INFORMAL PARK AND RIDE BEHAVIOUR IN LONDON

by M W Pickett and Mrs S M Gray

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Customer: London Assessment Division, DOT
(Mr B Titley)

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EXECUTIVE SUMMARY

Park and Ride is commonly defined as the act of parking at a purpose-built car park and transferring to another mode of transport to travel onward to one's destination. This type of Park and Ride is more commonly known as formal park and ride as dedicated parking facilities and public transport services are provided for users of a scheme.

Formal park and ride services are mostly bus-based and run either seasonally, typically during the summer holiday period or the pre-Christmas shopping period, or as a year-round service designed to relieve a town/city centre of congestion.

In the outer areas of London and other large conurbations, park and ride is more likely to be rail-based. This is mainly due to the delays often experienced by bus services as a result of traffic congestion. The scope for introducing formal park and ride from rail stations with their own car parks is, however, severely limited as there is little space available in the vicinity of rail stations for the provision of parking facilities.

As a result some motorists who do not have direct access to public transport services may feel inclined to drive to a rail station, park on-street while they are at work or elsewhere and travel onward by train with little regard to the effect their parked vehicle may have on the economic and environmental well-being of the locality in which the vehicle is parked. Others may prefer to park on-street to avoid paying to leave their vehicle in a car park.

In 1990, approximately 1,094,000 people commuted into London daily. A total of 76 per cent of commuter travel to Central London in peak hours is by rail, either using British Rail Network South East (NSE) (42 per cent) or London Underground (34 per cent).

Fifty-five per cent of the 950 NSE stations have their own car parks. These provide a total of 73,000 car parking spaces, but three quarters of these lie outside the M25 i.e. more than 30 kilometres from the centre of London. Many of the car parking facilities are provided on land which has become surplus to British Rail’s operating requirements (eg redundant goods depots, railway sidings etc).

London Underground Limited (LUL) has car parks at 65 of its 250 stations, providing a total of 12,000 spaces. Unlike BR LUL has not been able to make use of redundant facilities as it was built solely as a passenger carrying railway. Clearly there is a large shortfall in the number of station car park spaces provided, even allowing for multi-occupancy of vehicles wishing to park at/near stations, a significant number of “kiss and ride” passengers, and commuters arriving at stations otherwise than by car. It is estimated that 2 per cent of LUL passengers and 2 per cent of NSE passengers originating within Greater London park in station car parks. However, approximately 8.5 per cent of rail passengers from within Greater London park on-street. It is clear, therefore, that at most LUL stations and NSE stations within London, on-street parking is undertaken by at least twice as many motorists as those that use station car parks.

This ‘informal’ park and ride (otherwise known as ‘railheading’) is seen by many Boroughs as a nuisance bringing the surrounding station areas no benefit and in some cases discouraging motorists from visiting an area to undertake business etc which can affect the economic viability of shops/businesses in the area. It is often claimed that railheaders aggravate the free flow of traffic which can ultimately lead to increased congestion and other environmental disbenefits. This congestion makes parking difficult for the shorter-term parker who wishes to shop, undertake business or visit friends/relatives in the area and can present difficulty to any emergency services called to an incident.

Residents often cite the difficulty experienced in locating an unoccupied parking space near their residence, either by themselves or by their visitors, as a disbenefit of living in an area. They also claim that they suffer because their mobility is inhibited by the difficulty in finding an unoccupied parking space on their return home. In congested areas this may be considered, by opposing members of the community, to be a benefit as inhibiting mobility can lead to a reduction in traffic congestion.

Local authorities have begun to consider the need for the introduction of controls that would discourage non-resident motorists from parking their vehicles on-street for prolonged periods. There is a general expectation that any measures introduced would enable residents to park more easily and nearer their residences, stimulate trade at local shops and businesses and relieve the roads of excess traffic. It is also claimed that road safety and the environment would improve as a result of fewer cars and less pollution. Railheaders form a section of the motoring population that many parking regulations are designed to deter.

TRL has undertaken a study of Park and Ride Behaviour in London. The study was designed to determine the extent to which railheading actually was a problem and what effective means there were to discourage it.

It was found that:-

i) a significant proportion of non-resident motorists in the three areas studied were parking in these areas daily before continuing their journey to work. However, the proportion whose journey included rail travel was not as large as claimed by Local Authorities.
ii) motorists parking in the vicinity of BR and LU stations were principally short-distance commuters having driven less than 10km. Well over half the non-residents interviewed in each of the three study areas had travelled less than 10 km before parking their vehicles and, indeed, many had travelled less than 5 km.

iii) parking controls can be used to deter long-term parkers, which include 'railheaders'. All of the schemes monitored were found to be effective in controlling the parking of non-permit holders. Long-term parkers were displaced, making conditions easier for residents and short-stay parkers. These long-term parkers, however, included a large proportion of motorists who worked in the areas around the study stations.

Although surveys by London Transport and London Underground Limited indicate that only a very small proportion of Tube users park a vehicle in the vicinity of an Underground station, many London Boroughs consider that they have on-street parking problems associated with 'railheading'. An increasing number are considering the introduction of parking controls to alleviate these problems.
INFORMAL PARK AND RIDE BEHAVIOUR IN LONDON

ABSTRACT

Many parts of London suffer from high levels of on-street parking in residential areas where properties were constructed when car ownership was low.

The rise in car ownership amongst residents of these areas is putting increasing pressure on those on-street parking places available, especially when there is a major trip attractor, such as a rail station, in the vicinity.

Concern has been expressed about the level of parking that occurs in areas around some rail stations in London. It has been claimed that much of the parking problem in station areas is caused by motorists parking a vehicle prior to travelling onward by rail. This type of parking act is commonly called informal park and ride or railheading. It is reported that many of the vehicles are left parked on-street for a significant proportion of the working day thereby inhibiting those who will be returning home with their vehicle or those wishing to visit the area.

This study has investigated the parking behaviour of motorists leaving a vehicle on-street in three areas of London where Tube stations are located to seek to determine whether the parking problem is caused by railheaders.

Results from the study indicate that the railheader is not the major contributor to the high level of on-street parking nor that those parking have driven a long distance prior to leaving their vehicle as has been postulated by some parties.

1 INTRODUCTION

Park and Ride is commonly defined as the act of parking at a purpose-built car park and transferring to another mode of transport to travel onward to one's destination. This type of Park and Ride is more commonly known as formal park and ride as dedicated parking facilities and public transport services are provided for users of a scheme.

Formal park and ride services are mostly bus-based and run either seasonally, typically during the summer holiday period or the pre-Christmas shopping period, or as a year-round service designed to relieve a town/city centre of congestion. The Department of Transport's Traffic Advisory Unit has published a Traffic Topics Leaflet (Department of Transport, 1991) outlining the various bus-based park and ride schemes that have been tested and discussing the reasons for the success or failure of such systems.

In the outer areas of London and other large conurbations, park and ride is more likely to be rail-based. This is mainly due to the delays often experienced by bus services as a result of traffic congestion. The scope for introducing formal park and ride from rail stations with their own car parks is, however, severely limited as there is little space available in the vicinity of rail stations for the provision of parking facilities.

As a result, some motorists who do not have direct access to public transport services may feel inclined to drive to a rail station, park on-street while they are at work or elsewhere and travel onward by train with little regard to the effect their parked vehicle may have on the economic and environmental well-being of the locality in which the vehicle is parked. Others may prefer to park on-street to avoid paying to leave their vehicle in a car park.

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This 'informal' park and ride (otherwise known as 'railheading') is seen by many Boroughs as a nuisance bringing the surrounding station areas no benefit and in some cases discouraging motorists from visiting an area to undertake business etc which can affect the economic viability of shops/businesses in the area. It is often claimed that railheaders aggravate the free flow of traffic
which can ultimately lead to increased congestion and other environmental disbenefits. This congestion makes parking difficult for the shorter-term parker who wishes to shop, undertake business or visit friends/relatives in the area and can present difficulty to any emergency services called to an incident.

Residents often cite the difficulty experienced in locating an unoccupied parking space near their residence, either by themselves or by their visitors, as a disbenefit of living in an area. They also claim that they suffer because their mobility is inhibited by the difficulty in finding an unoccupied parking space on their return home. In congested areas this may be considered, by opposing members of the community, to be a benefit as inhibiting mobility can lead to a reduction in traffic congestion.

Local authorities have begun to consider the need for the introduction of controls that would discourage non-resident motorists from parking their vehicles on street for prolonged periods. There is a general expectation that any measures introduced would enable residents to park more easily and nearer their residences, stimulate trade at local shops and businesses and relieve the roads of excess traffic. It is also claimed that road safety and the environment would improve as a result of fewer cars and less pollution. Railheaders form a section of the motoring population that many parking regulations are designed to deter.

TRL has undertaken a study of Park and Ride Behaviour in London. The study was designed to determine the extent to which railheading actually was a problem and what effective means there were to discourage it.

This report presents the results of this research programme and discusses the extent to which claims about ‘railheaders’ are justified.

2 HISTORICAL BACKGROUND

Many of the London Underground lines were constructed in the late nineteenth or early twentieth century at a time when both vehicle ownership and housing density was low.

Extracts from the London Transport Museum Guide (London Transport Museum, 1989) indicate, for instance, that:

“Suburban development in Victorian London often depended on, and followed, the provision of local railway services. An early example was the impact of the District Railway’s western extension which provided a direct service to Westminster and the City from 1877. This prompted the development of Bedford Park, a new middle class suburban housing estate adjacent to Turnham Green station, and helped turn the village of Hammersmith into a suburb for City clerks.”

“The Hampstead Tube opened in 1907 between Charing Cross and Golders Green, then in open country. Within five years a completely new suburb had grown up around the station, while just to the north the first section of Hampstead Garden Suburb had been laid out”.

When “the Hampstead Tube was extended northwards from Golders Green in 1923-4, speculators began buying up land for houses and shops. By the late 1930s the population was more than ten times greater”.

“New streets of semi-detached houses followed the extension of the Northern Line south to Morden in 1926”.

Much of this ‘turn of the century’ housing remains. Little provision was made at the time of building for the parking of residents’ vehicles off road. No garages or drives were provided. There was little anticipation of any possible increase in car ownership.

As vehicle ownership has increased more residents have had to resort to parking their vehicles on street thereby contributing to the problems caused/experienced by visiting motorists.

In more recent decades some of the larger properties have been converted to multi-occupancy. The problem of residential parking has subsequently increased as more motorists attempt to park in the limited kerbside space available in the vicinity of their residence.

3 LITERATURE REVIEW

A literature review of published research material on the IRRD database maintained by TRL produced little of direct relevance to this study. A number of papers have been written on bus-based park and ride systems and a smaller number on ‘formal’ rail-based systems, usually specific to a particular area.

A paper by R Niblett and D J Palmer, (Highways & Transportation, 1993), reviewed the opportunities for promoting greater Park & Ride use and discussed the difficulties likely to be encountered. It concluded that limited opportunities exist for new ‘formal’ Park & Ride in the London area, mainly as a result of limited land availability and its cost.

N Andrew’s paper (Traffic Engineering + Control, 1985) documented the attempt by the London Borough of Redbridge to reduce the adverse effects of all-day parking by commuters using the Underground railway stations in its area. It described how lessons learnt from an initial pilot scheme were used to develop a programme of traffic management measures. These included a waiting restriction which operated for one hour in the middle of the day, and provisions for parking by residents.
The results of other studies that have been commissioned by London Boroughs into the problems associated with commuter travel have not been published.

There were no papers in the database on informal park and ride in Europe or North America.

4 PARKING STUDIES

From the literature review it would appear that the phenomenon of informal park and ride is peculiar to the United Kingdom. Many European countries provide park and ride facilities at convenient interchange points on the public transport network. This is often facilitated by the availability of suitable land in the close proximity of rail stations or bus/tram stops. Planning policies have also been used to advantage by directing attention to the need to provide such facilities.

Parking surveys were initiated in three study areas to determine whether the commonly expounded view that railheaders were responsible for many of the parking problems that exist is true. The Department had received representations from local authority associations and others to the effect that the longer-distance railheader was the cause of much of the parking problem experienced in these areas.

The surveys undertaken in the three areas of London selected for study were designed to test the following hypotheses:-

i) The high occupancy of on-street parking spaces in the vicinity of rail stations is caused by motorists who park their vehicle prior to travelling onward by rail. Turnover in the parking spaces is often reported to be low because many of the vehicles are parked for a significant proportion of the working day. This hypothesis is based on comments emanating from local authorities when attributing some blame for difficult parking/traffic conditions in their area.

It is also postulated that railheaders tend to be concentrated in station areas where there is no charge for parking.

ii) Railheaders drive some distance from outside London before parking their vehicle on-street and continuing their journey by rail. This argument is often put forward by local authorities as a palliative to the local population to indicate that the problem is not caused by other members of their locality (or even London).

iii) Parking controls are an effective means of reducing the number of railheaders who park on-street.

4.1 METHODOLOGY

Each parking study consisted of

a) the administration of questionnaires to determine the parking behaviour of motorists parking a vehicle in the vicinity of rail stations

b) the continuous monitoring of parking activity over a defined period of, say, ten hours at a sample of sites within each study area.

4.1.1 Parking behaviour

Questionnaire surveys have long been considered an important element of studies of parking behaviour. Prior to this study of informal park and ride, local authorities had indicated that they believed that ‘railheaders’ were the cause of a majority of the parking problems in station areas. This view had been formed partly through observation but, to a large extent, by deduction.

Before measures can be introduced to tackle a problem, the true cause of that problem must be identified. The characteristics of motorists parking in an area, and their reasons for parking, can best be determined by an interviewer administered questionnaire survey.

4.1.2 Parking activity

Motorists will indicate in a questionnaire survey how long they plan to leave their vehicle parked. Where restrictions are in force the answers given may be those the interviewees think they should provide. A more realistic answer will be obtained if parking activity is monitored independently.

Parking activity may be monitored by means of a continuous survey or a beat survey. In a continuous survey, a set of parking spaces is observed over a 10 to 12 hour period on one or more days. In a beat survey, an observer patrols at regular intervals (usually 30 minute) around a circuit containing a number of parking spaces. Beat surveys can thus cover more spaces than continuous surveys, but they tend to miss the shorter duration parking acts.

Beat surveys may be appropriate in areas where long-term parkers are concentrated. This was expected to be the case, at least in the ‘before’ studies, in the areas chosen. However, if parking controls proved to be effective in displacing the longer-term parkers, continuous monitoring would be more likely to detect the shorter duration parkers who would be expected to take their place. The chosen method for monitoring parking activity in the three study areas was therefore the continuous survey method.

All the parking activity surveys were undertaken using the PARC suite of software developed by TRL (Binning & Smith, 1991; Binning, Smith & Phillips, 1991) for the collection and analysis of data.
4.2 STUDY AREAS

The original programme of surveys planned involved undertaking ‘before’ and ‘after’ surveys during the three year study in three areas where it was anticipated some form of parking control was being introduced as a means of deterring railheaders from parking on-street. In practice this did not proceed according to the original plan as will be explained in the following sections.

4.2.1 Barons Court and West Kensington

The area around Barons Court and West Kensington stations was the first area to be selected as it was known that the London Borough of Hammersmith & Fulham was implementing a rolling programme of introducing Controlled Parking Zones (CPZs) throughout its administrative area. When the study commenced it was anticipated that the CPZ would be introduced around these stations in 1991.

Barons Court and West Kensington stations are served by the District Line. Piccadilly Line trains also serve Barons Court station. London Transport bus services operate past West Kensington station. The A4 trunk road passes within 100 metres of both stations.

The areas around the stations were predominantly residential with shopping parades near both stations. Most of the housing is terraced with a significant proportion in multiple occupancy.

Charing Cross Hospital is located on the western boundary of the proposed CPZ, the Royal Ballet Dancing School and Queens Tennis Club were also just outside the boundary of the zone. Employees and visitors to all three of these attractions were likely to need to park on-street within the proposed CPZ when visiting any of the establishments. There are no off-street car parks in the vicinity.

A survey of parking activity was undertaken at two sites near Barons Court and West Kensington stations in March 1989 as part of another study for the Department. An interview survey of approximately 1,000 motorists leaving/returning to a parked vehicle was conducted in September 1990. The Controlled Parking Zone (CPZ) was introduced in the area in January 1992. ‘After’ surveys were carried out in September 1992. The ‘after’ surveys were designed to be similar to both the parking behaviour and parking activity surveys carried out before the introduction of the CPZ. The ‘after’ study was undertaken two years after the ‘before’ study because of a later than anticipated introduction of the parking controls.

Pay & Display parking equipment was used as the parking control mechanism. The hours of regulation were 9am to 5pm. The tariff for parking in the permitted parking places was 50p per hour. Parking attendants employed by the London Borough of Hammersmith & Fulham enforced the regulations in the permitted parking places.

4.2.2 Hampstead

The second study area selected was Hampstead. This area was chosen following discussions with parking officers in the London Borough of Camden.

Hampstead is a suburb of London with a wide mix of small shops, offices, restaurants etc. There are two main roads through the area, both roads meeting at a junction by the Hampstead underground station. The rest of the area within the CPZ is predominantly residential. Most of the properties are larger than in the first study area with limited facilities for parking vehicles off-road on the owner’s property. There are no off-street car parks in the CPZ, the nearest public car park being located on Hampstead Heath. A major attractor to the area is the Royal Free Hospital which is located just outside the Controlled Parking Zone. Many small businesses and privately funded schools are also located in the area, all of which generate trips from employees, scholars and parents/guardians.

Hampstead station is served by trains on the Northern Line branch to Edgware. A network of London Transport bus services operates through the suburb. The A41 road runs to the west of Hampstead and the A502 road runs through the area.

TRL undertook a ‘before’ study in Hampstead in May 1991 to determine the characteristics of motorists currently parking their vehicles in the area. This was again intended to be used to determine whether railheaders made a significant contribution to the parking problems in the area, and to assess the likely effect of the introduction of parking charges. The London Borough of Camden was planning to introduce a Controlled Parking Zone in the area where parking would be regulated with permits and prepaid vouchers.

TRL’s study again consisted of two data collection exercises. One survey involved the administration of a questionnaire to nearly 1,000 drivers leaving/returning to their parked vehicles. The other survey involved the continuous monitoring of parking activity at six sites within the proposed CPZ, which was introduced in November 1991.

An ‘after’ survey was not undertaken as will be explained later.

4.2.3 South Wimbledon and Colliers Wood

The areas around South Wimbledon and Colliers Wood stations were selected following examination of a number of potential areas where it was thought there might be a significant level of railheading (see Appendix A).

This area consists predominantly of Edwardian terraced housing with local shopping parades near the stations. The residential roads were heavily parked with vehicles there being virtually no provision for parking vehicles off-road.

Both stations are served by the Northern Line to/from Morden. London Transport bus services operate past
each station. The A24 London to Worthing trunk road passes through the area.

When the third study area was selected it was recognised that there would be insufficient time to undertake an ‘after’ study. Another study was, however, required to substantiate or refute the findings of the ‘before’ studies in Barons Court, West Kensington and Hampstead. A third study in South Wimbledon and Colliers Wood was considered to be more important than selecting another less suitable area where controls were to be introduced within a short timescale allowing ‘before’ and ‘after’ studies. Experience gained during the monitoring of the introduction of parking controls by a number of local authorities has shown that timescales for implementation are prone to slippage so that the choice of such an area would not have guaranteed the completion of an ‘after’ study within the timescale of the project.

A questionnaire survey of parking behaviour, involving over 900 residents and non-residents, and a parking activity survey at six sites, were carried out in the areas around the two Tube stations in September 1992. The London Borough of Merton had nominated a number of stations in their area as having a commuter parking problem although at the time of the study there were no immediate plans to introduce parking controls.

5 RESULTS

In this report, the results are considered in terms of the three hypotheses stated in the previous section. Results from other studies are referenced as appropriate.

5.1 TESTING OF FIRST HYPOTHESIS

The first hypothesis to be tested was

“The high occupancy of and low turnover in parking spaces on-street in the vicinity of rail stations is caused predominantly by motorists who park their vehicle prior to travelling onward by rail”.

This hypothesis was concerned with determining the predominant group of motorists that parked on-street near rail stations. It was also postulated that railheaders tend to be concentrated in station areas where there is no charge for parking.

Data collected from the questionnaire surveys were used to test this hypothesis.

Table 1 shows that work related journeys (eg travel to/from work and business trips) form a significant proportion of the journeys made by interviewees. Hampstead, with its wider range of shopping facilities and restaurants, clearly has a major influence on the distribution of journey purposes of those visiting the suburb.

Between a third and a half of those interviewed (Table 2) parked daily whilst a further 25 per cent parked at least once a week. Clearly there is a high level of parking by motorists who visit the study areas frequently.

When comparisons are made with the results in Table 3 it can be seen that a significant proportion of non-resident motorists do not travel onward by Tube. The reason for parking in the area is to work/undertake business in the area.

Whilst the majority of non-resident motorists interviewed parked in a study area regularly whilst travelling to/from work or undertaking business at least 50 per cent of the non-resident motorists interviewed in Barons Court/ West Kensington and South Wimbledon/Colliers Wood and virtually all of those in Hampstead were staying in the area and not travelling onward by rail to complete their journey. This is contrary to the impression gained from the representations made by the local authority associations to the Department.

There could be a retrograde effect on the economic well-being of an area if parking controls were to displace the main category of motorist leaving a car parked in that area.

When asked 86 per cent of Tube users interviewed in Colliers Wood/South Wimbledon gave ‘convenience’ as the main reason for parking in the area prior to travelling onward by Tube. Five of the twelve Tube users (42 per cent) in Hampstead also gave ‘convenience’ as the reason for parking in the area. ‘Free parking’ and ‘availability of parking’ were the other most often quoted responses.

Although a smaller proportion of motorists parking vehicles travel onward by Tube the average parking time for this group is far in excess of that for motorists who stay in the area. In the Hammersmith study area the total time that parking places were occupied by motorists travelling onward by Tube was found to be approximately equal to the total time that kerb-side space was occupied by those walking to a destination in the area. In Hampstead the walkers occupied considerably more kerb-side space than the small proportion of motorists travelling onward by Tube. In South Wimbledon and Colliers Wood the total time that kerb-side parking space was occupied by those travelling onward by Tube was approximately twice that of those walking to their destination.

It can be seen from Table 4 that the average parking duration of vehicles left by railheaders is greater than that of vehicles left by non-resident motorists walking to an attractor. However it can rightly be argued that those staying in the area are more likely to be contributing to the economic well-being of the area. Displacement of railheaders would not affect the economic well-being of the area significantly whereas displacing those who work/shop in the area would.

An important feature of any parking control initiative is to ensure that those contributing to the well-being of the area are not disadvantaged to such an extent that they shop/work elsewhere.
### TABLE 1
Journey purpose of non-residents

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Barons Court/ West Kensington</th>
<th>Hampstead</th>
<th>South Wimbledon/ Colliers Wood</th>
</tr>
</thead>
<tbody>
<tr>
<td>To/From Work</td>
<td>49%</td>
<td>24%</td>
<td>56%</td>
</tr>
<tr>
<td>On Business</td>
<td>19%</td>
<td>18%</td>
<td>14%</td>
</tr>
<tr>
<td>Visiting Friends/ Relatives</td>
<td>15%</td>
<td>8%</td>
<td>13%</td>
</tr>
<tr>
<td>Shopping</td>
<td>1%</td>
<td>19%</td>
<td>6%</td>
</tr>
<tr>
<td>Delivering</td>
<td>2%</td>
<td>1%</td>
<td>3%</td>
</tr>
<tr>
<td>Dropping/Collecting passengers</td>
<td>2%</td>
<td>11%</td>
<td>5%</td>
</tr>
<tr>
<td>Other</td>
<td>12%</td>
<td>19%</td>
<td>3%</td>
</tr>
</tbody>
</table>

### TABLE 2
Parking frequency of non-residents

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Barons Court/ West Kensington</th>
<th>Hampstead</th>
<th>South Wimbledon/ Colliers Wood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>36%</td>
<td>38%</td>
<td>45%</td>
</tr>
<tr>
<td>At least once a week</td>
<td>26%</td>
<td>28%</td>
<td>22%</td>
</tr>
<tr>
<td>At least once a month</td>
<td>18%</td>
<td>18%</td>
<td>17%</td>
</tr>
<tr>
<td>At least once a year</td>
<td>12%</td>
<td>12%</td>
<td>4%</td>
</tr>
<tr>
<td>Less than once a year</td>
<td>3%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>First time</td>
<td>6%</td>
<td>2%</td>
<td>10%</td>
</tr>
</tbody>
</table>

### TABLE 3
Onward mode of non-residents.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Barons Court/ West Kensington</th>
<th>Hampstead</th>
<th>South Wimbledon/ Colliers Wood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk</td>
<td>63%</td>
<td>96%</td>
<td>57%</td>
</tr>
<tr>
<td>Train</td>
<td>30%</td>
<td>1½%</td>
<td>41%</td>
</tr>
</tbody>
</table>

### TABLE 4
Average anticipated parking duration

<table>
<thead>
<tr>
<th>Mode</th>
<th>Barons Court/ West Kensington</th>
<th>Hampstead</th>
<th>South Wimbledon/ Colliers Wood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk</td>
<td>5hr</td>
<td>2hr 10m</td>
<td>3hr 13m</td>
</tr>
<tr>
<td>Train</td>
<td>10hr 9m</td>
<td>8hr 12m¹</td>
<td>8hr 29m</td>
</tr>
</tbody>
</table>

¹ Small sample of respondents.
This study has demonstrated that the high occupancy is not caused predominantly by railheaders although this sector of the motoring community would be the least missed if they were displaced to other areas. Railheaders do, however, make a significant contribution to the high occupancy and low turnover at kerbside parking spaces.

It has not been possible to substantiate the hypothesis.

### 5.2 TESTING OF THE SECOND HYPOTHESIS

This hypothesis was concerned with a frequently expounded view that:

"Railheaders travel relatively long-distances in order to park near a rail/Tube station in London".

Concern had been expressed that much of the traffic congestion caused around Tube stations could be attributed to motorists driving from beyond the M25 corridor in order to park near a rail station prior to boarding a train.

This hypothesis was tested by enquiring on the motorist's journey starting point during the administration of the questionnaire. From the locality given it was possible to determine the crow-fly distance travelled.

Tables 5 & 6 demonstrate that there is a tendency for railheaders to drive relatively short distances to a station. In all three study areas a higher proportion of railheaders travelled less than 5km than those who walked from a parked vehicle to their destination.

Driving to a fare zone boundary is seen as an attractive option by some motorists as cheaper tickets are then available for their onward journey. Hampstead station lies on the boundary between London Transport fare zones 2 and 3 but the sample size was too small in the Hampstead survey to form any conclusion. South Wimbledon and Colliers Wood lie just inside the outer boundary of zone 3 and the result was too close to draw a conclusion. Barons Court & West Kensington stations are in zone 2 but not on a boundary.

A high proportion of the railheaders drove to a station to undertake a rail journey which would not require any change of train on the way to their destination. This implies that motorists were using the flexibility of a private vehicle to drive to a station appropriate for a direct rail journey. This flexibility is less likely to exist by relying on a network of road-based public transport services.

Anecdotal evidence collected during the survey around Barons Court and West Kensington showed that some motorists were driving 'just round the corner' from their residences before catching a Tube train, a frequent reason given being concern about personal safety when returning to the area at night. Based on the results of the TRL study, the London Borough of Hammersmith & Fulham now designs its Controlled Parking Zones (CPZ) so that residents' permits apply only to the CPZ in which the residence is located. This restriction prevents permit holders from parking elsewhere within the borough without the payment of a fee and restricts the number of short distance journeys. This method is now being applied more widely by a number of London boroughs.

### TABLE 5

Distance travelled by motorists with walk as onward mode

<table>
<thead>
<tr>
<th></th>
<th>Barons Court/ West Kensington</th>
<th>Hampstead(^2)</th>
<th>South Wimbledon/ Colliers Wood</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\leq 5)km</td>
<td>37%</td>
<td>45%</td>
<td>55%</td>
</tr>
<tr>
<td>(&gt; 5 \leq 10)km</td>
<td>24%</td>
<td>33%</td>
<td>24%</td>
</tr>
<tr>
<td>(&gt; 10)km</td>
<td>39%</td>
<td>22%</td>
<td>21%</td>
</tr>
</tbody>
</table>

\(^2\) Small sample of respondents.

### TABLE 6

Distance travelled by motorists with Tube as onward mode

<table>
<thead>
<tr>
<th></th>
<th>Barons Court/ West Kensington</th>
<th>Hampstead</th>
<th>South Wimbledon/ Colliers Wood</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\leq 5)km</td>
<td>43%</td>
<td>50%</td>
<td>66%</td>
</tr>
<tr>
<td>(&gt; 5 \leq 10)km</td>
<td>12%</td>
<td>17%</td>
<td>16%</td>
</tr>
<tr>
<td>(&gt; 10)km</td>
<td>45%</td>
<td>33%</td>
<td>19%</td>
</tr>
</tbody>
</table>
Longer established schemes, such as in the Royal Borough of Kensington & Chelsea, permits residents to park anywhere within the borough without needing to pay a parking fee. The need to restrict the use of resident permits to smaller geographical areas within the borough is now being discussed as a means of restricting parking in some of the more heavily congested areas. The public reaction to such a change in the issue/use of permits is bound to be unpopular amongst those who had previously had no restrictions placed on where and for how long they might park.

It has not been possible to substantiate the hypothesis.

5.3 TESTING OF THE THIRD HYPOTHESIS

This hypothesis was concerned with finding out whether:

"Parking controls are an effective means of deterring railheaders".

'After' surveys were undertaken in the Barons Court/West Kensington study area and in Hampstead. Results have also been derived from data collected in other areas located near railway stations where parking controls had been introduced.

There are two types of control which have been chosen in an attempt to deter railheaders:

i) time restrictions - e.g. a selected time when permits are required, as in some areas of Clapham Junction (Pickett et al., 1993) where only residents/business permit holders are allowed to park between 0930hrs and 1030hrs.

ii) payment of a parking fee - e.g. in Hammersmith and Fulham, the cost of parking is 50 pence per hour for a maximum of 8 hours; restrictions begin at 0900hrs and payment is not permitted before this time. A maximum permitted parking period is also used in some schemes. In Hampstead a non-permit holding motorist was required to pay a parking fee of £1-20 per hour in parking spaces with a maximum permitted parking period of two hours.

In each 'before' study, interviewees were asked what they would do if parking restrictions/charges were introduced (Table 7). In the case of Hammersmith and Fulham, the follow-up study gave some indication of the extent to which motorists had been displaced.

The answers given in each area will be dictated by the type of parking control likely to be introduced, if known. Care should, therefore, be taken when comparing the results for different study areas. The high incidence of "Don't Know's" clearly demonstrates that a significant proportion of motorists have not considered other options should their current parking arrangements not be available or economic to use. The need for publicity/information which could direct motorists to more 'acceptable' parking areas or modes of transport may be a useful technique in ensuring that vehicles are not parked in areas where parking conditions deteriorate even further.

Table 7 indicates that the introduction of parking controls will not affect the modal split but simply move much of the problem elsewhere.

There may be some merit in identifying what action had been taken by those questioned when the parking controls were introduced and how the actual parking behaviour related to anticipated parking behaviour given prior to the introduction of controls. This question of follow-up was not within the remit for this study but could be usefully included in any subsequent exercise.

5.3.1 Barons Court and West Kensington

Those questioned around Barons Court and West Kensington who responded that they would park elsewhere were asked where they would move to. Forty-four per cent of Tube users responded that they did not know and 13 per cent that they would move to the 'nearest area with free parking'. Sixty per cent of those who were not travelling further indicated they would continue to park in the area.

<table>
<thead>
<tr>
<th>TABLE 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived effect of charges/parking restrictions on motorists’ parking behaviour</td>
</tr>
<tr>
<td>Barons Court/ West Kensington</td>
</tr>
<tr>
<td>Walk</td>
</tr>
<tr>
<td>Continue to park in area</td>
</tr>
<tr>
<td>Park in another area</td>
</tr>
<tr>
<td>Don't know</td>
</tr>
<tr>
<td>Use public transport</td>
</tr>
<tr>
<td>Walk here</td>
</tr>
</tbody>
</table>
A parking control scheme was introduced in the Barons Court and West Kensington area during January 1991, following a consultation exercise with the local residents. The scheme introduced involved shared use of kerbide parking space by residents and non-residents alike. Residents are able to purchase annual permits which entitle them to park without a requirement to pay a parking fee, while non-residents are required to purchase a ticket from Pay and Display equipment installed strategically throughout the parking zone. The hourly charge of 50p/hour with a maximum stay of eight hours and no prepaid parking was designed to discourage the long-term parker thereby enabling residents to park closer to their homes and encourage motorists to visit the area to shop, undertake business etc.

‘After’ surveys were carried out in September 1992, the design of these surveys being such that meaningful comparisons could be made between the results obtained and those yielded by the earlier work. Over 1,000 motorists were approached during the survey period and 50 per cent of those who agreed to be interviewed were residents of the area. The introduction of parking regulations had clearly been of benefit to residents in that they were now able to park nearer their homes. Of those residents who had lived in the area since before the introduction of regulations, 70 per cent had found it easier or much easier to park since the new regulations came into force. Other changes noticed by residents included ‘fewer commuters’, ‘less traffic’ and ‘more spaces available’.

Of the non-residents interviewed in the ‘after’ survey, a smaller percentage than in 1990 were travelling to or from work, although a higher proportion were on business. More were collecting or dropping passengers, on personal business and shopping. The smaller proportion of people travelling to/from work has reduced the demands on parking space which in turn has enabled others to park and increased the turnover in the parking places.

The percentage of daily parkers had fallen from 36 per cent in 1990 to 20 per cent in 1992. Average anticipated parking duration for non-residents was 3hrs 10minutes in 1992 compared to 6hrs 29minutes in 1990, thus effectively doubling the number of vehicles that could park in the space available. It was clear that in 1992 it was much easier to find a parking space - 67 per cent of non-resident respondents were able to find a parking space immediately compared to only 11 per cent in 1990.

There was a noticeable decline in the number of people travelling onwards by Tube from nearly one third of respondents in 1990 to 7 per cent in 1992. Reasons given by Tube using interviewees for continuing to park in Barons Court and West Kensington included comments concerning the area’s convenience to their destination, convenience for work and that they were familiar with the area and therefore parked in it.

In 1992 none of the Tube users expected to be parked in the area for more than 10 hours, whereas in 1990, the average anticipated parking duration for Tube users was 10hrs 9minutes. This gives some indication of the effect that the introduction of the CPZ has had on the parking behaviour of Tube users. While the majority of motorists travelling to work in the centre of London would need to have parked well before 9 a.m. if continuing by Tube, it would be possible for a Tube user to arrive in the area at 9 a.m., affix an 8 hour ticket to his windscreen, and return after a full-days work after 5 p.m. when the time restrictions are no longer in force. It is suggested, therefore, that commuters have been deterred by the cost of parking for a full 8 hours (£4) rather than the time restriction. Those people working in the area prior to the introduction of restrictions are also likely to have been affected more by the cost than the time limit although they may have less choice in where else they are able to park in order to work in the locality. The effect of parking charges will depend on a number of factors including, presumably, disposable income.

The effect of the recession and the associated levels of unemployment may mean that motorists are prepared to pay up to £4 per day to be able to work. As the economy improves and the labour market becomes more buoyant, motorists may be more selective in where they work and the fees they are prepared to pay in order to secure and remain in employment. It can also be argued that as the economy improves motorists may be more tolerant of the need to pay £4 per day to park near their place of employment.

The parking activity survey confirmed that mean parking duration had decreased. Mean occupancy per bay was much reduced at each of the two sites surveyed, but there was little change in the number of acts per bay.

The results of both surveys suggest that the diversion of commuters and other long-term parkers from the area has enabled a new group of motorists to park. These motorists tend to be short term parkers shopping/conducting business or visiting friends/relatives in the area which in turn suggests that the business community could be benefiting.

5.3.2 Hampstead

When asked what effect they thought the introduction of a parking charge of 60p per hour and a maximum permitted stay of two hours would have on their parking habits, seven of the twelve Tube users indicated that they would park elsewhere whilst three said they would continue to park in the area.

The average anticipated parking duration of all non-residents interviewed was 2hrs 11minutes, while the average for those who said they would park in another area when charges were introduced was 4hrs 7minutes. It was concluded, therefore, that the introduction of parking charges in Hampstead would displace the longer term parkers. However, despite indications from local traders, businesses and Camden Borough Council, the study detected little railheading. The problem of long-term parkers was considered to be caused predominantly by motorists working in the area. Other major trip attractors such as the Royal Free Hospital and a number of private schools to/from which pupils were delivered/collected, as well as the lack of off-street car parks in
Hampstead, were thought to contribute to the high level of parking that occurred within the proposed CPZ prior to its introduction in November 1991.

The Controlled Parking Zone initially included only 140 short-stay voucher parking spaces, parking elsewhere in the Zone being by Resident's or Visitor's Permit only. Further short-stay Pay and Display parking, intended for use by the occasional visitor, has since been provided. The introduction of this very limited amount of non-resident parking in Hampstead has had the effect of diverting those motorists working in the area to on-street parking outside the CPZ, leaving residential roads within the CPZ underutilised.

5.3.3 South Wimbledon and Colliers Wood

At the time of the TRL study, the LB of Merton had no plans to introduce controlled parking zones at either South Wimbledon or Colliers Wood. Nevertheless, those respondents who were continuing their journey by Tube were asked what they would do if the London Borough of Merton introduced parking restrictions in the area. Answers given (see Table 7) indicate that a third of the motorists would park elsewhere. Blackfriars, Clapham, East Croydon, Merton, Mitcham, Morden, the Oval, and Tooting were given as possible alternative localities where motorists might choose to park. Many of these locations also have stations on the Northern Line. Twenty one respondents said they would try to park elsewhere in Wimbledon and Colliers Wood. The majority would continue to park on-street.

5.3.4 Clapham Junction

The Laboratory has been involved in an exercise to monitor the introduction of a Controlled Parking Zone in Clapham Junction (LB of Wandsworth) in January 1992 (Pickett et al, 1993). One of the functions of the Controlled Parking Zone was to remove long-term (i.e. commuter) parking and limit waiting time for other visitors, thereby making parking easier for residents and businesses with premises in the area. Parking vouchers were chosen as the means of regulating non-resident parking, residents being eligible for free permits, and businesses being entitled to purchase unlimited business permits. In some areas of the CPZ, parking between the hours of 9.30 a.m. and 10.30 a.m. is by permit only.

A questionnaire survey carried out as part of a 'before' study of parking in the proposed CPZ revealed that 38 per cent of non-resident respondents thought they would be deterred from parking in the CPZ by the introduction of voucher parking and 'permit only' areas, although almost half of these would continue to park elsewhere in Clapham.

In the event, the voucher parking control scheme was found to be effective in controlling the parking of non-permit holders. Both average parking duration of non-permit holders and parking bay occupancy decreased, whilst turnover of vehicles increased.

5.4 OTHER FACTORS

During the course of this study other results have been obtained which give an insight into the parking behaviour of those motorists questioned.

All three parking studies, undertaken as part of the Informal Park and Ride research programme, have confirmed that rail commuters do contribute to the parking problems which occur in the vicinity of rail stations, but not to the extent claimed by some local authorities. Visits to other heavily parked station areas indicate that the lack of off-street parking, the level of businesses, including shops, will all contribute to parking conditions in an area. Ladbroke Grove and Latimer Road station areas are typical examples of where heavily parked streets are more likely to result from the type of housing in the area ie high-rise and/or multi-occupancy. Harrow & Wealdstone station is located near a district shopping centre where high occupancy on-street parking is more likely to be a result of business activity in the area than of railheaders.

This was particularly true in Hampstead, where only 12 motorists, out of over 700 non-residents interviewed over a two week period, could be found who said they were continuing their journey by Tube. In considering the results, however, the following points are worth noting:-

i) true long-stay commuter parkers are available for interview only at the beginning and end of the working day, and any questionnaire survey which also includes interviews during the middle part of the day will underestimate the proportion of motorists who are 'railheading'.

ii) since park and riders tend to leave their vehicle for longer periods, at any one time the proportion of spaces they populate will be higher than the proportion of interviewees who say they are 'railheading'.

6 DISCUSSIONS WITH LONDON BOROUGHS

In March 1989, prior to the commencement of this programme of research, TRL commissioned a study of parking activity in Hammersmith and Fulham to examine the effects of the formation of additional controlled parking zones within the Borough. The Borough Council had expressed concern at the high level of long-term parking in the area around Barons Court and West Kensington stations, and the inadequate levels of enforcement (Simpson, 1989). The borough council proposed to regulate parking with the introduction of a scheme based on the shared use of defined parking areas. As a result of this study Hammersmith and Fulham was regarded by the Laboratory as a suitable candidate for a study of railheading.
Camden was one of the first London Boroughs to seek Special Approval for the introduction of a parking voucher scheme (Pickett, 1993) and Hampstead was therefore selected by the Laboratory for a monitoring exercise which would assist the Department of Transport in its assessment of innovatory schemes. Because of the location of Hampstead Underground station in the centre of the proposed Controlled Parking Zone, and the claim by some Council officers\(^2\) that the high level of long-term parking in the area was caused mainly by railheaders, Hampstead was chosen as a second site for a railheading study.

In May 1991, letters were sent to the City of London and all of the London Boroughs in order that a third site for study might be selected. The local authorities were asked to suggest sites satisfying the following criteria:

i) Situated near a British Rail or London Underground station.

ii) Considered to have an on-street parking problem which was perceived to be caused, wholly or in part, by motorists who leave their vehicles parked at the roadside whilst they continue their journey by rail.

iii) The area was scheduled for the introduction of a parking control scheme which was aimed, wholly or in part, at regulating on-street parking.

All except one of the 21 London local authorities who responded to the letters, considered that they had on-street parking problems associated with 'railheading', although not all were able to suggest sites which satisfied all three criteria. A total of forty sites near stations were put forward as candidates for study (see Appendix A). Visits were made to a selection of these sites after which South Wimbledon and Colliers Wood Tube stations, in the London Borough of Merton were selected as the third area for a detailed study of parking behaviour and activity.

The stations which were highlighted (see Appendix A) by the London Authorities are located in all areas of the capital. Clearly, the 'railheading' problem extends across all of the London Transport fare zones. A few stations are situated on the border between two zones; such a position is occupied, for example, by Kew Gardens station. The London Borough of Richmond-upon-Thames suggested that the differential in the cost of a season ticket for the two zones, was one reason for many commuters travelling as far as Kew by car in order to obtain the lower priced season ticket for their onward journey into London.

The London Borough of Hounslow advised the Laboratory that they had commissioned consultants to carry out surveys which would enable an assessment of the proposed Chiswick Outer Controlled Parking Zone. A copy of the commuter survey report was made available to the Laboratory. The number of drivers interviewed (on station platforms) was small, but it was concluded that a significant number of commuters parked around Turnham Green, Stamford Brook and Gunnersbury stations. It was suggested that the introduction of a CPZ would cause these drivers to divert to a variety of different stations or to adopt an alternative method of travel to their desired stations.

7 CONSULTATIONS WITH PUBLIC TRANSPORT OPERATORS

British Rail (BR), London Transport (LT) and London Underground Ltd (LUL) were approached to enquire on the availability of statistics on mode of travel to a Tube/rail station.

A survey of Tube Users undertaken by London Transport in 1990 yielded the results listed in Table 8 for the stations under study.

At all stations, a large proportion of the users had arrived by foot and a very small proportion by car, many of the latter arriving as passengers rather than as drivers. This would explain why the Laboratory's railheading studies in these areas found that a relatively small proportion of motorists parking in the vicinity of these stations travelled onward by Tube.

<table>
<thead>
<tr>
<th>Station</th>
<th>Arrival Mode</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Walk</td>
<td>Car/van parked</td>
<td>Car/van driven away</td>
</tr>
<tr>
<td>Barons Court</td>
<td>91%</td>
<td>5%</td>
<td>1%</td>
</tr>
<tr>
<td>W.Kensington</td>
<td>90%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Hampstead</td>
<td>87%</td>
<td>1%</td>
<td>3%</td>
</tr>
<tr>
<td>S.Wimbledon</td>
<td>77%</td>
<td>4%</td>
<td>5%</td>
</tr>
<tr>
<td>Colliers Wood</td>
<td>82%</td>
<td>7%</td>
<td>5%</td>
</tr>
</tbody>
</table>

TABLE 8

Arrival Mode at Station (LT Survey, 1990)
The Underground Users Survey, by London Underground Ltd, is a tracking study with a sample size of over 20,000 a year. Results for 1991-1992 confirmed that the majority of Tube users get to the station by walking. Overall, only 5 per cent either drive or are driven to the station. The further away from Central London the Tube traveller starts his rail journey, the more likely he is to get to a station using a car (i.e. for origin in Zone 2 - 5 per cent use a car, and for origin in Zone 6 - 16 per cent use a car). This may reflect the different densities of housing that exist around stations in the different zones and the distances to be travelled to reach a Tube station.

The use of National Travel Survey (NTS) data was also considered - this ongoing survey interviews people at home about journeys made, and could pick out those journeys which involve a car journey followed by Underground. It was felt that the time and cost involved in obtaining this data was not justified as the process would be complex and results more recent than 1985/86 were not available.

8 DISCUSSION

Railheaders are seen as the section of the parking community least likely to be missed if they were to be displaced from parking in a particular area. The presence of their vehicles is not likely to benefit the area financially and can cause considerable disbenefits such as displacing those who may wish to visit the area to transact business, visit friends etc.

Given that we are aware of the type of motorist who wishes to railhead how can they be persuaded to change the modal split of their journey? Given that the period between departure from and return to the area can be long without any need for the use of the vehicle it could be argued that the vehicle could be dispensed with entirely. Given that many of the motorists travel less than 10km, alternatives could be to use public transport or bicycle in place of the car; motorists may even find a station nearer their journey starting point as many cited 'free parking' as the reason for choosing to park in that particular area.

Encouragement of the use of bicycles would require the provision of a facility where bikes could be left in safety. With the difficulty of finding land for such a use it could be argued that this is not a viable or realistic option.

The provision of public transport which is intended to displace the peak time motorist is probably uneconomic. Difficulty has been experienced in the past when trying to encourage a change of mode, for instance from car to bus.

There is obviously no easy answer to the problem of how to discourage railheaders from parking without consequently displacing other users. If the solution was easy an answer might well have been found before this study commenced. The use of the pricing mechanism seems the only practical solution despite the problems of inequity caused.

The widespread introduction of parking controls with adequate enforcement resources deployed should relieve areas where railheading occurs. If this solution were to be tested adequate provision would need to be made for those who wish to park for prolonged periods whilst working in the area or visiting relatives. An adequate enforcement regime would have to be deployed to ensure that any parking regulations were complied with.

The issue of permits is another sensitive area worthy of consideration. Lower occupancy of parking bays may encourage residents to purchase a vehicle once it becomes easier to park in the locality. Local authorities would need to decide the proportion of resident’s vehicles that could be permitted to be parked in an area and issue the appropriate number of permits accordingly. This is a contentious issue which is likely to generate an adverse reaction from some sections of the community.

Not until these controls are introduced over a wide area is there likely to be any shift in the modal split.

9 SUMMARY AND CONCLUSIONS

The Laboratory has carried out a study of Informal Park and Ride or ‘railheading’ following representations by Local Authorities to the Department about the ‘common’ practice of parking in the vicinity of a station and continuing a journey by rail. Excessive levels of railheading aggravate traffic congestion around stations and can have an effect on road safety and atmospheric pollution in the area. It is also claimed that parking is difficult for residents and short-term parkers wishing to shop and undertake business in the area.

A literature review of published research material found that few papers have addressed the subject of informal, rail-based park and ride.

Parking studies were undertaken in the areas around the following underground stations:

i) Barons Court and West Kensington

ii) Hampstead

iii) South Wimbledon and Colliers Wood.

The studies consisted of questionnaire surveys and continuous monitoring of parking activity. It was found that:

i) a significant proportion of non-resident motorists in the three areas studied were parking in these areas daily before continuing their journey to work. However, the proportion whose journey included rail travel was not as large as claimed by Local Authorities.
ii) motorists parking in the vicinity of BR and LU stations were principally *short-distance* commuters having driven less than 10km. Well over half the non-residents interviewed in each of the three study areas had travelled less than 10 km before parking their vehicles and, indeed, many had travelled less than 5 km.

iii) parking controls can be used to deter long-term parkers, which include 'railheaders'. This has been demonstrated by the follow-up study around Barons Court and West Kensington where a high parking tariff was introduced in January 1992; and by other TRL studies conducted in Hampstead and Clapham Junction where time restrictions and permit requirements in certain areas have been in operation since the creation of a CPZ. All of these schemes were found to be effective in controlling the parking of non-permit holders. Long-term parkers were displaced, making conditions easier for residents and short-stay parkers. These long-term parkers, however, included a large proportion of motorists who worked in the areas around the study stations.

Although surveys by London Transport and London Underground Limited indicate that only a very small proportion of Tube users park a vehicle in the vicinity of an Underground station, many London Boroughs consider that they have on-street parking problems associated with 'railheading'. An increasing number are considering the introduction of parking controls to alleviate these problems.

10 ACKNOWLEDGEMENTS

The study described in this report forms part of the research programme undertaken as part of Department of Transport Letter of Agreement T1/14 'Park and Ride Behaviour in London', Project Officer B Titeley, London Assessment Division, DOT.

11 REFERENCES


### APPENDIX A

Station areas reported as having parking problems caused by railheaders.

<table>
<thead>
<tr>
<th>London Borough</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redbridge</td>
<td>Barkingside (LU, Central) Fairlop (LU, Central)</td>
</tr>
<tr>
<td>Greenwich</td>
<td>Greenwich (BR)</td>
</tr>
<tr>
<td>Enfield</td>
<td>Enfield (BR) Palmers Green (BR)</td>
</tr>
<tr>
<td>Haringey</td>
<td>Wood Green (LU, Piccadilly) Turnpike Lane (LU, Piccadilly)</td>
</tr>
<tr>
<td>Kensington &amp; Chelsea</td>
<td>Ladbrooke Grove (LU, Metropolitan) Latimer Road (LU, Metropolitan)</td>
</tr>
<tr>
<td>Newham</td>
<td>West Ham (LU, Metropolitan/District) Plaistow (LU, Metropolitan/District)</td>
</tr>
<tr>
<td></td>
<td>Upton Park (LU, Metropolitan/District) East Ham (LU, Metropolitan/District)</td>
</tr>
<tr>
<td></td>
<td>Stratford (BR) Maryland (BR) Forest Gate (BR) Manor Park (BR)</td>
</tr>
<tr>
<td>Bromley</td>
<td>Chelsfield (BR)</td>
</tr>
<tr>
<td>Hounslow</td>
<td>Chiswick Park (LU, District) Turnham Green (LU, District)</td>
</tr>
<tr>
<td>Camden</td>
<td>Belsize Park (LU, Northern)</td>
</tr>
<tr>
<td>Ealing</td>
<td>South Ealing (LU, Piccadilly)</td>
</tr>
<tr>
<td>Bexley</td>
<td>Welling (BR)</td>
</tr>
<tr>
<td>Havering</td>
<td>Rainham (BR) Elm Park (LU, District)</td>
</tr>
<tr>
<td>Kingston</td>
<td>Surbiton (BR)</td>
</tr>
<tr>
<td>Harrow</td>
<td>Stanmore (LU, Jubilee) Wealdstone (LU, Bakerloo)</td>
</tr>
<tr>
<td>Tower Hamlets</td>
<td>Aldgate (LU, Circle/Metropolitan) Whitechapel (LU, District/Metropolitan)</td>
</tr>
<tr>
<td></td>
<td>Stepney Green (LU, District/Metropolitan) Mile End (LU, District/Metropolitan/Central)</td>
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<td>Stepney East (BR) Shadwell (LU, Metropolitan) Other LU &amp; Docklands stations.</td>
</tr>
<tr>
<td>Merton</td>
<td>Wimbledon Park (BR) Morden (LU, Northern) South Wimbledon (LU, Northern) Colliers Wood (LU, Northern) Raynes Park (BR)</td>
</tr>
</tbody>
</table>