TRANSPORT RESEARCH LABORATORY

# Alternative routes for cyclists around pedestrian areas

## Prepared for Driver Information and Traffic Management Division, Department of the Environment, Transport and the Regions

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# CONTENTS

# Executive Summary

Pedestrianisation of central streets, usually in prime retail areas, has become a common feature of UK town centres, creating safer conditions for walking and a more attractive environment for shopping. Depending on local circumstances and policies, cycling may or may not be permitted in these areas. Where cyclists, along with other vehicles, are excluded for all or parts of the day, cyclists may seek alternative routes: sometimes these are formally provided.

The Driver Information and Traffic Management Division of the Department of the Environment, Transport and the Regions commissioned TRL to research the alternative routes used by cyclists to avoid pedestrian areas, in terms of the safety and convenience for cyclists. This is prompted by a consensus that cyclists should not be endangered on alternative routes, typically ring roads or inner relief roads, designed to accommodate high flows of motor traffic (Trevelyan and Morgan 1993). Nine towns (Andover, Basingstoke, Bath, Chelmsford, Chichester, Erdington, Ipswich, Kingston upon Thames and Leicester) were selected for study. The distance, delay, road type, junctions and traffic flows on the alternative routes were quantified. The report shows that the alternative routes involve greater distance; many require cyclists to dismount; and only two allow cyclists to follow the same route in both directions, due to one-way working. The alternative routes tend to be, at least partly, along heavily-trafficked roads and involve significant additional junctions.

Three towns (Chelmsford, Kingston upon Thames and Leicester) that have provided signed alternative routes with facilities, and which prohibit cyclists from most of the pedestrian area, were investigated in greater detail. In all cases it is quicker to cycle the alternative route than to push a cycle through the pedestrian area. Over the five years 1991-1995, no accidents between pedestrians and cyclists were reported in the pedestrian areas; two accidents involving cyclists and motor vehicles occurred at the edge of the pedestrian area.

Over 700 cyclists were interviewed in the three towns, in the pedestrian areas and on the surrounding streets that might form alternative routes. No significant differences were found between cyclists using the two types of route in terms of gender, age, or journey purpose. Cyclists use a wide variety of routes to cross and access the town centres. Many use both the pedestrian areas and the alternative routes, according to time of day, pedestrian density, the need to make stops on route and the particular details of their journey. Cyclists on both types of route choose their route largely on the basis of directness and minimising delay. Many cyclists choose to avoid the pedestrian areas when pedestrian activity is high.

Cyclists are generally satisfied with the signed alternative routes provided by the local authorities in the three towns although there are concerns about traffic flows, junctions and parked cars. Obstruction and unpredictable movements by pedestrians were also of concern to cyclists on some sections.

Based on this and previous research, design guidelines are proposed for alternative routes. It is concluded that signed cycle routes that are continuous, direct, safe and integrated with the surrounding road network, can reduce the need for cyclists to use pedestrian areas and bring safety and convenience benefits. Some cyclists will still need to access pedestrian areas. Where possible, measures should be put in place to ensure that cyclists and pedestrians are able to share space safely and comfortably. This may involve some regulatory measures, and will require careful attention to design detail.

# 1 Introduction

Pedestrianisation began in the UK in the 1960s, as local authorities sought to reduce the impact of increased traffic in town centres. Since then, the central streets in many towns and cities have been pedestrianised to improve the environment for pedestrians, and to enhance the viability of central areas. Whereas in 1971 almost 90% of prime town centre shopping areas were located in vehicular streets, by 1994 this had declined to 40% (Erdman Lewis 1994). Pedestrian areas vary in size and character due to a range of local factors including vehicle flows, access requirements, land uses and pedestrian needs.

Most pedestrian areas allow access by some vehicles at some times. Restrictions on vehicle access vary from the exclusion of virtually all vehicles, to limited exclusions with exemptions based on time of day, or class of vehicle. When establishing or modifying a pedestrian area, deciding which vehicles to permit and which to prohibit can be controversial. It may be desirable to permit buses, taxis, orange badge holders (disabled parking), service and delivery vehicles as well as cyclists. Advice is provided in Local Transport Note 1/87 'Getting the Right Balance' (DOT 1987).

There are basically three ways in which cyclists are treated in pedestrian areas:

- Cycling is permitted at all times (eg New Street, Birmingham)
- Cycling is prohibited during specified times, usually during peak shopping hours, thereby allowing access to commuter cyclists when pedestrian areas are quiet (eg York Footstreets area)
- Cycling is prohibited at all times (eg High Street, Southend-on-Sea).

Department of Transport advice (1993), IHT guidelines (1996) and advice from the Netherlands (CROW, 1993) discuss the issues pertaining to a decision as to whether or not to allow cyclists into the pedestrianised area for all or part of the day. Where cycling is permitted, careful design can seek to minimise any conflict with pedestrians.

In locations where cyclists are excluded from the pedestrian area, they may seek an alternative route, usually shared with other displaced vehicles, or they may push their bikes through the pedestrianised street, or not travel by bicycle. They may also (illegally) disregard the cycling prohibition.

The Driver Information and Traffic Management Division of the Department of the Environment, Transport and the Regions commissioned the Transport Research Laboratory (TRL) to investigate the problems, if any, of cyclists displaced from or prohibited from using pedestrian areas, and the quality of alternative routes available to them. The risks to cyclists excluded from pedestrian areas are to be compared with the risks to cyclists if they were permitted in pedestrian areas.

# 2 Methodology

TRL obtained information from eight local authorities on cycling conditions for nine pedestrian areas and the alternative routes used by cyclists. Although cycling is permitted in some pedestrian areas, the study concentrated on sites where cycling is prohibited for all or most of the day. The sites were selected to provide a range of conditions. Information was collected on the quality of the principal alternative routes, including distances, traffic flows, junctions, dismount requirements and other relevant aspects.

Three towns (Chelmsford, Kingston upon Thames and Leicester) with signed cycle routes around the pedestrian areas and with above average numbers of cyclists using the central areas, were chosen for more detailed study, including site visits and accident data analysis. Interviews with 717 cyclists were carried out in these three towns: in the pedestrian areas, on the signed routes and other streets likely to be used as alternative routes used by cyclists. The interviews were split evenly between the pedestrian areas and the alternative routes, to ascertain cyclists' views on the safety and convenience of the routes used, and the effects on their travel patterns. The value of the signed routes around the pedestrian areas was investigated.

# 3 Overview of alternative routes in nine towns

### 3.1 Site descriptions

Information on nine pedestrian areas in the following towns was obtained from local authorities:

Andover

Basingstoke

Bath

Chelmsford

Chichester

Erdington (Birmingham)

Ipswich

Kingston upon Thames

Leicester

Cyclists are excluded from the pedestrian areas at all times, except in Chichester where cycling was permitted between 17:30 and 9:30 Monday to Saturday and at all times on Sundays. The pedestrian areas and principal alternative routes are summarised in Table 1. Details of the pedestrianisation schemes, the principal alternative routes used by cyclists and other relevant factors are described in Appendix 1.

The sites were selected to provide a range of conditions to illustrate the types of alternative route available to cyclists around pedestrian areas. They are not intended to be a representative sample of pedestrian areas in the UK. They range from relatively small, linear sites, such as Erdington, to larger sites where a number of streets are closed to traffic to form a pedestrianised network, such as Bath.

**Table 1 Detour and dismount requirements of alternative routes**

| | *Pedestrian area (No cycling)* | | *Principal alternative routes* | | |
|---|---|---|---|---|---|
| *Town* | *Total length of pedestrianised streets (metres)* | *Route through pedestrian area (metres)* | *Alternative Route 1 (metres)* | *Alternative Route 2 (metres)* | *Dismount required* |
| Andover | 550 | 300 | 575 [1] | 600 [2] | Yes |
| Basingstoke | 250 | 125 | 200 [3] | 325 [4] | No |
| Bath | 425 | 200 | 550 [1] | 500 [2] | No |
| Chelmsford | 600 | 500 | 500 [1] | 700 [2] | Yes |
| Chichester [5] | 525 | 250 | 900 [3] | 450 [4] | Yes, in one direction |
| Erdington | 100 | 100 | 250 [1] | 250 [2] | No |
| Ipswich | 1000 | 750 | 1100 [3] | 925 [4] | No |
| Kingston upon Thames | 275 | 200 | 425 [3] | 425 [4] | No |
| Leicester | 200 | 200 | 425 [1] | 425 [2] | Yes |
| Average | 436 | 229 | 547 (+88%) | 508 (+75%) | 4/9 |

*[1] North-South, [2] South-North, [3] East-West, [4] West-East, [5] Cycling prohibited 9.30-17.30 Monday to Saturday only.*

### 3.2 Convenience

The distances through the pedestrian areas are compared with the distances on the alternative routes that cyclists are most likely to use - identified with the assistance of the local authorities. Across the nine sites, the average additional distance that cyclists are required to travel to avoid the pedestrian area is approximately 235 metres (Table 1). The total length of pedestrianised streets where cycling is prohibited is also shown to indicate where the restrictions affect more than just a single route.

Only two out of the nine sites has principal alternative routes along the same stretches of carriageway or cycleway in both directions. For the others, one-way systems make some routes up to twice as long in one direction as the opposite direction.

In four of the nine towns, cyclists using the principal alternative routes are required to dismount. In two cases this is due to the signed route crossing or using a short stretch of the pedestrian area, and in another case this is due to the need to exit a road closure with no cycle gap. Additionally, in Chelmsford, cyclists are required to dismount to cross two pedestrian bridges.

### 3.3 Safety

In all towns the alternative routes involve additional hazards for cyclists, when compared to the pedestrian area. Table 2 summarises the road type, traffic flows, and significant additional junctions that cyclists use on the alternative route.

A number of the alternative routes require cyclists to use dual carriageways, ring roads and gyratory systems. Although all alternative routes have speed limits of 30 mph or below, it was evident from site visits and information from the local authorities that actual vehicle speeds are sometimes considerably higher on some sections of the alternative routes. Exceptions to this are Bath and Leicester where the nature of the central streets constrain vehicle speeds; and in Chelmsford where most of one alternative route is off-road. Traffic flows are high on sections of some routes, notably Basingstoke and Erdington.

The additional junctions that cyclists are required to negotiate are also shown in Table 2. At most sites, the routes involve a right turn at either a roundabout or a priority junction. Where this is not the case, there are a number of minor junctions to negotiate. Around three-quarters of pedal cyclist accidents that involve a motor vehicle occur at junctions, and pedal cyclists injuries tend to be more severe when higher speeds are involved. As the pedestrian area cycling restrictions prevent cyclists from following a straight-ahead route with no turning manoeuvres, virtually free of motor traffic, most of the alternative routes involve additional hazards for cyclists. The accident record for three sites is examined in section 4.

**Table 2 Road type and junctions on alternative routes**

| *Town* | *Alternative route 1 - road type[1]* | *Alternative route 2 - road type[1]* | *Traffic flows[2] - (vph)* | *Additional significant junctions* |
|---|---|---|---|---|
| Andover | Two lane ring road (60%) | As route 1 | 900 | 5-arm roundabout |
| Basingstoke | Two lane ring road [3] | Two lane ring road [3] | 1,300 | Right turns at Y-junctions in one-way traffic |
| Bath | One / two lane streets [3] | One / two lane streets [3] | 400 | Numerous turns at priority junctions |
| Chelmsford | Service road (75%) [3] | Off road cycleway | na | 4-arm roundabout |
| Chichester | Two lane ring road (60%) | One lane streets [3] | 1,200 | Large gyratory |
| Erdington | Two lane dual carriageway (60%) | Two lane dual carriageway (100%) | 1,875 | 3-arm roundabout |
| Ipswich | One lane streets [3] | Two lane streets | 700/1,500 | Two major accesses |
| Kingston upon Thames | Two lane streets (60%) | As route 1 | 180 | 2 mini-roundabouts |
| Leicester | Single lane streets [3] | Single lane streets [3] | 200 | Numerous turns at priority junctions |

*[1] Single carriageways unless stated; [2] Off-peak hourly flows, 2-way on busiest sections; [3] one-way streets*

# 4 Detailed assessment of three towns

## 4.1 The three towns: pedestrian areas and alternative routes

### *Selection of towns*

Three towns (Chelmsford, Kingston upon Thames and Leicester) were selected for study in further detail. The town centres and main pedestrian areas are shown in Figures 1 to 3. In particular, the pedestrian areas and the alternative routes were assessed in terms of journey times, street furniture, pedestrian levels and traffic conditions. In addition, accident data were obtained for the town centre areas for the pedestrian area and the surrounding streets. They were chosen because all sites provide signed routes for cyclists to bypass the pedestrian areas (see Figure 1-3), although these routes vary in the comprehensiveness and directness. (Most of the designated routes actually crossed the pedestrian areas or used short stretches of them at some point.) The towns have levels of cycling to work close to, or slightly above, the average for England (Chelmsford 5.8% of journeys to work, Kingston upon Thames 3.5%, Leicester 3.8%, England 3.5% - 1991 Census), and reasonably high numbers of cyclists in the town centres. Kingston upon Thames and Leicester have extensive vehicle restricted areas in which the restrictions on cycling varied. The towns vary in population size, regional location and type of authority.

### *Description of pedestrian areas*

All the pedestrian areas are primary shopping centres with high pedestrian densities. At the three sites, at least 400 pedestrians were counted in any one direction over a 15 minute period. Approximately half the cyclists observed in the pedestrian areas were riding, and half were pushing their cycles. Sheffield cycle parking stands are located at or near both ends of the three pedestrian areas. These are well used.

Benches, litter bins, plants and other street furniture are located in the pedestrianised areas. In Chelmsford the street furniture is located in the middle of the pedestrian area in some sections, whilst in Kingston upon Thames and Leicester these are towards the edges of the streets, with larger gaps in the centre.

### *Signed alternative routes for cyclists*

The three towns have signed cycle routes which form part of a town-wide cycle network. They were generally pleasant to cycle because there were few motor vehicles on many sections. Some of the alternative routes included facilities shared with pedestrians (shared use footway / cycle track in Chelmsford) or roads with significant pedestrian crossing movements (Silver Street and Cank Street in Leicester). The main pedestrian areas and the alternative routes are shown in Figures 1-3.

### *Comparison of travel times*

It takes a similar amount of time to push a cycle through the pedestrian area as it does to cycle the alternative route (Table 3). The only alternative route that is quicker is the North-South route in Chelmsford, which is a direct route parallel to the pedestrian area. The South-North route takes longer because it is more sinuous and indirect. Journeys times tend to be more variable on the alternative routes than through the pedestrian area due to delays at pedestrian crossings and junctions. No attempt was made to time cycle journeys through the pedestrian area as cycling was not permitted. However, these would clearly be quicker than walking with the cycle.

## 4.2 Reported accidents

Table 4 shows the accidents that were reported in the three town centres in the five years 1991 to 1995, taken from STATS19 data obtained from the local authorities. The areas approximate closely to those shown in Figures 1 to 3. These include the roads that cyclists may use as alternatives to the pedestrian areas.

Out of a total of 643 accidents (all road users), only 16 occurred in the pedestrian areas. Moreover, most accidents

**Table 3 Comparison of travel times through pedestrian areas and alternative routes**

| | *Chelmsford* | | *Kingston upon Thames* | | *Leicester* | |
|---|---|---|---|---|---|---|
| | *Route* | *Time taken to walk or cycle route* | *Route* | *Time taken to walk or cycle route* | *Route* | *Time taken to walk or cycle route* |
| Pedestrian Area (Walk) | High Street / Springfield Road / Moulsham Street | 5:15 minutes | Clarence Street | 2:50 minutes | Gallowtree Gates / East Gates | 1:55 minutes |
| Alternative Route 1 (Cycle) | South-North. Network of dedicated cycle routes. | 5.30 minutes | West-East. Union Street / Eden Street | 2:55 minutes | South-North. Friar Lane / Greyfriars / Cank Street | 2:15 minutes |
| Alternative Route 2 (Cycle) | North-South. Tindal Street / New London Road / Parkway | 4:05 minutes | East-West. As West-East | 2:50 minutes | North-South. Silver Street / Loseby Lane / Hotel Street | 2:05 minutes |

*The times are the average of 3 journeys.*

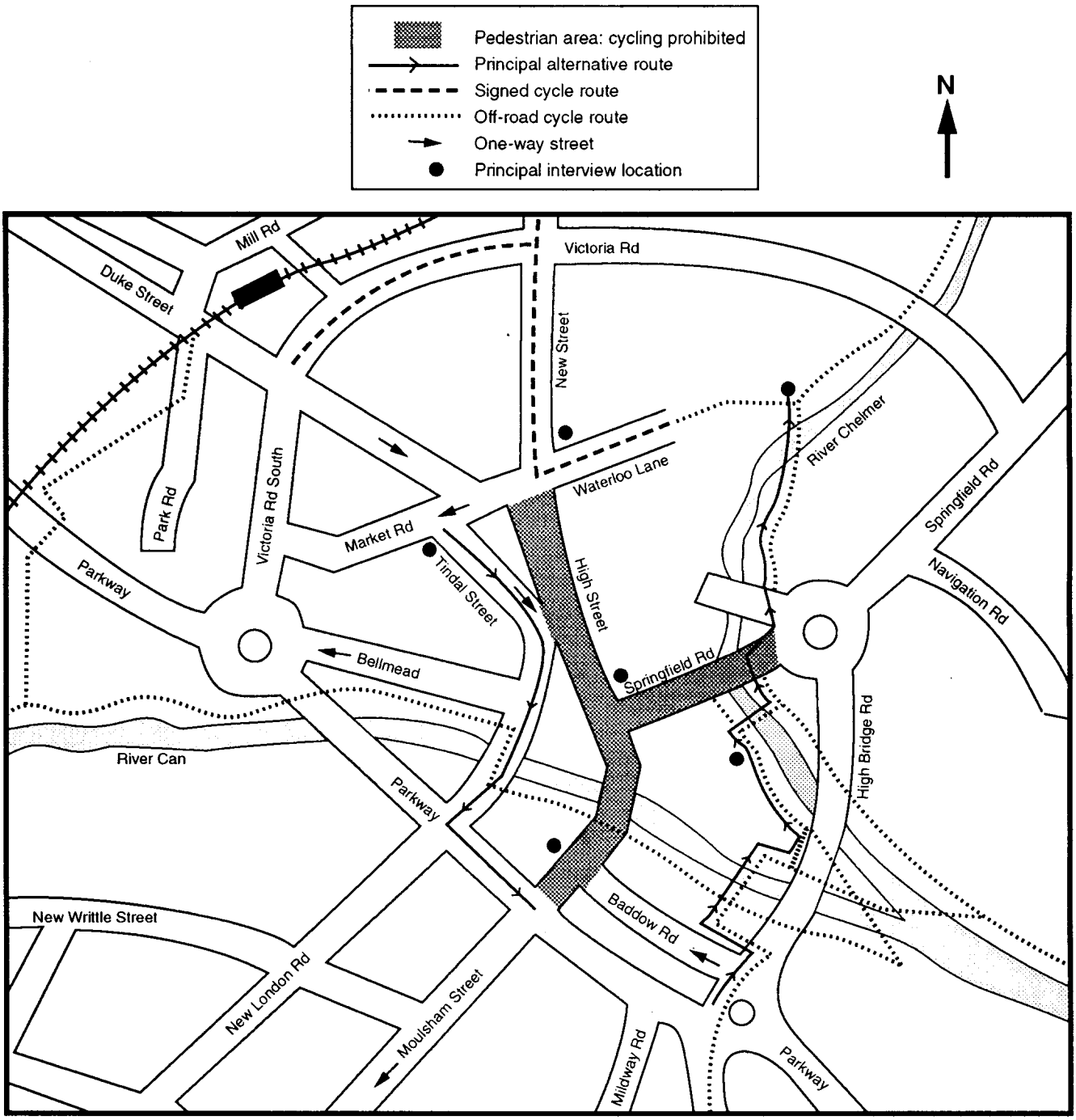



**Figure 1** Chelmsford

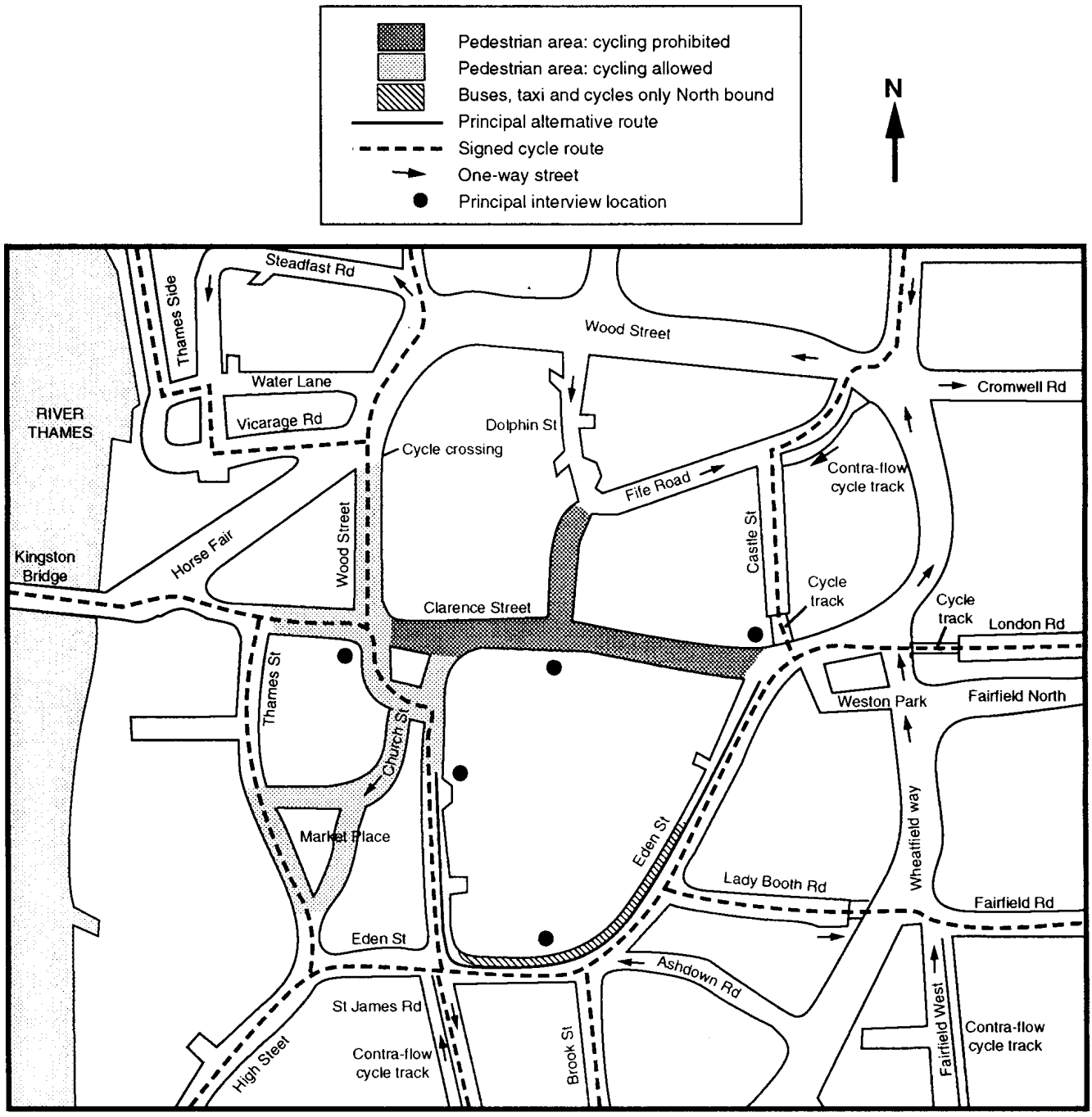



**Figure 2** Kingston-upon-Thames

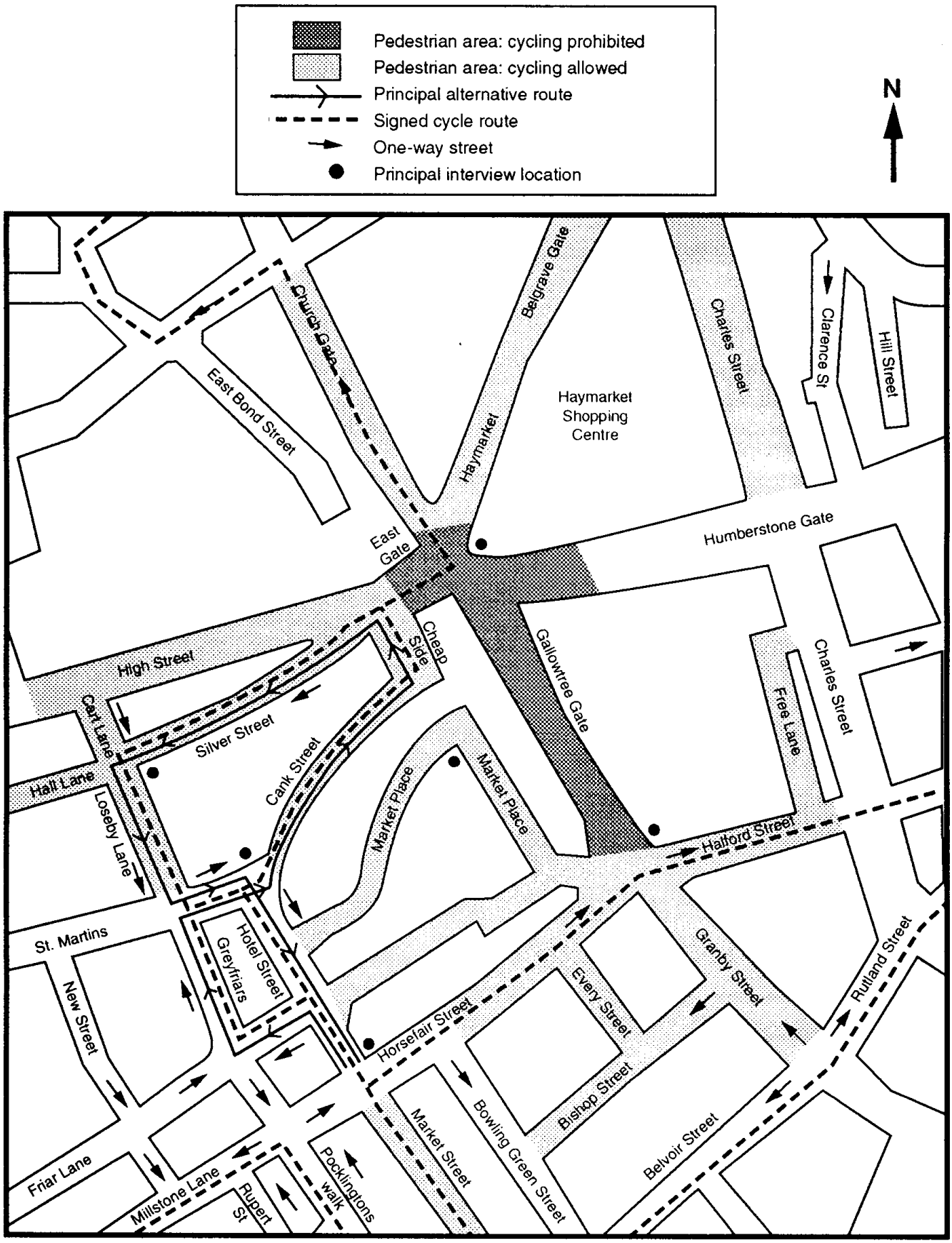



**Figure 3** Leicester

**Table 4 Accidents in the three town centres 1991-95**

| | *Site total accidents (all users)* | *Accidents involving cyclists* | *Accidents involving pedestrians* | *Cyclist-pedestrian accidents* |
|---|---|---|---|---|
| Chelmsford | 225 (4) | 38 (0) | 44 (3) | 0 |
| Kingston upon Thames | 257 (3) | 36 (0) | 85 (3) | 2 (0) |
| Leicester | 161 (9) | 11 (1) | 128 (8) | 1 (0) |
| Total | 643 (16) | 85 (1) | 257 (14) | 3 (0) |

*The numbers in brackets () refer to accidents, included in the total, occurring within and on the edges of the pedestrian area.*

classified as occurring in the pedestrian area actually occurred where it joins the surrounding streets. Most of these usually involved a pedestrian and a motor vehicle. Three accidents involved both a cyclist and a pedestrian; none of these was in the pedestrian areas.

Chelmsford was the only site to be pedestrianised between 1991 and 1995, in July 1992. The 4 accidents inside the area pedestrianised in 1992 occurred before pedestrianisation. The number of accidents per year involving a cyclist in Chelmsford town centre was similar before and after pedestrianisation: 13 accidents before pedestrianisation (average of 9 per year) and 25 after pedestrianisation (average of 7 per year).

Of the 85 accidents involving cyclists, 79 involved motor vehicles, including 10 with parked vehicles. The cyclist was injured in all except 2 cases; 3 pedestrians were also injured. Of these 86 casualties, 69 sustained slight injuries, 15 sustained serious injuries and there was 1 fatality (a cyclist). The higher numbers of accidents in Chelmsford and Kingston may reflect higher numbers of cyclists and the presence in the town centre of features, such as roundabouts, recognised as hazardous for cyclists. In Chelmsford, 17 accidents occurred at large roundabouts, primarily the Odeon and Army & Navy roundabouts on Parkway; 7 accidents in Kingston occurred at mini-roundabouts.

Fourteen (16%) of the accidents involving cyclists were on signed alternative routes; only 1 involved serious injury. Ten of these were in Kingston, of which 3 occurred at mini-roundabouts, 2 at priority junctions and 2 were cyclist-pedestrian accidents on a link section. Cyclist accidents appeared to occur less frequently in locations where vehicular traffic flows were low or motor vehicles were excluded from alternative routes.

### 4.3 Interviews with cyclists

#### *4.3.1 Method and sample*

***The interviews***

Cyclists were interviewed in the pedestrian areas and on a comprehensive range of possible alternative routes in the three towns. They were asked for details of their current journey and route, about alternative routes that they sometimes used, and the reasons for their preferences in terms of safety and convenience. The purpose was to see if route choice was affected by the characteristics of the respondent and journey purpose, and the factors that influenced route choice decisions.

***Survey dates and locations***

The interviews were conducted over 12 days (Monday to Saturday for 2 weeks) in September 1996, 8:30 to 17:45. In total, 717 cyclists were interviewed, approximately 240 in each of the three towns. A good response was obtained: almost one in two cyclists approached agreed to be interviewed. Some 349 cyclists were interviewed in the pedestrian area, and 368 on the alternative routes ie. roads or cycle tracks running parallel to the pedestrian area. The response rate was very similar for pedestrian areas and alternative routes. The questionnaire is provided in Appendix 2. Details of the sample are shown in Tables 5 and Figure 4.

***Characteristics of respondents***

Two thirds of cyclists interviewed were male. There was a fairly even distribution of ages, including 15% over 60 years. Cyclists under the age of 16 were not approached. Most respondents were frequent cyclists, with 70% cycling 6-7 days a week. Immediately prior to interviews in the pedestrian areas, 43% of cyclists were pushing their bicycles, 30% were parking them and 27% were riding them.

#### *4.3.2 Results*

***Journey purpose***

The main purposes of the cyclists' journeys (when interviewed) are shopping (47%) and commuting/business (26%). This is almost the reverse of usual cyclists' journey purpose, as shown in UK National Travel Surveys. The high percentage of shopping trips found in this survey partly reflects the location of the interviews and the time of day.

Forty-two percent of cyclists make a stop on their journey, which will have influenced the route choice of these cyclists. Those cyclists who stop on route do so mainly for shopping (58%). Stops at a cash point, bank or building society (18%) and post office or post box (4%) were also mentioned by many cyclists stopping on route.

***Route choice***

Of all cyclists interviewed, 186 (26%) use only the pedestrian area, 232 (32%) use only the alternative routes and (299) 42% use both the pedestrian areas and the alternative routes on occasions, according to the particular requirements of the journey. 485 (68%) push or ride their bicycle through the pedestrian area at least sometimes and 531 (75%) use alternative routes at least sometimes (see Table 6 and Figure 4).

Cyclists were asked to draw the alternative route they use, if any, on a map provided. In each town it was clear that cyclists use a wide variety of routes through and around the central pedestrian area, even for journeys that apparently have a similar origin and destination. This may be partly explained by the need, or opportunity, to make intermediate stops. Cyclists tend to use short stretches of the signed alternative routes, according to the origins and destinations of their trips.

In Chelmsford, 83% of all cyclists interviewed sometimes use an alternative route whereas only 36% of those interviewed on alternative routes sometimes use the

**Table 5 Interview sample**

| | Chelmsford | | Kingston | | Leicester | | |
|---|---|---|---|---|---|---|---|
| | *Pedestrian Area* | *Alternative Route* | *Pedestrian Area* | *Alternative Route* | *Pedestrian Area* | *Alternative Route* | *Total (weighted %)* |
| *n Number of interviews* | *112* | *135* | *112* | *116* | *125* | *117* | *717* |
| ***Sex (%)*** | | | | | | | |
| Male | 59% | 58% | 65% | 55% | 77% | 80% | 66% |
| Female | 41% | 42% | 35% | 45% | 23% | 20% | 34% |
| ***Purpose of current journey (%)*** | | | | | | | |
| Commuting / on business | 38% | 32% | 23% | 11% | 21% | 28% | 26% |
| Education | 6% | 4% | 5% | 4% | 5% | 6% | 5% |
| Shopping | 32% | 44% | 47% | 68% | 51% | 40% | 47% |
| Other personal business | 24% | 20% | 23% | 17% | 23% | 26% | 22% |
| ***How often respondent cycles (%)*** | | | | | | | |
| 6-7 days a week | 68% | 58% | 69% | 72% | 81% | 76% | 70% |
| 3-5 days a week | 25% | 28% | 16% | 24% | 14% | 20% | 21% |
| 1-2 days a week | 6% | 7% | 11% | 3% | 5% | 3% | 6% |
| Less than once a week | 0% | 5% | 2% | 1% | 0% | 1% | 2% |
| Other | 1% | 2% | 2% | 0% | 0% | 0% | 1% |
| ***Cyclists stopping on route (%)*** | 44% | 33% | 42% | 49% | 46% | 41% | 42% |

**Table 6 Routes taken by cyclists**

| | *Chelmsford* | *Kingston* | *Leicester* | *Total (weighted %)* |
|---|---|---|---|---|
| *n Number of interviews* | *247* | *228* | *242* | *717* |
| Cyclists interviewed in pedestrian area | 112 | 112 | 125 | 349 |
| % who sometimes use an alternative route | 63% | 34% | 43% | 47% |
| Cyclists interviewed on alternative routes | 135 | 116 | 117 | 368 |
| % who sometimes use pedestrian area | 36% | 29% | 46% | 37% |
| Cyclists sometimes using pedestrian area | 160 | 146 | 179 | 485 |
| % of cyclists interviewed | 65% | 64% | 74% | 68% |
| Cyclists sometimes using an alternative route | 206 | 154 | 171 | 531 |
| % of cyclists interviewed | 83% | 68% | 71% | 75% |

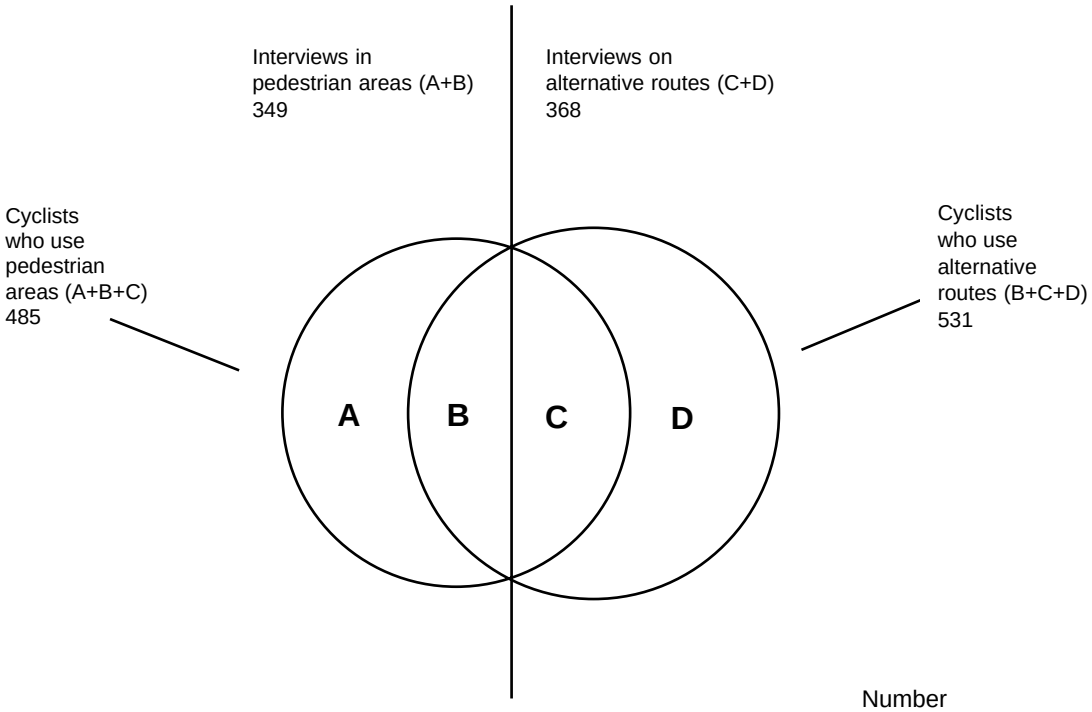
pedestrian area. Of the principal alternative routes identified previously, the North-South route in Chelmsford has the highest level of use (53 cyclists - 26% of all cyclists using alternative routes in Chelmsford). In addition, 15 cyclists use the (unsigned) one-way North-South route on Tindal Street, and 38 cyclists use the signed shared use cycle track / footway to the East of the pedestrian area.

In Kingston upon Thames, 68% of cyclists sometimes use an alternative route but only 29% of those on the alternative route sometimes use the pedestrian area. Only 8 cyclists use the complete length of the signed alternative route through Union Street and Eden Street. However, many cyclists use short sections of the signed alternative routes, including 49 who use the short East-West section of Eden Street between 2 mini-roundabouts, often using Market Place instead of Union Street, or making North-South journeys. A few cyclists (7) use Wood Street as an East-West alternative route, part of the busy Kingston Relief Road.

In Leicester, 71% of all cyclists interviewed sometimes use an alternative route whereas only 46% of those interviewed on alternative routes sometimes use the pedestrian area. 15 cyclists travelled North-South across the city: 13 use the signed alternative route, involving a series of one-way streets to the east of Gallowtree Gate; 2 use an unsigned route to the East of the pedestrian area.

### *Characteristics of cyclists on each type of route*

In terms of gender, journey purpose, frequency of cycle use and stopping on route, there was little difference in the characteristics of cyclists interviewed in the pedestrian areas and those interviewed on the alternative routes. Table 5 shows that the Chelmsford survey found the highest percentage of commuter cyclists and Kingston had the highest percentage of shoppers. In all towns the majority




| | Number |
|---|---|
| A = Cyclists in pedestrian areas, who do not use alternative routes | 186 (26%) |
| B = Cyclists in pedestrian areas, who also use alternative routes | 163 (23%) |
| C = Cyclists on alternative routes, who do not use pedestrian areas | 136 (19%) |
| D = Cyclists on alternative routes, who also use pedestrian areas | 232 (32%) |
| B + C = Cyclists who use both pedestrian areas and alternative areas | 299 (42%) |

**Figure 4** Number of cyclists using pedestrian areas and alternative routes

of cyclists interviewed were frequent cyclists, cycling 6-7 days per week. In Chelmsford and Kingston, cycle commuters are more likely to use the pedestrian area than the alternative routes, probably because the pedestrian areas are quiet at commuting times. Perhaps surprisingly, in these two towns, cyclists on shopping trips are more likely to use the alternative routes. However, they tend to be shoppers going to and from the pedestrian area rather than cyclists making cross town journeys.

***Safety and convenience of pedestrian areas***

The majority of cyclists who sometimes push or ride their bicycles through the pedestrian area rated the route safe (70%) and convenient (81%). This is shown in Table 7. Of those who said the pedestrian area is safe, the majority said this is due, at least partly, to little or no traffic. Of the cyclists who feel the pedestrian area is unsafe, 54% said this is due to pedestrian density and 23% said it is due to obstacles (see Table 8). The pedestrian areas are described as convenient because they are more direct (84% of respondents gave this as their reason). Those cyclists who described them as inconvenient did so mostly because cycling is not permitted.

***Safety and convenience of alternative routes***

Cyclists' assessments of the safety and convenience of the alternative routes in Chelmsford, Kingston upon Thames and Leicester are shown in Table 7. The reasons are given in Tables 9 and 10.

70% of all cyclists said that their current alternative route was safe, and 86% said that their current alternative route was convenient. The proportion of cyclists who considered their routes safe (as opposed to unsafe) was very similar for those who used alternative routes and those who used the pedestrian area.

Of those cyclists using the alternative routes, (377) 71% said that the routes are safe. They judged the alternative routes to be safe due to little or no traffic (47%), the provision of traffic calming or specific cycling facilities (37%) and the absence of pedestrians (11%). Of the 154 cyclists who use the alternative routes but consider them unsafe, too much traffic is given as the main reason (73%), along with junctions (particularly roundabouts) (41%), parked cars (22%) and specific types of traffic, notably buses and lorries (14%). Concern about conflict with pedestrians was mentioned by 23% of respondents, presumably because the sections of the some alternative routes in all three towns, particularly Chelmsford, involved sharing with pedestrians. Although 'too much traffic' is clearly the feature that causes concern to most cyclists in all three towns, there are differences between towns. Cyclists on alternative routes in Leicester seem more concerned than cyclists in the other towns by traffic, parked cars, junctions and multi-lane roads. In Chelmsford, where one of the main alternative routes is largely off-road, there is greater concern about personal security on isolated routes.

The alternative routes are considered convenient largely because they are direct (65%) or fast/few delays (41%). Given that the alternative routes are less direct than the

## Table 7 Cyclists' views on the safety and convenience of cycling in the pedestrian area and on the alternative routes

| | *Chelmsford* | *Kingston* | *Leicester* | *Total (weighted %)* |
|---|---|---|---|---|
| ***Pedestrian area (A)*** | | | | |
| n Cyclists who use only the pedestrian area | 41 | 74 | 71 | 186 |
| Safe | 70% | 65% | 67% | 67% |
| Unsafe | 30% | 35% | 33% | 33% |
| Convenient | 82% | 85% | 85% | 84% |
| Inconvenient | 18% | 15% | 15% | 16% |
| ***Alternative route (D)*** | | | | |
| n Cyclists who use only an alternative route | 87 | 82 | 63 | 232 |
| Safe | 85% | 72% | 66% | 75% |
| Unsafe | 15% | 28% | 34% | 25% |
| Convenient | 97% | 99% | 87% | 95% |
| Inconvenient | 3% | 1% | 13% | 5% |
| ***Both (B+C)*** | | | | |
| n Cyclists sometimes using both | 119 | 72 | 108 | 299 |
| **Pedestrian area** | | | | |
| Safe | 78% | 75% | 64% | 73% |
| Unsafe | 22% | 25% | 36% | 27% |
| Convenient | 67% | 74% | 93% | 77% |
| Inconvenient | 33% | 26% | 7% | 23% |
| **Alternative route** | | | | |
| Safe | 75% | 67% | 61% | 68% |
| Unsafe | 25% | 33% | 39% | 32% |
| Convenient | 78% | 81% | 76% | 79% |
| Inconvenient | 22% | 19% | 24% | 21% |

[1] The percentages exclude 'Don't knows'.
[2] See also Figure 4

## Table 8 Reasons why cyclists consider pedestrian areas unsafe / inconvenient

| | *Chelmsford* | *Kingston* | *Leicester* | *Total (weighted %)* |
|---|---|---|---|---|
| ***Unsafe*** | | | | |
| n Cyclists who stated unsafe | 37 | 42 | 59 | 138 |
| Presence of pedestrians | 18 | 22 | 35 | 54% |
| Too many obstacles | 7 | 11 | 14 | 23% |
| Traffic / delivery vehicles | 5 | 4 | 6 | 11% |
| Lack of a cycle track | 5 | 3 | 5 | 9% |
| ***Inconvenient*** | | | | |
| n Cyclists who stated inconvenient | 44 | 28 | 17 | 89 |
| Have to stop cycling | 37 | 22 | 10 | 78% |
| Not direct route | 5 | 0 | 5 | 11% |
| Slow (generally) | 3 | 4 | 4 | 12% |
| Presence of pedestrians | 3 | 7 | 4 | 16% |
| Not clear if / where / when you can cycle | 0 | 2 | 0 | 2% |
| Vans / unloading | 0 | 0 | 1 | 1% |

## Table 9 Reasons why alternatives routes were considered safe / unsafe

| | *Chelmsford* | *Kingston* | *Leicester* | *Total (weighted %)* |
|---|---|---|---|---|
| ***Safe*** | | | | |
| n Cyclists who stated 'safe' | 162 | 108 | 132 | 402 |
| Less traffic | 49% | 49% | 42% | 47% |
| Helpful design features | 59% | 26% | 20% | 37% |
| Route easy to use | 6% | 6% | 7% | 6% |
| Few pedestrians | 12% | 11% | 9% | 11% |
| Other | 13% | 23% | 15% | 16% |
| ***Unsafe*** | | | | |
| n Cyclists who stated 'unsafe' | 42 | 46 | 60 | 148 |
| Too much traffic | 60% | 63% | 90% | 73% |
| Heavy traffic (lorries / buses) | 12% | 9% | 18% | 14% |
| Junctions | 10% | 15% | 32% | 20% |
| Roundabouts | 21% | 11% | 28% | 21% |
| Too many traffic lanes | 2% | 2% | 27% | 12% |
| Incomplete route | 10% | 11% | 5% | 8% |
| Parked cars | 10% | 15% | 35% | 22% |
| Pedestrians | 24% | 13% | 30% | 23% |
| Isolated route/ other | 40% | 30% | 13% | 26% |

[1] *Respondents were able to give more than one answer, therefore percentages total over 100%.*

## Table 10 Reasons why alternatives routes were considered convenient / inconvenient

| | *Chelmsford* | *Kingston* | *Leicester* | *Total (weighted %)* |
|---|---|---|---|---|
| ***Convenient*** | | | | |
| n Cyclists who stated 'convenient' | 175 | 137 | 132 | 444 |
| Most direct route | 57% | 74% | 66% | 65% |
| Few delays/more continuous | 26% | 11% | 29% | 22% |
| Fast route | 22% | 13% | 21% | 19% |
| Helpful cycle facilities | 6% | 5% | 0% | 4% |
| No traffic | 4% | 2% | 3% | 3% |
| Pleasant/shops/other | 15% | 6% | 5% | 9% |
| ***Inconvenient*** | | | | |
| n Cyclists who stated 'inconvenient' | 28 | 14 | 32 | 74 |
| Route not direct | 79% | 64% | 63% | 69% |
| Delays (junctions and traffic ) | 32% | 21% | 59% | 42 |
| Slow (generally) | 11% | 0% | 9% | 8% |
| Unhelpful design features | 7% | 0% | 3% | 4% |
| Traffic problems | 7% | 21% | 3% | 8% |
| No parking facility/Other | 25% | 21% | 25% | 24% |

[1] *Respondents were able to give more than one answer, therefore percentages total over 100%.*

pedestrian areas, this can be explained by the origin and destination of the cyclist's particular journey. Inconvenience factors on alternative routes were indirectness (69%), delays (42%) and lack of cycle parking facilities (24%). Of the 294 cyclists who use both the pedestrian areas and the alternative routes, a clear majority in all three towns found the alternative routes to be convenient. In each location, the alternative route was rated more highly for convenience than for safety. This may reflect a general willingness amongst cyclists to follow routes that are less-than-ideally safe, where convenience benefits can be obtained. Alternatively it may reflect a lack of route choice.

Cyclists' satisfaction with their alternative routes diminishes as the deviation distance increased. An increase in journey distance of 45-90 metres (about 25% of the length of the pedestrian area) seems to be acceptable to cyclists in the pedestrian area, although this varies between towns. Meaningful comparisons between routes through the pedestrian area and alternative routes for a given journey are difficult as cyclists tend to adapt their activities and destinations to the circumstances.

### *Preferred routes and reasons*

As noted above, cyclists interviewed in the pedestrian areas and cyclists interviewed on the alternative routes seem similarly content with the safety and convenience of their respective routes. 70% of cyclists interviewed in the pedestrian areas consider their route to be safe; and 71% of cyclists interviewed on the alternative routes consider their route safe. Convenience is rated highly on both routes (86% and 81% respectively). It is interesting that the pedestrian areas are rated more highly for convenience than for safety, and that there is virtually no difference in the safety rating of pedestrian areas and alternative routes. Once again, this may be a reflection of the greater priority attached to convenience in route choice by cyclists.

Of the total 717 cyclists interviewed, 50% preferred the alternative routes, 41% preferred the pedestrian area and 9% had no preference. However, these figures may reflect the fact that slightly more cyclists were interviewed on alternative routes than in the pedestrian areas.

Of the 299 cyclists who use both types of route between the pedestrian area and the alternative routes, 45% prefer the alternative routes, 39% prefer the pedestrian area, and 15% express no preference (see Table 11), presumably choosing their route according to the particular requirements of each journey. This varies somewhat among towns: slightly more cyclists in Chelmsford and Kingston prefer the alternative routes whilst in Leicester there is a preference for the pedestrian area.

Of those cyclists preferring the pedestrian areas, directness (51%), safety (22%), less traffic (22%) and the availability of shops and other amenities are primary reasons. Those cyclists who prefer the alternative routes do so because there are fewer pedestrians (30%), cycling is prohibited in the pedestrian areas (28%), the alternative route is more direct or quicker (42%) and for reasons to do with less traffic and safety (20%). The fact that cyclists were asked about using the pedestrian area may have reduced the number who say they would not use it because cycling is prohibited.

**Table 11 Cyclist route preferences: pedestrian area or alternative route**

| | *Chelmsford* | *Kingston* | *Leicester* | *Total (weighted %)* |
|---|---|---|---|---|
| ***Preferred route*** | | | | |
| n Cyclists using both routes | 119 | 72 | 108 | 299 |
| Prefer alternative route | 44% | 53% | 34% | 43% |
| Prefer pedestrian area | 39% | 31% | 39% | 37% |
| No preference / don't know | 17% | 16% | 27% | 20% |
| ***Reasons for preferring pedestrian area*** | | | | |
| n Cyclists preferring pedestrian area | 46 | 22 | 42 | 110 |
| Most direct route | 50% | 36% | 60% | 51% |
| Safety reasons | 26% | 18% | 19% | 22% |
| Less traffic | 17% | 27% | 26% | 22% |
| Best for shops, banks etc. | 17% | 9% | 10% | 13% |
| ***Reasons for preferring alternative route*** | | | | |
| n Cyclists preferring alternative route | 52 | 38 | 37 | 127 |
| Fewer pedestrians | 15% | 45% | 35% | 30% |
| Cannot cycle in pedestrian area | 33% | 41% | 8% | 28% |
| Most direct route | 15% | 32% | 30% | 24% |
| Quicker | 25% | 18% | 8% | 18% |
| Safety reasons | 17% | 0% | 14% | 11% |
| Less traffic | 6% | 5% | 16% | 9% |

[1] *Respondents were able to give more than one answer, therefore percentages total over 100%.*

One third of cyclists using the pedestrian areas said that they sometimes made their current journey using an alternative route. Their principal reasons for sometimes choosing the alternative route are that it is quicker (33%), that cycling is not allowed in the pedestrian area (30%), to avoid pedestrians (15%) or other convenience reasons (20%). Two thirds of cyclists on alternative routes said that they sometimes made their current journey via the pedestrian area. Their reasons are that it is quicker (40%), more convenient, (28%), the need to make intermediate stops (18%), or safety (6%).

### *Deterrent effect of a cycling restriction*

A minority of cyclists (8%) said that they do not make certain journeys by bicycle because of the restrictions on cycling in the pedestrian areas. The suppression is greatest in Leicester (10%) and least in Kingston (4%). This is shown in Table 12.

Shopping trips (52%) and leisure trips (13%) are the cycle trips most likely to be foregone or transferred to another mode. Commuter cyclists are less likely to be deterred from travelling by cycle due to the pedestrian area restriction: whereas the main journey purpose of 26% of cyclists interviewed is commuting/business, only 11% of trips foregone or transferred are commuting trips.

For those journeys that cannot be made by bicycle, because of the pedestrian area cycling restriction, 31% are transferred to walk, 24% to car (driver) and 15% to bus. 26% are not made at all as the respondents travel only by bicycle.

**Table 12 Suppressed cycle journeys due to cycling restrictions**

| | *Chelmsford* | *Kingston* | *Leicester* | *Total* |
|---|---|---|---|---|
| n Cyclists suppressing journeys | 20 | 9 | 25 | 54 |
| % of cyclists | 8% | 4% | 10% | 8% |
| ***Frequency*** | | | | |
| All of the time | 11 | 8 | 17 | 36 |
| Sometime | 9 | 1 | 8 | 18 |
| ***Journey purpose*** | | | | |
| Shopping | 9 | 5 | 14 | 28 |
| Leisure | 3 | 0 | 4 | 7 |
| Commuting | 3 | 1 | 2 | 6 |
| Other | 5 | 3 | 3 | 11 |
| Don't know / not applicable | 0 | 0 | 2 | 2 |
| ***Alternative mode of transport*** | | | | |
| Walk | 4 | 1 | 12 | 17 |
| Only travel by bike/ no alternative | 8 | 3 | 3 | 14 |
| Car (driver) | 7 | 2 | 3 | 12 |
| Car (passenger) | 0 | 1 | 0 | 1 |
| Bus | 1 | 1 | 6 | 8 |
| Don't know / not applicable | 0 | 1 | 1 | 2 |

### *Suppressed cycle trips and child cyclists*

Only adults currently cycling in the town centres were interviewed. Child cyclists and adults deterred entirely from cycling in the town centres (due to the restrictions on cycling in the pedestrian areas, the unsuitability of alternative routes, or a variety of other reasons) were not interviewed. The safety and convenience ratings given by existing adult cyclists are therefore likely to be higher than those that would have been given by less confident and potential cyclists.

# 5 Conclusions and recommendations

## 5.1 Conclusions

It was not part of this study to assess interactions between cyclists and pedestrians in the pedestrian area - although reported accidents (or lack of) are noted in section 4.2.

An examination of the alternative routes available to cyclists, to avoid pedestrian areas where cycling is prohibited, shows that these may involve additional inconvenience and risk, when compared to the route through the pedestrian area. The alternative routes studied were longer, almost half involved dismounting, and a different route was almost always necessary for the return journey. The alternative routes were likely to involve high capacity urban roads and additional junctions that are relatively high risk for cyclists, certainly in comparison with the route through the pedestrian area. The accident data from the three town centres showed only three reported accidents involving cyclists and pedestrians in five years, none of which occurred in the pedestrian area, compared with higher levels in the surrounding town centre streets.

Where signed alternative routes for cyclists are provided, most cyclists find these to be safe and convenient. The routes include contra-flow bus/cycle lanes, off-road cycle tracks and signalled junctions. Cyclists using the pedestrian areas and cyclists using the alternative routes tend to choose routes on the basis of directness and minimising delay. Safety, and the availability of shops and cycle parking facilities, are also route choice considerations, though less important. Many cyclists avoid the pedestrian areas because of pedestrian density and the restriction on cycling, preferring an alternative route. Minimising delays, the absence of large numbers of pedestrians, and reluctance to behave illegally are the important factors in the decision. Increases of around 45-90 metres (around 25% of the length of the pedestrian area) seem generally acceptable to cyclists using the pedestrian area.

Cyclists have very dispersed journey patterns, using a wide variety of routes to cross and access the central areas. It is therefore unlikely that all cyclists currently using alternative routes would switch to using the pedestrian area if permitted. Many cyclists make stops on route, particularly those routes with facilities such as shops and cash points. Shopping is a primary or secondary journey purpose for the majority of cyclists in the town centres. If signed routes can be provided for cyclists, to enable them to avoid the pedestrian areas, it is essential that these are continuous, minimise delays, and integrate with the local road network. If suitable alternative routes are provided, this will reduce the pressure on pedestrian areas and make it easier to permit cycling.

Because of the diverse journey patterns of cyclists in the town centres, safety needs to be improved throughout the road network. This would assist cyclists in town centres and reduce the incentive to cycle through the pedestrian area.

Good design is most important: it can help to provide convenient and safe conditions, and to minimise conflicts between users. However, some degree of conflict between users is probably inevitable in any traffic scheme, particularly so in congested urban centres with high levels of pedestrian, cycle and motor traffic. Competing demands must be weighed and a balance found.

## 5.2 Recommendations

The results from this study can be used to produce some design advice to assist designers, planners and engineers with regard to providing for cyclists in and around pedestrian areas. These guidelines are shown below. They should be considered in combination with other design advice available:

- A decision as to whether or not to restrict cycle access to pedestrian areas needs to be set within the context of the alternative routes available. In particular, routes should avoid high capacity roads (dual carriageways, rings roads and gyratory systems) and hazardous junctions such as roundabouts and priority junctions, especially where a right-turn manoeuvre for cyclists is required. They should also avoid the need for cyclists to dismount.

- Cyclists choose routes primarily based on convenience, and efforts should be made to make the most convenient routes as safe as possible. Routes noted as safe by cyclists have little or no motor traffic, speed limits of 30 mph or below, adequate width for motor vehicles to pass, little or no kerb-side parking and few side-road junctions. Specific cycling facilities such as advanced stop lines, or cycle-friendly traffic calming measures also tend to improve perceived and actual safety for cyclists.
- Provision for cyclists should be made within the context of an understanding of cyclists' journey origins and destinations. Cyclists wishing to stop on routes through and around pedestrian areas need to anticipated in design decisions. Secure cycle parking ought to be installed at convenient locations for cyclists.
- The results show the importance attached to convenience in route choice. The length of alternative route around the pedestrian area is therefore important: a route 25% longer than the pedestrian area could be a useful guide as to an acceptable upper limit on the length of an alternative route.
- The most convenient and practical alternative routes may involve use of service roads or bus only-roads. Whilst these may not be ideal from the cyclists' perspective, if they are direct and involve no significant hazards, they may provide the best option.
- Cycle routes around the pedestrian area need to be adequately signed in visible locations along the length of the route. Cyclists ought to be able to travel in both directions as much as possible. Contraflow cycle lanes are a way of enabling cyclists to do this along one-way streets.

## 6 Acknowledgements

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## 7 References

**CROW (1993)**. *Sign up for the bike*. Design manual for a cycle-friendly infrastructure. Centre for Research and Contract Standardization in Civil Engineering (CROW), Netherlands. The project was managed by Melanie Rickman, DITM, DETR.

**Department of Transport (1987)**. *Getting the right balance*. Local Transport Note 1/87 HMSO, London.

**Department of Transport (1993)**. *Cycling in pedestrian areas*. Traffic Advisory Leaflet 9/93. Traffic Policy Division, Department of Transport, London.

**Erdman Lewis Research and Consultancy (1994)**. *The pedestrianisation myth*. Erdman Lewis, London.

**Institution of Highways and Transportation, Bicycle Association, Cyclists' Touring Club and Department of Transport (1996)**. *Cycle-friendly infrastructure - guidelines for planning and design*. Cyclists' Touring Club, Godalming.

**Trevelyan P and Morgan J M (1993)**. *Cycling in pedestrian areas*. Project Report PR15. Transport Research Laboratory, Crowthorne.

## Appendix 1: Nine towns - site descriptions

*Andover, Hampshire*

The centre of Andover was pedestrianised by 1981, including the upper High Street and Chantry Way. Cyclists and all other vehicles are banned at all times from these roads. The principal alternative route for cyclists making North-South and South-North journeys uses a two lane inner ring road (Eastern Avenue) for 350m of the route. Two way motor vehicle flow on East Street is approximately 900 vehicles per hour in the off-peak. Cyclists joining or leaving Eastern Avenue from a road closure (dismount required) in London Street and leave East Street at a 5-arm roundabout into Newbury Street.

Another alternative route for cyclists is on quiet, residential streets on the eastern side of the ring road, a slightly longer route. To use this route, cyclists have to push their bikes across a pedestrian crossing on Eastern Avenue and then use a pedestrian subway under the 5-arm roundabout.

*Basingstoke, Hampshire*

A network of 5 streets in Basingstoke has been pedestrianised since 1988, including the West-East link of Winchester Street and London Street. London Street was pedestrianised in 1976, the other streets in 1988. Service vehicles and vehicles associated with the town market can use the pedestrian area except during the day (10:00-16:00).

The principal alternative route for journeys East-West and West-East is a heavily trafficked two lane one-way system (New Road and Timberlake Street) in a ring around the pedestrian area. The layout of the one-way system makes East-West journeys shorter in length (200m) than West-East journeys (325m). For both routes cyclists have to make two right turns at Y-junctions in one-way traffic. The hourly motor vehicle flow in the off-peak on the ring road is approximately 1,300 vehicles per hour. According to the local authority, cyclists, particularly those commuting during the off-peak, often use the pedestrian area as a through-route despite the ban.

*Bath, Avon*

Bath has a core pedestrian area (pre-1980) on a North-South axis, surrounded by a one-way system for vehicular traffic. Individual streets further away from the centre have been pedestrianised or partially closed (post-1980) to deter through traffic. Cyclists and all other vehicles are banned

from the core pedestrian area, but cycle gaps have been provided in several road closures to aid cycle journeys across the city.

Cyclists making North-South and South-North journeys, unable to use Union Street in the pedestrian area, are required to use the heavily trafficked one-way system (New Bond Street, Grand Parade, & St James Parade). Traffic flow on Milsom Street, on the North-South alternative route is 400 vehicles per hour in the off-peak (one-way). The one-way system fluctuates between one and two lanes, and according to the local authority is unpleasant to cycle, due to motor vehicles changing lanes and making turns at junctions. Both routes have two difficult junctions to negotiate and one set of cycle gaps.

*Chelmsford, Essex (Figure 1)*

The pedestrian area in Chelmsford consists of sections of the High Street, Springfield Road and Moulsham Street, pedestrianised in 1992. Cyclists and motor vehicles are prohibited from the pedestrian area. The only exemptions are for service vehicles, permitted between 18:00 and 10:00.

The principal alternative route for cyclists travelling North-South starts on a one-way service road (Tindal Street) with road humps, which runs parallel to the pedestrian area. Motor vehicular access is given only to buses and loading / unloading vehicles, and the vehicle flow is 50 vehicles per hour in the off-peak. As this road leads to a dual carriageway (Parkway) cyclists heading south have a choice of either using cycle ways in Central Park (if their destination is to the South-West), the shared cycleway / footway leading to the Odeon shared use subway (if their destination is to the South-East), or crossing Parkway via. the pedestrian subway leading to London Road (if their destination is due South). For cyclists travelling South-North, the alternative route is a shared-use cycleway / footway. This route is much longer than the North-South route, 700m long compared to 500m. Cyclists have to negotiate several sharp corners and a 4-arm roundabout on the route. They also have to dismount three times, twice to cross pedestrian bridges and once at a short stretch of the pedestrian area which is unavoidable. Cyclists have most difficulty travelling South-North.

*Chichester, West Sussex*

The pedestrian area in Chichester consists of four central streets (North Street, East Street, South Street & West Street) meeting at the Market Cross, and Crane Street. Cyclists were banned from the pedestrian area from the first pedestrianisation scheme in 1975 until an experimental traffic order in January 1996, when vehicle restrictions were relaxed. All vehicles are prohibited from the pedestrian zones of North Street (south of St. Peters), East Street (west of Little London) and Crane Street; except cyclists (in both directions) and delivery vehicles (one-way), permitted outside shopping hours. West Street (east of Chapel Street) and South Street (north of Cooper Street) are less restrictive to vehicles. Buses and cyclists are allowed to travel through this section in both directions; orange badge holders and delivery vehicles in one direction.

The principal alternative route is twice as long for cyclists travelling East-West (900m) than for those travelling West-East (450m), because the one-way system in Chichester obliges them onto Market Avenue, a busy inner ring road (2 way flow is approximately 1,200 motor vehicles per hour in the off-peak). The junction onto Market Avenue is particularly difficult for cyclists taking this route, a gyratory system. Leaving Market Avenue cyclists also have to make a difficult manoeuvre. Cyclists have to dismount and turn into South Street via. Theatre Lane. They only other option would be to stay on the one-way system along Basin Road, a longer route in heavy traffic which involves signalised junctions. Cyclists making the journey in the opposite direction (West-East) can use the minor one-way streets of West Pallant and East Pallant to avoid the pedestrianised East Street.

*Erdington, Birmingham*

A Traffic Regulation Order in 1989 prohibited cyclists and motor vehicles from the High Street. The only exemption is for service vehicles, which are allowed in at all times. According to the local authority many cyclists at present cycle through the pedestrian area.

The principal alternative route for cyclists making North-South and South-North journeys incorporates a heavily trafficked dual carriageway (Sutton New Road). Two way traffic flow on Sutton New Road is approximately 1,875 motor vehicles per hour (12 hour average). Both routes are 250m in length. Cyclists travelling North-South can use New Street, a quiet one-way street (35 motor vehicles per hour) for the last 100m of the alternative route, but this involves an additional detour.

*Ipswich, Suffolk*

Between 1986 and 1989 the main shopping streets of Westgate Street, Tavern Street and Carr Street were pedestrianised, with parts of some minor streets. The only vehicles permitted to use these streets are service vehicles between 16:30 and 10:30, and permit holders. Butter Market, a street parallel to the main pedestrian area, was pedestrianised in 1996. Ipswich Borough Council had planned to ban all vehicles from the Butter Market but, at a Public Inquiry into the Traffic Regulation Order, it was requested by objectors that cycle restrictions be modified to a daytime ban (10:30-16:00), because there were not safe alternative routes for cyclists. The Inspector's report subsequently recommended that cyclists be allowed full access from West to East (the street was previously one-way), a recommendation accepted by the local authority.

Butter Market provides part of a useful alternative route for cyclists travelling West-East across Ipswich, in conjunction with Elm Street, Northgate Street and Colman Street. The principal alternative route for cyclists making journeys in the opposite direction involves busier streets, including Falcon Street, which has a traffic flow of approximately 700 motor vehicles per hour (2 way) in the off-peak. Falcon Street is very narrow and has two junctions identified in the Public Inquiry as hazardous for cyclists (entrances to a bus station and a shopping centre). The other streets on this alternative route are Orwell Street,

Tacket Street and Princes Street. Another alternative route for cyclists would be Crown Street, to the north of the pedestrian area, which has a traffic flow of approximately 1,500 motor vehicles per hour (2 way).

*Kingston upon Thames, Surrey (Figure 2)*

The main pedestrian area in Kingston upon Thames is Clarence Street and Fife Road; cyclists and other vehicles are banned from this the west end of Clarence Street at all times, and from the east end of Clarence Street and Fife Road between 10.00 and 22.00. Market Place and Church Street are also pedestrianised, but cyclists, and vehicles with permits, are allowed into this area. East-West and West-East journeys for cyclists are the most difficult to make as the principal route for motor vehicles (the Kingston Town Centre Relief Road, completed in 1989) is heavily trafficked with several junctions involving merging manoeuvres.

The principal alternative route for both journeys is south of the pedestrian area on Union Street and Eden Street. Union Street permits cyclists to travel in both directions and has a narrow section of road used by few motor vehicles. Eden Street also permits cyclists to travel in both directions but only buses, taxis and cycles are permitted for most of its northbound length. Eden Street has 2 mini-roundabouts to negotiate but traffic flows are low. Motor vehicle flow travelling West along Eden Street is 180 motor vehicles per hour in the off-peak. In the opposite direction (West-East) to the east of Union Street only cycles, taxis and buses are permitted. Kingston upon Thames has an extensive array of facilities to allow cyclists to avoid the Relief Road and the pedestrianised area, including six contra-flow cycling schemes.

*Leicester, Leicestershire (Figure 3)*

Pedestrianisation in Leicester began in 1971 and has since been extended to cover the main shopping areas. Cyclists are banned only from the central North-South pedestrianised section along Gallowtree Gate and East Gates. Cyclists are allowed to use a series of pedestrian preference zones around this area; vehicle access is given to service vehicles, taxis, orange badge holders and buses.

The principal alternative routes North-South and South-North for cyclists are on part of a complicated one-way system. The streets are narrow and winding, diverging and converging through the retail and commercial sector of the city, both routes cross 3 minor junctions (no signals). Part of the alternative routes are through pedestrian preference zones (Silver Street, Loseby Lane, Cank Street, Cheap Side); traffic flows are low on the other streets, on St Martin Street (both alternative routes) 200 motor vehicles per hour were recorded in the off-peak. Both alternative routes are part of a city-wide network and pass through East Gates where cyclists have to dismount.

# Appendix 2: Cyclist interviews — questionnaire

Questionnaire used to interview cyclists on the alternative routes in Leicester. The same questionnaire was used on the alternative routes in Chelmsford and Kingston upon Thames. A similar questionnaire was used in the pedestrian areas.

RSL – Research Services Ltd Research Services House Elmgrove Road Harrow HA1 2QG United Kingdom Telephone 0181 861 6000 Fax 0181 861 551

J7879/SC

## LEICESTER PEDESTRIAN ROUTE

September 1996

REFUSALS (11)

DATE _____ TIME _____

POINT NUMBER

BN (1-3)
SN (4-9)
CC (10)

(12)
LEICESTER PEDESTRIAN ROUTE 3

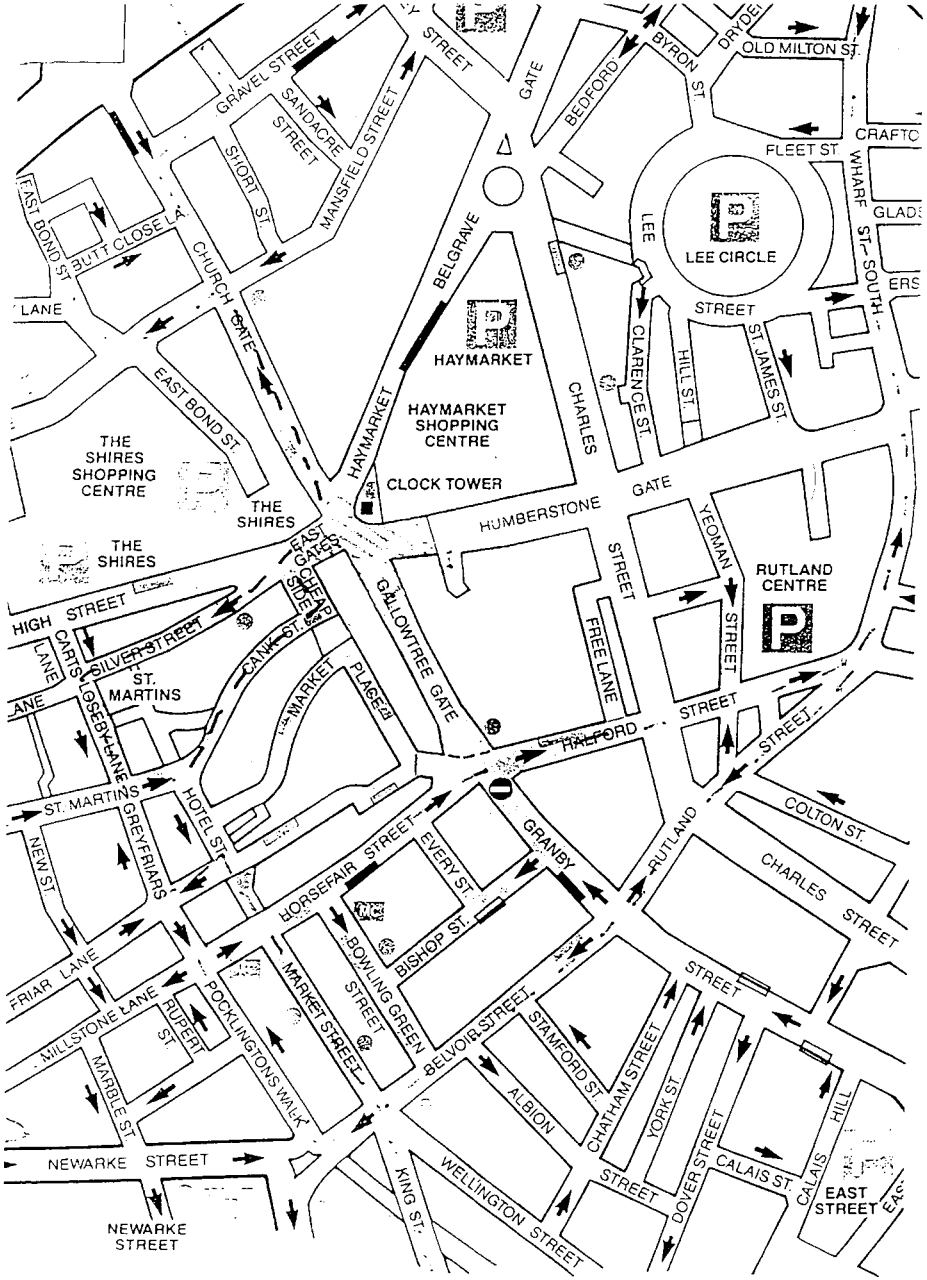
Good morning/afternoon. I am from RSL - Research Services Ltd. We are doing some work for the Transport Research Laboratory and would like to ask you some brief questions about cycling in the centre of Leicester. It will only take a few minutes. Thank you.

| | | | CODE | ROUTE |
|---|---|---|---|---|
| Q.1 | How often do you cycle?<br>DO NOT READ OUT<br>CODE ONE ONLY | | (13) | |
| | | 6-7 days a week | 1 | |
| | | 3-5 days a week | 2 | |
| | | 1-2 days a week | 3 | |
| | | Less than once a week | 4 | |
| | | Less than once a month | 5 | |
| | | The first time | 6 | Q2 |
| Q.2 | What do you mostly use your bicycle for?<br>DO NOT READ OUT<br>CODE ALL THAT APPLY | | (14)M | |
| | | Commuting to/from work | 1 | |
| | | On business | 2 | |
| | | Education (to/from school, college) | 3 | |
| | | Shopping | 4 | |
| | | Other personal business | 5 | |
| | | Leisure | 6 | |
| | | Other (please specify) _____ | 7 | |
| | | | (15) | Q3 |
| Q.3 | Where did you start this cycle journey (i.e. JOURNEY ORIGIN)<br>OBTAIN POSTCODE. ASK FOR STREET & AREA IF INDIVIDUAL CANNOT PROVIDE POSTCODE.<br>Postcode _____<br>Street/road _____<br>Area _____ | | (16-22)<br>(23-25) | Q4 |





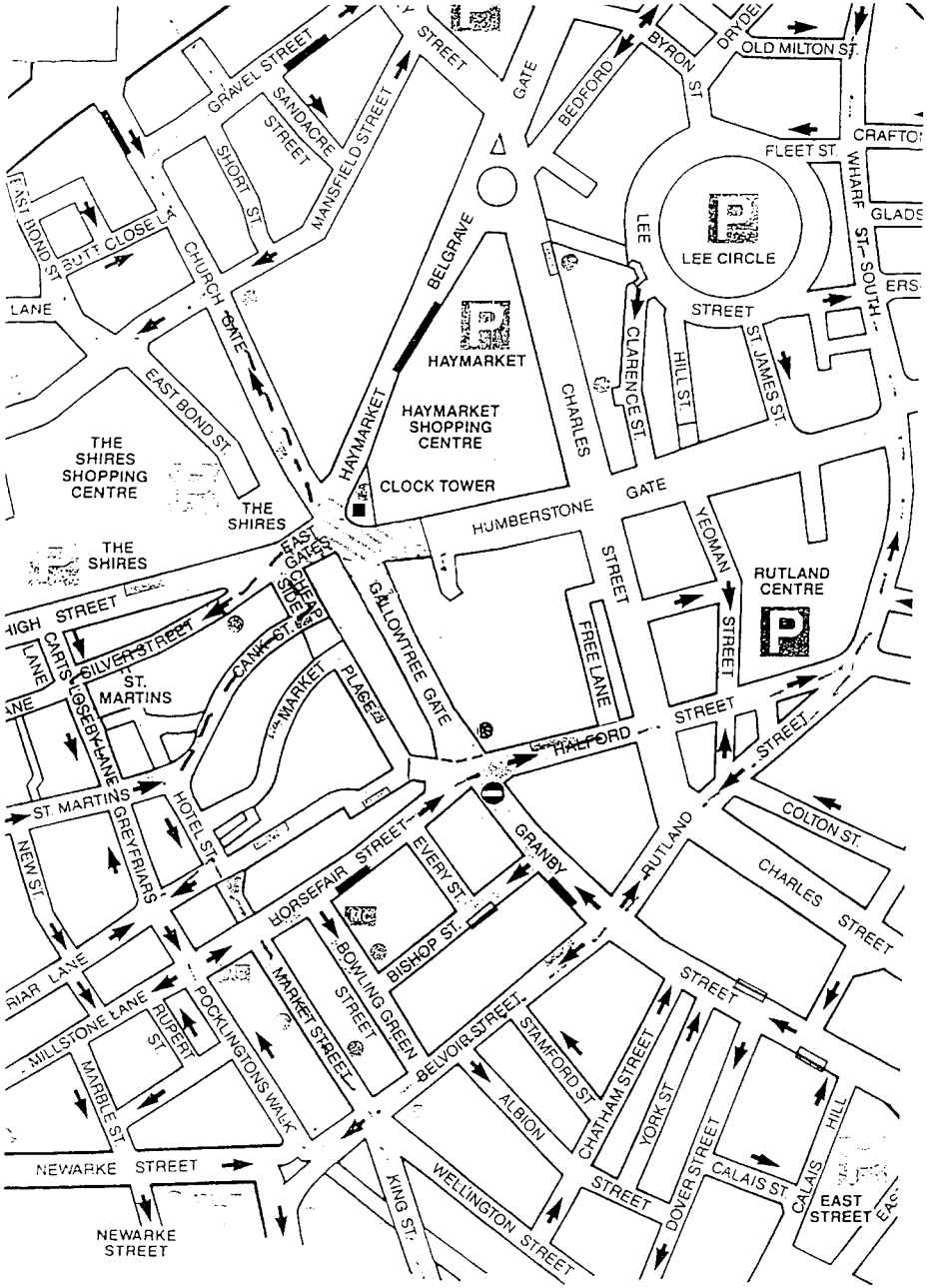
| | | | CODE | ROUTE |
|---|---|---|---|---|
| Q.4 | Where are you cycling to (i.e. JOURNEY DESTINATION - DO NOT INCLUDE INTERMEDIATE STOPS)<br>OBTAIN POSTCODE. ASK FOR STREET & AREA IF INDIVIDUAL CANNOT PROVIDE POSTCODE<br>Postcode _____<br>Street/road _____<br>Area _____ | | (26-32)<br>(33-35) | Q6 |
| Q.5 | Are you making or have you made any stops on route (not including this one)? | | (36) | |
| | | Yes | 1 | Q6 |
| | | No | 2 | Q8 |
| Q.6 | Where are you stopping/did you stop?<br>PROBE FOR STREET NAME(S) WHERE STOP(S) MADE<br>_____<br>_____ | | (37-40) | Q7 |
| Q.7 | What is/was the reason for stopping?<br>DO NOT READ OUT. CODE ALL THAT APPLY | | (41)M | |
| | | Newsagent | 1 | |
| | | Off licence | 2 | |
| | | Chemist | 3 | |
| | | Other shopping | 4 | |
| | | Bank/building society/cash point | 5 | |
| | | Post office/post box | 6 | |
| | | Doctor/dentist | 7 | |
| | | Other reason (specify) | 8 | |
| | _____<br>_____ | | (42-43) | Q8 |
| Q.8 | ASK ALL<br>What is the main purpose of your current journey?<br>CODE ONE ONLY. DO NOT READ OUT | | (44) | |
| | | Commuting to/from work | 1 | |
| | | On business | 2 | |
| | | Education (to /from school/college) | 3 | |
| | | Shopping | 4 | |
| | | Other personal business | 5 | |
| | | Leisure | 6 | |
| | | Other (please specify) _____ | 7 | |
| | | | (45-46) | Q9 |
| Q.9 | Please could you draw your route through the centre of Leicester on the map?<br>SHOW MAP, ALLOW RESPONDENT TO DRAW ROUTE ONTO MAP, WITH ARROWS SHOWING DIRECTION | | (47-52) | Q10 |






| | | CODE | ROUTE |
|---|---|---|---|
| | ASK ALL | | |
| Q.10 | Overall, how long does this journey take? (DO NOT INCLUDE TIME FOR INTERMEDIATE STOPS) | (53-56) | |
| | Hours_____ Minutes ____ | | |
| | | (57) | |
| | Don't know ..... | 1 | Q11a |
| Q.11 | How often do you usually cycle THROUGH Gallowtree Gate on route to somewhere else? CODE ONE ONLY. DO NOT READ OUT | 58-80 blank<br>cc02 blank<br>bn1-3<br>sn 4-9<br>cc03 10 | |
| | | (11) | |
| | 6-7 days a week ..... | 1 | |
| | 3-5 days a week ..... | 2 | |
| | 1-2 days a week ..... | 3 | |
| | Less than once a week..... | 4 | |
| | Less than once a month..... | 5 | |
| | The first time..... | 6 | Q12 |
| Q.12 | How often do you usually cycle TO Gallowtree Gate as a main destination? CODE ONE ONLY. DO NOT READ OUT | | |
| | | (12) | |
| | 6-7 days a week ..... | 1 | |
| | 3-5 days a week ..... | 2 | |
| | 1-2 days a week ..... | 3 | |
| | Less than once a week..... | 4 | |
| | Less than once a month..... | 5 | |
| | The first time..... | 6 | Q13 |
| Q.13 | Do you ever make your CURRENT cycle journey avoiding Gallowtree Gate? | (13) | |
| | Yes..... | 1 | Q16 |
| | No..... | 2 | Q14 |
| Q.14 | For OTHER journeys do you ever take a different route TO AVOID Gallowtree Gate? | (14) | |
| | Yes..... | 1 | Q15 |
| | No..... | 2 | Q29 |

| | | | |
|---|---|---|---|
| | IF USES ROUTE TO AVOID GALLOWTREE GATE | | |
| Q.15 | Thinking of when you choose a route which avoids Gallowtree Gate, what tends to be the main purpose of your journey?<br>CODE ONE ONLY. DO NOT READ OUT | (15) | |
| | Commuting to/from work .... | 1 | |
| | On business..... | 2 | |
| | Education ..... | 3 | |
| | Shopping ..... | 4 | |
| | Other personal business..... | 5 | |
| | Leisure..... | 6 | |
| | Other (please specify) | 7 | |
| | | | |
| | Varies too much to say..... | 8 | |
| | | (16) | Q16 |
| Q.16 | Please could you draw the route you usually take when your journey through the centre of Leicester avoids Gallowtree Gate?<br>SHOW MAP, ALLOW RESPONDENT TO DRAW ROUTE ONTO MAP, WITH ARROWS SHOWING DIRECTION | (17-22) | Q17 |



| | | CODE | ROUTE |
|---|---|---|---|
| Q.17 | Why do you use this alternative route?<br>CODE ALL THAT APPLY. DO NOT READ OUT | (23)M | |
| | Quicker | 1 | |
| | Not allowed in pedestrian area | 2 | |
| | Not allowed at time of day I cycle | 3 | |
| | More convenient | 4 | |
| | Safer | 5 | |
| | Have to make an intermediate stop | 6 | |
| | Other (please specify) | 7 | |
| | [ ] | | |
| | Can't say | 8 | |
| | | (24-25) | Q18 |
| Q.18 | Roughly, how often do you use this alternative route?<br>CODE ONE ONLY. DO NOT READ OUT | (26) | |
| | 6-7 days a week | 1 | |
| | 3-5 days a week | 2 | |
| | 1-2 days a week | 3 | |
| | Less than once a week | 4 | |
| | Less than once a month | 5 | |
| | Only done it once | 6 | |
| | Never | 7 | |
| | | | Q19a |
| Q.19a | How safe do you consider the route through Gallowtree Gate?<br>READ OUT..... | (27) | |
| | very safe, | 1 | |
| | quite safe, | 2 | Q19b |
| | quite unsafe, | 3 | |
| | or very unsafe? | 4 | Q20 |
| | Don't know | 5 | Q21a |
| | IF CONSIDER ROUTE SAFE (CODE 1 OR 2 AT q19a) | | |
| Q.19b | Why do you consider the route through Gallowtree Gate (quite/very) safe?<br>CODE ALL THAT APPLY. | (28)M | |
| | No\little traffic | 1 | |
| | Slow moving | 2 | |
| | Can't ride bike | 3 | |
| | Other (specify) | 4 | |
| | [ ] | | |
| | | (29-30) | Q21a |





| | | | |
|---|---|---|---|
| | IF CONSIDER ROUTE UNSAFE (CODE 3 OR 4 AT Q19a) | | |
| Q.20 | Why do you consider the route through Gallowtree Gate (quite/very) unsafe?<br>CODE ALL THAT APPLY. | (31)M | |
| | Too many pedestrians | 1 | |
| | Too many obstacles | 2 | |
| | Other (specify) | 3 | |
| | [ ] | | |
| | | (32-33) | Q21a |
| Q.21a | How safe do you consider the alternative route?<br>READ OUT..... | (34) | |
| | very safe, | 1 | |
| | quite safe, | 2 | Q21b |
| | quite unsafe, | 3 | |
| | or very unsafe? | 4 | Q22 |
| | Don't know | 5 | Q23a |
| | IF CONSIDER ROUTE SAFE (CODE 1 OR 2 AT q21a) | | |
| Q.21b | Why do you consider the alternative route (quite/very) safe?<br>CODE ALL THAT APPLY. | (35)M | |
| | No\little traffic | 1 | |
| | Special cycle lanes | 2 | |
| | No/few pedestrians | 3 | |
| | Other (specify) | 4 | |
| | [ ] | | |
| | | (36-37) | Q23a |
| | IF CONSIDER ROUTE UNSAFE (CODE 3 OR 4 AT Q21a) | | |
| Q.22 | Why do you consider the alternative route (quite/very) unsafe?<br>CODE ALL THAT APPLY. | (38)M | |
| | Too much traffic | 1 | |
| | Parked cars | 2 | |
| | Junctions | 3 | |
| | Roundabouts | 4 | |
| | Too many lanes in the road | 5 | |
| | Pedestrians | 6 | |
| | Too many other cyclists | 7 | |
| | Other (specify) | 8 | |
| | [ ] | | |
| | | (39-40) | Q23a |

| | | CODE | ROUTE |
|---|---|---|---|
| Q.23a | How convenient do you consider the route through Gallowtree Gate? READ OUT..... | (41) | |
| | very convenient,..... | 1 | |
| | convenient,..... | 2 | Q23b |
| | inconvenient,..... | 3 | |
| | or, very inconvenient?..... | 4 | Q24 |
| | Don't know ..... | 5 | Q25a |
| | IF CONSIDER ROUTE CONVENIENT (CODE 1 OR 2 AT q23a) | | |
| Q.23b | Why do you consider the route through Gallowtree Gate (very) convenient? CODE ALL THAT APPLY. | (42)M | |
| | Most direct route..... | 1 | |
| | Few delays on this route ..... | 2 | |
| | Other (specify)..... | 3 | |
| | | (43-44) | Q25a |
| | IF CONSIDER ROUTE INCONVENIENT (CODE 3 OR 4 AT Q23a) | | |
| Q.24 | Why do you consider the route through Gallowtree Gate (very) inconvenient? CODE ALL THAT APPLY. | (45)M | |
| | Have to stop cycling ..... | 1 | |
| | Not direct route..... | 2 | |
| | Slow (generally)..... | 3 | |
| | Other (specify)..... | 4 | |
| | | (46-47) | Q25a |
| Q.25a | How convenient do you consider the alternative route? READ OUT ..... | (48) | |
| | very convenient,..... | 1 | |
| | convenient,..... | 2 | Q25b |
| | inconvenient,..... | 3 | |
| | or, very inconvenient?..... | 4 | Q26 |
| | Don't know ..... | 5 | Q27 |





| | | CODE | ROUTE |
|---|---|---|---|
| | IF CONSIDER ROUTE CONVENIENT (CODE 1 OR 2 AT q25a) | | |
| Q.25b | Why do you consider the alternative route (very) convenient? CODE ALL THAT APPLY. | (49)M | |
| | Most direct route..... | 1 | |
| | Fast (generally)..... | 2 | |
| | Few delays on this route ..... | 3 | |
| | Other (specify)..... | 4 | |
| | | (50-51) | Q27 |
| | IF CONSIDER ROUTE INCONVENIENT (CODE 3 OR 4 AT Q25a) | | |
| Q.26 | Why do you consider the alternative route (very) inconvenient? CODE ALL THAT APPLY. | (52) | |
| | Not direct route..... | 1 | |
| | DELAYS: Traffic lights..... | 2 | |
| | Junctions..... | 3 | |
| | Sheer weight of traffic ..... | 4 | |
| | Other delays..... | 5 | |
| | Slow (generally)..... | 6 | |
| | Other (specify)..... | 7 | |
| | | (53-54) | Q27 |
| Q27 | Do you prefer cycling through Gallowtree Gate or the alternative route? | (55) | |
| | Gallowtree Gate..... | 1 | |
| | Alternative route..... | 2 | Q28 |
| | The same/No preference ..... | 3 | |
| | Don't know ..... | 4 | Q37 |
| Q.28 | Why do you prefer it? (PROBE FULLY) | (56-58) | Q37 |

| | | CODE | ROUTE |
|---|---|---|---|
| | IF NEVER AVOIDS GALLOWTREE GATE (CODE 2 AT 14) | | |
| Q.29 | Are you put off making any journeys to the other side of town because you cannot cycle through Gallowtree Gate? | (59) | |
| | Yes | 1 | |
| | Sometimes | 2 | Q30 |
| | No | 3 | |
| | Don't know | 4 | Q33a |
| | IF YES/SOMETIMES (CODE 1 OR 2 AT Q29) | (60-62) | |
| Q.30 | Could you give me one example of such a journey - firstly thinking of the destination of that journey.<br>WRITE IN DESTINATION<br>_____<br>_____ | | Q31 |
| Q.31 | What is the purpose of that journey?<br>CODE ONE ONLY. DO NOT READ OUT | (63) | |
| | Commuting to/from work | 1 | |
| | Business | 2 | |
| | Education (to/from school/college) | 3 | |
| | Shopping | 4 | |
| | Other personal business | 5 | |
| | Leisure | 6 | |
| | Other (please specify) | 7 | |
| | | (64) | Q32 |
| Q.32 | How do you make that journey, if not by bike?<br>DO NOT READ OUT. CODE ONE ONLY | (65) | |
| | Walk | 1 | |
| | Bus | 2 | |
| | Car (driver) | 3 | |
| | Car (passenger) | 4 | |
| | Train | 5 | |
| | Taxi | 6 | |
| | Other (specify) | 7 | |
| | Only travel by bike | 8 | |
| | Don't know | 9 | |
| | | (66) | Q33a |





| | | CODE | ROUTE |
|---|---|---|---|
| | IF NEVER AVOIDS GALLOWTREE GATE (CODE 2 AT 14) | | |
| Q.33a | How safe do you consider the route through Gallowtree Gate?<br>READ OUT..... | (67) | |
| | very safe, | 1 | |
| | quite safe, | 2 | Q33b |
| | quite unsafe, | 3 | |
| | or very unsafe? | 4 | Q34 |
| | Don't know | 5 | Q35a |
| | IF CONSIDER ROUTE SAFE (CODE 1 OR 2 AT q33a) | | |
| Q.33b | Why do you consider the route through Gallowtree Gate (quite/very) safe?<br>CODE ALL THAT APPLY. | (68)M | |
| | No\little traffic | 1 | |
| | Slow moving | 2 | |
| | Can't ride bike | 3 | |
| | Other (specify) | 4 | |
| | | (69-70) | Q35a |
| | IF CONSIDER ROUTE UNSAFE (CODE 3 OR 4 AT Q33a) | | |
| Q.34 | Why do you consider the route through Gallowtree Gate (quite/very) unsafe?<br>CODE ALL THAT APPLY. | (71)M | |
| | Too many pedestrians | 1 | |
| | Too many obstacles | 2 | |
| | Other (specify) | 3 | |
| | | (72-73) | Q35a |

| | | | |
|---|---|---|---|
| Q.35a | How convenient do you consider the route through Gallowtree Gate? READ OUT ..... | BN 1-3 SN 4-9 CC=4 10 | |
| | | (11) | |
| | very convenient, ..... | 1 | |
| | convenient, ..... | 2 | Q35b |
| | inconvenient, ..... | 3 | |
| | or, very inconvenient? ..... | 4 | Q36 |
| | Don't know ..... | 5 | Q37 |
| | IF CONSIDER ROUTE CONVENIENT (CODE 1 OR 2 AT q35a) | | |
| Q.35b | Why do you consider the route through Gallowtree Gate (very) convenient? CODE ALL THAT APPLY. | (12)M | |
| | Most direct route ..... | 1 | |
| | Few delays on this route ..... | 2 | |
| | Other (specify) ..... | 3 | |
| | | (13-14) | Q37 |
| | IF CONSIDER ROUTE INCONVENIENT (CODE 3 OR 4 AT Q35a) | | |
| Q.36 | Why do you consider the route through Gallowtree Gate (very) inconvenient? CODE ALL THAT APPLY. | (15)M | |
| | Have to stop cycling ..... | 1 | |
| | Not direct route ..... | 2 | |
| | Slow (generally) ..... | 3 | |
| | Other (specify) ..... | 4 | |
| | | (16-17) | Q37 |





| | | CODE | ROUTE |
|---|---|---|---|
| | ASK ALL | | |
| Q.37 | Do you ever push your bike through Gallowtree Gate instead of riding it? | (18) | |
| | Yes ..... | 1 | Q38 |
| | No ..... | 2 | Q39 |
| | IF PUSHES BIKE (CODE 1 AT Q37) | | |
| Q.38 | At what times of day do you push your bike? DO NOT READ OUT. CODE ALL THAT APPLY | (19)M | |
| | 00.00-07.59 ..... | 1 | |
| | 08.00-09.59 ..... | 2 | |
| | 10.00-15.59 ..... | 3 | |
| | 16.00-17.59 ..... | 4 | |
| | 18.00-20.59 ..... | 5 | |
| | 21.00-23.59 ..... | 6 | |
| | Other (please specify) | 7 | |
| | Any time of day ..... | 8 | |
| | | (20) | Q39 |
| Q.39 | What was your age last birthday? DO NOT READ OUT | | |
| | WRITE IN _____ | (21-22) | |
| | | (23) | |
| | AND CODE: Under 18 ..... | 1 | |
| | 18-24 ..... | 2 | |
| | 25-39 ..... | 3 | |
| | 40-59 ..... | 4 | |
| | 60+ ..... | 5 | |
| | REFUSED ..... | 6 | Q40 |
| Q.40 | Are there any other comments you would like to make about cycling in Leicester? WRITE IN | (24-27) | Q41 |
| | OBSERVATIONS | | |
| Q.41 | Sex | (28) | |
| | Male ..... | 1 | |
| | Female ..... | 2 | Q42 |
| Q.42 | Interviewee was: | (29) | |
| | Pushing bike ..... | 1 | |
| | Riding bike ..... | 2 | |
| | Scooting bike ..... | 3 | |
| | Parking bike ..... | 4 | Q43 |

| | | | |
|---|---|---|---|
| Q.43 | Location of interview<br>_____<br>_____ | (30-33) | |
| Q.44 | Time of interview completed (24 HOUR) _____ | (34-37) | Q45 |
| Q.45 | Day interview completed | (38) | |
| | Monday | 1 | |
| | Tuesday | 2 | |
| | Wednesday | 3 | |
| | Thursday | 4 | |
| | Friday | 5 | |
| | Saturday | 6 | |
| | Sunday | 7 | |





## CONTACT DETAILS

FULL NAME: _____

ADDRESS: _____

_____

_____

_____ POST CODE _____

TELEPHONE NUMBER: _____ _____

I DECLARE THAT THE INFORMANT WAS UNKNOWN TO ME UNTIL THE INTERVIEW TOOK PLACE; AND THAT THE QUESTIONNAIRE HAS BEEN CONDUCTED ACCORDING TO THE MANUAL AND THE MRS CODE OF CONDUCT, AND HAS BEEN CHECKED.

SIGNED _____

INTERVIEWER NUMBER ☐☐☐☐☐ (39-43)

## Abstract

Nine pedestrian areas where cycling is prohibited, and the alternative routes that cyclists use, are analysed in terms of the safety and convenience for cyclists. Three towns where signed routes have been provided to enable cyclists to avoid the pedestrian area are considered in greater detail, and the results of interviews with 717 cyclist are presented. Accident data are also presented. Most alternative routes studied involved high capacity roads and additional hazardous junctions, when compared to the pedestrian area. All the alternative routes involved additional distance and the majority required cyclists to dismount. Where signed routes with facilities were provided to enable cyclists to bypass the pedestrian area, cyclists generally found them to be convenient. Most cyclists said that directness and minimising delay were the main reasons for their choice of route. Design advice on the provision of alternative routes around pedestrian areas is provided.


## Related publications

TRL358 *Further developments in the design of contra-flow cycling schemes* by T J Ryley and D G Davies. 1998 (price £25, code E)

TRL302 *Roundabouts in continental Europe designed with cycle facilities or 'cycle-thinking'* by J M Morgan. 1998 (price £25, code E)

TRL287 *Delineation for cyclists and visually impaired pedestrians on segregated, shared routes* by T A Savill, C Galton, and G McHardy. 1997 (price £25, code E)

TRL285 *Cyclists at roundabouts - the effects of 'continental' design on predicted safety and capacity* by D G Davies, M C Taylor, T J Ryley and M E Halliday. 1997 (price £35, code H)

TRL241 *Cyclists at road narrowings* by D G Davies, T J Ryley, S B Taylor and M E Halliday. 1997 (price £35, code I)

PR93 *The Southampton Western Approach Cycle Route. Cyclist flows and accidents* by F Shipley. 1994 (price £25, code E)

PR42 *Cycle routes* by G Harland and R Gercans. 1993 (price £35, code H)

PR15 *Cycling in pedestrian areas* by P Trevelyan and J M Morgan. 1993 (price £35, code J)

CT2.1 Cycling safety update (1993-1996). *Current Topics in Transport: selected abstracts from TRL Library's database.* (price £15)

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