses

The report notes that existing services, though quite good, are not very well patronised, and suggests this is due to delays due to traffic congestion. No doubt this is correct. I am not sure whether the report considers (if only to discard) the possibility of introducing much needed electric, mini-buses, running short-to-long shuttle services across the City from points just outside it, e.g. perhaps Liverpool Street to London Bridge, Waterloo to Clerkenwell Green, Trafalgar Square to the Tower. This is one area where the traditional disadvantages of conventional battery-powered vehicles might not apply and after all the City institutions themselves use them for (presumably) sound commercial reasons.

This incidentally might get over the difficulty that the existing road network in somewhat conservative and doesn’t conveniently provide for all reasonable demands – e.g. to get from Trafalgar Square to Clerkenwell Green by any form of public transport (other than taxi) takes an absurdly long time – I would guess about 40 minutes.

4) Presentation

is fine as far as it goes, for a technical report, but I fear the proposals won’t get the discussion they deserve unless your clients can get these patted and promoted in the form of a lively illustrated presentation setting out the options and perhaps illustrating how far London is lagging behind other cities. Maybe this exists and we have missed it?

5) Weekends

I am not sure whether the report looks hard enough at the weekend situation, which of course is quite different from the weekday one. Cheapside at least ought to have quite a future (ironically in view of its situation at the heart of things) as a kind of weekend-only ‘out-of-town’ shopping centre – and of course the tourist potential is enormous. I dare say your proposals could accommodate this and might even be strengthened by it, but I am not sure whether you say so.

I ought to add that I went to school in the City and have been using Cannon Street Station daily for 27 years. I am also a freeman (though not a liveryman) of a City Company. So I am not entirely a foreigner!

With best wishes,

Yours sincerely,

ARTHUR PERCIVAL MB E BA FSA
Dear Mr Roberts,

Mr Waldegrave has asked me to thank you for your letter of 6 September enclosing a copy of 'The Accessible City', which he has noted with interest.

However, as the report is also intended to be a response to the City of London Draft Local Plan, which could eventually come before the Secretary of State I hope you will understand it would be inappropriate for the Minister to comment on it.

Yours sincerely,

A G Donney
Private Secretary

John Roberts Esq BA DiplArch RIBA MCICT

DEPARTMENT OF TRANSPORT
2 MARSHAM STREET LONDON SW1P 3EB
01-212 4444
My ref: C/PSC/12685/85

Dear Mr Roberts,

Thank you for your letter of 6 September enclosing a copy of 'The Accessible City', which I have noted with interest. Thank you for sending me the report.

As the report is also intended to be a critique of the City of London's Draft Local Plan, which could eventually come before the Secretary of State for the Environment, I am sure you understand that it would be inappropriate for me to comment.

Yours sincerely,

[Signature]
1st October, 1985

John Roberts
TEST
177 Arlington Road
LONDON
NW1 7EY

Dear John,

THE ACCESSIBLE CITY

Thank you for sending me a copy of your report on The Accessible City, which I have perused with interest, although time has prevented a more detailed examination.

The general objective of reducing traffic to allow increased pedestrianisation and an improved environment is clearly in the interests of tourists, residents and people working in the city. We have little direct evidence of tourist modes of travel in the city area although clearly a high proportion use public transport of one form or another. A survey of visitors to St. Paul's showed only 16% of visitors coming by car, van or other forms of personal transport. I would not have expected any major differences to occur at other tourism sites in the city.

Whilst the objectives are therefore supported in principle, I think there may be considerable problems in achieving that objective. You make a telling point that 16% of cars brought into the city remain parked all day, and that a substantial reduction in that proportion could well ease traffic congestion at peak hours. However, you also point out that the city has an excellent public transport service. Anyone choosing to drive into work therefore must either feel that there are substantial advantages in using his own car in terms of cheapness, and ease of transport, or be averse to public transport. I would have thought that people already highly motivated in this manner to bring cars into the city will not easily be dissuaded from continuing to do so.

There are of course a number of other trends affecting traffic in London. The growth of tourism, particularly overseas tourists to the city, includes an increase in group travel and consequential increase in tourism coaches within the city area. It is interesting to note however that in the St. Paul's survey only 3% of visitors actually arrived in tourist coaches. Perhaps more significant has been the increase in commuter coaches which have resulted following deregulation of coach operation. Again these vehicles presumably come into the city and remain parked all day, aggravating an already serious problem of shortage of coach parking space. Commuter coaches are likely to increase as a result of further deregulation and a move away from the very low fares policy previously adopted by GLC for public transport in the area.

Finally, I welcome the preparation of the report by TEST and the initiative of CILT in commissioning it as a useful and thoughtful contribution on a complex subject.

Yours sincerely,

Geoff

GEOFF BROOM
Head of Development Planning

c.c. Robert Chenery, LVCB
The office of
From ALAN GREENGROSS
LEADER OF THE OPPOSITION
GREATER LONDON COUNCIL.
THE COUNTY HALL SE1 1PR
Phone 01 633 3504

6 September 1985

John Roberts, Esq.
VWT
177 Arlington Road
LONDON
NW1 7EY

Dear Mr Roberts,

Alan Green Gross has asked me to thank you for your letter of 21 August and the enclosed report “The Accessible City” which he has read with interest.

Yours sincerely,

Susan Ramsey

Personal Secretary
to the
Leader of the Opposition

Please reply to:
Tony Howell / Secretary
Tress House 3 Stamford Street SE1

October 3rd 1985

Dear Sir,

We thank you for your letter of 21 August, enclosing a copy of your report “The Accessible City” and it is noted that you require observations by 16 September.

We regret that we do not have the resources nor the time to which to give adequate study to what seems to be a full report on a very important topic.

Yours Faithfully,

G W Mills
Senior Deputy Secretary

The Accessible City

The Accessible City provides the most telling arguments yet seen about the importance of planning for pedestrians in London, and for local authorities adopting positive policies for this purpose. It demonstrates that the City of London, on which it concentrates, would operate more efficiently with streets made over to pedestrians on a wide scale. 90% of City workers arrive by public transport and must then walk to their offices. Most then walk about the City on business and to lunch. There is scarcity of open spaces for them and the condition of streets for walking is disgraceful. Needless to say as a result of this the City has the second highest number of pedestrian accidents in London, although in many places without pedestrian crossing pedestrian flows are between 2 and 12 times the volume that justifies them. The measurement of the street’s inadequacy for pedestrians tells the same tale.

The report’s tables are full of basic statistics of which little is usually seen.

The plan for the City to remove traffic from the Centre and concentrate it on four main roads needs full assessment because of the effects on surrounding Boroughs. But it is the right approach. There needs also to be more emphasis on improvements to public transport services without which the scheme would not be as effective.
T.S.T.,
177, Arlington Road,
London, N.W.1. NT.
12th September, 1981.

Dear Sir or Madam,
The Accessible City.

While agreeing with your desire to discourage private car usage within the City in favour of public transport I cannot agree with some of your conclusions and proposals for future development.

Your comparison of the City with other conurbations could be misleading to those who are unaware of the vast numerical differences in comparison to taxis licensed to operate in London. Furthermore the methods of operation within the City have not been fully understood. Large numbers of radio-controlled taxis operate within this area both day and night. Their function is to provide a door to door service for both passengers and deliveries, frequently of valuable documents and equipment, and any proposals which would hamper these operations would be vigorously opposed.

Your proposals for pedestrianised areas and “go slow” areas would certainly inhibit picking up and setting down passengers. These passengers, I remind you, are the growing army of professional and managerial staff whose time is extremely valuable. They demand the most efficient transport facilities and would not be tempted onto the bus network, during working hours, even if its efficiency could be radically improved. I also doubt they would appreciate the inconvenience of walking to the nearest reasonable pick up point, should their office be located in a pedestrianised area in our frequently inclement weather.

You have mentioned freedom of access for disabled vehicle users but unfortunately overlook the vast numbers of disabled passengers who use taxis regularly. The highly successful and rapidly expanding O.L.C. taxi-card scheme demands that taxis should also enjoy this freedom of access if their disabled passengers are not to be disadvantaged.

Your proposed “third phase”, as described in Paragraph 4–5, has omitted to mention taxis at all but strangely appears to supplement them with “mini buses”. Since the failure of AMO to obtain a license to operate minibuses their future function within the City is purely speculative and should have no place within your document. However, taxis have a proven role and their omission, I must assume, is an error.

Paragraph 11th makes several unjustified statements regarding taxis. Here taxis within the City are not effective and must operate elsewhere. Taxis are not expensive and operate wherever and whenever they are needed. Furthermore the current fare structure is eminently “equitable” as can be demonstrated by the large number of hires in “deprived” areas such as Brixton. Indeed Brandt’s O.D.T. taxi rank is one of South London’s busiest.

Whilst the recent Transports Bill provided for taxi-sharing it is not envisaged that this will become the norm. Short of operating scheduled routes, impossible without direction of labour, there is no question but that the majority of hires will continue to be for exclusive use. It is not the intention of the taxi trade to compete with London Buses Ltd within the City. However there may some scope for taxis to operate as an alternative for commuters during the peak periods on a shared ride basis.

The fact that no overall taxi policy exists suggests that a London Taxi Board could usefully be instituted with a City sub-committee.

I am sceptical about your plans for Bank Junction. It is my experience that during peak hours, pedestrians will not willingly comply with crossing facilities or signals. However I would welcome measures which may improve road safety.

I am in complete agreement with your views on the nuisance value of tourist and commuter coaches. They duplicate existing services and the lack of off street bus stations and parking facilities add an unwelcome burden to already congested thoroughfares.

I hope my comments are helpful to your consultation. Should you require assistance with any future studies of London’s transport I shall be pleased to oblige. You might also find a visit to the LTDA’s subsidiary Computer Check provides a useful insight into the trade’s future.

Yours faithfully,

John Berry
Chairman

World Transport Policy and Practice
Volume 24.3 Oct 2018
Dear John

"THE ACCESSIBLE CITY" - A REPORT BY TEST FOR CILT

Thank you for sending me copies of this report, under cover of your letter of 21st August, and for the extra few days in which you have allowed me to reply. The views expressed in this letter represent those of both LRT and LRL.

As regards the principle of the report, we are obviously in favour of measures intended to facilitate the movement of buses and of pedestrians whether on or off buses. We agree with the ultimate objective of cleaning the City (or at least its core) of all traffic during certain hours except pedestrians, cyclists, buses (and perhaps minibuses), disabled persons and emergency vehicles. This is provided, of course, that due attention is given to the needs both of essential access and servicing trips and of City residents and workers.

LRT accepts that some bus stops could be better sited (p.56 - Summary and para 4.14 'BUSES') in relation to pedestrians' needs, but at present we are severely constrained in their location by narrow, congested streets and the need for safe movement for all types of traffic, both through and local, as well as buses and pedestrians; at present it is an unsatisfactory compromise. Less traffic is a prior condition for better located stops.

THE PROPOSED SCHEME

PHASE 1:

The Report suggests that Phase 1 could be operational within a year (para 4.06 p.66) but on this I have reservations. The City, as you are no doubt aware, argue that the completion of ring roads (especially the Little Britain Link to London Wall via Holborn Viaduct) are essential before any step, such as Phase 1 of your proposals, is introduced. On this I would tend to agree since the potential impact of such a scheme, without the public being made aware of convenient alternative routes, might have a far more detrimental effect on the environment than any of the City's existing problems. The success of the scheme must surely rest on it's initial impact and the maintained support for it by the general public.

LRT are concerned that when this stage is implemented, further traffic congestion will result especially on the approaches; buses must be protected by priority measures at points where additional traffic queues will form. The situation for buses is already serious without further congestion - particularly when it is suggested that this stage may last from one to two years, during which time it is hoped some private car users will switch to other modes of transport (ie: when the bus service must become more attractive not less).

PHASE 3:

Following discussions with myself and with representatives of LRL, I am pleased to see that you have noted our comments on some of the more controversial proposals and that these have been dropped. However, what causes us most concern is the suggestion that at this stage "run-down bus services would stop at the boundary of the City giving way to a network of special City - Centre buses". We would resist this since:-

1) given passengers' strong dislike of changing buses, and the many through passengers (eg: to/from Kent End destinations) who would have to change twice, we would be most concerned not to force passengers to change unless absolutely necessary.

2) It would represent an extravagant use of resources by reducing the proportion of running time to stand time;

3) there would not be the space physically for two lots of buses to terminate and stand; it is most improbable that off-street terminals could be found, and we from experience that the City is strongly opposed to on-street stands, and

4) we have few enemies well placed for this "in-City" Link.

continued on page 11
Having said this, I wish to return to your proposals for Phase 2, in which a number of issues arise.

**Phase 2**

It is LRT's opinion that restraint in the City hardly seems possible without introducing measures for the whole of the West End: this issue is emphasized above when discussing special 'City-Centre' buses. I now understand, however, that you are moving onto a study of South Camden.

Another point that must be stressed is that the concept of ease of access must be applied to buses as well as pedestrians, as you indicate in the third paragraph of your covering letter but seem to lose sight of in the report. Our view is therefore that a satisfactory scheme must be based on the principle that buses should continue to use streets which they use at present (except Flinthurst Circus when Liverpool Street Bus Station opens).

On this principle LRT cannot accept the loss of Cheapside/Poultry, Fenchurch Street, Threadneedle Street and Old Broad Street. We would also like to see the designation of further streets for continuing bus use (these being Houndsditch, St. Botolph Street, Minories, South Place/Elydon Street and Cheapside Lane). I do not, however, rule out the possibility that alternative routes might be found, an detailed assessment to be no less favourable, for through and originating bus passengers and for bus operating costs, than existing streets – but such cases are likely to be few and far between.

As regards Cheapside/Poultry, I note from CILT's letter dated 29th November, 1984 (to the City Architect and Planner), in which, they objected to the City's Draft Local Plan, that a number of 'Bus and Access Only' streets were proposed, including Cheapside. It is unfortunate that in the present report City's proposal Cheapside/Poultry are now shown as one of the 'fully pedestrianised' streets. Although LRT appreciate the potential for economic improvement of these streets, we feel that they are generally wide enough to permit a considerable measure of enhanced pedestrian provision without losing a two-way bus way of 5 metre width through the centre. The loss of these streets would allow plenty of room for pedestrian movement and for attractive but safely located street furniture (such as did not happen in Poultry Street development). It is our opinion and as such, it will be aware that there is much evidence to support it both nationally and internationally – that bus operation is compatible with the safe and effective functioning of otherwise pedestrian areas.

In conclusion Houndsditch and St. Botolph Street, LRT wish to continue to use these routes since we feel that Cannon Street/Bevis Marks and Aldgate, their existing parallel streets, could not cope with the probable extra diverted traffic flows.

Some further specific issues arise out of your proposals.

**Rank Road intersection** (p.70 and p.4-25 p.75)

I agree that given lower overall traffic levels, pedestrians should have a greater allowance of total time at the Rank junction, but we feel that under existing conditions, that at worst buses should not be delayed more than at present. You have already suggested (para. 4-22 p. 75) that transponders be used to give buses priority at signalised junctions. A better solution would be to use them here and allow buses on arrival to have priority over pedestrians. Buses, taxis and cyclists could then all be phased together. Allowance at this junction should also be made for buses to enter and leave Cheapside and Threadneedle Street (see above).

**Cannon Street** (para. 4-32, p.62)

I am doubtful whether Cannon Street has the capacity to cope with both peak pedestrian flows and the extra diverted traffic including buses which you wish to see directed along it.

**Pedestrians at the Barbican Estate**

I am surprised you have given little attention to pedestrian movement on the fringes of the area of the Barbican Estate, where I believe the local Residents Association has been campaigning for improvements (eg: across Bevis Marks to Miller Street and across Cannon Street and at the Barbican Station junction). The very high rate of bus journey times which you quote (Para A-11 on page 96) again illustrate how difficult it is, because of the random incidence of congestion, for bus operators to provide a predictable and therefore reliable bus service.

A final minor point is that you state (para. 4-30, p.62) that BR proposes pedestrianisation of the eastern part of Liverpool Street. This is in fact a City proposal, but BR and LRT are quite happy about it.

Please feel free to publish this letter in the supplement mentioned in the last paragraph of your covering letter. I shall be sending a copy in any case to the City of London.

Should you have any queries on these points, or other issues arising from our letter, my assistants David Freeman (227-3561) or John Bowles (227-3707) would be glad to help. The former will be happy to meet you to discuss your early ideas for South Camden.

Yours sincerely,

P H Collins
Group Planning Manager
Dear John,

'The Accessible City'

Thank you very much for sending us the above report and for asking us for our comments.

The Pedestrians Association welcomes the TETF report in that it is a detailed examination of movement in the City of London packed with commonsense solutions for enhancing its value as a centre for work and tourism. We particularly welcome it in view of the fact that pedestrian flows in the City are the heaviest in London, possibly in the UK and the worst provided for, while noise and air pollution from motor vehicles (largely inessential traffic) are considerably higher than might be expected for the heart of most great cities.

The 'Accessible City' is well named. The achievement of access is the purpose of movement. It would be reactionary to plead a reluctance to impair the individual's freedom to use the transport mode of his/her choice in order to insist on a status quo which indirectly impairs the freedom of the majority to gain access with the minimum of disruption and danger to their places of employment and to tourist attractions.

A city, being a meeting place for people (especially one like the City of London whose existence depends on a population which so conspicuously exceeds and outstrips for five days out of seven) needs accessibility; otherwise it ceases to be effective in fulfilling its function. The extent to which it becomes inaccessibility is a measure of the extent to which the fulfillment of its functions is being sabotaged.

Good public transport is an essential factor in persuading people to leave cars at home and while access by rail to the City is comparatively good, buses, in particular, suffer from intolerable levels of disruption caused by both moving and parked vehicles. From statistics used in the report it seems that only 11% of journeys to work are made by car which causes problems out of all proportion. On average journeys to work are not used again until the 'owner' goes home. The spaces needed to store all these empty vehicles (entering, the PA estimates for less than one in ten of all those who work in the City) could be used for more economically and environmentally satisfying purposes, especially in an area so seriously deficient in open spaces.

The improvements outlined in the report which favour essential traffic (pedestrians, buses and service vehicles) whilst discouraging inessential traffic (motor cars and through vehicles) are to be applauded.

The Pedestrians Association therefore, bearing in mind that people on foot are the most important part of TETF's equation, warmly welcomes this imaginative and radical approach to problems in the City of London and urges its adoption as a first step towards improving conditions generally in our capital city.

Yours sincerely,

Felicity Rea (SECRETARY)
Comments on "The Accessible City", a report by TEST for CILT

Roy Turner
Transport Studies Group
Polytechnic of Central London

"The Accessible City" is a stimulating first stab at what is likely to be an area of increasing concern: the protection of London's environment through pedestrianisation measures and traffic restraint. The report focuses on the City of London; the rest of Central London awaits further examination.

The report considers the traffic and environmental problems of the City in relation to the substantial pedestrian movements therein. The study methods, and solutions proposed will probably raise questions as answers in the minds of the study's readers. In doing so the discourse will be articulated, and the basis of its arguments fleshed out. The thrust of the report is compelling, and the need for area-wide pedestrianisation convincing.

The fact of this has been recently demonstrated in London by what has become a major tourist attraction: Covent Garden. Not only does this follow similar success stories abroad – in Europe, North America and elsewhere as documented in the report – but also, like them, helps to establish the foundation for a firm argument: a better environment leads to a healthier economy.

Despite any economic advantages, such developments do not happen by themselves or through traditional market forces. A firm hand is needed to plan and implement area-wide environmental measures; here lies the role of the local authority. However, with the demise of the GLC in April 1986, strategic control of planning and transport matters will effectively be lost. The boroughs, under a regime of rate capping and grant penalties, will take a decidedy more parochial stance, whilst the government – retaining elements of strategic control – is not subject to local accountability, but concerned primarily with national issues.

Ironically, against this background, the Centre for Policy Studies has recently published a document (Policy Study No 72) which urges the Conservative party to adopt the transport strategy of the GLC as part of a new package of environmental measures.

The TEST report has a simple line of argument. If only non-essential motor traffic is allowed into an area, more efficient use of road space will result. This quite literally 'paves' the way for a better environment by pedestrianisation or by designating roads for certain traffic only. The economic improvements flow from the environmental: street cafes blossom and retail trade improves. This chain is rather tenuous, as the evidence is difficult to pin down. But TEST presents its case forcefully.

What makes TEST's case particularly convincing are pedestrians very pressing needs as evidenced by their movements, especially in journey-to-work trips. The staggering number of workers infusing into the City arrive predominantly by rail – either to BR's mainline terminals, or LT's underground – and then make the remainder of their work journeys on foot. The modal split profile of these commuters – as the numbers are quite atypical of British Cities as a whole. TEST should have made more of this by reference to comparative census data. The City's pedestrian journey-to-work flows, along with the need for recreational lunchtime spaces for workers, clearly establishes the relevance and importance of more extensive traffic management and pedestrianisation.

The feasibility of fully implementing 'Phase 2' of the report's recommendations would appear to hinge on the traffic volumes which adjacent areas would have to accommodate. I would have liked to have seen more details on the assignment model and data assumptions underlying the impact analysis. Nevertheless, the key question is: can car traffic be adequately restrained in Central London, and to a lesser extent in Inner (and Outer) London?

I would like to have seen more details on illegal parking in Central London (the reference in Section 3.45 is insufficient, I felt), and some data on the effectiveness of the recent very successful wheel-clamping experiment. Under a more vigorous restraint scenario, enforcement of car parking offences becomes more crucial.

continued on page 14
On the flip side of the coin - the 'carrot' approach - restraint on car traffic is also possible by improving public transport. Recent events in London, particularly low fares and travelcards - have demonstrated that commuters will indeed switch from car to public transport. The latest GLC/LRT Travel Diary Panel has shown that since autumn 1982 journey-to-work car use has fallen by 17%, whilst public transport work trips has increased by 20%. For all trip purposes, underground passenger miles increased by 44% between 1982 and 1984, and bus by 13% according to LT/LRT's annual reports. This shows that the traffic restraint levels considered in the TEST report are quite feasible, propositions which may have appeared impractical just three years ago. It is a pity TEST did not quote these figures in their report.

Unfortunately, the TEST report suffers from being a little obtuse and technical at times, which may lessen its impact. Thus, "CBD" - a term unfamiliar to the lay reader - is undefined. Reference is made to the "GLC model" without stating what it is. Pedestrian density flows are first referred to as 'levels 1 to 7' without defining this scale in the text when first mentioned. Some of the figures could have been improved. For example in Figs 3.23 to 3.25 the shading chosen does not make it easy to appreciate the 'density' of the problem at a glance, and the categories 'crowded' and 'impeded' appear indistinguishable in the key. Figure 4.19 is unclear: no roads are referred to. The derivation of Figure 4.1 should have been spelt out more clearly, and the 'result' for the car appear implausible - certainly for long distance travel. The reference to 'Phase 3' is confusing and unnecessary; it is defined only in the depths of the text and not in the introduction and concluding paragraphs. I'm not sure that the balance is quite right concerning the level of detail: the 'grand plan' tends to get bogged down in minutiae.

I would have liked to have seen more on financial appraisal. Pedestrianisation has been costed out, and the sums involved seem minimal. Added to these should be the cost of traffic management, enforcement, and some indication of the costs of wider restraint measures outside of the City itself. All of these costs, on the face of the evidence presented concerning similar schemes elsewhere, would appear to be outweighed by the benefits. If street-level trading increases anything like what has been experienced elsewhere, then a very modest rate increase would justify the costs very rapidly. Street cafes and the like would increase rates revenues in any case.

The 'Accessible City' is a commendable effort within the project's logistic constraints. It will be an invaluable reference for those investigating such possibilities further. Let's now consider the scope for the West End...
30 September 1985

Dear Mr. Roberts,

'THE ACCESSIBLE CITY'

Unfortunately it has not been possible to study the document in a sufficiently thorough way for the Commission to make a formal comment. However, I have personally studied it in part and must complement you on its thoroughness. Such a document must be welcomed in order to stimulate thoughtful discussion on this important matter. The Commission has for a long time supported the need for retail street pedestrianisation and would, I am sure, welcome a comprehensive bus lane system enabling the provision of a more attractive public transport system.

I am sorry that I am unable to comment further as a complete understanding of your three phase proposal would require much closer study.

Yours sincerely,

Richard Coleman
DEPUTY SECRETARY

John Roberts Esq.,
TEST,
777 Arlington Road,
LONDON,
NW1 7EY.
Dear Mr. Roberts,

"The Accessible City"

Thank you for sending me a copy of this report. Not only is it a very timely contribution to the debate on the new draft city local plan, but it represents perhaps the most important new thinking on the city's transport priorities in more than a generation.

The city is an ideal candidate for a radical change of direction in this area. For more than 30 years it has pursued a strategy of diverting traffic away from its centre without any effective policy to constrain it. The environmental and financial cost of this strategy has been huge, with scores of shops, cafes, low-cost business premises and others - many in conservation areas - demolished, including the Coal Exchange and even a wine bar, pulled down in 1972 for the Northern route. Many more have been damaged by traffic or have their surroundings wrecked.

It is ironic that in so compact an area, where the need for face-to-face meetings is high, life is so difficult for the pedestrian. Shoppers and public alike stand to gain a great deal from a better deal for those on foot.

The report documents the consequences of such a policy and challenges the city to justify them. They make sorry reading:

- poor or non-existent pedestrian facilities despite the second highest pedestrian flows (and casualties) in London;
- poor bus facilities (only one short bus lane in the city);
- the high level of unnecessary car journeys (over 77%); and
- the noise and disturbance caused by excessive traffic.

We heartily endorse the report's analysis. In our area we have discovered an unfortunate degree of complacency on the part of the city engineer's department towards pedestrian improvements and road closures, although one of two long-promised road closures in Little Britain is now under way, experimentally, 6 years after it was first proposed. Another seems to have been quietly abandoned.

The report also takes the opportunity to test the hypothesis that as good physical environment is a good economic environment. There seems to be ample, if anecdotal, evidence of this from other quarters, and we see it as the key to persuading the city authorities and businesses of the need for radical changes in policy.

We believe such changes may find unexpected allies among traders, office workers and even property developers, who have an obvious interest in increasing land values. The implementation of traffic restraint measures would be very likely to have this effect, since (to take one example) office premises near busy roads and without air conditioning would become lettable, and demand for ground floor accommodation would increase.

There is therefore a need for the environmental movement in the city to broaden its base and evolve a political strategy for implementation of the ideas contained in the report. For that reason, there may be value in seeking resources to expand the report so that the consequences of its proposals could be considered in more detail. We shall be happy to participate fully in such an exercise.

Yours sincerely,

G.E. Allan
Chairman

NOTE BY TEST: The original of this second letter from the Smithfield Trust was lost in the post, so this is a copy to which the Trust's letter heading was attached.
John Roberts  
Director  
TEST  
177 Arlington Road  
London NW 7EY.  
8 October 1985.

Dear John,

Report for CILIT: The Accessible City

Thank you for your kind request, asking us to comment on your new report.

We all want pleasant surroundings. A chance to relax and enjoy the environment and others' company are basic elements for a humane society. Civilisation should not have to be associated with pollution, noise and danger.

The rewards - and the obstacles to action - are of course most pronounced in major towns and cities, with their high traffic density which reflects the intensity of activity and yet is one of the principal causes of environmental damage. All too often in cities, obstacles have been regarded as insuperable, and talk of improvements has meant just that - talk.

So we consider THE ACCESSIBLE CITY's most important achievement is to show, in clear, practical terms, just how straight-forward it really is to reduce traffic density - even in one of the busiest urban centres in the world - and produce a traffic-free and attractive environment worthy of a capital city. We also agree with your cogent arguments that a better physical environment can mean better business and a healthier economy.

We commend THE ACCESSIBLE CITY, as a vital blueprint for serious city planning and development.

Yours sincerely,

Susan Boyle  
Executive Director
AGENCIES AND INDIVIDUALS TO WHOM 'THE ACCESSIBLE CITY' WAS SENT

Adams, Dr John
Association of London Authorities
Associated Society of Locomotive Engineers and Firemen
Automobile Association*
Brewers Hall
British Rail
British Road Federation
British Tourist Authority/
English Tourist Board
British Transport Officers Guild
Campaign for Homes in Central London
Capital
City of London Corporation* and Lord Mayor
City of London Police
City of London Retail Traders Association
Civic Trust
Dyers Livery Hall
Environment, Department of the
Farrell, Terry
Federation of London Dial-a-rides*
Fishmongers Livery Hall
Freight Transport Association
Friends of the Earth*
Greater London Council*
Members: P Moore, D Wetzel,
A Greengross, K Livingstone
Hamer, Mick
Institute of Actuaries
Institute of Bankers
Institute of Chartered Accountants
Krier, Leon
Licensed Taxi Drivers Association
London Amenity & Transport Association
London Boroughs Association
London Boroughs of Camden*
Hackney
Islington
Lambeth
Southwark
Tower Hamlets
Westminster

London Buses Ltd (in LRT response)
London Chamber of Commerce
London Cycling Campaign
London Regional Transport
London Regional Passengers Committee*
London Tourist Board
Mercers Livery Company
Metropolitan Police
Middle Temple*
NALGO
National Union of Railwaymen
Parliament, Members of:
Tony Banks, Lynda Chalker (see DTP), Frank Dobson, Gwyneth Dunwoody, Simon Hughes,

John Prescott, Jo Richardson,
William Waldegrave (see DoL)

Pedestrians Association
Royal Automobile Club
Royal Fine Art Commission
Royal Institute of British Architects*
Royal Society of Arts*
Royal Town Planning Institute*
St Pauls Dean & Chapter*
Salters Livery Hall
Smithfield Market Tenants Association
Smithfield Trust
Spitalfields Market Traders Assoco
Stationers Livery Hall*
Stepney Street Market Tenants Assoco
Stirling, James
Town & Country Planning Association*
Transnet
Transport, Department of
Transport 2000
Transport & General Workers Union
Transport Salaried Staffs Assoco
Transport Studies, Imperial College
Transport Studies Group, University College London
Transport Studies Unit, Oxford
University

Bold entries indicate written response
* indicates unfulfilled intent to respond, brief telephone apology, etc.

TEST publication no. 66
October 1985
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The 1992 Beckton Travel Survey

A study of travel patterns in Beckton before the opening of the extension of the Dockland Light Railway

A report for London Transport and the Commission of the European Communities

TEST

MTRU

The Open University
The Beckton Travel Survey

A study of travel patterns in Beckton before the opening of the extension of the Docklands Light Railway.
A report for London Transport and the Commission of the European Communities

by
Dr Stephen Potter
September 1993

ABSTRACT

This is the fifth study in the Trip Degeneration series, the long term aim of which is to identify ways in which the demand for travel can be reduced and modal shift permanently effected from cars to 'greener' forms of travel.

It is hoped that with additional case studies it will be possible to further isolate the key influences on travel patterns and inform the use of land use planning to encourage the use of more energy efficient and environmentally benign travel. The study in Beckton had the additional objective of providing London Transport with base travel pattern data in an area shortly to be served by the extension of the Docklands Light Railway DLR.

The area surveyed has good pedestrian access to shopping, primary schools, health and a variety of other local facilities. A high proportion of everyday journeys are subsequently by foot. There are strong links to the area immediately to the north in Newham, which will not be served by the DLR extension. Subsequently, it appears that the DLR will have little impact upon existing travel patterns. The major exception involves work trips to Central London and Docklands itself, most of which is already by public transport.

However, in the long term, the opening of the DLR and associated development of the nearby Royal Docks and Gallions Reach will affect job and leisure opportunities and is likely to produce a structural shift in travel patterns which had the potential to reduce car dependence.
Published by The Centre for Technology Strategy, The Open University, Walton Hall, Milton Keynes MK7 6AA

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ISBN

Work on the 1992 Beckton Travel Survey was begun by the TEST team of John Roberts, Sheena Maclean and Chris Wood. It was completed and this report written by Stephen Potter, in conjunction with the transport research consultancy MTRU, including Keith Buchan and Matt Beale Collins.

ACKNOWLEDGEMENTS

London Transport for their financial contribution towards this study

The Commission of the European Communities for their financial support to this and four other Trip Degeneration studies.

Dr Alan Sturt and students at Westminster University, who undertook the fieldwork in Cyprus, West Beckton.

The Open University Technology Faculty who provided a grant for transferring the information on this and other Trip Degeneration studies from TEST and to Chris Wood for his advice on this process. Thanks are also due to Dr David Wilson of the Open University's Academic Computing Service and Marcus Enoch in actually transferring the TEST Trip Degeneration database from one system to another.

Thanks are also due to the Trip Degeneration Advisers for their support and invaluable comments on the project and report drafts. The Advisers are:

Dr John Adams, University College London; Professor Monheim, The University of Bayreuth, Germany; Dr Alan Sturt, Westminster University; Professor Newman, Murdoch University, Perth and Dr John Whitelegg, University of Lancaster.

The Trip Degeneration project was initiated by Dr John Roberts, founder and Director of TEST.
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SUMMARY

The long term aims of the Trip Degeneration studies are to identify ways in which the demand for travel, and particularly trip length, can be reduced, and to effect a permanent modal shift from cars to ‘greener’ forms of travel. In order to address these aims, a series of 30 international case studies will be carried out which look at travel behaviour of people in different local areas in a number of countries with differing transport policies and cultures. In particular, emphasis will be placed on places that have introduced innovative local policies aimed at producing a trip degeneration effect.

By building up a detailed empirical data-base of how travel behaviour is influenced by different land use structures and densities, population characteristics, culture and travel facilities, it will then be possible to inform urban policies in which energy use and environmental destruction from transport are minimised. The study in Beckton had the additional objective of providing London Transport with base travel pattern data in an area shortly to be served by the extension of the Docklands Light Railway.

The area surveyed (the Cyprus area of Beckton) is a recent planned development of low-rise, inner suburban housing. Main roads are to the periphery of housing ‘clusters’ and local shops, primary schools and other facilities are within easy walking distance of all dwellings. Subsequently a high proportion of local trips are by foot.

The population of Cyprus has close links to the area immediately north and west - Stratford, East Ham and Barking, from which many Cyprus residents moved when the Cyprus estates were built. Many people work in the ‘Stratford-Barking corridor’ and it is an important destination for shopping, leisure and social trips. Travel to such destinations is by bus and car. The new DLR extension will not affect such trips.

With the exception of work trips to Central London and to Docklands itself, few trips are currently made to destinations to be directly served by the DLR. Most of these work trips are already by public transport so it appears that the DLR is unlikely to shift more than a tiny proportion of current car journeys to public transport.

However, the opening of the DLR, and the associated continued development of Docklands, will change the travel opportunities of Beckton residents. In the longer term, the provision of employment along the DLR may result in a shift from the established commuting patterns to Central London and the Stratford-Barking corridor. This could result in shorter, less car-oriented journeys. The overall picture is therefore one of the DLR Beckton extension likely to have little immediate effect in reducing car use combined with an unmet need for public transport improvements to the north, but in the longer term there is the potential for the DLR to effect a structural change to a less car dominated pattern of travel for Beckton residents.
CHAPTER 1: INTRODUCTION

1.1 The Problem

The problem of ever-growing motor traffic, particularly in and around towns and cities, has reached epic proportions and become a significant issue on political, energy and environmental agendas. Over the last 40 years Europe and all ‘developed’ countries have witnessed a ‘mobility explosion’. People are travelling more and further than ever before. For example, in Britain, the amount of personal travel undertaken has risen from less than 200 billion kilometres in 1952 to 600 billion today (Figure 1). Britons spend more of their disposable income on transport than before. In 1953, 7% of an average British household’s weekly expenditure was spent on transport; today it is nearly 20%\(^1\). Bovey et al (1992, p 5) cite 15% as the 1985 European and USA average with the Japanese spending only 9.5% of household expenditure on transport. As can be seen in Figure 1, most of the growth in travel demand is attributable to the rise in car ownership and its effect on the way in which people arrange their lives.

![Graph showing billion pass km from 1952 to 1990](image)

**Figure 1: The growth of travel in Britain since 1952**

Source: Transport Statistics Great Britain and National Surveys

\(^1\) Source Family Expenditure Survey, quoted in Potter and Hughes, 1990.
This growth in travel can be analysed in terms of two factors: firstly an increase in the number of journeys, and secondly an increase in journey length. Added to this are transfers from walk and cycle to motorised travel.

The growth in motorised traffic is also associated with feedback effects that have gradually increased the amount of travel that is necessary. Local shops are being replaced by the out-of-town hypermarket, retail warehouse and shopping centre; hospitals and schools are getting bigger and more remote; journeys to work are increasing in length. Although not entirely a product of more cars and better roads, better transport facilities have played a major enabling role in stimulating these economic and lifestyle trends.

Local access has declined, and with it the option to walk or cycle. This has not always been directly linked to increased car use, but a high level of car access has been one factor in enabling change to take place. City and town centre shops have probably fared better than suburban and local shops by competing with the new suburban and out-of-town shopping complexes by enhancing their advantages - pedestrianising their streets to provide an attractive street life and a diversity that the out-of-town shops cannot match. Caught in between the two, the local suburban shops have suffered most, ending up with motorised transport being increasingly required for access to either the town centre or out-of-town shops.

Trends in health care have also concentrated facilities into larger units (see Potter and Hughes, 1990, p21). In Britain, the one or two-doctor neighbourhood practice has largely been replaced by the health centre, with up to 10 doctors plus a wealth of other medical services. In this case local access has been traded for more remote, but better health facilities. Throughout the 1970s and 1980s many town centre hospitals moved to peripheral sites. Selling the often-outdated town centre site provided funds to build a good modern hospital on much cheaper land on the urban periphery. To some extent, poor access (in determining a cheap site) was almost a criterion. Schools have also become bigger with larger catchments, some even grouping into two or three-school ‘campuses’ in order to pool resources and to obtain facilities that an individual school could not manage (e.g. a fully equipped theatre, large indoor pool etc.)

Coupled with the greater dispersal of facilities has been a long-term trend to more dispersed settlement patterns. Lower density developments have been reinforced by lower densities of occupation as household size has declined. This is associated with long-term demographic trends in developed countries, which include fewer children; more young adults setting up home on their own rather than living with their parents; more divorces and separations; and longer life expectancy leading to an increasing proportion of one or two person ‘elderly’ households.

More dispersed and lightly occupied settlement patterns, although well suited to the car, provide very difficult operating conditions for public transport. It suffers a double blow: firstly it is used less because people have better access to cars; and secondly, the subsequent changes in our towns and cities lead to hostile operating conditions for public transport. This consists of lighter loadings spread over a large number of routes. Equally, reduced population catchments

2See TEST (1989) for a study of how several cities in Europe have managed this.
leads to the decline of local facilities. Access and mobility becomes polarised. Those with a car readily available have unparalleled freedom of travel. Those who do not have a car (particularly children, the old, women and people with disabilities) find themselves increasingly isolated. This process has been documented by several authors: Adams (1985) notes the loss of mobility suffered by many elderly people 'trapped' in their homes by hostile road conditions in their neighbourhood; Hillman, Adams and Whitelegg (1991) detail the increasing restrictions parents feel they have to place on their children due to danger from traffic. As Cleary (1992, p 154) notes, "ironically, while siblings are now ferried to school or recreational events by car rather than enjoying the freedom to walk or cycle, their anxious parents are actually adding to the threat to children posed by growing motor traffic." One of the significant conclusions of an earlier Trip Degeneration study (TEST 1991), comparing the car-oriented urban structure of Milton Keynes to the more walk/bike-oriented Dutch town of Almere, was the liberating effect of the latter to children and teenagers. Whereas in Milton Keynes a third of trips of 5-18 year olds was by car, in Almere it was only 5%.

Until recent years, most nations' response to traffic growth has involved 'supply-led' policies whereby government investment is used to increase road capacity roughly in line with traffic growth. For example, Britain's current roadbuilding programme is based on the 1989 White Paper Roads for Prosperity, in which road traffic is predicted to rise by between 83 and 142% by the year 2025, accommodated by a £17 billion roadbuilding programme. Although the bypassing of towns and villages is frequently cited as a justification for this programme, in practice bypasses amount to only 15% of the schemes in preparation. In contrast, 85% of expenditure is aimed at increasing motorway and trunk road capacity.

The credibility of this policy is beginning to crack. One reason for this is worsening road congestion, particularly in South-East England. The M25 orbital motorway around London, completed at a cost of over 1.3 billion ECU (£1 billion) in 1986, was congested on the day it opened. In September 1991 the government announced plans to rebuild it at a further cost of £2.8 billion on the basis that upgrading to 14 lanes (the widest motorway outside the USA) might help matters. The pro-Conservative Daily Telegraph dismissed this plan as a waste of money that "will ultimately have little effect on congestion" and highlighted the experience of Los Angeles, where it concluded that only "revolutionary methods involving a change in lifestyle will really ease the problem" (Hiscock, 1991). However, despite objections from local authorities seeking a coordinated planning approach, the government appears "anxious to press on with its plans, seemingly in the hope of getting things underway before it comes across more opposition" (Local Transport Today, 1993).

The widespread view that throwing money at congested roads will only create bigger, more congested roads is not simply media cynicism. Goodwin et al (1991) provide rigorous proof that "all available road construction policies only differ at the speed at which congestion gets worse" (Goodwin et al, 1991 p.111). Leaving aside the environmental concept of sustainability, traditional supply-led transport policies are physically and economically unsustainable, but politically, governments have considerable difficulties in accepting that the 'rationing' of car use is inevitable.

Thus recent trends in transport demand have created a concern as to where our high-mobility society is leading us. It seems to be producing economic inefficiencies and social divisions, and we cannot buy or build our way out of these problems. But added to such misgivings are political concerns over more difficult transport issues. In particular, transport has emerged as a major source of environmental pollution. Road traffic is responsible for over half of all nitrogen oxide pollution in the EC and 85% of carbon monoxide emissions (CEC, 1992). Probably the most severe long-term environmental threat of all is global warming and climatic change. Carbon dioxide (CO₂), is the most abundant 'greenhouse gas', responsible for around
50% of global warming. The Intergovernmental Panel on Climate Change (Houghton et al 1990)\(^3\) has estimated that emissions of CO\(_2\) must be reduced worldwide by at least 60 per cent in order to halt the net growth of this gas in the atmosphere.

Energy consumption for transport purposes is the fastest-growing source of CO\(_2\) emissions in most developed countries. For example, according to UK Department of Energy figures, transport in Britain has grown from being a relatively moderate consumer of energy in 1960 to the largest (and fastest growing) in 1990. Within the EC as a whole, transport consumes just under 30% of total energy used (CEC, 1992 p12). Such figures suggest that the transport sector should be prioritised for energy conservation measures.

As part of the 1992 Earth Summit agreement, Britain has announced a target to return CO\(_2\) emissions at their 1990 level by 2000. A number of other countries have a similar goal, including Canada, Italy, Belgium, Finland and Sweden. Germany plans a 25-30% cut in CO\(_2\) by 2005 (MacKenzie, 1993).

Containing emissions from cars, let alone reducing them, is a formidable task given the historical trend of rising car ownership and use. For passenger travel, Whitelegg (1993, p25) notes a preference in most discussions to technological solutions rather than lifestyle/behavioural changes. However, he notes that Hughes (1992) shows that one without the other tends only to produce a temporary dip in CO\(_2\) and has no hope of achieving even modest targets for CO\(_2\) stability or slight reduction. Such targets, he notes are well short of estimates of ‘sustainable’ emissions from transport. Overall, Whitelegg summarises the most promising measures to address CO\(_2\) from transport as:

- fuel economy; alternative fuels; reduced engine size and power; transferring to modes producing less CO\(_2\); land use and other changes to shorten journey length; substitution measures to allow journeys to be foregone; speed limitation; traffic management and traffic calming.

1.2 The Trip Degeneration Study

It is in the context of the above transport problems that the Trip Degeneration project has developed with the aim to identify policies that reduce travel need and promote the use of environmentally sustainable methods of travel. This is in order to develop the reverse of the traditional supply-led policies that have encouraged trip generation, i.e. policies that promote access with reduced travel need, or trip degeneration.

The Trip Degeneration project was initiated by Dr John Roberts of the consultancy TEST (Transport and Environmental Studies). In 1988 TEST, with the support of the Rees Jeffreys Road Fund in Britain, carried out a literature review (TEST, 1991). In 1990, TEST were commissioned by the Rees Jeffreys Road Fund to carry out a comparative study of car dependence in the English new town of Milton Keynes and the Dutch new town of Almere. The study was intended to compare their trip-generative characteristics, taking into account their respective land-use dispositions and residential densities (TEST 1991h).

That report became the starting point of a much larger international study, partly funded by the Commission of the European Communities, OECD, ECMT, the Anglo German Foundation together with contributions from the city and transport authorities of the areas surveyed. The Beckton travel survey was undertaken with financial assistance from London Transport.

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\(^3\)Houghton et al, 1990.
A report for the City of Berlin Senatsverwaltung für Stadtentwicklung und Umweltschutz became the third study, which describes the travel patterns of residents in two areas of eastern (ex East) Berlin, (Altglienike and Baumschulenweg) where car use was relatively low and public transport facilities excellent. The fourth study is of the Wilmslow Road corridor to the south of Manchester, examining the travel patterns for two residential areas of the city, (Rusholme and Withington) attempting to explain the travel patterns in terms of population characteristics, travel facilities, land use and culture (TEST 1992).

Following the death of Dr. Roberts in July 1992, and the subsequent closure of TEST, the Trip Degeneration project has been continued under the guidance of its group of advisers. It is administratively based at the Open University, under the direction of Dr. Stephen Potter with the close involvement of the transport research consultancy MTRU (Metropolitan Transport Research Unit).

1.3 Study Aims and Objectives

The longer-term aims and objectives of this study are the same as for the previous Trip Degeneration studies and as they will be for all others that follow. These are:

i) to examine ways in which motorised travel can be reduced;
ii) to determine how trip lengths can be shortened;
iii) to effect a modal shift to 'greener' modes of transport, located to the right of Fig 1

![Environmentally unfriendly modes](#) ![Environmentally friendly modes](#)

Aircraft Car (driver only) Car (full) Rail Bus Bicycle Walk

Figure 2: Spectrum of 'environment friendliness' by transport mode.

The aims are interrelated to the extent that, if trip lengths can be reduced, then travel demand will be reduced; this in turn will automatically encourage lower car and air use and travel by other, less energy (and environment) intensive means of transport.

In order to meet the aims of the study and to be positively influence policies that affect future travel patterns, it is first necessary to define and understand the relative importance of those variables which influence current travel behaviour; this is therefore the main objective of the study. The main variables are thought to be land-use and density, population characteristics (age, gender, income), travel facilities and culture (For details at a national level, see Potter and Hughes, 1990). This could be, in a very simplified way, represented as the equation:

\[
\text{Travel Patterns} = \text{population characteristics} \times \text{land-use & density} \times \text{travel facilities} \times \text{culture}
\]

These variables are not independent of each other, but they serve as broad headings to categorise the influences on travel patterns. Further objectives of the study are therefore to analyse each variable in the equation through information provided by land-use and travel surveys, in order to determine what typical travel patterns arise from a given urban structure and population. It is felt that this study will complement traffic and passenger studies undertaken by local authorities, Dockland Development Corporation and London Transport. Much work has already been done on predicting traffic growth from land use changes at the macro level, but the local 'micro' approach of the Trip Degeneration studies aims to show how
1.4 The Beckton Situation

Beckton lies to the south of the London Borough of Newham. It is basically a residential area between the old traditional docklands to the south and the East London centres of East and West Ham to the north. People have tended to move to Beckton from elsewhere in Newham, particularly when older housing areas have been demolished and redeveloped. West Beckton was developed from the 1930s, but East Beckton, of which the survey area of Cyprus consists of the southern part, has been developed over the past 25 years. It may be characterised as typical of recent planned inner suburban developments in London (or any major British city). Although most of East Beckton predates the Docklands development, begun in the early 1980s, a large new housing estate is under construction to the south of the new Beckton Docklands Light Rail terminus.

Fig 3: Beckton and the Royal Docks area

The survey area was Cyprus, bounded by Straignt Road, Cyprus Bypass and to the south of the District Centre.

East Beckton consists of three ‘clusters’ of housing at medium suburban densities in small estates of cul-de-sac roads. These are grouped around the East Beckton District Centre where there is a large Asda supermarket, health centre, church and community centre. There are two primary schools located in the housing areas with extensive provision of parkland, sports grounds and allotments, largely on the edge of the housing areas. East Ham United Football
Club's ground happens to be within the Cyprus area, the only facility that serves an area wider than Beckton itself.

The survey area of Cyprus consists of the housing area just to the south of the District Centre, with all dwellings within a 5-20 minute walk of the centre itself; a primary school and the football club are within Cyprus itself. The housing is a mix of private and public developments in a variety of styles, as is illustrated in Fig 4. Following a period of in-migration, the population is reasonably stable; In our survey, 70% of people stated that they were living in Beckton 3 years ago.

![Image: Housing in the survey area](image)

**Fig 4: Housing in the survey area**

Overall the area has better housing and is somewhat more prosperous than Newham in general and could be seen as a foretaste of the sort of development and population that will arise as the area develops further in the next 10 years. As such it is a very suitable area to survey for this project.

There is no employment within East Beckton beyond that in local services; nor is there a local secondary school, with the main school serving this area being about 2km to the north in East Ham. There is a retail and industrial park about 1km to the north of Cyprus, but most employment for Cyprus residents is either in central London (about 5-7km away) or to the north along the traditional East London employment corridor from Stratford through West and East Ham to Barking/Dagenham, 2-4km away.

The pattern of employment in this part of London is set to change dramatically in the next few years with the commercial development of the Royal Docks area under the London Docklands Development Corporation (LDDC). One recent nearby development is London City Airport, 1.5km to the south of Cyprus across the Royal Albert Dock (although 3km by road around the dock). Immediately to the south of Cyprus, adjoining the Royal Albert Dock, a business park is planned and a regional shopping and leisure centre is planned for Gallions Reach, to the east of Cyprus. All these locations will be directly on the DLR and within walking/cycling distance of all the housing areas surveyed.
CHAPTER 2: THE BECKTON TRAVEL SURVEY

2.1 Beckton and the DLR Extension

The Beckton travel survey took place in the Cypris area of East Beckton during the last two weeks of February 1992. The main reason for the choice of this area was because an extension of the Docklands Light Railway was under construction and this survey would provide detailed information on travel patterns prior to the opening of this line in the Autumn of 1993. A later survey, after the line has opened, will permit an assessment of the impact of the line on travel behaviour. The area chosen for the survey is within a few minutes walk of the new DLR stations of Beckton Park, Cypris and Beckton.

Figure 5: the DLR network

The existing DLR line links the City of London to the Isle of Dogs, including the massive Canary Wharf office development. A branch of the DLR connects the Isle of Dogs to Stratford. According to DLR survey figures, the existing network is largely a commuting line. 68% of trips are work related, with tourism, at 9% of trips, being the next largest trip purpose. School trips account for 7% and shopping 5%.

The £250m Beckton extension will serve a large development area, running close to the new London City Airport before terminating at Beckton. The 8km extension will have 11 stations and a capacity of 6,000 passengers per hour in each direction. When fully operational, it will take 25 minutes to carry passengers from Beckton to Bank station in the City of London.

4 Information kindly provided by Keith Seaman of DLR
As was noted above, East Beckton has very little local employment with most employed residents travelling either 5-7km to central London or 2-4km to workplaces in the Stratford-Dagenham corridor. Thus the DLR is associated with not only the possibility of shifting existing trips from car to public transport, but a longer term change as increased local employment opportunities reduce the need for motorised commuting trips to traditional centres of employment. The possible development of a more self-contained employment pattern could only be assessed by longer term surveys.

The short term modal shift arising from the opening of the DLR extension could be examined by a matched travel survey to this one once DLR operations and awareness of the new service are established.

Fig 6: A DLR train entering Westferry Station on the existing DLR network

2.2 Methodology

It was decided, as in other Trip Degeneration studies, to seek a sample of 250 households. In practice, completed questionnaires were obtained from 249 households containing 670 people in total. The purpose of the survey was twofold; firstly to provide base travel data to be compared with a future survey to assess the impact of the DLR extension (and possibly, longer term surveys to assess the effects of increased local employment opportunities); secondly to inform the EC study on comparative travel patterns in local areas of contrasting cities in Europe.

The survey, as used in all the Trip Degeneration studies, is shown in the appendix. The methodology for the survey consists of three parts:

i) choice of sample area
ii) sampling technique
iii) inventorying
2.2.1 Choice of Sample Area

The selection of the sample area was made in conjunction with London Transport. There were not many existing communities along the route of the DLR extension (which runs largely through disused dock areas). All parts of the Cyprus area of East Beckton is within five minutes’ walk of one of three DLR stations, making it the most affected established area.

2.2.2 Sampling Technique

The area was divided geographically between interviewers. Every interviewer began at a random point in his/her area and interviewed every other household. The entire interview was conducted on the doorstep; in order to try to remove any bias concerning which member of the household would be at home, interviews were not conducted before 1600 on weekdays and not before 1100 on weekends. Travel information was obtained for all the days of the week.

The household survey consists of three parts; household information, regular trip information and a travel diary. The first two parts were completed for every member of the household by whomever answered the door, provided they were over 16 years old. These two sections covered the demographic and occupational characteristics of the householders, as well as work/education-place, mode of transport, reason for choice, regular shopping visits etc. Data were obtained on 698 regular trips (local shopping, work, school, bulk buy and doctor).

The third section of the interview was a detailed travel diary. Since the entire household could not be interviewed for travel diaries on the doorstep, a simple technique has been developed to randomly choose one household member. This is to interview the person whose birthday fell next.

That person was asked to recall, for the previous day, what trips they had made, to identify the origins and destinations of their trips on either a local map or a larger map of London, the purpose of the trips, what modes of transport they chose (and why), the time their trips took, the time they started etc. The aim was to break trips into stages (e.g. walk to bus stop, bus to train station, walk to office etc.). All trips were conceived as starting and ending at home or wherever the base was at the time. A total of 926 travel diary trip legs were obtained.

This method of sampling by birthdate did not produce the same ratio of adults to children as was found from the household information for this area. A shown in Figure 75, the proportion of children in the households surveyed was lower than in area household information (Electoral Register) and the proportion of elderly higher. There is a possibility of Electoral Register data being inaccurate due to people not registering in the belief it would permit them to avoid paying the Poll Tax, but it seems likely that the survey does genuinely underrepresent children and so the results have a bias towards adult-type trips.

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5 see also Table 4
Fig 7: Age and gender of the sample population and area household information

However, this bias is not particularly large and, overall, the sample is a reasonable reflection of the survey area population.

2.2.3 Inventorizing

the third and final part of the methodology involved members of the study team visiting the household study area and making a inventory of facilities and land uses; shops, schools, play grounds, bus stops, letter boxes, etc. were all located and plotted on a map of the area. This was to see what facilities were available to the people, as well as to see how they used those facilities.
CHAPTER 3: ANALYSIS

3.1 Nature of the Area

As noted in section 1.4, the survey area of Cyprus may be characterised as typical of recent planned inner suburban developments in London, with ‘clusters’ of cul-de-sac housing at medium suburban densities. There is extensive provision of parkland, sports grounds and allotments, largely on the edge of the housing areas. The housing is a mix of private and public developments in a variety of styles.

The population has largely moved here from elsewhere in the Borough of Newham and retains strong ties to places like East Ham, Stratford and Wanstead to the north.

Fig 8: Housing adjacent to new Beckton Park

3.2 Travel Facilities

Travel facilities can be broken down into two important and distinctive constituent parts:

Travel Potential: the number of vehicles and bicycles per head of population, percentage of adults with driving licences etc.

Travel Provision: the provision of roads, segregated cycleways and paths, bus routes, the frequency, reliability and cost of public transport, parking facilities, level of road congestion etc.
3.2.1 Travel Potential

More than a third of households did not have a car; 48% had one car and 15% had two cars. The lowest level of car ownership was in one person households (probably pensioners and young single people) with two person household having the highest proportion of multiple car ownership (probably professional couples). Details are shown in Table 3.

Table 1: Household size and car ownership

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<tr>
<td>5</td>
<td>28.6</td>
<td>35</td>
</tr>
<tr>
<td>ALL</td>
<td>37.3</td>
<td>100%</td>
</tr>
<tr>
<td>Sample</td>
<td>93</td>
<td>47.8</td>
</tr>
<tr>
<td></td>
<td>119</td>
<td>14.9</td>
</tr>
<tr>
<td></td>
<td>249</td>
<td></td>
</tr>
</tbody>
</table>

Overall, car ownership was 0.4 per adult/0.78 per household. Figure 5 compares this to other areas we have surveyed in the Trip Degeneration project. The ownership level is typical of inner city areas. In Manchester the inner city area of Rusholm had 0.2 cars per adult, with somewhat more affluent Withington, 2km further out, having 0.5 cars per adult. In Beckton driving licences averaged 0.59 per adult/1.15 per household (Figure 10).

Fig 9: Car ownership in Beckton compared to other areas in Trip Degeneration Study.

Fig 10: Driving licence ownership in Beckton compared to other areas in the Trip Degeneration Study.

Bicycle ownership in Beckton, averaging 0.33 per household, was much lower than any other area we have surveyed (Figs 11 and 12).
As would be expected, car ownership varied according to occupational groups (Table 2).

### Table 2: Car ownership by occupation

<table>
<thead>
<tr>
<th>Occupation</th>
<th>% of households with car(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>71.4</td>
</tr>
<tr>
<td>A2a</td>
<td>100.0</td>
</tr>
<tr>
<td>A2b</td>
<td>100.0</td>
</tr>
<tr>
<td>B1a</td>
<td>81.3</td>
</tr>
<tr>
<td>B1b</td>
<td>100.0</td>
</tr>
<tr>
<td>B2a</td>
<td>61.5</td>
</tr>
<tr>
<td>B2h</td>
<td>63.2</td>
</tr>
<tr>
<td>B3</td>
<td>39.1</td>
</tr>
<tr>
<td>B4</td>
<td>50.0</td>
</tr>
<tr>
<td>B5</td>
<td>54.7</td>
</tr>
<tr>
<td>Unemployed</td>
<td>20.4</td>
</tr>
<tr>
<td>Retired</td>
<td>13.3</td>
</tr>
<tr>
<td>Housewife</td>
<td>19.4</td>
</tr>
<tr>
<td>Student</td>
<td>12.4</td>
</tr>
</tbody>
</table>

**Sample = 249**

### 3.3.2 Travel Provision

**Bus routes**

The area is served by five local bus routes which basically link East Beckton to three areas: West Ham/Stratford, East Ham/Ilford, and Dagenham (see Fig 13). There is also the X15 Docklands Express service which picks up locally in East Beckton and then runs non-stop to Central London. This route roughly parallels the DLR, although without intermediate stops.
Fig 13: Bus routes serving East Beckton

Fig 14: East Ham Manor Way
A bus enroute to Ilford from Cyprus Place
British Rail Stations

No British Rail Line directly serves this area. The closest station is at North Woolwich, about 2km away from the closest housing in Cyprus. This is the terminus of the North London Line which runs to Stratford and then around inner London to Richmond. This line does not directly serve Central London, but at Stratford there is an interchange with the Central Underground Line, the British Rail line to Liverpool Street and the existing Docklands Light Rail system.

London Underground (Tube) Stations

No Tube line directly serves this area. The closest station is East Ham on the District Line. In the Westerly direction this line serves Central London with interchanges at a number of stations with the rest of the Underground network. In an Easterly direction the line continues to Barking and Upminster with connections to British Rail’s Southend and Tilbury Line.

Pedestrian Paths and Cycleways

The planned nature of East Beckton has resulted in a good pedestrian environment, with major roads to the periphery of housing areas with a network of safe pedestrian paths both beside roads and separate from them. There are some segregated cycleways near the East Beckton District Centre and Cycle Lanes along some roads. In addition there are cycle links between some of the residential cul-de-sacs. In general, local provision for pedestrians and cyclists is better than in most other parts of Inner London.

Fig 15: Housing near Savage Gardens

Note the exclusion of cars from the paved areas outside the houses and the provision for cyclists to travel through these between cul-de-sacs.

Airport

London City Airport is about 3km from the survey area.
Roads

Local roads are relatively quite and uncongested, which reflects the planned nature of this area and the large investment in road capacity in Docklands in recent years. To the immediate south of the survey area, a large new dual-carriageway road, the Royal Albert Dock Spine Road, was built in 1990 by the London Docklands Development Corporation (LDDC). Another new road, the Eastern Gateway Access Road, has been built linking the Spine Road to the A13. These are part of the LDDC programme of four to six lane dual carriageway roads from the edge of the City of London, through Canary Wharf and the Royal Docks to the A13, the new East London Crossing and motorways outside London. Together with associated Department of Transport schemes, well over a billion pounds will have been spent on new and improved roads in Docklands.

However, to the north of Beckton, major roads are typically congested in peak hours (and frequently at all times). This affects not only car travel but the reliability of bus services, in particular to East Ham.

3.3 Culture

Culture in this context refers to those differences in behaviour and attitudes to transport which occur internationally (e.g. the complete acceptance of the bicycle as a travel-to-work mode in Beijing or Amsterdam). Culture is therefore going to be a significant variable when comparing travel habits of Beckton to other studies in this series and will be considered in the Synthesis Report for the EC due to be completed in 1994.

3.4 Summary

East Beckton is a new residential area that is in the midst of substantial change. The DLR is not the only new development that is going to affect the people who live here. Massive road building, more new housing and the commercial development of the Royal Docks and Gallions Reach will all have a profound effect on the area and the people who live here.

Locally, the Cyprus area is a pleasant inner London suburb. It is well planned with medium-density housing clusters permitting easy foot and cycle access to local facilities.
CHAPTER 4: SURVEY RESULTS

4.1 Household Information

4.2.1 Household Size and Characteristics

The mean household size in Cyprus was 2.69 persons (see Table 3), with most households (60%) consisting of only one or two persons.

Table 3: Household Size

<table>
<thead>
<tr>
<th>Number of Persons</th>
<th>Percent</th>
<th>Number in Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22.1</td>
<td>55</td>
</tr>
<tr>
<td>2</td>
<td>37.8</td>
<td>94</td>
</tr>
<tr>
<td>3</td>
<td>12.0</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>14.1</td>
<td>35</td>
</tr>
<tr>
<td>5</td>
<td>7.6</td>
<td>19</td>
</tr>
<tr>
<td>6</td>
<td>4.0</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>2.4</td>
<td>6</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100.0</strong></td>
<td><strong>249</strong></td>
</tr>
</tbody>
</table>

As noted above, in order to check the representativeness of the sample it was compared to area household information (the latest Electoral Role statistics). The results of this exercise are shown in Table 4.

Table 4: Age and gender of the sample population and area household information

<table>
<thead>
<tr>
<th>Age</th>
<th>Male %</th>
<th>Female %</th>
<th>Area Male %</th>
<th>Household info Male %</th>
<th>Female %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>3.5</td>
<td>1.4</td>
<td>5.8</td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>6-17</td>
<td>3.6</td>
<td>2.5</td>
<td>9.1</td>
<td>9.1</td>
<td></td>
</tr>
<tr>
<td>18-64</td>
<td>35.6</td>
<td>38.6</td>
<td>31.9</td>
<td>31.0</td>
<td></td>
</tr>
<tr>
<td>65+</td>
<td>6.4</td>
<td>8.5</td>
<td>3.9</td>
<td>4.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>49.0</strong></td>
<td><strong>51.0</strong></td>
<td><strong>50.7</strong></td>
<td><strong>49.3</strong></td>
<td></td>
</tr>
</tbody>
</table>

Sample = 670 people
Figures 16 and 17 show the occupational structure of the sample.

Figures 16: Occupational structure of Cyprus sample.

Figures 17: Occupational breakdown of the Cyprus sample (employed persons only).
4.2 Regular trips

4.2.1 Journeys to Work

Of those employed in the Cyprus sample (293 people), only 9% worked locally in Beckton (Table 5) which, as noted earlier, reflects the lack of employment opportunities in the immediate area. A third of those employed commuted to Central London with about a quarter working in the Stratford - Barking Corridor. The average journey to work distance was 9.74 km (Figure 18).

Table 5: Distribution of work destinations

<table>
<thead>
<tr>
<th></th>
<th>%</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td>DLR Corridor</td>
<td>14</td>
<td>40</td>
</tr>
<tr>
<td>Central London</td>
<td>33</td>
<td>96</td>
</tr>
<tr>
<td>Stratford-Barking Corridor</td>
<td>24</td>
<td>71</td>
</tr>
<tr>
<td>Inner London</td>
<td>8</td>
<td>25</td>
</tr>
<tr>
<td>Outer London</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Outside London</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
<td>293</td>
</tr>
</tbody>
</table>

Figure 18: Distances to workplace
Residents in Beckton have a shorter average work journey than in Milton Keynes and Almere, which may be explained by these towns having out commuting to nearby cities and (in the case of Milton Keynes) its very dispersed land-use pattern. A more appropriate comparison is with the inner suburban areas of Manchester and Berlin, which tend to have shorter work journeys than Beckton. The lack of local employment opportunities in Beckton probably helps to explain this difference.

<table>
<thead>
<tr>
<th>Mean 1 way trip length (km)</th>
<th>Beckton</th>
<th>Alt Berlin</th>
<th>Baum DL</th>
<th>With Manchester UK</th>
<th>Rush UK</th>
<th>MK UK</th>
<th>Almere NL</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.7</td>
<td>25.7</td>
<td>9.0</td>
<td>8.3</td>
<td>4.5</td>
<td>12.4</td>
<td>14.2</td>
<td></td>
</tr>
</tbody>
</table>

Work journey modes (Table 7) reflect the split between destinations. Local work journeys are largely by foot or by car. The relatively high proportion of local trips by car is probably linked to the lack of local road congestion and ample free car parking, which are aspects that counteract the good local pedestrian/cycle accessibility of the area.

Central London was the largest work destination, involving a third of all work trips. Most were by public transport with an even split between bus (the X15 Express service) and Tube. Thus, for existing trips, the DLR extension seems likely to only involve a transfer between one public transport mode and another. The 13% of trips by car to Central London may be affected by the DLR, but this proportion may simply reflect people with company vehicles, who are not very susceptible to improvements in public transport.

The next largest category of work trips is to the Stratford-Barking corridor (24% of work trips). Here car use is high (53% of trips), with bus being the main alternative (42%). As this route will not be served or affected in any way by the DLR extension, it cannot be expected to alter trips to these destinations.
Table 7: Usual method of travel to / from work

<table>
<thead>
<tr>
<th></th>
<th>Foot</th>
<th>Bike</th>
<th>Car Driver</th>
<th>Car Pass</th>
<th>M/C</th>
<th>Bus</th>
<th>LRT</th>
<th>LT Tube</th>
<th>BR Train</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workplace</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local</td>
<td>37</td>
<td>4</td>
<td>41</td>
<td>0</td>
<td>0</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DLR Corridor</td>
<td>5</td>
<td>3</td>
<td>50</td>
<td>5</td>
<td>0</td>
<td>25</td>
<td>0</td>
<td>10</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Central London</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>2</td>
<td>1</td>
<td>43</td>
<td>0</td>
<td>42</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Stratford-Barking Corridor</td>
<td>3</td>
<td>1</td>
<td>47</td>
<td>6</td>
<td>1</td>
<td>42</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Inner London</td>
<td>0</td>
<td>0</td>
<td>64</td>
<td>4</td>
<td>4</td>
<td>20</td>
<td>0</td>
<td>4</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Outer London</td>
<td>0</td>
<td>0</td>
<td>47</td>
<td>0</td>
<td>0</td>
<td>33</td>
<td>0</td>
<td>13</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Outside London</td>
<td>0</td>
<td>0</td>
<td>68</td>
<td>5</td>
<td>0</td>
<td>16</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>TOTAL</td>
<td>5</td>
<td>1</td>
<td>38</td>
<td>3</td>
<td>1</td>
<td>34</td>
<td>0</td>
<td>16</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total (n)</td>
<td>14</td>
<td>3</td>
<td>111</td>
<td>10</td>
<td>3</td>
<td>99</td>
<td>0</td>
<td>48</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Reasons for choice of mode for the work journey are given in Table 8. Cost, speed and were very minor factors. Generally people had no choice or found their preferred choice generally convenient.

Table 8: Reason for choice of mode for work journey (%)

<table>
<thead>
<tr>
<th>Reason</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No alternative</td>
<td>42.2</td>
</tr>
<tr>
<td>Convenience</td>
<td>46.3</td>
</tr>
<tr>
<td>Cost</td>
<td>4.1</td>
</tr>
<tr>
<td>Speed</td>
<td>6.1</td>
</tr>
<tr>
<td>Safety</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
</tr>
</tbody>
</table>

Work trips to areas within the DLR corridor at presently involve only 14% of the total. It is high (55%) with Tube and bus accounting for 35% of journeys. With the exception of X15 Express Bus service to the far western end of the DLR corridor (Katherine's Dock), public transport links along the corridor are poor, with no direct service to Beckton. It seems likely that the opening of the DLR will effect not only a transfer from and Tube, but attract some existing car users. However, road and parking provision in Docklands is new and generous by London standards. The scope for the DLR to attract motorists is thus somewhat reduced by the large investment in the infrastructure for the 
Car travel to Inner London destinations is also high, at nearly 70% of these trips. The DLR may have some effect on this by permitting a fast transfer to other rail and bus services. It should, however, be noted that these destinations are quite scattered and the potential for a shift to public transport will be constrained by the number of changes needed and the closeness of stations/stops to work places.

In terms of reducing car use, it appears that the DLR is only likely to affect the 6% of Cyprus commuters who travel by car to destinations in the DLR corridor and may possibly be a marginal influence on the 5% who travel by car to destinations in Inner London. The rest of the effect of the DLR on existing journeys looks likely to be a simple transfer between public transport modes.

4.2.2 Education Journeys

The survey data on education trips shows two clusters at under half a kilometre and at just under 2.5 kilometres. This reflects the provision within Cyprus and Beckton of Primary Schools, with Secondary Schools being in Plaistow and West Ham (within the Stratford-Barking Corridor).

![Figure 19: Distances to place of education](image)

As shown in Table 9, school/education trips were mainly by foot or bus, largely reflecting the primary/secondary distance split. The very small use of the car to take children to school reflects the local provision of safe pedestrian routes in East Beckton and the very short distances involved. Children at secondary school are not regularly taken there in parents’ cars at all, which probably reflects the difficult driving condition to Plaistow and West Ham and also the good bus services (including special school services) to these destinations.

The very small (0.6%) of trips to London and the DLR Corridor are almost certainly all tertiary education (colleges and university).
Table 9: Usual method of travel to place of education

<table>
<thead>
<tr>
<th></th>
<th>Foot</th>
<th>Bike</th>
<th>Car Driver</th>
<th>Car Pass</th>
<th>M/C</th>
<th>Bus</th>
<th>LRT</th>
<th>LT Tube</th>
<th>BR</th>
<th>Train</th>
<th>Other</th>
<th>TOTAL</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>86</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>100</td>
<td>85</td>
</tr>
<tr>
<td>DLR Corridor</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>3</td>
</tr>
<tr>
<td>Central London</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>0</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>4</td>
</tr>
<tr>
<td>Stratford-Barking Corridor</td>
<td>2</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>92</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>51</td>
</tr>
<tr>
<td>Inner London</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>51</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>0</td>
<td>40</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Total (n) | 74   | 0    | 3          | 7        | 0   | 57  | 0   | 2       | 0  | 1     | 1     | 144   |    |

Most people undertaking educational trips had no alternative choice for their method of travel (Table 10).

Table 10: Reason for choice of mode for educational trips (%)

<table>
<thead>
<tr>
<th>Reason</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No alternative</td>
<td>73.6</td>
</tr>
<tr>
<td>Convenience</td>
<td>23.0</td>
</tr>
<tr>
<td>Cost</td>
<td>0</td>
</tr>
<tr>
<td>Speed</td>
<td>2.8</td>
</tr>
<tr>
<td>Safety</td>
<td>0.6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
</tr>
</tbody>
</table>

Sample (n) | 178 |

Only the small proportion (0.6%) of education trips that are to the DLR corridor and Central London are likely to be affected by the opening of the DLR. No school trips will be served by the DLR.

4.2.3 Other Local Trips

Information was gathered on regular local shopping and doctor trips Local shopping trips are mainly by foot and car (East Beckton District Centre has a large car park - Fig 20). For other shopping trips, East Ham was a popular destination. A few people travelled to the specialist ethnic shops in Stratford/Tower Hamlets.
Table 11: Usual method of travel to local shops

<table>
<thead>
<tr>
<th></th>
<th>Foot</th>
<th>Bike</th>
<th>Car Driver</th>
<th>Car Pass</th>
<th>M/C</th>
<th>Bus</th>
<th>LRT</th>
<th>LT Tube</th>
<th>BR Train</th>
<th>Other</th>
<th>TOTAL</th>
<th>%</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>59</td>
<td>1</td>
<td>26</td>
<td>2</td>
<td>0</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td></td>
<td>217</td>
</tr>
<tr>
<td>Stratford-Barking Corridor</td>
<td>3</td>
<td>0</td>
<td>43</td>
<td>0</td>
<td>0</td>
<td>54</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td></td>
<td>28</td>
</tr>
<tr>
<td>Inner London</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>53</td>
<td>-</td>
<td>28</td>
<td>2</td>
<td>0</td>
<td>16</td>
<td>0</td>
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<td>247</td>
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<tr>
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<td>70</td>
<td>5</td>
<td>0</td>
<td>40</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>247</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 20: East Beckton District Centre

Doctor journeys (Table 12) indicated a split between the local health centre, with access mainly by foot, and to practices in the Stratford-Barking corridor. The latter may represent people who moved to Cyprus from elsewhere in Newham retaining their old doctor. Travel to doctors in the Stratford-Barking corridor involved over half the trips being by car.

Only 3% of doctor trips were to the DLR corridor, with most by bus, although little can be said given such a small sample (only 7). Basically it seems unlikely that the DLR will have any significant impact on doctor trips.
Table 12: Distribution of doctor journeys

<table>
<thead>
<tr>
<th></th>
<th>%</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>66</td>
<td>157</td>
</tr>
<tr>
<td>DLR Corridor</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Stratford-Barking Corridor</td>
<td>29</td>
<td>70</td>
</tr>
<tr>
<td>Other</td>
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<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
<td>239</td>
</tr>
</tbody>
</table>

Table 13: Usual Method of Travel to Doctor

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<thead>
<tr>
<th></th>
<th>Foot</th>
<th>Bike</th>
<th>Car Driver</th>
<th>Car Pass</th>
<th>M/C</th>
<th>Bus</th>
<th>LRT</th>
<th>LT Tube</th>
<th>BR</th>
<th>Train</th>
<th>Other</th>
<th>TOTAL</th>
<th>%</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
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<td>28</td>
<td>3</td>
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<td>0</td>
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<td>100</td>
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<td>0</td>
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<tr>
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<td>0</td>
<td>0</td>
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<tr>
<td><strong>TOTAL</strong></td>
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<td>35</td>
<td>3</td>
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<td>0</td>
<td>54</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>-</td>
<td>239</td>
<td></td>
</tr>
</tbody>
</table>
4.5 Travel Patterns in Cyprus: Summary

Overall, this study indicates that travel by the population of Cyprus is split into three major groupings.

There is a lot of very local travel, to primary schools, health and social facilities, with a large proportion of this travel being by foot. This reflects the planned nature of the East Beckton area with good size catchments to local facilities and a high enough population to support them.

Secondly, there are strong links to the Stratford-Barking Corridor for shopping, work and leisure purposes. A lot of these trips were by car, but bus use was also high, particularly for shopping and school trips. Travel to this area involves using busy and congested roads, with no convenient rail or Underground link.

Thirdly, a large proportion of work trips were to Central London or to newer workplaces in Docklands. Most travel to Central London was by bus with car commuting significant to Docklands destinations. New road investment and ample parking makes car travel to the latter an attractive proposition.

One intriguing observation was the low cycle use despite the fact that, within East Beckton, there is actually quite good provision of cycleways and bike lanes. A number of factors may explain this. There may be a lack of a cycling 'culture' in Inner London due to the generally dangerous conditions for cyclists; the very low level of of local employment results in most work journeys beyond cycling distance; outside the immediate East Beckton area, roads are busy and conditions for cycling are poor and dangerous; Secondary schools are outside the local area in areas with heavy traffic and poor cycling conditions.

These observations suggest that the provision of local cycle facilities alone is not adequate to allow people good access by bike. Most potential bike trips go outside the East Beckton area and the development of a wider system of cycle routes is needed. A very real potential exists, with the development of the Royal Docks, for London Dockland Development Corporation to provide such a network linking into the existing Beckton facilities. To the north safe routes elsewhere in Newham are needed for the many local trips towards East Ham for shopping, school and leisure trips.
From this household travel survey, a picture emerges of a population with close links to the area immediately north and west - the 'Stratford-Barking Corridor' mentioned in the analysis of travel patterns.

At the moment, there is not very much travel along the corridor that will be served by the Beckton extension of the Docklands Light Railway. The main exception to this is that 46% of work destinations are in the DLR corridor itself or in Central London. However most of these trips are already by public transport and the main immediate effect of the opening of the DLR seems likely to be a simple transfer between one form of public transport to another. Only the 6% of Beckton commuters travelling by car to workplaces in the DLR corridor seem likely to be affected. But, given the heavy investment in road capacity and car parking in Docklands, the DLR may be unable to effect a large transfer away from the car.

Education trips are either very local or to places within the Stratford-Barking Corridor. Shopping, doctor and social trips have a very similar pattern. They are either by foot locally or by car or bus to destinations in the Stratford-Barking Corridor.

The Stratford-Barking Corridor has good public transport links running along it, but travel to the corridor from the south of Newham and the Royal Docks area is presently by bus and car along congested roads. A good, fast public transport link from Beckton to East Ham and Barking would address such difficulties and have a good potential to reduce car use.
Overall, examining existing travel patterns, the DLR extension serves areas where, with the exception of a proportion of work trips, East Beckton residents simply do not go.

Two observations may be made on this situation.

Firstly the building of the DLR Beckton Extension leaves a substantial unmet need. Links between Beckton and the Stratford-Barking Corridor are clearly important and public transport connections are in need of improvement. Local Authorities, the LDCC and London Transport have been examining a number of possibilities, including the further extension of the DLR or the building of another LRT line in order to improve public transport between the Docklands and existing centres of employment, shopping and leisure facilities in the Stratford-Barking corridor. The results of this study reinforce the need for such provision. Such an investment would appear to have considerably more potential to effect a shift from car to public transport than the existing DLR as it would serve areas where car use is greater and roads congested.

The second observation is that the opening of the DLR will change travel opportunities. People may not be travelling to the DLR corridor simply because, at the moment, it is so difficult to get to by public transport. Furthermore, the development which the DLR extension is designed to facilitate will further change travel patterns. The provision of more local employment opportunities may result in a shift from longer distance commuting to Central London and car commuting to Stratford, to shorter distance commuting to places in the DLR corridor.

The longer-term, structural changes arising from the building of the DLR to Beckton could be monitored by future surveys. It is possible that the beginning of such a trend will be identifiable in the “after” survey planned by London Transport to match this “before” study.

The overall picture of East Beckton and the DLR is therefore one of:

a) the DLR having little immediate effect on reducing car use and the need for further public transport improvements to more important destinations;

b) a long term potential for the DLR to effect a structural change to a less car-dominated life for Cyprus and Beckton residents.

The extent to which this potential will be realised remains, at this moment, an open question.
REFERENCES


Roberts, John and Wood, Chris (1992): Land Use and Travel Demand, Paper delivered to the PTRC Annual Summer Meeting, PTRC.


