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PROJECT REPORT 15

CYCLING IN PEDESTRIAN AREAS

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Customer: **Traffic Policy Division, DOT (Mr E Wyatt)**

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EXECUTIVE SUMMARY

Cycle use and the environment in pedestrian areas vary from place to place and it is common to find cyclists riding in and through pedestrian areas, even where they are not allowed. In pedestrian areas where cycling is permitted, this has been achieved by:

a) shared use of the whole, or certain sections of the pedestrian area;

b) combined use with selected motor vehicles (eg buses and service vehicles);

c) time-restricted access;

d) special path(s) for cyclists.

Examples of each method can be found in the United Kingdom (and in Western Europe, where the practice of allowing cyclists to use pedestrian areas is rather more widespread).

This study analysed 1 hour video recordings of pedestrian areas at 12 sites in England and 9 sites in mainland Europe; followed by 12 hour video studies and questionnaires at four sites in England. The main findings of the studies are:

a) pedestrians respond to the presence of motor vehicles (where permitted in shared areas) by altering their behaviour, whereas the presence of cyclists has no appreciable effect.

b) cyclists adapt their speed to suit pedestrian density and dismount if necessary. Potential conflicts are generally overcome by the cyclist taking avoiding action.

c) pedestrian areas have good safety records; no accident involving an adult pedestrian and a cyclist has been recorded in the data covering fifteen site years, and only one involving a child pedestrian and a cyclist. No collisions between pedestrians and cyclists were observed during the analysis of video surveys totalling 66 site hours.

d) at the lower levels of pedestrian and cycle flows, both users mingle readily throughout the pedestrian area.

e) at higher levels of flow, surface treatment and the disposition of street furniture and shop displays can have a significant influence. An identified section for cyclists clearly aids orientation and assists smooth operation. Where such aids are in place, observations indicate that pedestrians tend to use the side areas, while cyclists tend to ride in the middle of the street.

Conclusions

The extensive observations made during this project have disclosed no real factors that justify exclusion of cyclists from pedestrian areas and indicate that cycling can be more widely permitted without detriment to pedestrians. It is important not to exclude cyclists from pedestrian areas and force them to use dangerous alternative routes. There are a wide variety of appropriate and satisfactory solutions (in terms of design and regulation) the choice of which will vary from place to place, and depend on local circumstances.

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1. INTRODUCTION AND PROJECT BRIEF

Background

1.1 Early examples of pedestrian areas include Coventry (1950s), King's Lynn and Norwich (1960s). Subsequent Acts of Parliament gave local authorities new powers of traffic regulation and, as a result, such areas have become an established feature of numerous town and city centres throughout the country.

1.2 It was estimated in 1981 that there might be 1,450 such areas in the United Kingdom (Roberts, 1981) and the number has probably continued to increase during the 1980s.

1.3 Both local conditions and commercial interests have influenced the evolution of pedestrian areas. They have variously been created by conversion of streets from all-traffic uses and new construction of arcades and shopping malls.

1.4 Reasons for their creation are varied: to counteract the effects of out-of-town shopping, to conserve an historic centre, civic pride, or as part of urban renewal.

Transport policy

1.5 Traffic orders are used to ban vehicles from pedestrian areas. However, exceptions are often made to allow access for maintenance vehicles, buses or selected service vehicles and, in some examples, cycling has been permitted (McClintock, 1988). The scope of these orders vary from place to place, according to local circumstances; thus a wide variety of arrangements can be observed throughout the country and on the continent (Altruz, 1989. Foley, 1989).

1.6 Changing priorities in urban transport policy, in particular the greater emphasis on safety of vulnerable road users, have raised the issue as to whether or not cycling should be more widely permitted in these areas. In some instances, this issue has become controversial. Concern has been expressed by lobby groups; particularly those representing the blind and disabled. Perhaps this is because allowing cycling in pedestrian areas is perceived to compromise the freedom of movement, safety and amenity of pedestrians.

1.7 Conversely, it is apparent in many examples that bans on cycling in pedestrian areas interrupt safe and convenient connections for cyclists in or through the centre. In such cases, the safety of cyclists can be compromised by forcing them to use bypass roads which frequently carry high volumes of car and goods vehicle traffic.

Project Brief

1.8 Therefore, the main aim of this project was:
"... to determine whether any real factors contribute to the exclusion of cyclists from some pedestrian areas."
It was initiated by John Morgan, the Project Officer for the Transport Research Laboratory (TRL).

1.9 ABT Planning & Highways Consultancy Ltd, in collaboration with John Lawrence, of Southampton City Council, and the late John Roberts, of Transport and Environment Studies [and author of a recent report on Space-Sharing, see TEST 1990] were appointed to carry out the study, which was directed throughout by Peter Trevelyan.

1.10 The study was divided into two stages. The first stage comprised a preliminary survey of sites at twelve towns in the United Kingdom, from which three were selected for detailed study in the second stage. In parallel, TRL requested a visit to a suitable European site. In practice, it proved feasible to visit sites in nine comparable European towns.

2. DESCRIPTION OF STUDY METHOD

Stage One

2.1 Sites for study in the first stage were selected following contacts with local authorities throughout the UK (in particular through the Local Authority Cycle Planning and Pedestrian Liaison Groups - LACPLG and LAPLG). Following this a list of sites was prepared. These were then discussed with the TRL Project Officer and twelve sites were selected for study in Stage One:

Beeston	Chichester	Oxford
Bristol	Leicester	Peterborough 1
Cambridge	Manchester	Peterborough 2
Canterbury	Nottingham	York

2.2 All sites were visited during November and December 1990 and an hour's video survey conducted. It often proved possible to obtain access to a building overlooking the pedestrian area, from which vantage point the video survey could be conducted without alerting users of the pedestrian area. Most of the filming was conducted around midday (although a second visit to Peterborough was made so that a film could be taken around 1600 hours - when cycling was permitted in Bridge Street).

2.3 At the same time, various details about the pedestrian area (eg width of street and carriageway) were noted on a standard form. Photographs were used to record information about street furniture, use by buskers and other street activities.

2.4 The results of analysis of these films are shown in the appendix and are summarised in Table 1. Cycles and motor vehicles on film were counted in five minute bands and pedestrian flows were counted for one minute at the beginning of each five minute period. Pedestrian flows are therefore estimated from a 20% sample of the full period of the film.

Continental visit

2.5 Discussions with professional contacts in the Netherlands, Denmark and Germany, provided a list of potential sites to visit. A selection of nine towns was made to give a range of examples, on an itinerary that could be managed within a working week at the end of March 1991:

DENMARK:	GERMANY:	NETHERLANDS:
Odense	Hamm	Enschede
Herning	Hannover	Almelo
Wunstorf	Hengelo	Groningen

2.6 As with Stage One, video films were taken within the central shopping district of each town, often at more than one location, for subsequent analysis. In addition, a photographic record and measurements of the basic parameters of the precinct were made. Where possible, contact was made with staff in the local authority office with relevant experience in cycle planning.

Stage Two

2.7 Experience gained during Stage One of the project reinforced the view that, for Stage Two, sites should be selected where significant numbers of cyclists were to be expected, in order to obtain sufficient material for subsequent analysis. Another significant factor in the choice of sites was the traffic control regime. On this basis, the final selection of sites for study in the second stage was:

i) CHICHESTER (East Street) - where cycling is not permitted at any time (though goods vehicles are permitted before 0900 and after 1800 hours).

ii) PETERBOROUGH - where there are two differing street layouts and cycle control regimes: one (Long Causeway) where cycling was permitted, together with selected service vehicles, at all times; the other (Bridge Street) where cycling was permitted only before 0900 and after 1600 hours.

iii) OXFORD (Queen Street) - in a complex traffic control regime where buses are permitted throughout the day, service vehicles are permitted only before 1030 and after 1730 hours, and cyclists are permitted before 0900 and after 1800 hours.

2.8 From experience in the first stage, the advantages of filming from an elevated and concealed position were clear, as a considerable amount of information about the interaction of cyclists and pedestrians can be collected. Arrangements were therefore made to conduct the 12-hour video surveys from a concealed high-level location.

2.9 Drafts of the questionnaires for pedestrians and cyclists were prepared and discussed in advance with the TRL. The fieldwork was conducted in April and June 1991.

3. RESULTS OF STAGE ONE

3.1 The principal results (Table 1 and Figure 1) demonstrate that a wide range of conditions is found in British pedestrian areas, such as the adoption of different forms of time-sharing for cyclists. Three basic categories of pedestrian areas can be distinguished, in terms of the effect on cyclists, where:

a) cycling is prohibited at all times - Chichester,

b) cycling is allowed for part of the day - Oxford, Peterborough Bridge Street, York and, for access, Canterbury,

c) cycling is allowed at all times - Beeston, Bristol, Cambridge, Leicester, Manchester, Nottingham, and Peterborough Long Causeway.

3.2 Only one location, in Manchester, was identified as having a designated cycle route through the pedestrian area. However, unlike the other examples, this particular area was not a shopping street but a large public plaza, in the office district in the centre of the city.

3.3 Owing to the fact that each local authority allows certain categories of motor vehicles into the pedestrian area, eg maintenance, disabled, bank security deliveries, the observed level of vehicular traffic varied widely.

3.4 In some cases, such as in Bristol and Oxford, there were frequent movements of buses and other motor vehicles, clearly discouraging pedestrians from using the full width of the street. In other cases, eg Chichester and Canterbury, pedestrians did make full use the width of the street, the level of pedestrian activity being such as to discipline the few motor vehicles that used the street.

4. RESULTS OF CONTINENTAL VISIT

4.1 Principal results of the continental visit are summarised in Table 2 and Figure 2. It can be seen that the level of cycle use in the selected street in the towns chosen for study was generally, with the exception of Groningen (see below for an explanation), higher than the examples from the UK.

4.2 Table 2 shows clearly that a significant proportion of cyclists ride, rather than push their cycles, even in situations where cycling is not permitted.

4.3 In this context, the relationship between pedestrian density and cycle use assumes significance. Observations made on this visit suggest that pedestrian density is an important factor in determining whether cyclists ride in or through the centre of a given town.

4.4 This point is most clearly illustrated in Odense, where the central core of the town has grown up along and around the historic main street (Vestergade). This street is narrowest in the central section, where the oldest buildings are located, and widens towards the periphery.

4.5 Because of the limited width of the central section, and the fact that the highest pedestrian activity occurs here, for much of the day it would simply be impossible to ride a cycle, and, at the time of the visit, difficult even to push a cycle.

4.6 Pedestrian density is manifestly lower in the peripheral sections on either side of this central section. The municipality has therefore found that cycling can be maintained in these sections.

4.7 Consequently, three separate regimes have been imposed in Odense - full pedestrianisation in the centre section (150 metres); pedestrians and cycles in the east section (100 metres); pedestrians, buses and cycles in the west section (100 metres). Alternative routes have also been provided. The east section is referred to as site A, and the west section as site B, later in this report.

4.8 A similar situation arises in Groningen where the principal shopping street was selected for study. Here, pedestrian density was high (again through a combination of limited street width and high pedestrian activity). Cycle traffic was accommodated on peripheral streets running parallel to this street. These factors influenced cyclists' behaviour such that few tried to use the principal shopping street and those that did, and then attempted to ride, were constrained in speed to that of pedestrians.

4.9 Where pedestrian density is lower, for example in Hamm (site B), Herning and Almelo (site B), more cyclists use the street and a greater proportion are tempted to ride.

4.10 The streets in the continental examples showed a wide variety of designs. With one exception (Odense site B), all were paved across the full width of the street with no changes in level. Generally, channelling of pedestrians and cyclists was achieved through a disposition of the street furniture, so that three distinct corridors were created - one along the centre of the street, the other two being close to the shop fronts on either side. In some cases, this central corridor was further highlighted with a different surface treatment such as texture or colour or both.

4.11 At one site, in Hamm, where cycling was not permitted, the street furniture was located along the central axis of the street, thereby channelling pedestrians to either side, near to the shop fronts. In Odense site B, where buses were also permitted, the design was closer to that of a conventional traffic-carrying street, but with block paving for the vehicle pavement and only very shallow kerbing.

5. RESULTS OF STAGE TWO

5.1 In Stage Two, three towns - Peterborough, Oxford and Chichester - were studied in detail. One principal site was studied in each. Because of its proximity, a second site, with a different traffic control regime and layout (Long Causeway) was also studied in Peterborough.

Street layout

5.2 In these towns, the layouts of the streets studied show significant differences. In Oxford, Queen Street has a clearly marked surface for motor vehicles, double yellow lines, bus stops, and footways with paving slabs. The footways on either side are relatively narrow and only red-coloured block paving at either end and the absence of drop kerbs serve to distinguish this street from a conventional traffic street.

5.3 In contrast, Peterborough's Bridge Street has substantial in-situ trees and street furnishings in a broad band along the centre of the street, thereby creating two corridors for pedestrian and cycle movement on either side of the street near the shop fronts.

5.4 Long Causeway in Peterborough has a central row of mature trees and street furnishings. On one side a surface for cycle and motor vehicle traffic has been created using block paving, though occupying less than one quarter of the street width. Shallow angled kerbs serve to demarcate the 'vehicle' areas from the bulk of the street.

5.5 East Street in Chichester has been designed so that the central section is distinguished by a different surface colour and texture from the sections near the shop fronts. There are some mature trees and street furnishings; more than Oxford, less than Peterborough.

Pattern of cycle and pedestrian use

5.6 The basic pattern of movements in the three towns is presented in Tables 3 to 5 and Figures 3 to 5. Generally, cycle use peaks in the morning and evening periods, whereas pedestrian activity builds up during the morning to a peak around lunchtime, stays on a plateau during the early part of the afternoon, and declines towards the early evening.

5.7 Even where and when cycling is not permitted, a significant proportion of cyclists in these three cities are prepared to flout the regulations and ride their cycles, in preference to pushing them. There also appears to be a relationship between pedestrian density and the proportion of cyclists riding - as pedestrian activity increases, the proportion riding decreases.

5.8 Differences in the behaviour of pedestrians are also apparent. In Chichester and Peterborough (Bridge Street) pedestrians make full use of the entire street. In contrast, in Oxford, pedestrians stay at the side of the street, on the 'pavement' section in front of the shops - it would be difficult to do otherwise because the central section is effectively monopolised by buses both travelling along the street and standing at the bus stops. Long Causeway in Peterborough is an intermediate example - the motor vehicles are fewer in number and less intrusive, so pedestrians are observed walking along and across the central section.

Cyclist and pedestrian interviews

5.9 Interviews with cyclists are summarised in Tables 6 to 11 (the questionnaire is set out in the appendix). The regularity of visits to the centre, and the fact that the majority of journeys are to or from the centre rather than through, are notable.

5.10 Attitude questions show clear differences in responses between the three towns. It is striking, though not surprising, that the feeling of safety is greatest in Chichester and least in Oxford. This is reflected in the extent to which, in the unsolicited responses, cyclists in Oxford indicated that motor vehicles should be banned.

5.11 Regarding the pedestrian interviews, it should be noted that roughly 1 in 5 of those interviewed cycled regularly, and a further significant proportion indicated that they cycled occasionally.

5.12 The pedestrian attitude questions produced a similar pattern to the cyclist interviews on the feeling of safety. Again this was reflected in the unsolicited responses in relation to Oxford, where the main comment was in favour of banning motor vehicles.

5.13 Specifically in relation to cycling in the pedestrian area, the responses to Questions 18 and 19 were somewhat in conflict - there was a similar degree of agreement both with the proposal that cyclists should not ride at all and that there should be a designated route for cyclists.

Accident data

5.14 One of the results anticipated from converting streets from traffic to pedestrian use is a reduction in the numbers of Personal Injury Accidents (PIAs) in these streets. Obviously, if cyclists were a significant source of danger to pedestrians, this effect would be diminished.

5.15 At a national level, it is clear that motor vehicles are responsible for almost all pedestrian casualties. In 1991 in Great Britain, for example, a total of 1,495 pedestrians were killed by motor vehicles (three-quarters of which were cars) and 13,430 seriously injured. This can be compared with 1 pedestrian recorded as killed, and 89 seriously injured, in accidents in which they were hit by pedal cycles [Source: Table 23, 'Road Accidents Great Britain' 1991]. Furthermore, the risk of death or serious injury to a pedestrian (the 'severity ratio') is much greater when a motor vehicle is involved.

5.16 It is known that few pedestrians are injured in accidents involving pedal cyclists (fewer than 0.5% nationally) and that a proportion go unreported, nonetheless this is the nationally accepted basis for comparison. Therefore, for the three towns studied in Stage Two, accident data have been obtained for the streets in the town centre.

5.17 The situation in the three cities over the last five years is as follows:

Oxford:- in Queen Street there have been two personal injury accidents, both slight [one a bus passenger, the other a pedestrian injured by a hit-and-run car making illegal use of the precinct].

Peterborough:- in Bridge Street, there have been two personal injury accidents involving cyclists. In one, the cyclist hit a kerb and fell off, seriously injuring himself. In the other, a young child ran out of a shop into the path of a cyclist, resulting in slight injuries to the child. No accidents were recorded in Long Causeway.

Chichester:- in East Street, there has been only one accident, in which slight injury was caused to a pedestrian by a car that had apparently entered the pedestrian area unknowingly.

5.18 The foregoing shows that the streets within each pedestrian area have good safety records. In a period totalling fifteen years, only one accident involving a cyclist and a (child) pedestrian have been recorded.

5.19 Using the video film record, the aspect of pedestrian and cycle safety was examined from a different perspective. It was found that, in a total of 66 hours of video film, both in the UK and on the Continent and featuring significant numbers of both cyclists and pedestrians, not one single collision between pedestrian and cyclist (or between cyclists) was recorded.

5.20 It was also notable that parents of young children were, with the exception of streets shared with buses, prepared to let their children wander at some distance, indicating that the presence of cyclists (as compared to motor vehicles) gave little cause for concern.

5.21 These films also show the extent to which cyclists adapt their speed to suit pedestrian density, dismounting if necessary, or taking a variety of other actions to avoid conflict with pedestrians.

5.22 An instructive comparison can be made with people observed running on foot through the pedestrian area - a not uncommon event. They can be seen weaving in and out among other pedestrians, avoiding conflict by swerving or changing their speed, slowing down or stopping if necessary.

5.23 Cyclists travel at a similar speed, taking similar avoiding action. At the lower levels of pedestrian and cycle flow, these avoiding actions appear to be quite distinct events. However, as flows increase, more and more such actions can be observed, merging into what appears to be norm for cyclists as they progress through the area.

5.24 These actions have been described by other authors [Milton] as 'incidents', the choice of terminology implying a degree of risk. However, it is difficult to attach significance to what is a fairly widely observed phenomenon. The evidence from the films is that pedestrian safety is not compromised by the presence of cyclists.

Police attitudes

5.25 Following discussions with local police in each area, their attitude can best be summed up through quoting the written view of the policeman responsible for policing the centre of Peterborough:

> "On the one hand there is the view that a complete ban would be more readily understood and more easily enforced. On the other, there is a great concern for the vulnerability of pedal cyclists mixing with heavy urban traffic. On balance, the Police feel that the present arrangement is the best option as long as it is understood that enforcement problems will always remain because of the limited extent to which Police time can be allocated to such matters" (Quoted by the Director of Engineering in a report to Council, July 1991).

6. SUMMARY OF PRINCIPAL FINDINGS AND CONCLUSION

General observations

6.1 - cycle use and the environment in pedestrian areas vary from place to place.

- it is common to find cyclists riding in and through pedestrian areas, even where they are not allowed.

- in pedestrian areas where cycling is permitted, this has been achieved by:

  a) shared use of the whole, or certain sections of the pedestrian area;

  b) combined use with selected motor vehicles (eg buses and service vehicles);

  c) time-restricted access; and

  d) special path(s) for cyclists.

- examples of each method can be found in the United Kingdom (and in Western Europe, where the practice of allowing cyclists to use pedestrian areas is rather more widespread).

Detailed observations

6.2 - pedestrians respond to the presence of motor vehicles (where permitted) by altering their behaviour, whereas the presence of cyclists has no appreciable effect.

- Cyclists adapt their speed to suit pedestrian density and dismount if necessary. Potential conflicts are generally overcome by the cyclist taking avoiding action.

- pedestrian areas have good safety records; no accident involving an adult pedestrian and a cyclist has been recorded in the data covering fifteen site years relating to Stage Two of the study, and only one involving a child pedestrian and a cyclist. Furthermore, not one single collision between pedestrian and cyclist was observed during the analysis of video surveys totalling 66 site hours.

- at the lower levels of pedestrian and cycle flows, both users mingle readily throughout the pedestrian area.

- at higher levels of flow, surface treatment and the disposition of street furniture and shop displays can have a significant influence. An identified section for cyclists clearly aids orientation and assists smooth operation. Where such aids are in place, observations indicate that pedestrians tend to use the side areas, while cyclists tend to ride in the middle of the street.

Conclusion

6.3 The extensive observations made during this project have disclosed no real factors that justify exclusion of cyclists from pedestrian areas and indicate that cycling can be more widely permitted without detriment to pedestrians. There are a wide variety of appropriate and satisfactory solutions (in terms of design and regulation) the choice of which will vary from place to place, and depend on local circumstances.

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TABLE 1 : PRINCIPAL RESULTS OF STAGE ONE

TOWN and street cycle regime	cycles /hour	peds /hour	cycles[1] as %	cycles[2] pushed	peds/min /metre	veh /hour
BEESTON High Street cycling allowed	70	2700	3%	48%	3.6	18
BRISTOL East Street cycles & buses allowed	40	1200	3%	5%	1.3	47
CAMBRIDGE Burleigh Street cycling allowed	240	2300	9%	17%	3.5	none
CANTERBURY High Street no cycling 1030-1600	20	3500	1%	68%	4.5	10
CHICHESTER East Street no cycling	70	4300	2%	96%	4.6	1
LEICESTER Market Street cycles & service vehs	10	3500	<1%	67%	4.8	20
MANCHESTER West Mosley Street cycle route	20	800	2%	4%	2.3	none
NOTTINGHAM Arkwright Walk cycling allowed	20	500	4%	15%	0.7	none
OXFORD Queen Street no cycling 0900-1800	90	4800	2%	48%	5.7	87
PETERBOROUGH Bridge Street no cycling 0900-1600	80	2500	3%	74%3)	1.7	none
PETERBOROUGH Long Causeway cycles & service vehs.	150	1800	8%	6%	2.5	12
YORK High Ousegate no cycling 1100-1600	40	3600	1%	98%	4.6	6

Notes:

The figures above are based on sample counts of short duration (1 hour). It follows that there may be considerable variability associated with each figure.

1) % of the combined pedestrian and cycle flow.

2) % of cyclists pushing, as distinct from riding or scooting.

3) this figure is for the period before 1600; after 1600, the proportion walking falls to 12%.

TABLE 2 : PRINCIPAL RESULTS OF CONTINENTAL EXAMPLES

TOWN and street site) cycle regime	Hourly Flows: cycles	peds	cycles[1] as %	cycles[2] pushed	peds/min /metre	veh[3] /hr
		- DENMARK -				
ODENSE Vestergade						
A) cycling allowed	560	1000	55%	11%	1.3	[22]
B) cycles & buses	830	1500	56%	8%	1.8	66
HERNING Bredgade						
no cycling	270	1600	17%	77%	1.7	0
		- GERMANY -				
HAMM Alte Bahnhofstrasse						
A) cycle route	140	1600(4)	9%	4%	1.1	3
B) no cycling	70	2100	3%	12%	2.3	0
HANNOVER Georgstrasse						
cycle route	280	1600	17%	9%	2.5	0
WUNSTORF Langestrasse						
A) no cycling 2-6pm	110	1100	11%	64%	1.3	1
B) no cycling 2-6pm	140	600	22%	68%	0.8	2
		- NETHERLANDS -				
ENSCHEDE						
A) no cycling	400	1700	24%	60%	2.5	[4]
B) service road	420	900	56%	5%	1.3	40
ALMELO						
A) cycle route	630	400	150%	1%	0.7	[17]
B) no cycling	340	1300	25%	49%	1.0	[16]
HENGELO						
cycling permitted	650	1100	62%	0%	1.6	[8]
GRONINGEN						
no cycling	50	2900	2%	71%	5.1	0

Notes :

The figures above are based on sample counts of short duration (15 minutes to 1 hour). It follows that there may be considerable variability associated with each figure.

1) % of the combined pedestrian and cycle flow.

2) % of cyclists pushing, as distinct from riding or scooting.

3) figures in square brackets indicate mopeds.

4) because of the width of the street, not all pedestrians could be contained in the field of view of the camera, thus the quoted figure understates the level of pedestrian activity.

TABLE 3 : OXFORD Queen Street

Hourly flows (17th & 18th April 1991)

time from:	cyclists	cycling permitted?	percent pushed	pedes-trians	Buses	other m/vehs
0700-	120	Yes	3%	575	73	22
0800-	169	Yes	13%	1,285	82	21
0900-	69	No	64%	2,050	75	12
1000-	58	No	62%	2,985	73	12
1100-	76	No	70%	4,830	72	6
1200-	85	No	66%	5,485	75	9
1300-	83	No	60%	4,025	71	11
1400-	59	No	68%	4,890	73	7
1500-	70	No	61%	5,100	70	7
1600-	79	No	57%	4,310	75	7
1700-	107	No	47%	3,695	78	9
1800-	91	Yes	12%	1,925	52	36
totals	1,066			41,155	869*	159

Notes : * 56% of buses did not stop in Queen Street.

TABLE 4a : PETERBOROUGH Bridge Street

Hourly flows (22nd & 23rd April 1991)

time from:	cyclists	cycling permitted?	percent pushed	pedes-trians	motor vehicles
0700-	117	Yes	0%	85	0
0800-	164	Yes	2%	575	1
0900-	123	No	76%	1,625	0
1000-	103	No	74%	3,075	1
1100-	108	No	77%	3,830	2
1200-	86	No	70%	3,530	4
1300-	88	No	55%	4,030	0
1400-	84	No	70%	2,920	0
1500-	71	No	58%	2,160	0
1600-	166	Yes	17%	1,570	0
1700-	172	Yes	2%	1,280	0
1800-	66	Yes	3%	380	0
totals	1,348			25,060	8

TABLE 4b : PETERBOROUGH Long Causeway

Hourly flows (22nd & 23rd April 1991)

time from:	cyclists	cycling permitted?	percent pushed	pedes-trians	motor vehicles
0700-	118	Yes	1%	75	13
0800-	199	Yes	2%	565	17
0900-	183	Yes	11%	1,305	33
1000-	166	Yes	9%	2,140	17
1100-	157	Yes	9%	1,705	13
1200-	126	Yes	6%	2,815	11
1300-	142	Yes	4%	2,990	6
1400-	162	Yes	7%	2,070	15
1500-	127	Yes	3%	1,725	12
1600-	234	Yes	6%	1,005	10
1700-	261	Yes	11%	585	13
1800-	99	Yes	3%	135	11
totals	1,974			17,115	171

TABLE 5 : CHICHESTER East Street

Hourly flows (5th & 6th June 1991)

time from:	cyclists	cycling permitted?	percent pushed	pedes-trians	motor vehicles
0700-	19	No	21%	210	17
0800-	42	No	76%	1,230	9
0900-	44	No	91%	2,270	5
1000-	50	No	94%	3,010	3
1100-	50	No	94%	3,590	1
1200-	30	No	100%	3,890	1
1300-	27	No	100%	4,440	0
1400-	37	No	86%	3,250	0
1500-	43	No	91%	2,840	1
1600-	37	No	73%	2,975	2
1700-	42	No	69%	1,820	1
1800-	15	No	13%	225	4
totals	436			29,750	44

TABLE 6 : BASIC INFORMATION FROM CYCLIST INTERVIEWS

Units: Percentages

Town:		Oxford	P'boro	Chich'r
No. of interviews		42	50	49
Q1. Frequency of visit to centre				
	daily	57%	66%	76%
	once or twice a week	38%	34%	18%
	less frequently	5%	0%	6%
Q2. Purpose of visit	shopping	36%	48%	65%
	work	26%	44%	22%
	leisure	10%	6%	4%
	education	19%		
	other	9%	2%	9%
Qs 3 & 4. Type of journey				
	to/from centre	62%	84%	88%
	through centre	38%	16%	12%
Q15. Knowledge of traffic regulations				
	correct for pedal cycles	81%	100%	100%
Q16. Cycle use	regular	100%	98%	96%
Classification data:	female	40%	42%	63%
	male	60%	58%	37%
	student	29%	12%	14%
	adult	69%	78%	78%
	retired	2%	10%	8%
	alone	100%	94%	88%
	with others		6%	12%

TABLE 7 : ATTITUDES OF CYCLISTS - Q5 to Q20

Units : mean scores; (calculated using 2 for 'strongly agree' to -2 for 'strongly disagree')

Town:	Oxford	P'boro	Chich'r
Q5. Feel safe moving / cycling along street	-0.2	0.4	1.1
Q6. Street often too crowded	0.7	0.4	-0.1
Q7. Easy to get from end to end	-0.2	0.5	0.8
Q8. Street cluttered	-0.4	-0.7	-0.8
Q9. Cycle parking sufficient	-0.8	-0.1	-0.6
Q10. More trees and planters	0.3	-0.3	0.5
Q11. Have to move over for motor vehicles	0.9	-0.5	-
Q12. Motor vehicles are driven slowly	0.2	0.7	-
Q13. Not given enough time	-0.1	-0.2	-
Q14. Room for motor vehicles and pedestrians	-0.8	0.1	-
Q17. Room for cycles in street	-0.2	0.6	-0.1
Q18. Cyclists should not ride at all	0.1	-1.0	0.2
Q19. There should be a designated route	1.0	1.2	0.2
Q20. Cyclists should not ride, except outside the main shopping hours	0.6	-0.1	0.7

TABLE 8 : UNPROMPTED COMMENTS BY CYCLISTS - Q21

i) OXFORD 32 responded, out of 42 interviewed

buses/motor vehicles should be banned (18)

there should be a designated route (6)

about right (4)

concern for safety, cycles and motor vehicles don't mix, cycling should be encouraged (2 each)

pedestrians should be more aware, enforcement, comment on detailed design, should follow continental example, concern about driver behaviour (1 each).

ii) PETERBOROUGH 31 responded, out of 50 interviewed

pedestrians should be more aware (9)

there should be a designated cycle route [thro' Bridge St] (7)

cycling acceptable out of shopping hours (4)

cycles and pedestrians don't mix (3)

children give cycling a bad name, about right, end of cycle route a problem (2 each)

concern about safety, wouldn't object to walking, cycles and motor vehicles don't mix, comment on detailed design, cycling should be encouraged, buses should be allowed in (1 each).

iii) CHICHESTER 19 responded, out of 49 interviewed

About right (7)

there should be a designated route, enforcement, cycling should be encouraged (3 each)

pedestrians should be more aware, cycling acceptable out of shopping hours, cycles and pedestrians don't mix, should follow continental example, Northgate gyratory is a problem, buses are a problem in West and South streets, motor vehicles should be allowed in at night, precinct disliked (1 each).

TABLE 9 : BASIC INFORMATION FROM PEDESTRIAN INTERVIEWS

Units: Percentages

Town:		Oxford	P'boro	Chich'r
	No. of interviews	73	97	86
Q1. Frequency of visit to centre				
	daily	34%	35%	35%
	once or twice a week	30%	45%	26%
	less frequently	36%	20%	39%
Q2. Purpose of visit	shopping	58%	69%	64%
	work	27%	19%	12%
	leisure	10%	7%	20%
	education	4%	2%	1%
	other	1%	3%	3%
Q3. Start of journey	in centre	8%	6%	1%
	in town	56%	65%	40%
	outside town	36%	29%	59%
Q4. Mode of travel	car driver	26%	51%	51%
	car passenger	7%	3%	9%
	bus	49%	23%	8%
	pedal cycle	4%	6%	5%
	foot	14%	16%	27%
	other		1%	
Q15. Knowledge of traffic regulations				
	correct for pedal cycles	52%	71%	83%
Q16. Cycle use	regular	16%	19%	20%
	occasional	29%	22%	24%
	never	55%	58%	56%
Classification data:	female	58%	68%	45%
	male	42%	32%	55%
	student	5%	3%	10%
	adult	81%	84%	80%
	retired	14%	13%	10%
	alone	93%	67%	67%
	with others	7%	33%	33%
	pushchair	4%	10%	8%
	carrying shopping/goods	23%	13%	40%
	able	97%	95%	99%

TABLE 10 : ATTITUDES OF PEDESTRIANS - Q5 to Q20

Units : mean scores; [calculated using 2 for 'strongly agree' to -2 for 'strongly disagree']

Town:		Oxford	P'boro	Chich'r
Q5.	Feel safe moving about street	0.2	0.9	1.5
Q6.	Street often too crowded	0.7	-0.3	-0.2
Q7.	Easy to walk from one side to other	-0.1	0.8	1.1
Q8.	Street cluttered	-0.4	-0.8	-1.1
Q9.	Enough seats	-0.6	0.6	0.5
Q10.	More trees and planters	0.4	-0.2	0.5
Q11.	Have to move over for motor vehicles	0.4	-0.7	-
Q12.	Motor vehicles are driven slowly	0.6	0.6	-
Q13.	Not given enough time	-0.1	-0.4	-
Q14.	Room for motor vehicles and pedestrians	-0.8	0.2	-
Q17.	Room for cycles (& motor vehicles) in street	-0.6	-0.1	-0.8
Q18.	Cyclists should not ride at all	0.6	0.2	0.7
Q19.	There should be a designated route	0.7	0.7	0.2
Q20.	Cyclists should not ride, except outside the main shopping hours	0.7	0.3	0.7

TABLE 11 : UNPROMPTED COMMENTS BY PEDESTRIANS - Q21

i) OXFORD 52 responded, out of 73 interviewed

buses/ motor vehicles should be banned (20)

there should be a designated route (8)

should be completely pedestrianised (6)

cycles and motor vehicles don't mix, better enforcement, critical comment [squalid / chaotic / unsatisfactory] (4 each)

concern about safety, unpleasant noise and fumes (3 each)

cycling acceptable out of shopping hours, cycles and motor vehicles don't mix, cycling should be encouraged, cyclists a nuisance when 2 abreast, more cycle parking, more information, cyclists should be allowed to ride, buses and pedestrians only (1 each).

ii) PETERBOROUGH 42 responded, out of 97 interviewed

There should be a designated cycle route [thro' Bridge St] (8)

about right, motor vehicles should be banned / should be fully pedestrianised (6 each)

cycles and pedestrians don't mix (5)

general praise, enforcement (4 each)

cycling acceptable out of shopping hours, concern about safety, more cycle parking (2 each)

more information, uneven paving, cycle training, child cyclists a problem, too many parked cycles, cyclists ok if slow, more seats (1 each).

NB Two users of disabled electric vehicles both commented that cyclists were not a problem.

iii) CHICHESTER 34 responded, out of 86 interviewed

There should be a designated cycle route, cycles and pedestrians don't mix (5 each)

cycling acceptable out of shopping hours, concern about safety, cyclists should be allowed to ride (4 each)

enforcement, very busy on Saturday (3 each)

don't object to walking [comment by regular cyclists], too many buskers / street vendors (2 each)

cyclists are rude, no more trees, more planters, prams are a nuisance, cycling should be encouraged, more cycle parking, more information, should be completely pedestrianised (1 each).

Fig 1 Cycle and pedestrian flows

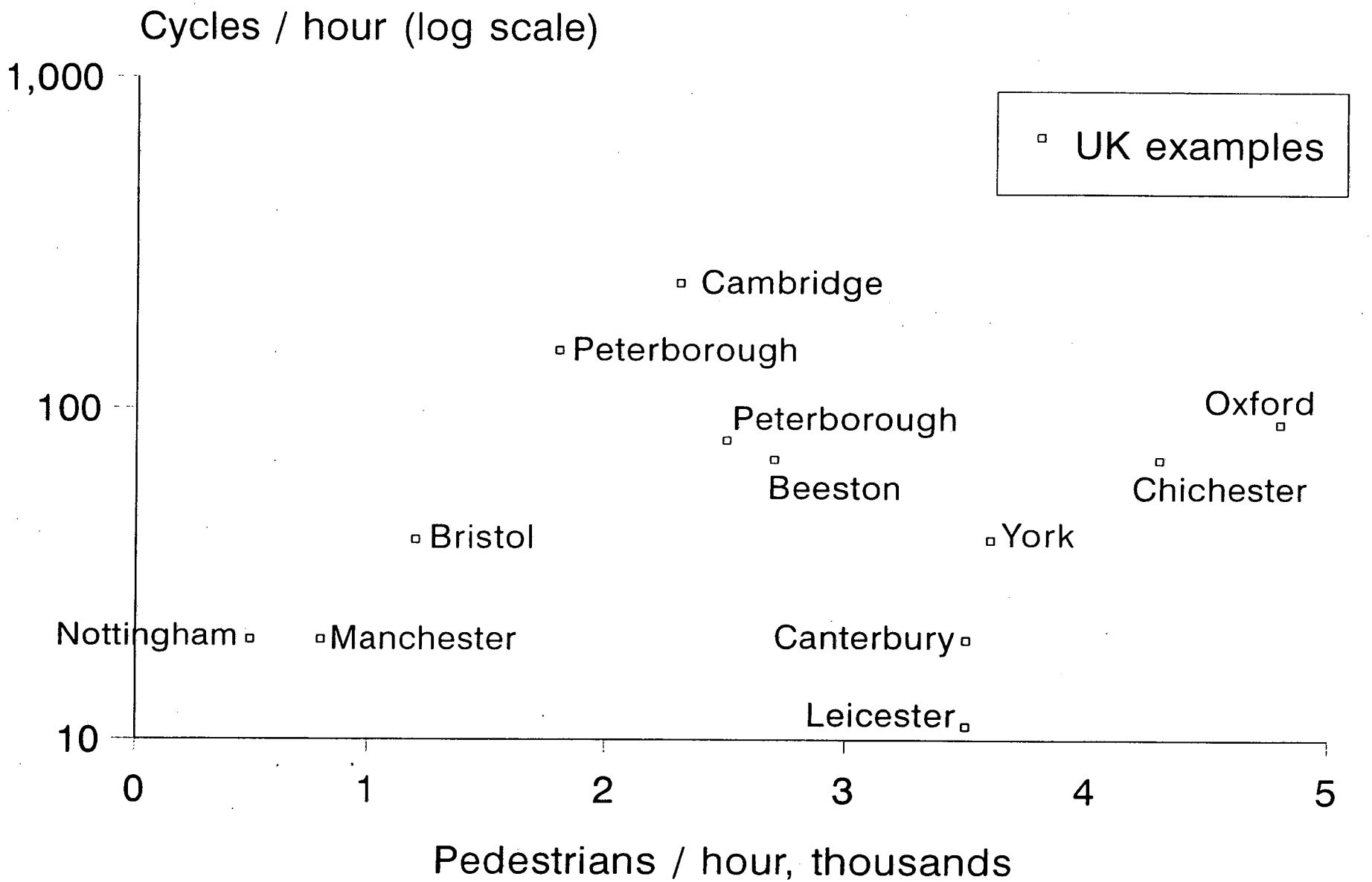


Fig 2 Cycle and pedestrian flows

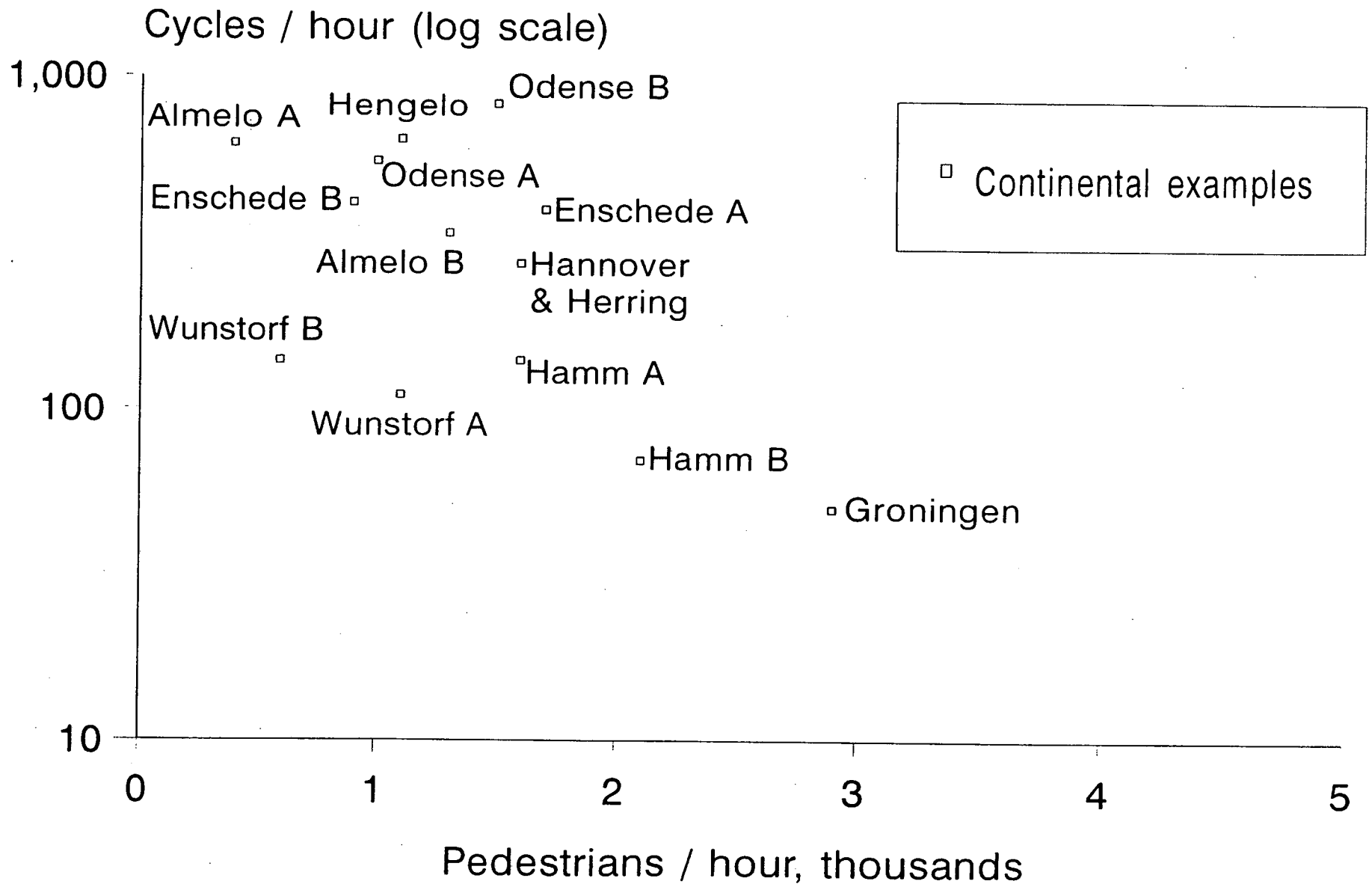


Fig 3 OXFORD, Queen Street

NB 'No Cycling' 9am to 6pm

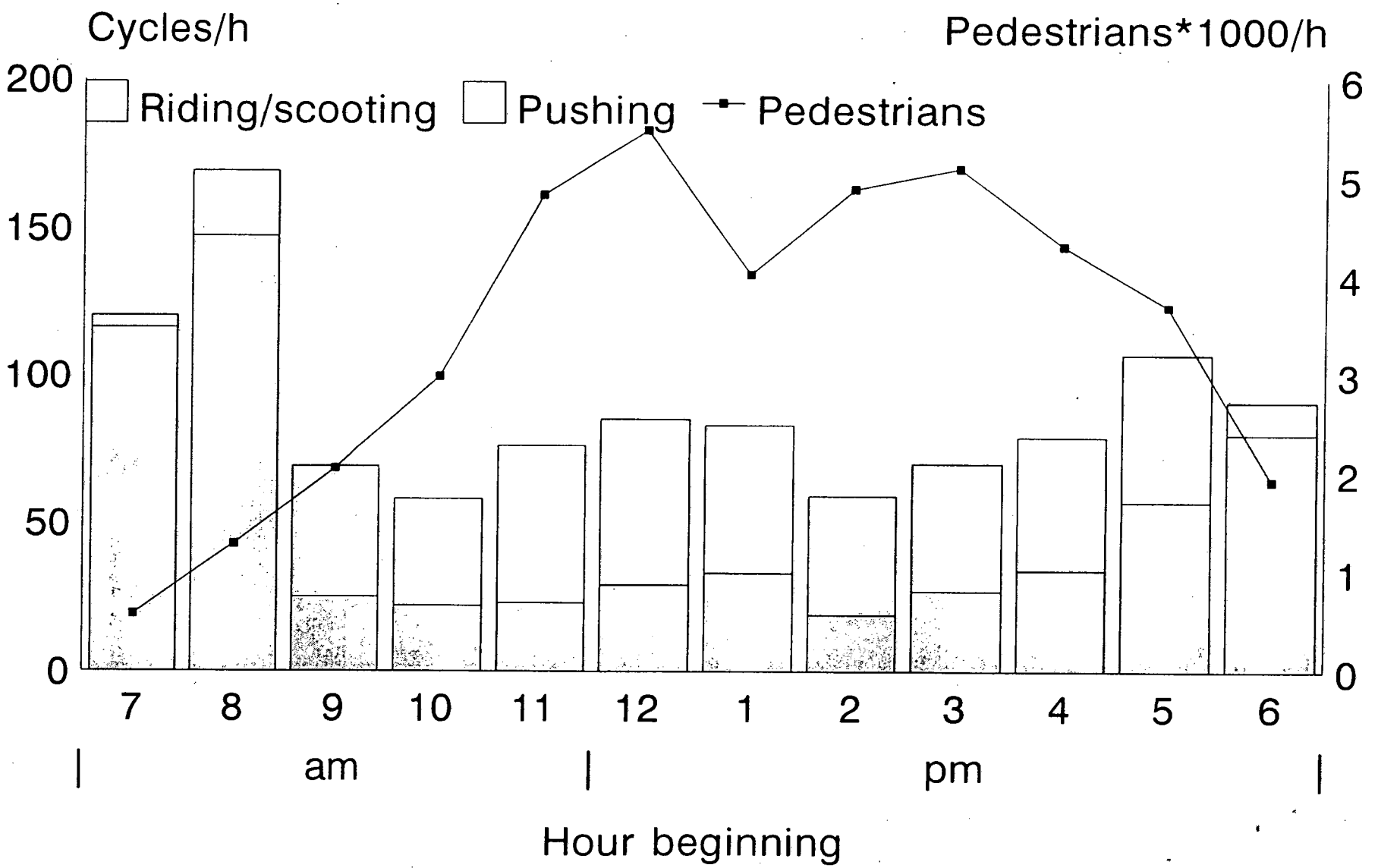


Fig 4a PETERBOROUGH, Bridge Street

NB 'No Cycling' 10am to 4pm

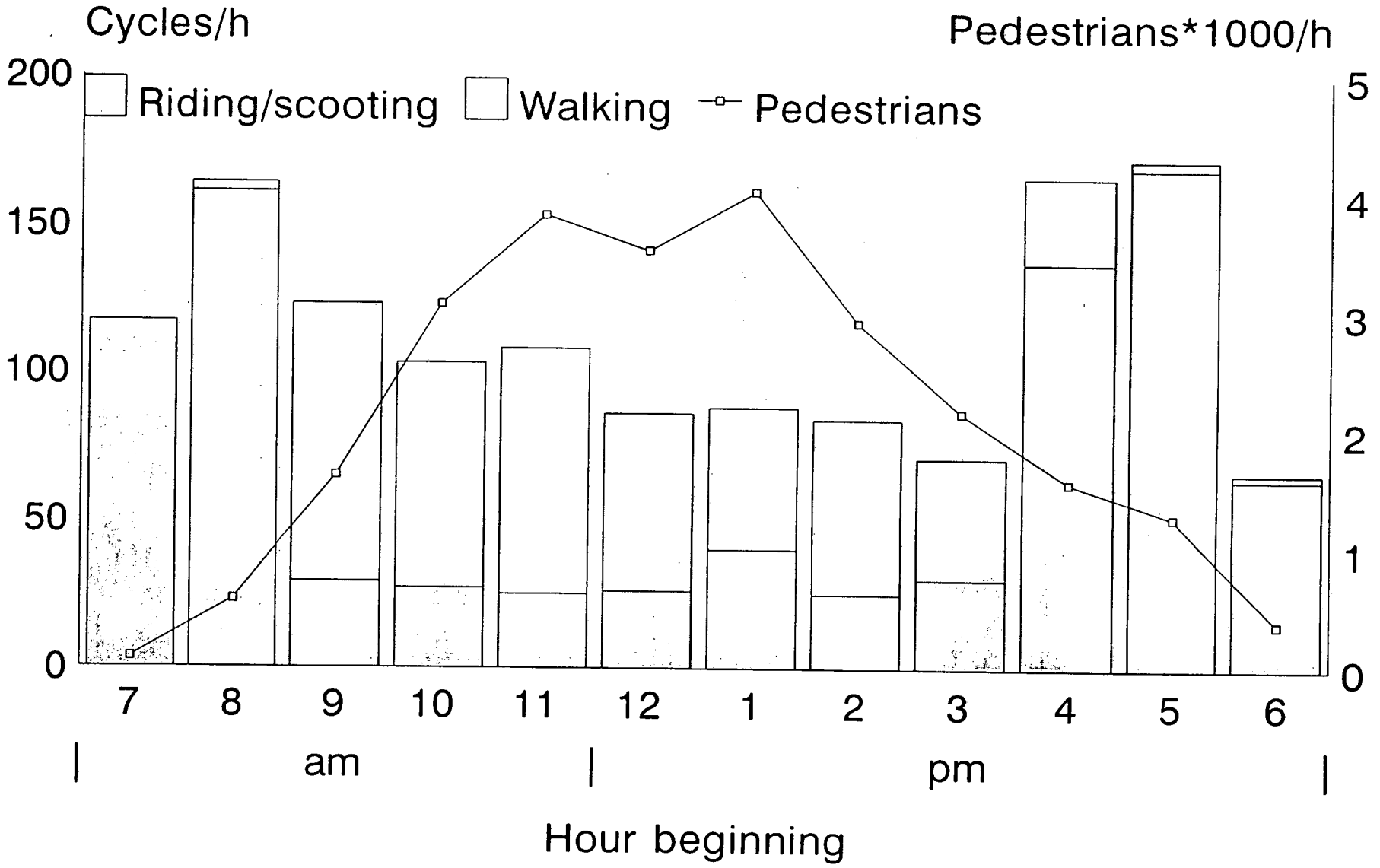


Fig 4b PETERBOROUGH, Long Causeway

NB Cycling permitted at all times

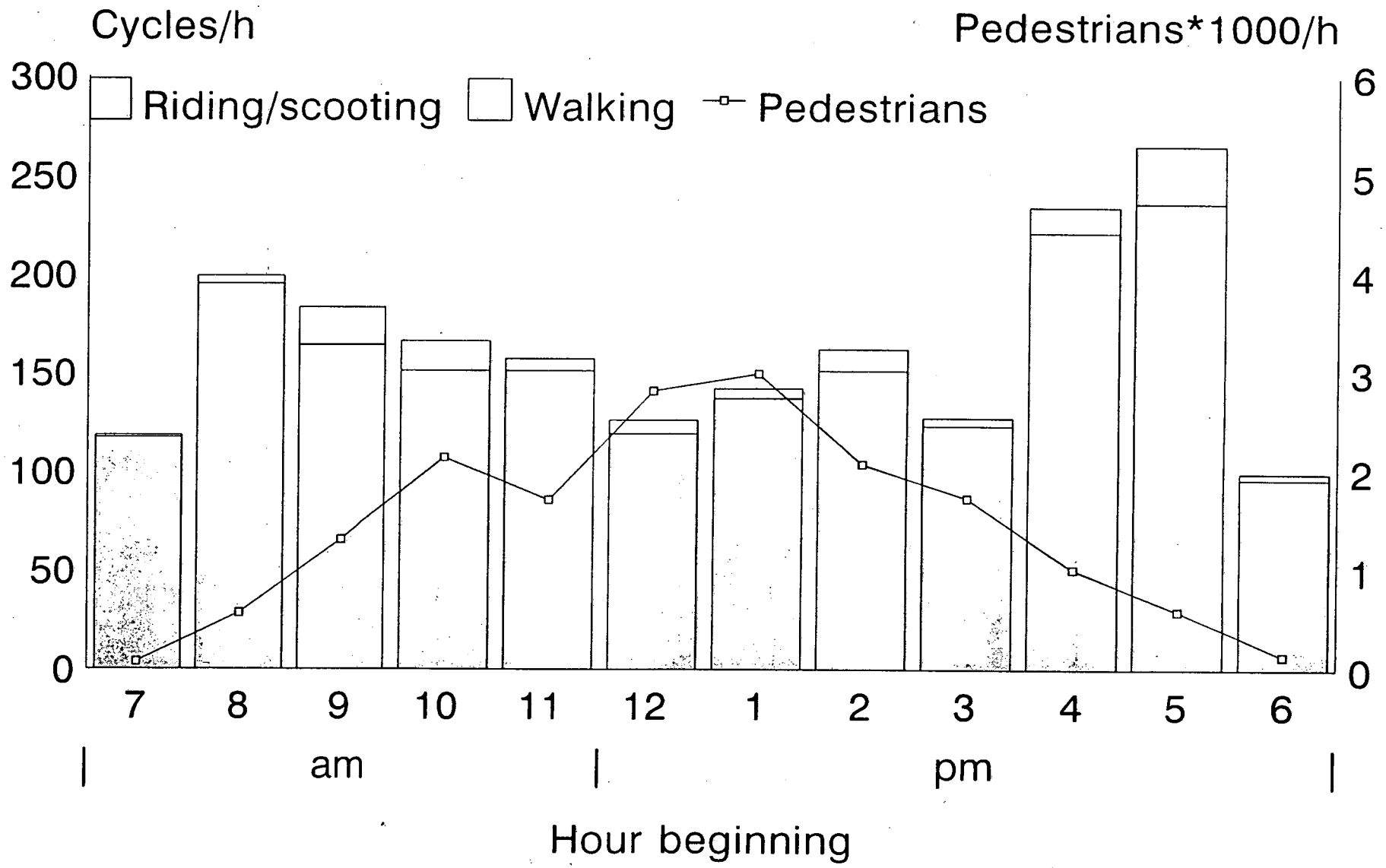
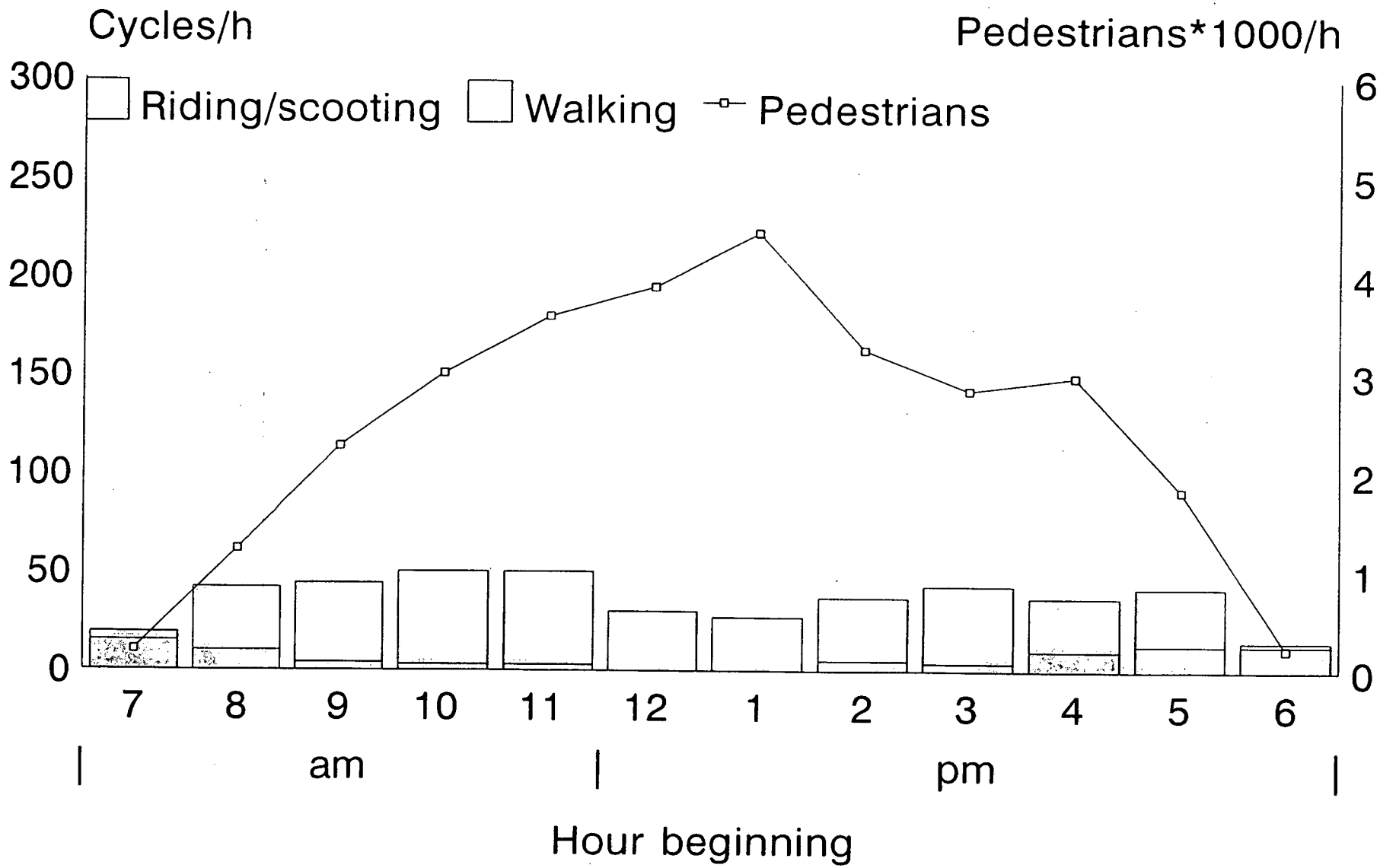


Fig 5 CHICHESTER, East Street

NB Cycling prohibited at all times



APPENDIX

Cyclist form

Chichester / Oxford / Peterborough

Date:

Survey location:

Time (24-hr clock):

Refusals: M / F St / Ad / Re

M / F St / Ad / Re M / F St / Ad / Re

GOOD MORNING / AFTERNOON. WE ARE DOING A SURVEY FOR THE DEPARTMENT OF TRANSPORT ON THE USE OF THIS STREET. THE INFORMATION YOU GIVE US WILL HELP US WITH FUTURE PLANS.

1. How often do you visit this street? — daily / once or twice a week / once or twice a month / less frequently

2. What is the purpose of your visit here today? — shopping / work / leisure / other

>

3. Where did you start this journey? — in centre / other (obtain full address)

>

4. Where are you going now? — to centre / other (obtain full address)

>

I AM NOW GOING TO READ OUT VARIOUS GENERAL STATEMENTS ABOUT THE STREET, AND I WANT YOU TO TELL ME WHETHER YOU STRONGLY AGREE, AGREE, DISAGREE OR STRONGLY DISAGREE WITH THEM, OR WHETHER YOU HAVE NO PARTICULAR VIEW.

	SA	Ag	??	Di	SD
5. I feel safe cycling along this street					
6. This street is often too crowded to cycle easily					
7. It is easy to get from one end of the street to the other					
8. The street is cluttered up with too much street furniture (bins, seats etc)					
9. There are sufficient cycle parking stands within the pedestrian area					
10. There should be more trees and planters in the street					

Oxford & P'boro only:

11. You have to keep moving over to let vehicles through					
12. Vehicles are usually driven slowly along this street					
13. Drivers don't give you enough time to get out of their way					
14. There is plenty of room in this street for both vehicles and pedestrians					

15. Can you tell me which if any of the following are permitted to use this street at this time of day?	Y	N	?
buses			
pedal cycles			
disabled vehicles			
some goods vehicles			
none of these			

I AM NOW GOING TO TURN TO CYCLING

16. First, could you tell me how regularly often you use a pedal cycle? occasionally / almost never

I AM NOW GOING TO READ OUT VARIOUS STATEMENTS ABOUT CYCLING IN THIS STREET, AND I WANT YOU TO TELL ME WHETHER YOU STRONGLY AGREE, AGREE, DISAGREE OR STRONGLY DISAGREE WITH THEM, OR WHETHER YOU HAVE NO PARTICULAR VIEW.

	SA	Ag	??	Di	SD
17. There is room in this street for both cycles and pedestrians					
18. Cyclists should not be allowed to ride their cycles in the street at all					
19. There should be a designated section / route for cyclists thro' the pedestrian area					
20. Cyclists should not be allowed to ride their cycles in the street, except outside the main shopping hours					

21. Finally, do you have any other views about the mix of pedestrians, cyclists (and vehicles) in this street?

>

THANK YOU FOR YOUR HELP

Classification data

Sex — Female / Male

Age — student / adult / retired

Cycling situation — alone / with other cyclists / with other pedestrians

Carrying — child in seat / shopping/goods

Approaching interviewer — cycling / scooting / pushing cycle

Figure A1. CYCLISTS' ATTITUDES - Oxford

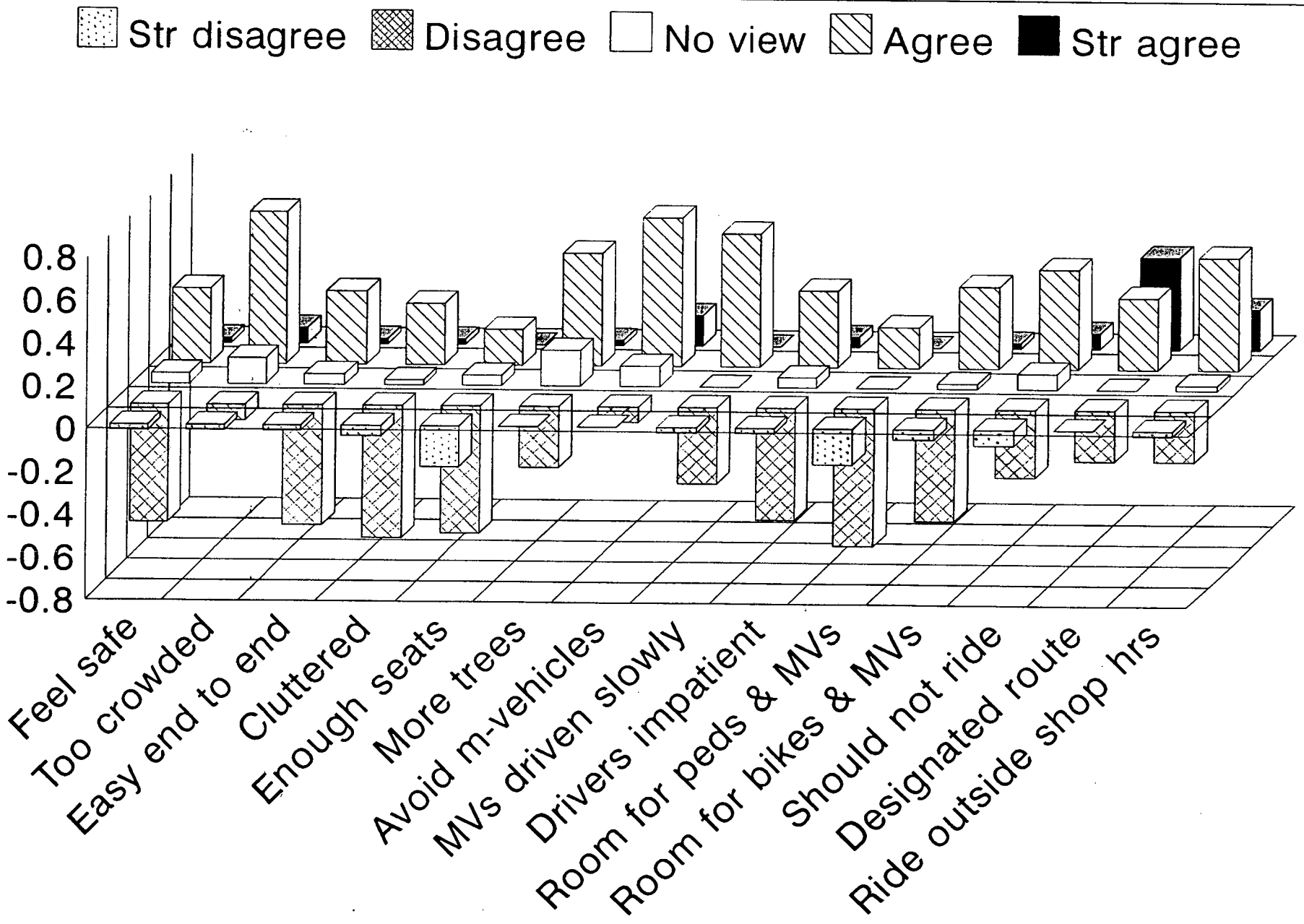


Figure A2. CYCLISTS' ATTITUDES - Peterborough

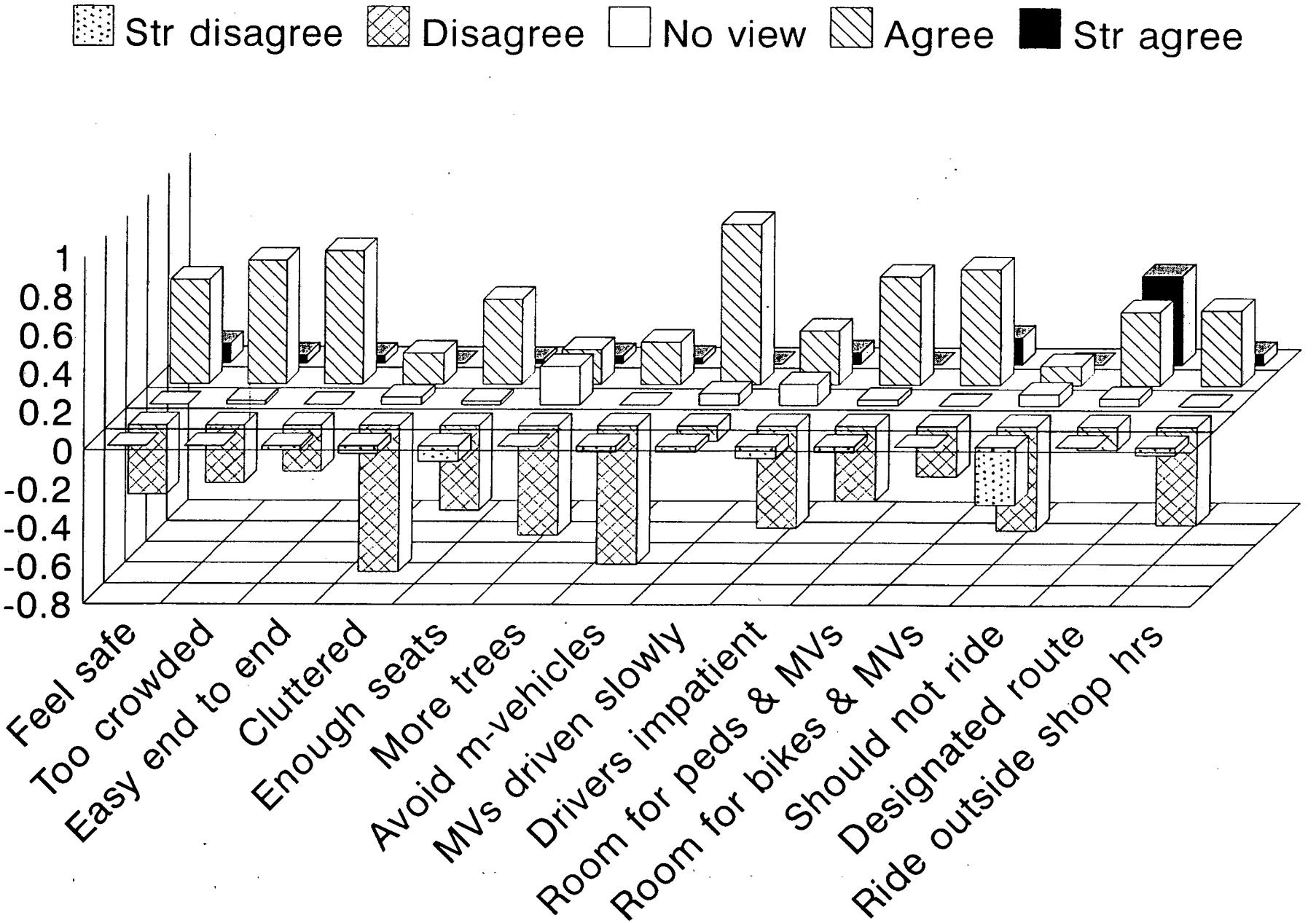
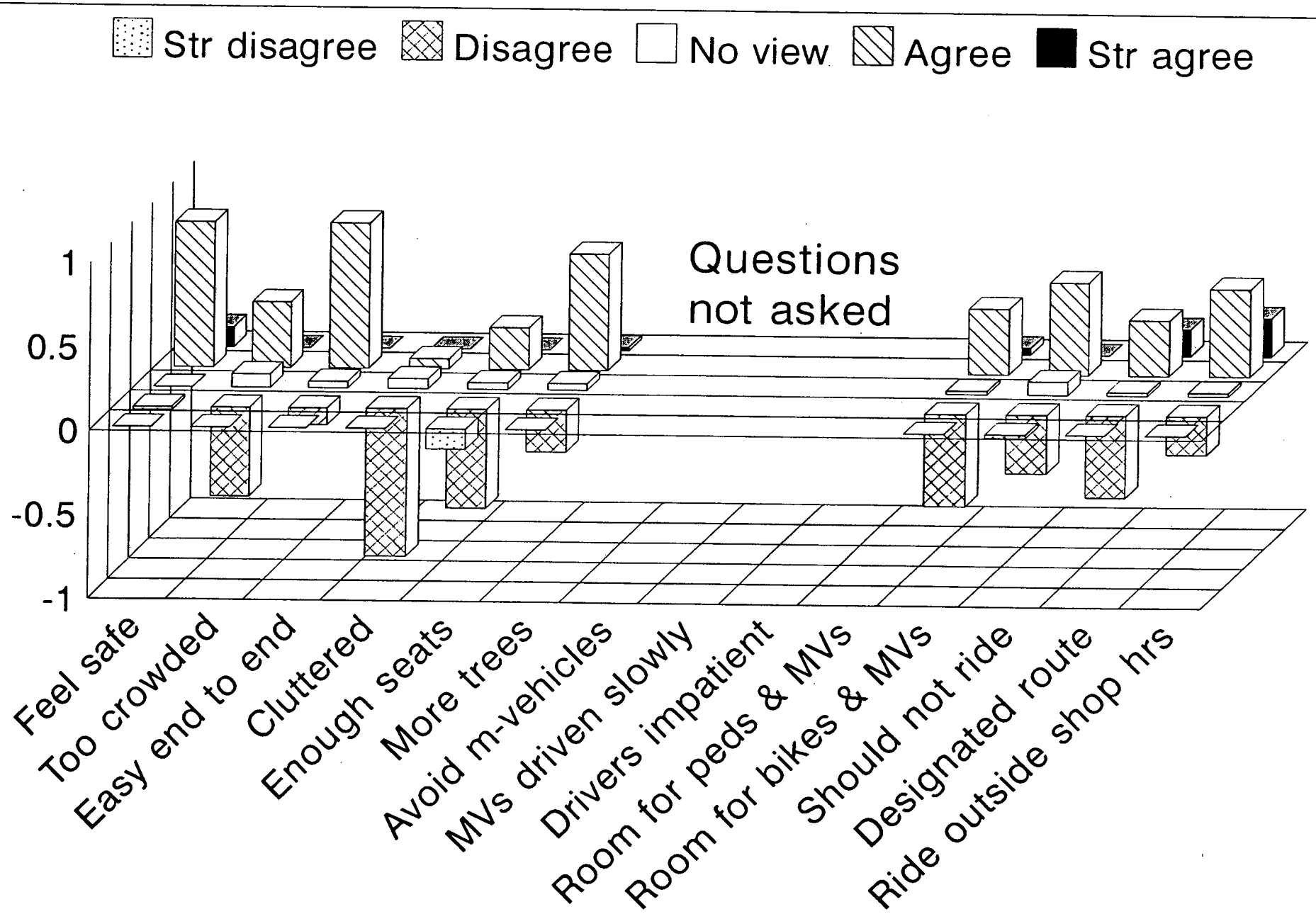


Figure A3. CYCLISTS' ATTITUDES - Chichester



Pedestrian form

Chichester / Oxford / Peterborough

Date: 1985

Survey location: West / East

Time (24-hr clock):

Refusals: M / F St / Ad / Re

M / F St / Ad / Re M / F St / Ad / Re

GOOD MORNING / AFTERNOON. WE ARE DOING A SURVEY FOR THE DEPARTMENT OF TRANSPORT ON THE USE OF THIS STREET. THE INFORMATION YOU GIVE US WILL HELP US WITH FUTURE PLANS.

1. How often do you visit this street? — daily / once or twice a week / once or twice a month / less frequently

2. What is the purpose of your visit here today? — shopping / work / leisure / education / other

>

3. Where did you start your journey? — in centre / other (obtain full address)

>

4. How did you travel here today? — car driver / car passenger / bus / pedal cycle / other

>

I AM NOW GOING TO READ OUT VARIOUS GENERAL STATEMENTS ABOUT THE STREET, AND I WANT YOU TO TELL ME WHETHER YOU STRONGLY AGREE, AGREE, DISAGREE OR STRONGLY DISAGREE WITH THEM, OR WHETHER YOU HAVE NO PARTICULAR VIEW.

	SA	Ag	??	Di	SD
5. I feel safe moving about this street					
6. This street is often too crowded for me to move freely					
7. It is easy to move from one side of the street to the other					
8. The street is cluttered up with too much street furniture (bins, seats etc)					
9. There are enough seats within the pedestrian area					
10. There should be more trees and planters in the street					
Oxford & P'boro only:					
11. You have to keep moving over to let vehicles through					
12. Vehicles are usually driven slowly along this street					
13. Drivers don't give you enough time to get out of their way					
14. There is plenty of room in this street for both vehicles and pedestrians					

	Y	N	?
15. Can you tell me which which if any of the following are permitted to use this street at this time of day? (buses) / pedal cycles / disabled vehicles / some goods vehicles / none of these			

I AM NOW GOING TO TURN TO CYCLING

16. First, could you tell me if you use a pedal cycle at all? — regularly / occasionally / never

I AM NOW GOING TO READ OUT VARIOUS STATEMENTS ABOUT CYCLING IN THIS STREET, AND I WANT YOU TO TELL ME WHETHER YOU STRONGLY AGREE, AGREE, DISAGREE OR STRONGLY DISAGREE WITH THEM, OR WHETHER YOU HAVE NO PARTICULAR VIEW.

	SA	Ag	??	Di	SD
17. There is room in this street for both cycles and pedestrians (and vehicles)					
18. Cyclists should not be allowed to ride their cycles in the street at all					
19. There should be a designated section / route for cyclists thro' the pedestrian area					
20. Cyclists should not be allowed to ride their cycles in the street, except outside the main shopping hours					

21. Finally, do you have any other views about the mix of pedestrians, cyclists (and vehicles) in this street?

>

THANK YOU FOR YOUR HELP

Classification data

Sex — Female / Male

Age — student / adult / retired

Walking situation — alone / with others / pushchair / carrying shopping/goods

Walking ability — able / walking stick / W/chr / other

Figure A4. PEDESTRIANS' ATTITUDES - Oxford

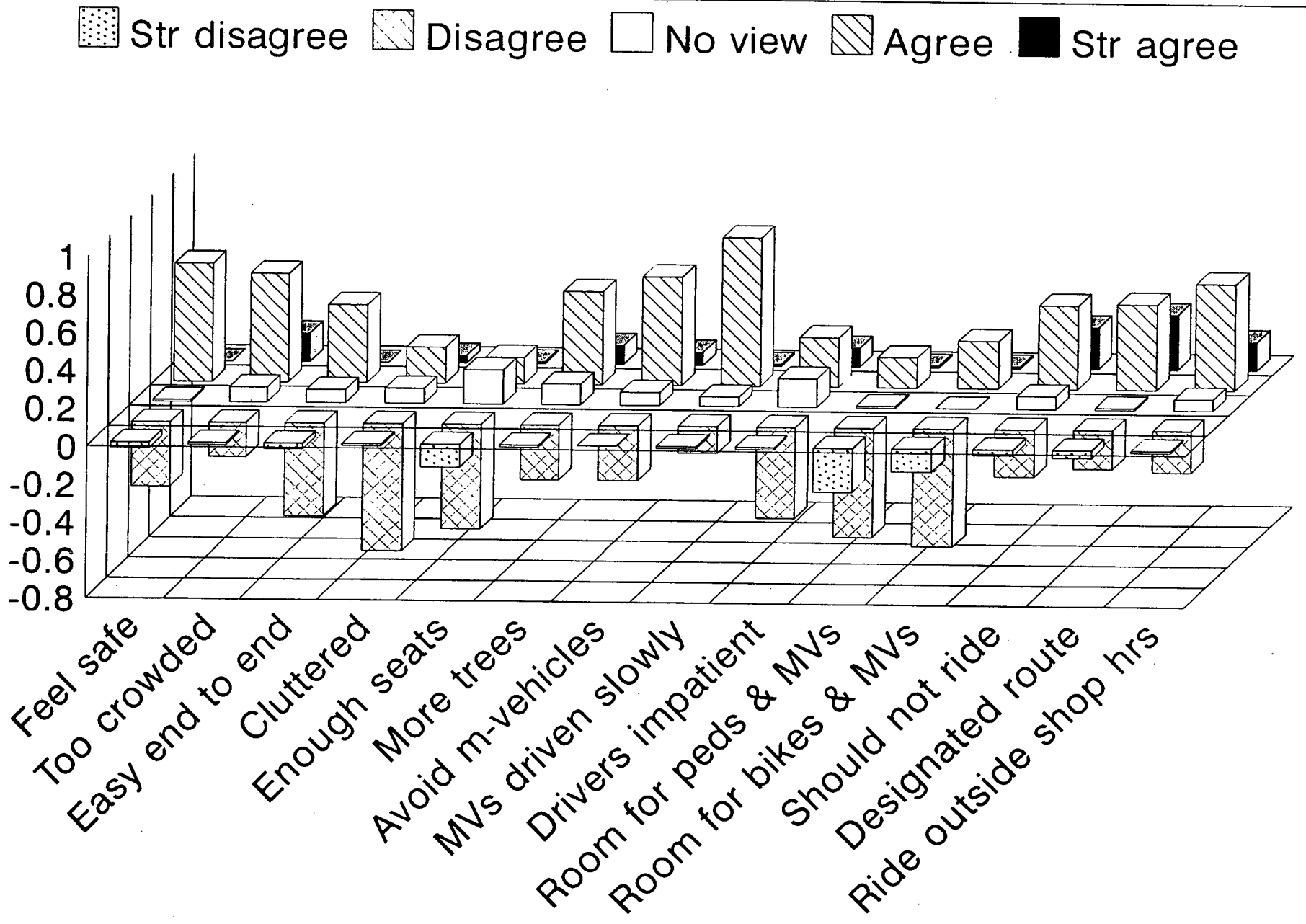


Figure A5. PEDESTRIANS' ATTITUDES - Peterborough

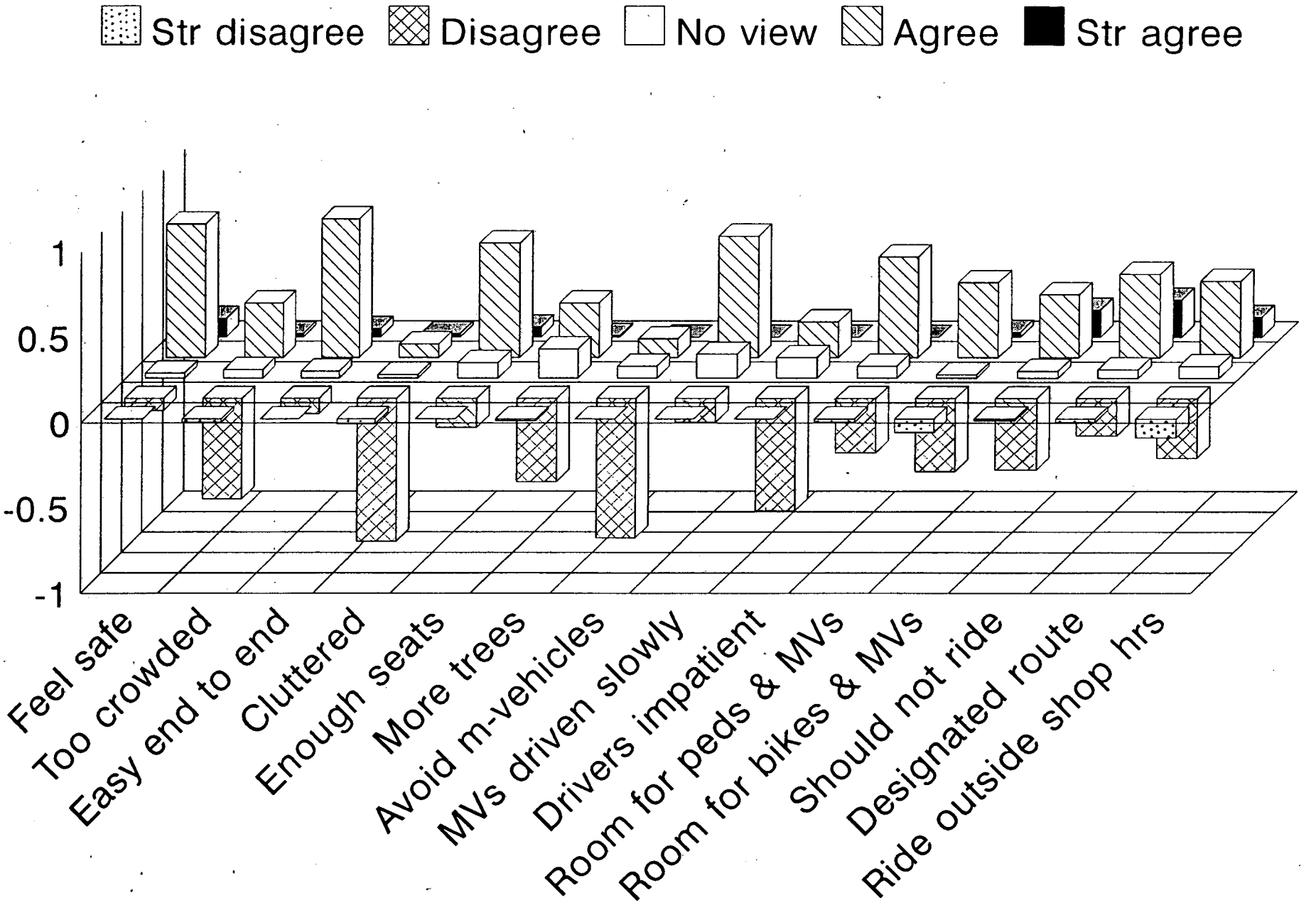
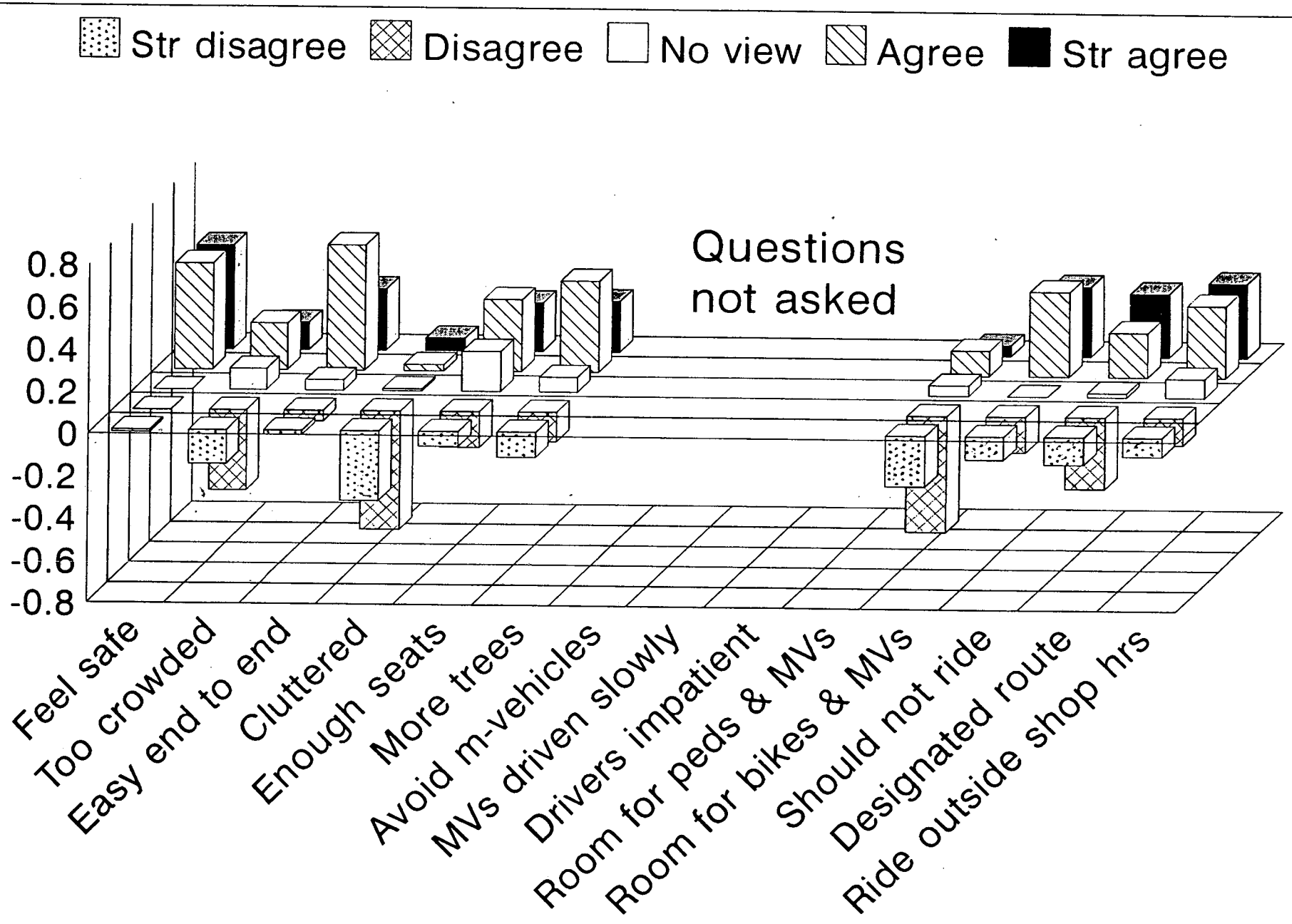


Figure A6. PEDESRIANS' ATTITUDES - Chichester



BEESTON High Street (Nottingham). Surveyed 16.11.90, 11.20-

street width = 12.5 metres range 12-15 metres

cycles/hr = 73 (2.7% of ped. flow, 47.9 % walking)

peds/hr = 2,715

peds/min/metre = 3.6 (min. = 5.0, max. = 2.5)

vehs/hr = 18

Traffic regulations and comments: Pedestrian zone, no motor vehicles except for loading. No entry at western end. Substantial use by disabled vehicles even though they do not appear to be permitted. Part of a designated cycle route.

BRISTOL East Street. Surveyed 12.11.90 & 16.10.90, 11.20-

street width = 15 metres range 14-17 metres

Carriageway width = 8 metres (5 metres at restrictions)

cycles/hr = 38 (3% of ped. flow, 5 % walking)

peds/hr = 1,205

peds/min/metre = 1.3 (min. = 0.7, max. = 1.3)

vehs/hr = 47

Traffic regulations and comments: Pedestrian zone, no motor vehicles except buses and loading by GV's between 0630 and 0830. One way for vehicles, but used 2-way by cyclists.

CAMBRIDGE Burleigh Street. Surveyed 14.11.90, 12.45-

street width = 11 metres range 10-14 metres

cycles/hr = 242 (10 of ped. flow, 17 % walking)

peds/hr = 2,320

peds/min/metre = 3.5 (min. = 1.6, max. = 5.1)

vehs/hr = nil

Traffic regulations and comments: No motor vehicles, with an extra sign 'CYCLISTS give way to pedestrians'. Part of a designated cycle route. Service vehicle access for a limited stretch at either end.

CANTERBURY High Street. Surveyed 22.22.90, 12.25-

street width =	13 metres	range 8-14 metres
cycles/hr =	22	(<1% of ped. flow, 68% walking)
peds/hr =	3,490	
peds/min/metre =	4.5	(min. = 3.2, max. = 5.9)
vehs/hr =	10	

Traffic regulations and comments: No vehicles except permit holders Mon-Sat 1030-1600. Access only at other times.

CHICHESTER East Street. Surveyed 6.11.90, 13.10-

street width = 15.5 metres range 14-21.5 metres

cycles/hr = 73 (2% of ped. flow, 96% walking)

peds/hr = 4,305

peds/min/metre = 4.6 (min. = 3.2, max. = 5.8)

vehs/hr = 1 (street cleaning vehicle)

Traffic regulations and comments: No vehicles except for loading by GV's Mon-Fri before 0900 and after 1800, Sat before 0900. Film taken outside Tesco, where there is a well used cycle parking stand.

LEICESTER Market Street. Surveyed 15.11.90, 12.20-

street width =	12	metres
Carriageway width =	6	metres (2.5 metres at restrictions)
cycles/hr =	12	(<1% of ped. flow, 67% walking)
peds/hr =	3,445	
peds/min/metre =	4.8	(min. = 3.3, max. = 6.4)
vehs/hr =	20	

Traffic regulations and comments: Pedestrian zone, no motor vehicles 0730-1800 Mon-Sat except disabled and loading. Part of signed cycle route.

MANCHESTER West Mosley Street. Surveyed 29.11.90, 12.10-

street width = 6 metres (but see below)
Carriageway width = 2 metres plus 1 metre edging
cycles/hr = 23 (3% of ped. flow, 4% walking)
peds/hr = 815
peds/min/metre = 2.3 (min. = 1.0, max. = 4.2)
vehs/hr = nil

Traffic regulations and comments: Cycle route, through a pedestrian plaza in the central business district. Not heavily used by cyclists, but will become of greater importance when LRT opens.

NOTTINGHAM Arkwright Walk. Surveyed 16.11.90, 13.10-

street width =	12 metres
cycles/hr =	20 (4% of ped. flow, 15% walking)
peds/hr =	515
peds/min/metre =	0.7 (min. = 0.3, max. = 1.3)
vehs/hr =	nil

Traffic regulations and comments: Shared use by pedestrians and cyclists. A fairly quiet local centre in a new neighbourhood.

OXFORD Queen Street. Surveyed 8.11.90, 12.30-

street width = 14 metres range 11-16 metres

Carriageway width = 8 metres

cycles/hr = 94 (2% of ped. flow, 48% walking)

peds/hr = 4,825

peds/min/metre = 5.7 (min. = 4.2, max. = 7.4)

vehs/hr = 87

Traffic regulations and comments: No cycling 0900-1800. Pedestrian zone, no motor vehicles except local buses and permitted vehicles at any time, and except for loading and disabled between 0530 and 1030. One-way operation for motor vehicles.

PETERBOROUGH Bridge Street. Surveyed 10.8.90 11.30-
and 10.12.90, 15.30-

street width = 25 metres range 24-26 metres

cycles/hr = 76 (3% of ped. flow, 74% walking before 1600 hrs, 12% walking after 1600 hrs)

peds/hr = 2,530

peds/min/metre = 1.7 (min. = 1.3, max. = 2.0)

vehs/hr = nil

Traffic regulations and comments: No cycling Mon-Sat 0900-1600.

PETERBOROUGH Long Causeway. Surveyed 10.8.90 10.30-

street width =	27 metres	range 24-30 metres
Carriageway width =	6 metres	
cycles/hr =	147	(8% of ped. flow, 6% walking)
peds/hr =	1,835	
peds/min/metre =	1.1	(min. = 0.6, max. = 2.3)
vehs/hr =	12	

Traffic regulations and comments: Cycle route in pedestrian zone. No vehicles except permit holders in core period - times indicated on concealed sign.

YORK High Ousegate. Surveyed 27.11, 12.35-

street width =	13 metres
Carriageway width =	6 metres
cycles/hr =	41 (1% of ped. flow, 98% walking)
peds/hr =	3,610
peds/min/metre =	4.6 (min. = 2.8, max. = 6.6)
vehs/hr =	6

Traffic regulations and comments: Authorised vehicles only 1100-1600 Mon-Fri, 1030-1630 Sat. Traffic regulations had recently been changed and regular policing was ensuring compliance by cyclists.

HERNING Bredegade (Denmark). Surveyed 25.3.91, 11.30-

street width = 15 metres

cycles/hr = 270 (17% of ped. flow, 78% walking)

peds/hr = 1,600 (1.7/min/metre width)

vehs/hr = nil

Traffic regulations and general comments: All vehicles are now excluded from the central shopping street of this town. Until a few years ago, cycling had been permitted, but commercial and political pressure had lead to their being banned.

ODENSE Vestergade (Denmark). Surveyed 25.3.91, 15.30-

street width =	13 metres (site A)	14 metres (site B)
cycles/hr =	560 (55% of ped. flow, 11% walking)	
peds/hr =	1,000 (1.3/min/metre width)	
vehs/hr =	22 (site A)	66 (site B)

Traffic regulations and general comments: Both sites were located on either side of the central shopping core. Cycling was permitted at site A. At site B, only buses and cyclists were permitted.

HAMM Alte Bahnhofstrasse (German). Surveyed 30.3.91, 12.45-

street width =	23 m (site A) 15 m (site B) 8m (site C)
cycles/hr =	140 (9% of ped. flow, 4% walking) Site A 70 (3% of ped. flow, 12% walking) Site B 120 (15% of ped. flow, 15% walking) Site C
peds/hr =	1,000 (1.3/min/metre width)
vehs/hr =	22 (site A) 66 (site B)

Traffic regulations and general comments: All three sites were located along the central shopping corridor. Site A was within the primary shopping centre. The wide street was marked out with a central section for cycles and service vehicles. Site B was somewhat narrower, and contained up-market fashion shops. Cycling was not permitted here. Site C (not illustrated) was located between sites A and B, within the central bus terminus, and comprised a narrow cycleway running on the outer edge of the pavement, between the shop fronts and the bus stands.

HANNOVER Georgstrasse (Germany) Surveyed 27.3.91, 11.45-

width of cycle route = 11 metres

cycles/hr = 280 (17% of ped. flow, 5% walking)

peds/hr = 1,600 (2.8/min/metre width)

vehs/hr = nil

Traffic regulations and general comments: The central shopping street in Hannover is over 30 metres wide; this has enabled the creation of a service access road on one side, a fully pedestrianised section on the other, and cyclists and pedestrians share the central section.

WUNSTORF Langestrasse (Germany) Surveyed 27.3.91, 14.45-

street width = 13 metres

cycles/hr = 120 (22% of ped. flow, 68% walking)

peds/hr = 800 (1.1/min/metre width)

vehs/hr = 2

Traffic regulations and general comments: Langestrasse is the main shopping street; cyclists are permitted ride before 2pm and after 6pm.

ALMELO (The Netherlands) Surveyed 28.3.91, 16.00-

street width = 10 metres (Site A) 11 metres (Site B)

cycles/hr = 630, 150% of ped. flow, <1% walking (Site A)
340, 25% of ped. flow, 49% walking (Site B)

peds/hr = 400 (0.7/min/metre width) Site A
1,300 (1.0/min/metre width) Site B

vehs/hr = 12 mopeds (Site A) 39 vehicles (Site B)

Traffic regulations and general comments: The central shopping district of this town spreads along a linear corridor. Cycling is permitted in the secondary sections (Site A), wheras it is banned in the central section (Site B).

ENSCHEDE (The Netherlands) Surveyed 28.3.91, 12.00-

street width = 11 metres (Site A) 12 metres (Site B)

cycles/hr = 400, 22% of ped. flow, 68% walking (Site A)
520, 56% of ped. flow, 5% walking (Site B)

peds/hr = 1,700 (2.5/min/metre width) Site A
900 (1.3/min/metre width) Site B

vehs/hr = 12 mopeds (Site A) 39 vehicles (Site B)

Traffic regulations and general comments: The central area of Enschede is diffuse, and different regulations apply in different streets. Cycling was not permitted in site A, but in site B nearby was used as an access road for service vehicle traffic.

GRONINGEN (The Netherlands) Surveyed 29.3.91, 17.00-

street width = 9.5 metres

cycles/hr = 50 (2% of ped. flow, 72% walking)

peds/hr = 2,900 (5.1/min/metre width)

vehs/hr = nil

Traffic regulations and general comments: All vehicles are banned from the use of this principal shopping street. It is also clear that pedestrian density is so high, at least during the main shopping hours, that it is quite impracticable to cycle along this particular street.

HENGELO (The Netherlands) Surveyed 28.3.91, 12.00-

street width =	11 metres
cycles/hr =	400 (62% of ped. flow, <1% walking)
peds/hr =	1,100 (1.6/min/metre width)
vehs/hr =	8 mopeds

Traffic regulations and general comments: Cycling is permitted through the central shopping streets of Hengelo.