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THE UNIVERSITY OF ASTON IN BIRMINGHAM

PLANNING FOR CYCLING IN THE WEST MIDLANDS

DAVID GRAHAM DAVIES

Submitted for the Degree

of

Doctor of Philosophy

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Thesis Summary

The issues involved in planning for pedal cyclists are examined with reference to the West Midlands County. Working with a local cycling campaign group, the researcher uses action research methods to investigate and influence the campaign.

Development of cycle planning is traced through the literature, focusing on bicycle ownership, bicycle use and cycling policy. UK practice is contrasted with the integrated approach of other countries. An extensive bibliography is provided.

Local authority cycle planning through the TPP process is systematically assessed over three years. This provides a context for the information regarding cycling in the West Midlands. Existing data is presented from the 1981 Census and local police road accident and bicycle theft records.

The developing relationship between the local authority and the cycle campaign group is narrated in detail, explaining the problems that can beset efforts to improve conditions for cyclists. The researcher was closely involved in this interaction, particularly with policy and a major public inquiry. A survey of the Cycle Campaign Network indicates that the local group was not atypical.

To provide information relevant to the local campaign and for effective local planning, a survey of 3,500 West Midlands residents was conducted using a novel combination of questionnaires and interviews. It shows that

1) Bicycle ownership and use is considerably higher than indicated by the 1978/9 National Travel Survey

2) Cycling is most import to certain disadvantaged sections of the community, particularly the young, those without access to a car and in the lower SEGs.

The broader issues of transport policy are discussed, concluding that cycling is regarded as a marginal activity and that changes in general transport policy, land use planning and fiscal arrangements are necessary conditions for cycle planning to succeed. An integrated package of cycling measures involving engineering, education, enforcement and encouragement is also required.

Recommendations are made concerning central government, local authorities and cycle campaign groups. Subjects for further research are identified.

KEY WORDS: BICYCLE, CYCLE PLANNING, TRANSPORT POLICY, WEST MIDLANDS.

to my family

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I am grateful to a number of people for their help with this thesis. In particular, to my supervisory team. To Mike Harris who always gave me genuine support and constructive guidance when I most needed it. To Tom Pettitt who had the foresight to set up the project and who was friend and advisor to me throughout the period. To Dr David van Rest who provided a valuable local government perspective and showed much interest. To Paul Truelove, particularly for assisting with the European research.

Thanks must also go to my IHD friends and colleagues: Carol Seale and Jenny Owens who typed sections of this thesis; Jon Bader and Clive Bright for help with word processing and graphics; and to my fellow students, especially Andy, Doug, and Cathy who made completing a team effort.

The research might have been a dry affair without the help and encouragement of the many people who give their free time so willingly to cycling and other environmental issues. The members of Pushbikes, the Cycle Campaign Network and Friends of the Earth, too numerous to mention, deserve much credit for this work.

Finally, I must thank Usha for getting me through.

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CHAPTER ONE: INTRODUCTION

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Outline

The background to the research project is described and the organisations involved are introduced. A brief outline of the IHD Scheme and its methodology is given in order to explain the nature of the research which is unlike a conventional doctoral project. Finally, the structure of the thesis is outlined.

1.1 The IHD Scheme

1.1.1 Origins and Aims

The Interdisciplinary Higher Degree Scheme at Aston University was launched in 1968 as a direct result of the Swann Report which called for greater collaboration between industry and universities and

"Bold new initiatives with the PhD" (Swann 1968)

The principal aim was (and is) to attract gifted graduates into central areas of industry and public service and to train them for interdisciplinary careers. Further details can be found in Cochran (1981).

1.1.2 IHD Research Projects

IHD students undertake research projects in collaboration with an external organisation which has a real, "live" problem. The collaborator benefits from the process by way of new data and analysis whilst the student is able to study a problem that is of immediate and genuine importance to someone outside the university environment.

Each research project has a supervisory team which consists of a main academic supervisor, an IHD tutor, a collaborator and one or more associate academic supervisors. The main academic supervisor is responsible for academic standards and overall project management; the IHD tutor ensures the co-ordination and balance between the academic and collaborative interests; the collaborator's role is to check that the project remains of value to the organisation; and the associate supervisors are chosen to provide perspectives from other disciplines. The supervisory team for this project is shown below:

Main Academic Supervisor - M.R. Harris, Transport Studies, Aston

Associate Academic Supervisor - P. Truelove, Transport Studies, (formerly Environmental Planning and Policy Studies) Aston.

Collaborating Supervisor - T.W. Pettitt, Pushbikes, Birmingham

IHD Tutor - Dr. D.J. van Rest, IHD Scheme, Aston.

1.2 The Collaborator: Pushbikes

1.2.1 Origins and Aims

Pushbikes is the West Midlands Cycling Campaign. It was launched at a public meeting in Dr Johnson House, Central Birmingham in September 1979 although a cycling group had met at the premises of Birmingham Friends of the Earth as early as 21 September 1978.

The campaign has two basic aims:

a) To promote the use of bicycles, particularly as a means of transport.

b) To make conditions safer for cyclists.

Underlying these aims is the belief that cycling is a desirable form of transport for the urban environment because it is energy-efficient, non-polluting and does not significantly endanger others. However, present conditions in the West Midlands make cycling excessively dangerous and unpleasant.

Pushbikes is a single-issue campaign and although it recognises that cycling is only part of the wider environmental debate it has restricted itself to issues where the relevance to cycling can clearly be demonstrated.

1.2.2 Structure and Membership

There are approximately 60 local cycle campaign groups in Britain which form the Cycle Campaign Network (Appendix 1). Pushbikes is one of the largest and best-established Network groups although not necessarily the most successful. Groups are entirely autonomous and use the Network for exchange of information and co-ordination of policy on national matters such as relationships with the Department of Transport and British Rail and the organisation of National Bike Week.

The relationship of Pushbikes to other bodies is shown in Figure 1.1. Whereas the group has reasonably good links with other environmental and cycling bcdies, it has few areas of formal, local representation. The Highways Advisory Group ceased with the abolition of the West Midlands County Council and the Birmingham Cycling Alliance was not formed until late 1985. Involvement with the Birmingham Think Green Network is only slight.

Pushbikes now has over 300 members, mostly adults living in and around Birmingham. It has a non-hierarchical, democratic structure with decisions taken at monthly general meetings which all members are entitled to attend. There is no management committee or executive, nor does it have any paid staff. All work is done by individuals acting through sub-groups with about half a dozen members (Figure 1.2).

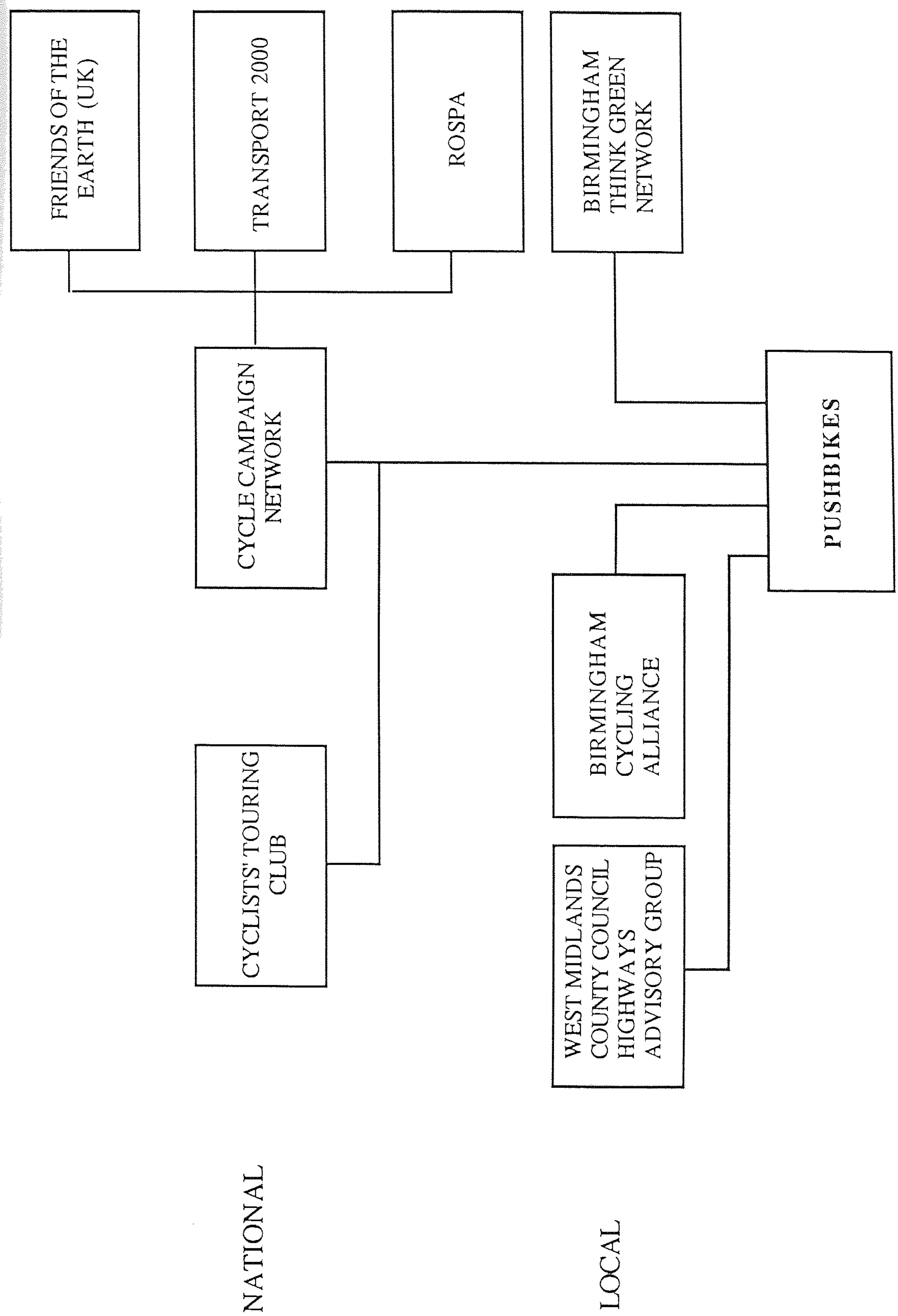

FIGURE 1.1 PUSHBIKES-FORMAL RELATIONS WITH OTHER ORGANISATIONS—MARCH 1986

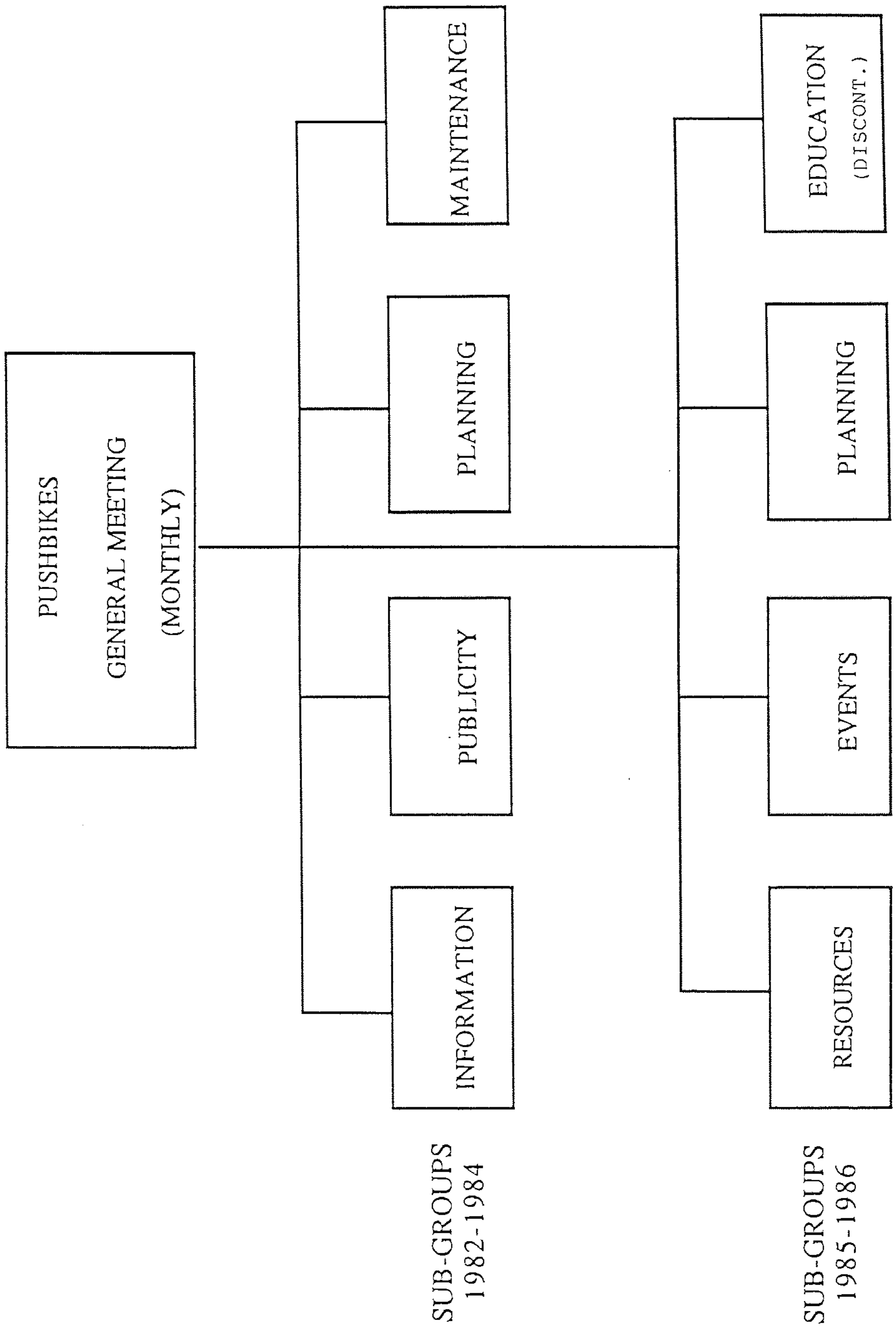

FIGURE 1.2 PUSHBIKES - ORGANISATIONAL STRUCTURE

1.2.3 Activities

Since the formation of the group, Pushbikes has undertaken a variety of activities in pursuit of its aims. These include lobbying, direct actions, recreational events, research and publicity stunts. Perhaps the most notable successes are:

a) The Great Midlands Bike Ride.

- An annual event attracting 1,500 cyclists.

b) "A Guide to Cycling in Birmingham".

- Now in its second edition having sold 1,500 copies.

c) Demonstration and Petition.

- To demand better conditions for cyclists in the West Midlands.

d) "Cycle-Friendly Birmingham".

- Publication of a strategy and detailed plan for making Birmingham safer and more attractive for cyclists.

e) Safe Routes to Schools in Sandwell.

- Sponsorship of a Manpower Services Commission project to survey safe routes to school for cyclists and pedestrians in Sandwell. Report published 1986.

f) Local Plans.

- Participation in local plans, particularly the Birmingham Central Area Plan and subsequent inquiry.

In addition to these indivdual events, Pushbikes attempts to maintain a regular dialogue with the local authorities, both officers and councillors, and has represented cyclists on the West Midlands County Council Highways Advisory Group.

1.3 Project Origins

This project was conceived and set up by Tom Pettitt, a founder member of Pushbikes and a key worker at Birmingham Friends of the Earth. The idea sprang from the perceived needs of Pushbikes for technical expertise and continuity in their discussions with the local authorities. It crystallised into an IHD project largely due to the precedents set by two former IHD doctoral students who had started on research in collaboration with Birmingham Friends of the Earth in 1979 and 1981.

In keeping with the best traditions of IHD collaborators, Pushbikes' reasons for initiating the project were essentially pragmatic. The members recognised that the cycling campaign, even at local level, could not be won quickly or simply. No single council decision, legislative change or design standard would reverse the years of transport and land-use planning that had ignored the needs of cyclists. Pushbikes considered (correctly) that a mix of technical, administrative and political changes would be needed in order to introduce a network of cycle facilities in the West Midlands. Moreover, not only was the mix of changes required wide but also the timespan over which they would be implemented was relatively long, perhaps ten years. Pushbikes needed to sustain pressure and technical expertise over several years in order to set these changes in motion. A PhD student with three year funding offered the prospect of fulfilling at least the technical functions in greater depth and with greater permanence than any prospective voluntary member.

The project description submitted to the Science and Engineering Research Council reflected these pragmatic needs. There was to be

> "an <u>investigation</u> into the provision of safe, useful and effective cycle facilities" (My emphasis)

Recent cycle schemes were to be "reviewed". In other words, no specific hypothesis or research question had been formulated: the project was intended to provide an informed overview of providing cycle facilities. The idea of formulating a central research question in operational terms either never arose or was considered beyond the organisation.

However, there was another aspect to Pushbikes' original concept of the project: constructive, practical advice. In order to fully appreciate this point, it is necessary to remember the close relationship between Pushbikes and Birmingham Friends of the Earth. In particular, the shared premises, the overlap in membership and the fact that both groups drew significant support from a particular sector of Birmingham society, namely the young, educated middle-classes some of whom had rejected conventional politics and careers.

This meant that the practical approach to environmental campaigning, largely pioneered in Birmingham by Friends of the Earth, rubbed off onto Pushbikes. Whereas certain other members of the Cycle Campaign Network have adopted a more combative campaign style, eg. The London Cycling Campaign and The Bristol Urban Cycling Campaign, Pushbikes was keen to appear positive and to offer practical advice to the local authorities who clearly had no experience of providing facilities. The project description, therefore, included specific practical targets, namely

> "a manual for local authorities and a practical constructive response to government's consultation on policy and procedures of implementation. Also, action guides for voluntary groups."

In addition, I sensed an expectation on the part of a number of members that the project would produce a plan of cycle routes throughout

Birmingham. Some doubts were raised about the value of such a positivistic approach and Tom Pettitt commented that

> "A manual makes sense only if it is found that lack of knowledge is a problem."

He wanted more emphasis on possible obstacles which he noted as being

- Financial (lack of money)
- Human (lack of people)
- Knowledge (lack of ideas and experience)
- Political (lack of lobby)
- Direction (lack of policy)

Yet in spite of these doubts and concerns about the emphasis of the research, there was a clear expectation that some form of master plan or blue-print was the objective of the project.

Taken together - the pragmatic needs of the campaign group, its desire to produce practical and constuctive material and the inevitable lack of clearly defined research question - these factors did not necessarily combine easily in one research project. In particular, it was not clear whether I was supposed to be working on, with, for, or even against the local authorities. In Checkland's (1981) root definition terms, the problem, its owners and clients were poorly defined.

Pushbikes never claimed to know precisely what it wanted from the project although members probably knew what they did not want. From the outset, it was made clear that it would be up to me as the researcher to identify the problems. Thus the student was immediately cast in the role of consultant although the nature of the problem was negotiable. It is for these reasons that the 1982 project description differs in important respects from the finished article.

1.4 Project Funding

This project was funded jointly by Pushbikes and a research studentship from the Science and Engineering Research Council/Economic and Social Research Council Joint Committee. As Pushbikes was (and still is) a voluntary organisation with limited funds provided by membership subscriptions and fundraising events, it was necessary to find other bodies to provide Pushbikes' share of the research costs.

The bicycle industry via the Bicycle Association was approached - unsuccessfully. So too was the West Midlands County Council which, though supportive of the project, was unable to offer either financial assistance or supervision. In May 1982, after considerable efforts by Tom Pettitt, the Cadbury Trust confirmed that it would support the research with the necesary funding for at least two years. In the event, it decided to extend the grant for a further year. A small donation was also received from the Charles Henry Foyle Trust, a local charitable trust. Without the support of these organisations the project would not have existed.

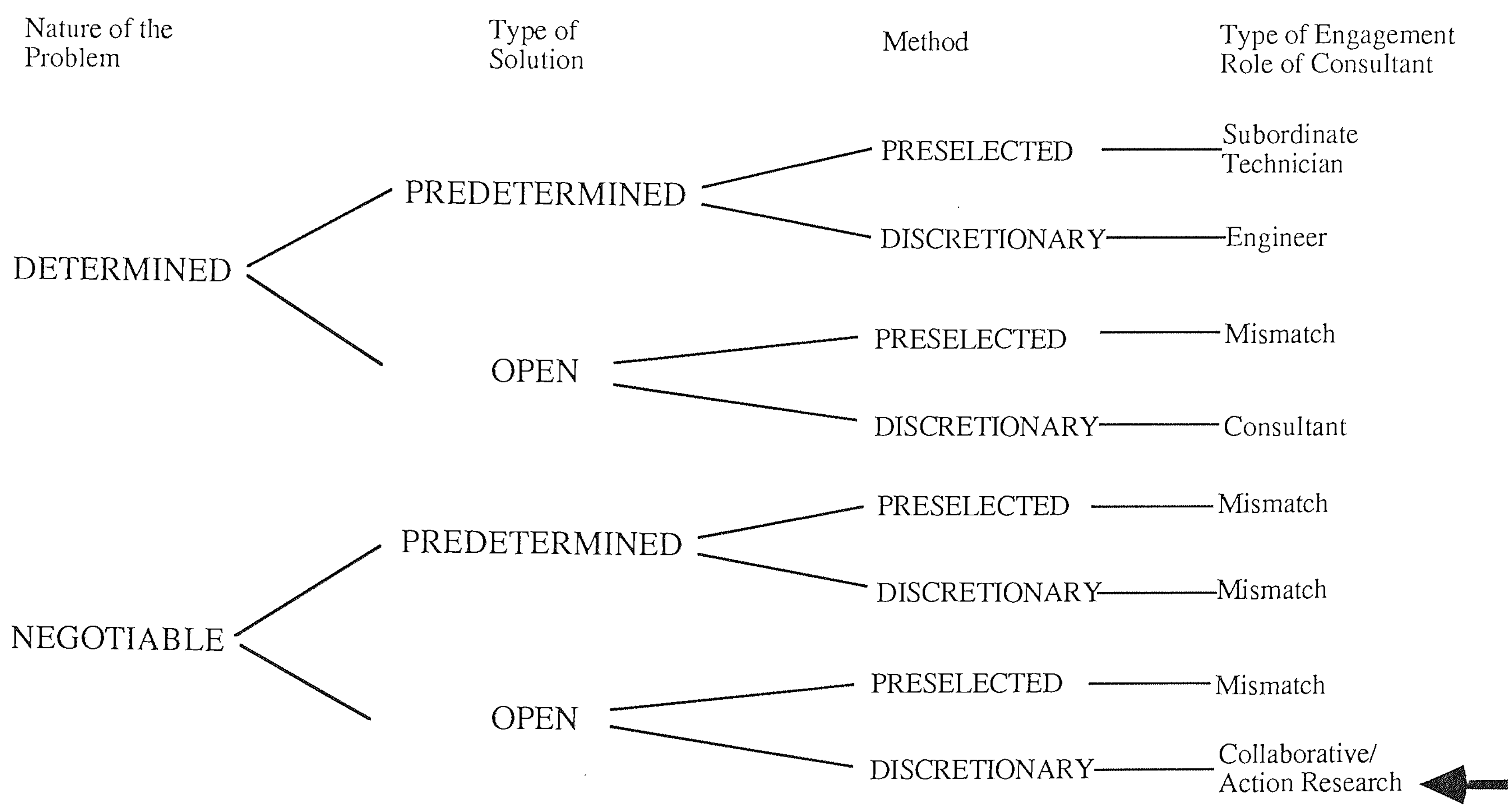

FIGURE 1.3 CLASSIFICATION OF THE RESEARCHER-CLIENT RELATIONSHIP. ADAPTED FROM CHERNS (1976)

1.5 Project Methodology

The methodology adopted in IHD projects is action research using an interdisciplinary approach. This is virtually inevitable due to the multiple facets of the problems and the fact that, at the outset, the problems are not fully understood and rarely formulated into research questions.

Cherns (1976 p905) provides a taxonomy of behavioural science engagements: IHD projects in general, and this project in particular, fit the action research category (Figure 1.3). The nature of the problem is negotiable, the type of solution open and the method discretionary.

Action research was described by Curle in 1949 as a method that

> "aims not only to discover the facts, but to help in altering certain conditions experienced by the community as unsatisfactory"

There is an explicit commitment on the part of the researcher to not only study the problem but also to try to alleviate or solve the problem through the research.

Sabin (1980) reviews the literature on action research in relation to the experience of the IHD Scheme. He finds that action research is usually considered in relation to the social sciences in community work.

> "The IHD Scheme has (however) adopted much of the methodology of action research for use within more technical fields."

Unfortunately, the dilemmas found by social scientists practising action research still arise.

Firstly, there are conflicting demands made of the researcher from the various parties to the Scheme. The academic demands of the university are not necessarily synonymous with the pragmatic needs of the collaborator.

Secondly, the researcher is both an apprentice and a consultant, sometimes simultaneously, during the project. S/he is learning a new discipline in a new organisation yet is expected to provide guidance on and solutions to the collaborator's problem. As the problem becomes more clearly defined the student is seen increasingly in the role of consultant yet s/he is typically in a novel situation. (This was particularly true of my situation where the organisation employed no other staff).

Thirdly, the conventional linear model of the research process (problem definition, selection of method, data collection, analysis, conclusions) is seen by Clark (1972) as inappropriate to action research which is a cyclical process in which the elements such as problem definition, investigation, feedback and design may occur at approximately the same time.

Finally, Rapoport (1970) concludes that the action researcher

> "sacrifices a degree of detachment and independence (but gains) a sense of sympathy and identification which may produce more valid information than that which might have been gathered from a more detached vantage point."

Moreover, this subjectivity can be a strength in that it obliges the researcher

> "to clarify and represent his own ethics and values so that they, along with those of the client system, can serve as guidelines against which to assess jointly planned actions."

The last point is particularly crucial to this project in that, even before the research began, I identified with the aims and values of the collaborators. I say this not to apologise for any lack of impartiality but to highlight the fact that a successful action researcher <u>must</u> be in harmony with the collaborating organisation if s/he is to obtain the necessary co-operation to produce plans that are of value and are likely to be accepted.

1.6 Thesis Outline

1.6.1 Logical Order

The subjects described in the remaining chapters are presented in logical order and not necessarily chronological order. This is for reasons of clarity and because of the cyclical nature of action research, as described in 1.5. It is often possible to see the significance of events and relationships between them more clearly in retrospect. This is not to say that post hoc justifications have been invented but that the lasting value of a particular research phase may only emerge with time.

1.6.2 Chapter Outlines

Chapter 2 reviews the literature on cycle planning, which has become quite extensive in this decade. It draws on foreign research, particularly West German, which contrasts sharply with the perspective so far adopted by the authorities in the UK.

In Chapter 3 the West Midlands is set in context through a review of cycle planning at county level in England and Wales. It then focuses on the local scene and describes Pushbikes' interaction with the local authorites, particularly with regard to local plans.

The assessment of the cycle planning environment and the available data pointed to the need for improved information at local level. There were significant gaps in the knowledge base of the local authorities and Pushbikes in relation to planning facilities for cyclists. The need for a local survey was clear.

Chapter 4 describes the aims and hypotheses of the survey (described throughout this thesis as the West Midlands Cycling Survey in order to distinguish it from other surveys that I carried out during the project). It also sets out the methods used and the response obtained.

Chapter 5 presents the key survey results in graph form, leaving the tabulations of the full results to the appendices. The micro-level conclusions from the findings are given at the end of the chapter.

Chapter 6 discusses the broad implications of the entire action research process, relating them to transport policy, economics and land use. Conclusions are drawn at both national and local level and recommendations are made regarding transport and cycling policy and the role of cycle campaign groups. Particular recommendations for the West Midlands and Pushbikes are also made. Finally, areas for further research are identified.

CHAPTER TWO: HISTORY AND LITERATURE

Contents

Outline

This chapter traces the recent history of planning for cycling through the literature. Research findings and philosophies relevant to the thesis are summarised and some interpretation is given. Selected foreign research and practice is cited, particularly from West Germany, which is contrasted with that of the UK.

2.1 Priorities in Transport Planning

The 1973/74 oil crisis was a watershed in transport policy and research. The quadrupling in oil prices and the threat of oil shortages and embargoes shifted attention to the need for greater fuel-efficiency and alternatives to oil. The ensuing world economic decline reinforced the predictions of conservationists, encapsulated in such texts as the Club of Rome Report (Meadows 1974) that the exponential growth in consumption of natural resources was unsustainable. No longer was it realistic to plan for high and increasing levels of employment, economic growth and government spending. The vital areas were perceived to be energy, the environment and economic-efficiency.

In addition, road safety began to grow in official importance. The US and UK speed restrictions, imposed in response to the oil crisis, coincided with a fall in road accidents. More recently, the rise in cyclist and pedestrian accidents in Britain, the controversy over seat-belt legislation (Adams 1985) and 1986 European Road Safety Year have increased the Government's concern for the subject.

It is within this policy and research context that the current planning for cyclists lies. Cycling is highly relevant to the issues of energy conservation, the environment, economic efficiency and road safety. Yet prior to the late seventies cycling was largely ignored in the UK by policy makers and researchers alike. Even in the eighties it is argued that cycling is not given the attention that its problems and potential benefits warrant. As a first step to understanding cycle planning over the past decade it is necessary to try and establish the reasons for this neglect.

2.2 Cycling: Decline and Neglect

Exactly why cycling as a mode of transport was so neglected by central and local government, transport planners and researchers has not been considered in any detail.

During the late fifties and sixties this neglect was probably due to the declining level of cycle use and the assumption that the car would entirely replace the bicycle for transport purposes. The idea of universal car ownership was largely unquestioned and the environmental consequences had not yet emerged. As such, the neglect of cycling went unquestioned, even by the cyclists' organisations. The Cyclists' Touring Club, suffering a severe decline in membership, concentrated its efforts on road-safety issues, such as the cycling proficiency scheme, and access to the countryside (Warner 1980). It did not challenge the thrust of transport policy - a transport system dominated by the private motor car. The fact that cycling was still a major mode of transport in many parts of the country was ignored and the decline in cyclist casualties encouraged the authorities to take no action to arrest the decline in cycle use.

Why this neglect should persist into the late seventies and eighties is less easily explained. Levels of cycle sales and use and cyclist accidents have been rising since 1974 and new cyclists' organisations have emerged demanding action from the authorities. Hillman and Whalley (1983) suggest of cycling (and walking) that

> "there has simply been a professional oversight of these issues, which in turn has been reinforced, until recently by the paucity of data on the characteristics and the correlates of the two modes. ...there appears to be a belief that it is social rather than institutional changes which have contributed to the decline in their use." (p99)

In a later study, Plowden and Hillman (1984) expand on this explanation and suggest rather more substantive causes than mere oversight. They cite

a) "The idea that the main task of transport planning was to provide for the increasing use of the car."

b) "the very merits of the bicycle, that it is inconspicuous, cheap to use and relatively easy to provide for, have been treated as reasons for not taking it seriously."

c) The failure to develop cost-benefit methods to evaluate investment in cycling facilities.

d) Problems in the relationship between central and local government regarding responsibility for transport policy.

e) "the small attention paid to environmental considerations here in the formulation of transport policy".

f) The weakness of the cyclist and environmentalist lobby relative to other road interests and the excessive moderation of the former's demands.

i) A failure of professional planners and engineers to learn from the experience of other European countries and to reappraise the British approach to transport planning.

(Plowden and Hillman 1984 pp142-143)

Some of these points are supported by more general studies of transport politics. Wistrich (1983) describes the substantial differences between the environmentalist and road pressure groups. She points to the disparity in financial resources and the greater unity and single-mindedness of the road lobby as reasons for the strength of the latter.

The reasons for the neglect of cycling at local level, documented by Levy (1982) and E. C. Davies(1981), are probably those found by Grant (1976) in his case studies of Southampton, Nottingham and Portsmouth. In each instance the main transport issues identified by the council closely reflected the training and experience of the chief engineer. In order to bring about significant change in policy a new engineer and political party were necessary. An effective local pressure group was also a necessary condition.

As cycling forms only a small part of the training and experience of most chief engineers and it lacks powerful economic and political interests, it is perhaps not surprising that cycling is not seen as an important issue by many local authorities.

2.3 Cycling: the Revival

2.3.1 Bicycle Ownership and Use

Stores (1978) presents the first comprehensive collection of statistics and analysis of bicycle ownership and use in the current debate. Based on the National Travel Survey 1972/73 and annual Traffic Censuses, it raises as many questions as it answers. In Great Britain in 1972/73 25% of households owned one or more bicycles but this varied considerably between regions. Cycle sales more than doubled between 1969 and 1975, preceding the upturn in cycle use by 5 years. Cycle use declined substantially from 16.2 billion kilometres in 1956 to 3.4 billion kilometres in 1974. At the time of writing, Stores could only note that

> "the rate of decline has reduced and in 1975 there was a levelling off of the downward trend... However, it remains to be seen if this trend will continue." (p1)

There is an attempt to answer basic questions about ownership and use in terms of socio-economic group, household size, age, sex, geography and accident risk. However, it chiefly reveals

> "the paucity of data on the travel patterns and characteristics of cyclists." (p1)

Some of the data is seriously out of date, such as the 1966 Traffic Survey (used to show the distribution of cycle traffic on all types of roads including unclassified roads); and the results of the 1975/76 National Travel Survey were evidently not available.

The 1978/79 National Travel Survey collected more detailed information on bicycle ownership and use than its predecessors. Lester and Potter (1983), using special tabulations, emphasise the importance of cycling (and walking) and estimate that there were some 9.5 million bicycles in Britain in 1978, excluding those owned by children under 5 years old. Cycling accounted for 2% of total journeys but 5% of journeys in the course of work and 6% of "other" journeys. As household bicycle ownership increases, bus travel tends to decrease but the authors suggest it is increased household income which explains both trends.

Not until 1984 did the Department of Transport update Stores' work with an analysis of the 1978/79 National Travel Survey and Traffic Censuses 1973-83. Compiled by Needham (1984) it provides the most recent, comprehensive and authoritative set of statistics available in one report. Unlike Stores, it contains limited trend data on bicycle ownership and provides greater explanation of variations. It shows that 29% of households owned at least one bicycle in 1978/79 compared with

24% of households in 1972/73 and in 1975/76. Levels of ownership are positively related to household size, number of children, car ownership and income. Men are more likely to cycle than women and bicycles are used most during weekdays and for non-leisure purposes. Needham concludes that there has been a "sharp increase" in cycling since the 1978/79 National Travel Survey, implying that the analysis might already be out of date. Moreover, there is still insufficient data to properly analyse trends in use, for example by SEG, and no consideration is given to <u>individual</u> bicycle ownership, as opposed to household bicycle ownership.

Regional analyses have provided more recent and detailed information. Bannister and Groome (1983a) examine the 1981 Census journey to work data for NW England and note that the bicycle

> "is a more important means of transporting people to work than local rail services... (and)... a more important means of transport for those groups of the population who are less well-off, either being in non car-owning households or in the socio-economic groups most associated with the working class" (p74)

In areas of high cycle use, the percentage of women that cycle to work is higher than the percentage of men that cycle to work; in areas of low cycle use the situation is reversed. They find that women more than men are deterred from cycling by both hills and traffic danger. This is put down to "social attitudes".

The 1981 Census data for Greater London is analysed by Murray-Clarke (1984a) in one of the GLC series of Cycle Papers. 2.37% of journeys to work are made by bicycle, equivalent to 4.09% of road-vehicle journeys to work. Compared to the 1971 Census levels, cycling increased in Inner London but decreased in Outer London. There is some variation in usage between the boroughs but

> "The data is of limited use in determining the importance of factors that might be expected to affect the level of bicycle usage" (p15)

No conclusions can be made on the deterrent effect of the risk of having an accident but there are indications of the effects of car ownership, occupation, sex and hilliness. Cycling to work is more important for people in households without a car than for people with a car. In Inner London (where cycle use has risen) professionals are the greatest users of bicycles whilst in Outer London it is manual semi-skilled and unskilled workers. Murray-Clark also concludes that social attitudes are an important factor in determining the level of cycle use.

A detailed overview of recent changes in cycle flows in London is made by Kilroy and Hunter (1985). Cordon and screenline counts between 1977 and 1984 indicate increases of 70% in cyclists entering Central and Inner London but a much smaller increase in flows across the Greater London Council boundary. Trends in cycle flows, particularly following London Transport's dramatic fares changes, are also analysed by Gardner (1985) and Baker (1982).

Bicycle ownership in London, based on the 1981 Greater London Travel Survey, is analysed by Landrock and Holden (1984). Drawing on the framework of Wigan (1983), they find that household bicycle ownership has risen to 25% (compared with 19% in 1978/79) and that it is primarily dependent on the number of children in the household.

> "Other factors positively correlated with bicycle ownership include household size, household income, number of cars and vans available to household members and distance from the centre of London" (p1)

Whilst Landrock and Holden's findings are consistent with Needham's earlier data, they hypothesise that it may be misleading to consider bicycle ownership by household if bicycles are used by only one member of the family at a time. This points to a need for individual rather than household bicycle-ownership data.

In the West Midlands, there has been no attempt by the authorities to publish bicycle-ownership or use data beyond a simple statement of the census data and some education trip surveys. In the annual West Midlands County Transport Monitor, bicycle use is mentioned only once in the entire 100+ page document; bicycle ownership does not feature at all.

2.3.2 Campaign Groups

Along with an increase in cycling has come an increase in campaigning to promote cycling and to make it safer. Organisations such as Friends of the Earth, the British Cycling Bureau, the Cyclists' Touring Club and the Cycle Campaign Network (Appendix 1) have attempted to pressure central and local government into supporting cycling. They have also published some significant research on various aspects of cycle planning. Although criticised by Hillman and Whalley for being too moderate in their demands, they must take some credit for the gradual change in Government policy towards cycling.

The campaign has been led by Friends of the Earth (UK). In 1975 they published Fielden's report "Give Way" which sets out the environmental case for transport planning in Britain and proposals for cycleway networks in Lambeth, Nottingham and Portsmouth. It draws on the ideas of Claxton and Hillman who, respectively, provide the engineering and conceptual framework. Although much experience has been gained since Fielden's report, it is remarkable how familiar are his arguments today.

Hudson, Bicycles Campaigner for Friends of the Earth, provided the first British manual (1978b) on bicycle planning, preceding the Department of Transport's advice (1978). This was followed in 1982 by the more comprehensive and authoritative "Bicycle Planning - policy and practice" which draws on European and US experience to cover not only physical facilities but also policy, education, law, enforcement and data collection.

2.3.3 Government Policy on Cycling

The official version of the development of Government cycling policy is set out by Ford (1982) and updated by Wall (1984). E. C. Davies (1981) reviews this policy and Plowden (1985) summarises it ironically:

> "Until recently, the official neglect of cycling was virtually complete. In the 1960s and early 1970s it seems to have been thought that cycling would die away in the face of competition from cars, clearly a superior means of travel, and that in the view of the accident rate amongst cyclists this decline was more to be welcomed than checked." (p128)

The 1977 Transport Policy White Paper marked the change in official policy, albeit not dramatically, and recommended that local authorities should consider helping cyclists by means of traffic management schemes and cycle parking stands. The 1982 Statement on Cycling Policy (Department of Transport 1982) perhaps represents the high point when, for the first time in recent history, the government expressed a clear desire to encourage cycling. However, in the opinion of the cyclists' organisations (Clarke 1986), the Department of Transport is trying to go back on this policy due to lack of funds and criticisms over the rising number of cyclist accidents. Although other political parties, particularly the Liberals (Rumney 1985) are incorporating cyclists' needs into their transport policies, it seems highly unlikely that the present administration will make significant advances on the 1982 policy.

2.3.4 Research and Publications

Without doubt, there has been an enormous growth in the research and publications on cycling since the mid-seventies in Britain and other developed countries. However, I am not aware of any attempt to measure this growth so I have analysed TRRL publications in order to provide some quantitative indication.

The 1983 TRRL leaflet "TRRL Research on Cycling" lists 24 reports published by the Lab between 1952 and 1982. Table 1 shows that 20 (83%) were published in the 6 years prior to 1983 whilst only 4 (17%) were published in the previous 25 years.

TABLE 2.1
TRRL PUBLICATIONS ON CYCLING @ APRIL 1983

Year	The Bicycle	Bicycle Facilities	Cyclist Accidents	Cyclist Education	Other	Total
1952	1					1
1955	1					1
1958	1					1
1973	1					1
1977	1	1				2
1978					1	1
1979	1	2	1	2		6
1980	1	1			1	3
1981	1	2	1			4
1982		4				4
Total	8	10	2	2	2	24

Source: TRRL Leaflet LF942 "TRRL Research on Cycling" April 1983.

In 1984 the Department of Transport published a bibliography on recent cycling policy and planning (Lambert 1984). This contains 185 dated publications between 1977 and 1984. Whilst this bibliography is concerned principally with the issues since 1981, it is significant that there are so few references pre 1981 and that no earlier bibliography exists. The obvious (and correct) inference is that very little was published.

2.4 Engineering Dominance

The same TRRL and Department of Transport sources can be used to show the thrust of government-sponsored research and advice on cycle planning. Table 2.1 shows the preponderance of engineering issues, particularly special facilities for cyclists. Of the 24 TRRL publications, all of those prior to 1977 and one third of the total are concerned with the bicycle. A further 10 (42%) are concerned with cycle facilities and these are concentrated around 1980.

The Department of Transport bibliography lists 65 Department of Transport publications: four are about government cycling policy, three review statistics on cycling[1] and cyclist accidents and 56 are technical notes on the provision of cycle facilities. (These include 33 annexes to the report on disused railway lines (Grimshaw 1982) and 13 leaflets on specific cycle schemes).

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[1]The paper by Waldman (1977) is not included although comissioned by the Department of Transport. It may be that it was considered too old for inclusion but this is an example of the Department's reluctance to acknowledge the paper. Further examples are given in 6.2.

There is a view that engineers dominate not only cycling policy but UK transport policy in general. The Department of Transport is still seen by its critics as being biased towards road building, continuing the work of the Road Construction Units phased out in 1980. Moreover, the training and experience of engineers in the UK is probably narrower in concept than in Europe where planning and engineering have greater overlap. However, it is not within the scope of this thesis to pursue these ideas at the level of general transport policy.

2.5 The Integrated Approach

The approach adopted in the UK contrasts with that recommended by other developed countries who precede us in their efforts to promote cycling, particularly Australia, Germany, the Netherlands, Scandinavia and Japan.

The first formal recognition of the importance of integrated measures to assist cyclists was the Geelong Bikeplan of Australia (1977). This recommended four areas for action, now referred to as the "4 E's", which were

Engineering Provision of on and off road facilities and traffic management measures.

Education Education programmes designed to improve the on-road relationship of cyclists and other road users.

Enforcement Enforcement programmes designed to reinforce bicycle education programmes and obtain a high level of compliance with traffic law in general and bicycle traffic law in particular.

<u>Encouragement</u> Media programmes and activities designed to create a greater awareness of cyclists' needs, increase bicycle use and the other 3 E's programmes.

Geelong was perhaps the first area to recognise the limitations of the "segregated facilities approach" to cycle planning which seeks to provide a network of cycle routes segregated from motor vehicles wherever possible. Although the segregated facilities approach still pertains in some Australian states (and in some other countries),

> "the picture was far from clear in 1977.... (but the) facts show the correctness of the 'integrated approach'" (Parker and Gately 1984 p3)

The involvement of cyclists in the planning process - rather than depending exclusively on the views of transport professionals - is acknowledged as "a most important feature".

> "The driving force behind the move away from the 'segregated facilities approach' to the 'integrated approach' came from the cyclists themselves." (p3)

Hudson et al (1982), in their review of good cycle planning practice in Britain, Europe and the USA, also strongly advocate the integrated approach.

> "With the hindsight of the successful and unsuccessful experiments of the 1970's, an integrated approach to planning for cyclists began to emerge. An approach recognising that each of the solutions previously advocated (special facilities, education and the use of the existing road network) has a role to play, but that none is sufficient on its own to create a safe and attractive cycling environment." (Hudson et al 1982 p2)

Thus, by the early 1980's, a concensus had emerged amongst the (more progressive) advocates of cycle planning that an integrated approach was required. This view was tested in Germany through the Cycle-Friendly Towns Project, described by Otto (1984).

The five-year Cycle-Friendly Towns Project of the Federal Republic of Germany started in 1981. Two towns, Detmold (North Rhine Westphalia) and Rosenheim (Bavaria) were selected as model towns where no bicycle infrastructure existed. The Project goal was to effect a modal shift from car to bicycle and thereby improve the quality of the urban environment. The secondary Project goals were to provide detailed information and experience on ways to promote bicycle use and the consequences of so doing. The programme was to

- Modify the traffic infrastructure to include safe and attractive cycle routes, cycle parking facilities, "service stations", cycle hire and integration with public transport.
- Create a cycle-friendly atmosphere in which cycling was recognised as a safe and sensible means of transport; and one in which cyclists felt their views and welfare were taken into account in policy decisions.

Involving the local community was seen as extremely important. Consequently, bicycle planning offices were opened on town centre streets so that local people could easily call in to discuss problems with the specialist cycle-planning officers. Conferences and public meetings were held to stimulate discussion and interest and add to the pro-cycling atmosphere. Public figures, such as the Burgermeister, were photographed riding bicycles by the local press. In addition, extensive research projects were conducted into the traffic, environmental and safety aspects of the project.

The prototype planning, advice and accompanying research were paid for by the Federal Environmental Agency. The local councils paid for the physical implementation.

The Cycle-Friendly Towns Project is due to end in 1986 and a full report is to be published. Interim findings and recommendations were summarised by Otto (1984) thus:

- A shift from motorised vehicles to bicycles is possible through traffic policy.
- Pollution in town centres is reduced by a shift from motorised vehicles to bicycles.
- Improving the cycling infrastructure is only one of several key factors in promoting cycling.
- A Cycle Office in a local action centre is recommended.
- Cycle promotion should be integrated with schemes to lessen traffic in the whole city.

Further support for the idea that individual measures would have little impact whilst a package of measures would have a considerable synergistic effect is provided by Brog (1983b), also based on the experience of the Cycle-Friendly Towns Project. He attempts to measure potential levels of bicycle use and to quantify the effects of different policies. He shows that both engineering and behavioural measures are important and calculates that bicycle use could be doubled for trips of less than 15 kilometres through the cumulative effects of

- Improving the climate of opinion towards cycling.
- Public relations work to clarify misconceptions.
- Infrastructural investments.
- Improving the luggage-carrying and weather-protection properties of the bicycle.
- Greater bicycle availability.

He notes that

> "Bicycles are rarely not used only because persons perceive the bicycle infrastructure to be inferior. Thus, when the infrastructure is improved but no other measures are instituted, the effect is minimal. However, when other measures are taken and the bicycle network is also improved a considerable potential can be attained." (p1)

It could be said that the Cycle Friendly-Towns Project simply confirms the view of the Geelong Bike Plan published four years before the German experiment even began. However, there are three important contributions. Firstly, the European experience has greater validity for British towns than the Australian experience where population densities are lower and journey distances greater. Secondly, it provides a considerable amount of additional, high-quality data and methodological techniques. Thirdly, the German research suggests that there are limits to the effectiveness of policies that promote cycling: other (traffic) policies must be complimentary.

> "Cycling can only be promoted to a certain extent through the improvement of cycling conditions. In order to generate the maximum potential for extra cycle traffic and take the maximum amount of stress off the environment, restrictive measures must also be introduced for motorised vehicles." (Otto 1984 p6)

This view is apparently growing in Britain. Clarke (1986), in response to the Department of Transport's "Ways to Safer Cycling" conference, criticises the Department for treating cycling in isolation from its other transport policies. In particular, he notes the expanded road building programme and its traffic generating effects, the continued installation of roundabouts despite their extreme danger to cyclists and the estimated £2 billion annual tax subsidy on company cars. He is clearly concerned that the cycling will be further marginalised in transport planning.

On the basis of a detailed and highly critical review of the safety record of the Milton Keynes Redway, Franklin also comes to the view that the narrow pursuit of cycling matters is an inadequate approach.

> "It is becoming increasingly evident that cycling safety cannot be dealt with in isolation from general traffic (and to some extent transport) policy and that cycle "facilities" have only a limited role to play in improving safety."
> (Franklin 1985 p2)

The compatibility of general transport policy with a policy on cycling is increasingly brought into question. There appear to be two schools of thought. Firstly, the marginalist view that cycling can be made safer and (possibly) more attractive by special cycling facilities, better education of road users and safety devices such as conspicuity aids and helmets for cyclists. Secondly, there is the fundamentalist view that cycling will only become a safe and popular form of transport if general transport policies were altered to give greater emphasis to equality, the environment, safety and health. Due to the weakness of the cycling lobby, the former view has often been advanced. However, there are now doubts about the success of this approach.

2.6 Conclusions

This chapter has traced the recent history of planning for cycling through the literature, focusing on bicycle ownership, bicycle use and the policy on cycling adopted by the UK government and local authorities. Contrasts have been drawn with the policy and practice of other countries, particularly Germany and Australia, and the Department of Transport has been criticised for the narrowness of its approach to the issues.

It is the case that, since 1974, much has been learned and written about planning for cycling. Indeed, the term "bicycle planning" is now quite widely used whereas ten years ago it would have had little meaning. Yet it still remains the case that a large amount - and some of the best - of the research, the ideas and the analysis is undertaken by enthusiastic amateurs. This would be unimaginable for almost any other major transport mode.

Many questions remain to be satisfactorily answered. For example: What levels of cycle use are likely in the UK given the current demographic, land use and economic trends? What levels could be achieved if pro-cycling policies were adopted as demanded by the cycling lobby? And what policies would be most effective: those encouraging cycling or those restraining car use? There is no consensus yet on the most appropriate engineering measures to assist cyclists, though this reflects different transport priorities as much as different technical views.

If on a national level these questions remain unanswered, then at the local (West Midlands) level they are equally unresolved. Much more research of quality is required if cycling is once again to become a safe and widespread form of transport.

CHAPTER THREE: THE WEST MIDLANDS SCENE

Contents

Outline

This chapter describes the situation regarding cycling and cycle planning in the West Midlands County. It first sets the West Midlands in context and then describes local proposals for cycle planning and the interaction between Pushbikes and the local authorities which brought them about. Published data is included from national and local sources, such as Department of Transport statistics, the 1981 Census and County Council accident records. Also included is primary data assembled in the course of this thesis from surveys of county councils and their Transport Policies and Programmes.

3.1 The County in Context

The framework for planning for cycling is set by the Department of Transport and the development of this is summarised in 2.3.3. The extent to which local authorities have responded to the Department's exhortations to consider cyclists in local transport planning is assessed in a series of surveys commissioned by Friends of the Earth and carried out as part of this research project. They were necessary due to the reticence of the Department of Transport to provide such information, even to members of parliament. For example, in parliamentary written questions, Jack Dormand MP asked how much each local authority spent on cycle facilities in 1984/85. Transport Minister, Lynda Chalker, replied only that

> "This information is not available centrally."

He further asked if the recent changes in Transport Supplementary Grant had affected the provision of facilities for cyclists. Again, the Minister replied briefly

> "I am not aware of any changes in local authority commitment to cycling provision."
> (Hansard, Parliamentary Written Answers, 19 April 1985)

Appendix 2 contains the first of the three surveys of local authority commitment to cycle planning. It is based on a study of the Transport Policies and Programmes for 1984/85 for all the English counties and the response to a letter sent to all county surveyors. It shows that

1) English county councils allocated approximately £2 million (0.2%) of total capital bids for cycling facilities in 1984/85.

2) 46% of English Transport Policies and Programmes do not specify any amount for expenditure on cycling in 1984/85.

3) Only 10% of Transport Policies and Programmes give clear indications of programmed cycle facilities, including costs and implementation dates.

4) Under 50% of county councils mention cycling as one of their policy considerations in their Transport Policies and Programme.

5) Whilst most county councils have some form of policy on cycling, this is typically expressed in the TPP as accommodating existing cyclists, not encouraging more cycling.

6) Policy on cycling is rarely integrated with other transport policies and few authorities link it with objectives such as energy conservation and environmental improvement.

7) Four English county councils employ Cycling Officers but there are none in Wales or Scotland.

8) County councils place greater emphasis on road-safety education for child cyclists than on changes to the physical infrastructure.

The survey of TPPs was repeated in 1985 and 1986. As Table 3.1 shows, the financial allocation has changed little over the 3 year period. One might have expected a reduction in 1986/87 due to changes in the Transport Supplementary Grant criteria but this has not happened.

TABLE 3.1 CAPITAL ALLOCATIONS FOR CYCLING FACILITIES

AUTHORITY	£000 1984/85	£000 1985/86	£000 1986/87
Greater London	1%	1%	1%
Greater Manchester	150	110	
Merseyside			0.1%
South Yorkshire	34	30	40
Tyne and Wear			
West Midlands	14		
West Yorkshire	200	200	200
Avon	#35	#37	
Bedfordshire			156
Berkshire	*168	*165	*177
Buckinghamshire			63
Cambridgeshire	*341	*292	*300
Cheshire	25	25	25
Cleveland	58	63	63
Cornwall	30		
Cumbria			
Derbyshire	40	6	6
Devon			300
Dorset			
Durham			
East Sussex			
Essex			
Gloucestershire	32		
Hampshire			
Hereford & Worcester	10	15	15
Hertfordshire	10	60	60
Humberside	7		45
Isle of Wight	57	61	22
Kent	63	71	99
Lancashire	39	55	
Leicestershire	110	115	115
Lincolnshire			
Norfolk	15	15	30
Northamptonshire	60		60
Northumberland	20		30
North Yorkshire			20
Nottinghamshire			50
Oxfordshire			
Shropshire			
Somerset			
Staffordshire			
Suffolk	24	26	35
Surrey	100		
Warwickshire			
West Sussex			
Wiltshire	50		

Revenue expenditure. * Includes other expenditure eg footways and accident remedial measures.

Notes to Table 3.1
The figures are extracted from the TPPs for 1984/85 to 1986/87 and are not adjusted for inflation. They are "bid" figures, ie the amounts the county councils would like to spend on cycle facilities if they were accepted by the DTp and (until 1986/87) supported by Transport Supplementary Grant. The figures do not necessarily represent actual expenditure. In most cases the expenditure was less than the bid. Some authorities do invest in cycle facilities without allocating a specific cycling budget. However, it is a reasonable assumption that the total expenditure does not exceed the aggregate amount in Table 3.1. ie Cycle schemes receive less than £2 million or less than half of one percent of total capital expenditure on highways by local authorities.

3.1.2 Cycle Use and Cyclists Casualties

The 1981 Census journey to work figures for cyclists are reproduced from Bannister and Groome 1981 in Table 3.2. These show a considerable variation between counties, ranging from 1.17% of work journeys in West Yorkshire to 13.27% in Cambridgeshire. Analysis of Census data at more local level would show a much greater spread. Clearly, the bicycle is a major mode of transport in some parts of England even today.

The cyclist percentage of total casualties is calculated from Road Accidents Great Britain for the same year (1981). This shows noticeably less variation than the figures for cycle use. Whilst in Cambridgeshire cyclists form a percentage of all casualties that is almost equal to their percentage of journeys to work, in West Yorkshire the figures are not at all proportionate.

It is perhaps most interesting to look at the relationship between cyclist casualty rates and levels of cycle use. From these two sets of figures a cyclist casualty index has been calculated for each county by dividing the cyclist percentage of total casualties by the level of cycling to work. There is a highly significant degree of negative correlation (-0.777) between the level of cycling to work (a proxy for the general level of cycle use) and the derived cyclist casualty index. That is, casualty rates are lower in counties with higher levels of cycle use. It does not, of course, prove cause and effect but the variety of factors which influence cycle use, as described in 2.3.1, make it more likely that cycle use is the causative factor. In other words, increases in cycle use tend to lower the casualty rate perhaps because motorists become more accustomed to sharing the roads with cyclists. This, in turn, may have a positive feedback on levels of cycling. It is also possible that the "new" cyclists are more risk averse than those who cycle in areas where cyclists are less numerous.

Analysis of the recent trends in Germany shows that the cyclist casualty rate declined as the level of cycle use (Brog and Erl 1984). In Britain, the national cyclist casualty rates between 1974 and 1984 (Transport Statistics Great Britain 1984) show no clear relationship to the level of cycle use. In fact, the cyclist casualty rate (all severities) rose by 5.15% whilst the volume of cycle traffic rose by 55.56%, apparently contradicting the result of the geographical analysis above. However, the time-series data may be misleading if taken at face value for at least two reasons. Firstly, it takes no account of changes in other factors that adversely affect cyclist casualty rates. In particular, between 1974 and 1984, the volume of motor traffic increased by 31.93%, seat-belt wearing became compulsory, speed limits were increased and average vehicle sppeds rose, road surfaces have deteriorated and, in the West Midlands at least, the police have become more comprehensive in their reporting of cyclist accidents. Secondly, the casualty rates and severities fluctuate from year to year. Thus the choice of years to compare can be critical. For example, the (revised) cyclist casualty rate fell by 3% between 1973 and 1982 (RAGB 1983 p35). Moreover, the casualty rate for cyclists killed and seriously injured actually declines from 137 casualties per 100 million cycle kilometres in 1974 to 131 in 1984.

These factors suggest that simple analysis of time series data may obscure the relationship between cycle use and cyclist casualty rates. If these factors are controlled for, a negative relationship between cycle use and cyclists casualty rates almost certainly exists.

TABLE 3.2 CYCLING TO WORK, CYCLIST CASUALTIES AND CASUALTY INDEX FOR ENGLISH COUNTIES 1981

County	% Cycling to Work	Cyclists Casualties as % of Total Casualties	Cyclist Casualty Index
Greater London	2.39	7.79	3.26
Greater Manchester	2.47	8.84	3.58
Merseyside	2.70	7.86	2.91
South Yorkshire	1.47	4.81	3.27
Tyne and Wear	1.30	6.75	5.19
West Midlands	2.39	7.27	3.04
West Yorkshire	1.17	6.59	5.63
Avon	3.43	8.36	2.44
Bedfordshire	6.06	8.16	1.35
Berkshire	5.18	8.92	1.72
Buckinghamshire	3.60	7.44	2.07
Cambridgeshire	13.27	13.92	1.05
Cheshire	5.77	10.16	1.76
Cleveland	3.88	9.07	2.34
Cornwall	1.88	4.90	2.61
Cumbria	2.78	6.89	2.48
Derbyshire	3.36	7.12	2.12
Devon	2.61	6.11	2.34
Dorset	4.96	8.90	1.79
Durham	1.30	5.44	4.19
East Sussex	2.20	6.25	2.84
Essex	4.43	7.58	1.71
Gloucestershire	6.67	9.38	1.41
Hampshire	6.55	11.09	1.69
Hereford & Worcester	4.79	8.34	1.74
Hertfordshire	3.59	8.22	2.29
Humberside	10.95	13.20	1.21
Isle of Wight	3.15	9.50	3.02
Kent	3.65	7.81	2.14
Lancashire	2.88	8.82	3.06
Leicestershire	4.79	8.76	1.83
Lincolnshire	9.73	9.52	0.98
Norfolk	9.91	10.07	1.02
Northamptonshire	3.99	5.94	1.49
Northumberland	2.27	4.81	2.12
North Yorkshire	8.03	8.78	1.09
Nottinghamshire	3.92	8.17	2.08
Oxfordshire	9.41	9.93	1.06
Shropshire	5.18	6.64	1.28
Somerset	7.11	9.01	1.27
Staffordshire	2.96	7.81	2.64
Suffolk	9.38	10.03	1.07
Surrey	4.46	10.14	2.27
Warwickshire	5.61	9.12	1.63
West Sussex	6.64	10.07	1.52
Wiltshire	7.35	7.79	1.06

Source: 1981 Census (Bannister and Groome 1982); and RAGB 1981;
Cyclist Casualty Index = Col 2 divided by Col 1.

Correlation between Col 1 and Col 3 = -0.777, Significant at 99.99%.

3.2 Bicycle Statistics for the County

One of the early tasks of this project was to compile the available statistics on cycling for the West Midlands County into one document. This is reproduced in Appendix 3. Section 3.2 draws on this report and updates the statistics were possible.

3.2.1 Cycle Use

The 1981 Census provides the most comprehensive and reliable estimate of cycle use, albeit now 5 years old and limited to the journey to work. 2.39% of economically active West Midlands residents cycle to work, a lower percentage than Merseyside (2.70%) and Greater Manchester (2.47%), higher than South Yorkshire (1.47%), Tyne and Wear (1.30%) and West Yorkshire (1.17%) and exactly the same as Greater London (2.39%) (Bannister and Groome, 1982).

Within the West Midlands county there are considerable differences in levels of use. In two wards (Darlaston South, Walsall and Bilston North, Wolverhampton) the level is 8% of all work journeys; in some Birmingham wards, however, it is less than one percent. In total, some 26,000 residents cycle to work, 6,000 in Birmingham, 6,000 in Coventry, 1,500 in Dudley, 2,500 in Sandwell, 2,500 in Solihull, 3,500 in Walsall and 4,000 in Wolverhampton.

Compared with the 1971 Census (Table 3.3), cycling to work in the county has declined by about 11,000 journeys, slightly reducing its modal share from 2.82% to 2.38%. This is similar to the national situation. However, in Birmingham, Coventry and Solihull the modal share rose slightly.

Men are more likely to cycle to work than women, a difference that is more marked in the lower cycling districts of Birmingham, Dudley and Wolverhampton than in the districts with higher levels of cycle use. (See Appendix 4, Table 2). Across the county men cycling to work outnumber women by 4 to 1, varying between 61.73% male in Solihull to 93.28% male in Sandwell.

Persons living in households without a car are twice as likely to cycle to work as those living in a household with one or more cars. However, 53.71% of West Midlands residents who cycle to work live in car-owning households compared with 74.65% of all residents.

Cycling to work is higher for manual workers than non-manual workers. However, between 1971 and 1981 cycling to work rose for employers, managers, professionals and intermediate non-manual workers whilst falling for skilled manual and junior non-manual workers.

TABLE 3.3 CYCLING TO WORK BY AREA OF RESIDENCE 1971 AND 1981

Area of Residence	1971 Residents who Cycle	1971 % of all Residents	1981 Residents who Cycle	1981 % of all Residents
Birmingham	7,200	1.41%	5,990	1.50%
Coventry	6,840	4.46%	5,930	4.63%
Dudley	2,840	2.02%	1,550	1.18%
Sandwell	5,280	3.30%	2,380	1.92%
Solihull	2,550	2.59%	2,430	2.72%
Walsall	5,080	4.03%	3,270	2.95%
Wolverhampton	6,760	5.51%	4,230	4.23%
West Midlands	36,550	2.81%	25,780	2.38%
England & Wales	947,990	4.39%	800,870	3.85%

Source: 1981 Census - County Report (West Midlands) Part 2 and National Report (Great Britain) Part 2.
1971 Census - West Midlands County Council (Special tabulation - 1971 figures calculated for 1981 boundaries ie post 1974 Local Government Reorganisation).

Note: The journey to work data is based on the 10% Sample of the full Census. This has been multiplied by 10 in the above table to approximate to the true numbers. Obviously, percentages are not affected.

TABLE 3.4 CYCLING TO WORK BY SOCIO-ECONOMIC GROUP 1971 AND 1981

SEGs / Year	Managers & Professionals 1,2,3,4,13	Non-Manual 5,6	Skilled Manual 8,9,	Semi-Skilled Manual 7,10,15	Unskilled Manual 11	Others 12,14 16,17,18
1971	0.63%	1.25%	4.58%	3.68%	3.30%	0.66%
1981	0.81%	1.25%	3.63%	3.68%	3.23%	0.68%

Source: 1971 Census - Tabulation specially requested from OPCS
1981 Census - County Report (West Midlands) Part 2.

TABLE 3.5 CYCLING TO WORK BY HOUSEHOLD VEHICLE OWNERSHIP BY AREA OF RESIDENCE

Area of Residence	No Car	1 Car	2+ Cars
Birmingham	2.36%	1.31%	0.70%
Coventry	7.41%	4.40%	2.06%
Dudley	2.84%	0.96%	0.52%
Sandwell	4.08%	1.05%	0.68%
Solihull	6.89%	2.95%	1.11%
Walsall	7.58%	2.01%	0.81%
Wolverhampton	7.70%	3.68%	1.62%
West Midlands	4.36%	2.05%	0.97%
England & Wales	7.13%	3.71%	1.74%

Source: 1981 Census - County Report (West Midlands) Part 2 and National Report (Great Britain) Part 2.

TABLE 3.6 CYCLISTS BY HOUSEHOLD VEHICLE OWNERSHIP BY AREA OF RESIDENCE

Area of Residence	No Car	1 Car	2+ Cars
Birmingham	47.32%	43.31%	9.36%
Coventry	38.58%	52.28%	9.14%
Dudley	43.87%	43.87%	12.26%
Sandwell	65.55%	28.56%	5.88%
Solihull	30.04%	54.73%	15.55%
Walsall	57.49%	35.47%	7.03%
Wolverhampton	46.34%	45.15%	8.51%
West Midlands	46.29%	44.43%	9.28%
England & Wales	37.77%	50.11%	12.12%

Source: 1981 Census - County Report (West Midlands) Part 2 and National Report (Great Britain) Part 2.

Non-Census Data

Information on other journey purposes is less readily available. The West Midlands Transport Monitor, an annual County Council publication detailing almost 100 pages of local transport data, contains no information about cycling beyond the county-wide journey to work statistic. The West Midlands TPP for 1986/87 contains the following statement

> "It is believed that cycling is continuing to enjoy a revival of interest.... The number of trips made by bicycle, as a proportion of total trips in the county, is likely to be less than 1% but peak hour figures range up to 7% for parts of Wolverhampton and Coventry. Likewise, secondary school trips are up to 13% at locations in these districts." (p84)

The County Council has classified bicycles as a separate category in its manual classified vehicle counts since 1982. However, the authority has not seen fit to publish the results in its regular transport statistics.

3.2.2 Accidents and Casualties

Official accident statistics are compiled by the local authority on the basis of police reports on Stats 19 forms. It is widely accepted that official statistics underestimate the actual number of road accidents, particularly for cyclists. Two studies conducted in Birmingham compared hospital records with police records.

Bull and Roberts (1972) found that less than one quarter of pedal cyclist injuries were notified to the police.

> "The high proportion of un-notified accidents to pedal cyclists suggests that local or national figures based on police data must be used with great caution. In our sample the 14 notified serious cases and 22 notified slight cases were only the tip of an iceberg of a total of 40 serious and 114 slight cases of injury to pedal cyclists; most of the missing cases were riders who fell off their machines, no other vehicle having been involved." (p51)

Pedder et al (1981) also found dramatic under-reporting of pedal cyclist accidents: 91% involving slight injuries and 83% involving serious injuries had no Stats 19 record.

However, accepting the serious shortcomings of official cyclist accident statistics, they do provide the best available indication of trends and comparative risk between areas. Moreover, they are the statistics used by local authorities and others when considering road safety measures.

TABLE 3.7 BICYCLES INVOLVED IN INJURY ACCIDENTS IN THE WEST MIDLANDS COUNTY 1978-1985

Year	Bicycles	% of All Vehicles	All Vehicles
1978	822	4.85%	16,932
1979	874	5.38%	16,239
1980	898	5.41%	16,598
1981	928	5.99%	15,485
1982	1,161	7.03%	16,521
1983	1,220	7.89%	15,470
1984	1,203	7.29%	16,484
1985	1,007	6.46%	15,591

Source: West Midlands County Council

TABLE 3.8 CYCLIST CASUALTIES BY AGE FOR THE WEST MIDLANDS COUNTY 1978-1985

Year	Child Cyclist Casualties		Adult Cyclist Casualties		Total Cyclist Casualties		Casualties (All Classes)
		(%)*		(%)*		(%)#	
1978	412	52.09%	379	47.91%	791	5.84%	13,540
1979	435	51.12%	416	48.88%	851	6.54%	13,008
1980	424	49.02%	441	50.98%	865	6.69%	12,935
1981	421	46.37%	487	53.63%	908	7.27%	12,485
1982	468	42.24%	640	57.76%	1,108	8.61%	12,874
1983	511	43.34%	668	56.66%	1,179	9.96%	11,835
1984	523	44.85%	643	55.15%	1,166	9.14%	12,764
1985	383	38.65%	608	61.35%	991	8.21%	12,069

* % of Total Cyclist Casualties
# % of Total Casualties (All Classes)

Source: West Midlands County Council

TABLE 3.9 CYCLIST CASUALTIES BY SEVERITY 1978-1985

Year	Killed	Seriously Injured	Slightly Injured	Total Killed & Injured	Cyclist Severity Index	All Users Severity Index
1978	11	138	642	791	0.188	0.253
1979	5	159	687	851	0.193	0.257
1980	11	191	663	865	0.234	0.293
1981	6	199	703	908	0.226	0.287
1982	10	223	875	1,108	0.211	0.283
1983	8	238	933	1,179	0.209	0.273
1984	10	252	904	1,166	0.225	0.282
1985	3	222	766	991	0.227	0.277

$$\text{Severity Index} = \frac{\text{Killed and Seriously Injured}}{\text{All Injuries}}$$

Source: West Midlands County Council and West Midlands Joint Data Team.

Accidents

The number of pedal cycles involved in injury accidents in the West Midlands rose by 48.4% between 1978 and 1983, then fell in both 1984 and 1985 to 22.5% above the 1978 level. By contrast, total vehicles involved in injury accidents fell by 7.9% over the same period. Pedal cycles rose from 4.85% to 6.46% of total vehicles involved in injury accidents.

Casualties

Cyclist casualties also rose until 1984 when they levelled off and declined somewhat in 1985 in line with national trends. The rise was mostly made up of an increase in adult cyclist casualties which grew from less than half of total cyclist casualties in 1978 to over three fifths in 1985. 1983 - the year in which seat-belt wearing became compulsory - saw cyclist casualties peak at 9.8% of total casualties.

Severity

Not only have cyclist casualties increased in both absolute and relative terms but also the severity of casualties has risen. The severity index for cyclist casualties rose from 0.188 in 1978 to 0.227 in 1985. Cyclist casualties are, on average, slightly less severe than casualties for all users. The average casualty severity index for all users is higher by approximately 0.06 and given that there is greater under-reporting of slight cyclist injuries than serious injuries, the true cyclist casualty severity index is probably lower still.

Casualty Rates

Because adequate measures of cycle use are not available for the County on an annual basis, it is not possible to calculate cyclist casualty rates per trip or per kilometre travelled. Table 3.2 does, however, make an assessment of the relative casualty rates between counties. If the 7 metropolitan areas are compared, it appears that the West Midlands has a lower cyclist casualty index than all others except Merseyside. However, this is a rather crude calculation, relying on one year's data, and probably says very little about the physical conditions in the counties.

3.2.3 Theft of Bicycles

In recent years, theft of bicycles has increased in the West Midlands, no doubt due to the increased levels of bicycle ownership and use and the increase in theft generally. Thefts are more common in the Summer months when bicycle use is higher. The detection rate and recovery rate are very low (15% and 6% respectively in 1981 compared with 27% and 76% for motor vehicles).

Theft of bicycles has two particular effects on cycle use: firstly, cyclists may be deterred from making trips that involve leaving the bicycle unattended in a place considered unsafe, particularly at night or for a prolonged period of time; secondly, cyclists that are victims of theft may abandon cycling altogether. The extent of these effects is not known and TRRL research into the problem was inconclusive (Morgan 1985).

TABLE 3.10 THEFT OF BICYCLES IN THE WEST MIDLANDS COUNTY 1980-1985

Year	Offences Reported	Offences Detected	Value Stolen	Value Recovered
1980	5,748	1,008	£367,838	£23,524
1981	6,270	916	£449,467	£26,557
1982	7,584	1,107	£580,533	£33,254
1983	7,025	1,493	£614,434	£38,459
1984	6,323	823	£615,302	£39,960
1985	5,079	619	£537,519	£27,016

Source: West Midlands Police, Chief Constable's Reports 1980-1985.

3.2.4 Bicycle Production and Sales

Statistics on production and sales of bicycles are not publicly (if at all) available on a county basis. The Bicycle Association does, however, provide national statistics which are reproduced below in the absence of West Midlands County data.

TABLE 3.11 BICYCLE INDUSTRY STATISTICS 1967-1985

Year	Home Production	Exports	Imports	Home Market Deliveries
1967	1,490,000	905,000	5,000	590,000
1968	1,575,000	939,000	13,000	649,000
1969	1,647,000	1,078,000	11,000	580,000
1970	1,648,000	1,034,000	27,000	641,000
1971	1,806,000	1,099,000	45,000	752,000
1972	2,019,000	1,280,000	47,000	786,000
1973	2,059,000	1,303,000	74,000	830,000
1974	1,930,000	1,176,000	174,000	928,000
1975	1,952,000	1,084,000	236,000	1,104,000
1976	1,859,000	1,009,000	250,000	1,100,000
1977	1,746,000	1,005,000	173,000	914,000
1978	2,095,000	1,221,000	260,000	1,134,000
1979	1,770,000	770,000	450,000	1,450,000
1980	1,746,000	746,000	563,000	1,563,000
1981	1,210,000	453,000	486,000	1,243,000
1981*	1,325,000	463,000	635,000	1,497,000
1982	1,408,000	182,000	624,000	1,850,000
1983	1,550,000	240,000	840,000	2,150,000
1984	1,470,000	260,000	840,000	2,050,000
1985	1,173,000	208,000	535,000	1,500,000

*In 1982 a new category - "Play" cycles - was included in the Bicycle Association Statistical return forms. 1981 figures were therefore adjusted for comparison purposes.

Source: The Bicycle Association.

3.3 Cycling Proposals and Statutory Plans

3.3.1 Statutory Plans

The current system of statutory plans is governed by the Town and Country Planning Act 1971 (as amended). Local authorities are required to draw up a hierarchy of integrated plans dealing with land use, transport and related issues. The major plans are the Structure Plan, Local Plans and Transport Policies and Programmes (TPPs). This section lists those plans that refer to cycling and summarises the proposals. The full proposals regarding cycling are reproduced in Appendix 5.

3.3.2 West Midlands County Structure Plan

The Structure Plan is a county-wide strategic plan which designates land use, economic priorities, transport proposals, housing provision and environmental policies. It is subject to statutory public participation procedures and must be approved by the Secretary of State for the Environment.

The first West Midlands County Structure Plan was approved by the Secretary of State on 25 March 1982 and became operative on 16 April 1982. However, the following month a Labour administration was elected to County Hall and they called for a Structure Plan Review.

A new policy (Tp 21: Measures to help cyclists) was proposed by the County Council as the existing Plan contained no mention of cycling. Tp 21 gives the authorities sufficient scope to implement any cycling measures that might reasonably be envisaged. It also specifies two cycle routes deemed to be of strategic importance

- Sutton Park to Birmingham City Centre
- Birmingham to Wolverhampton.

Tp 21 was welcomed by Pushbikes and other cycling groups. It was included in the Structure Plan revisions accepted by the Secretary of State and the Structure Plan became operative on 17 February 1986.

3.3.3 Transport Policies and Programme

The Transport Policies and Programme (TPP) is a document produced annually by a highway authority. It serves three functions:

- a submission to the Department of Transport for Transport Supplementary Grant
- internal coordination of transport plans
- public information

The original purpose of the TPP system was to provide a mechanism for integrated transport planning, combining both public transport and highways, and a means of treating capital and revenue expenditure equally. However, the Department of Transport has altered the process considerably over the past few years, most significantly with Department of Transport Circular 3/84 which restricts Transport Supplementary Grant to major highway schemes. In principle, the TPP is not a policy making document but a planned and costed expression of the authority's transport proposals which are decided in the Structure Plan and in Committee. There is no formal public consultation regarding the TPP and the short time period in which it must be prepared mitigates against this.

TPPs 1981-1985

Despite the lack of reference to cycling in the existing Structure Plan, the 1981 TPP contained two paragraphs on cycling: "Problems" and "Chosen Course Of Action". Referring to the Government's consultation paper on cycling, the TPP talked of "a number of initiatives" but not specific proposals.

In 1982 the £250,000 North Birmingham Cycle Route (the northern end of the Sutton Park to City Centre scheme) was included and programmed for 1985/86. Early in 1983 the County Council Highways Committee adopted a policy on cycling (See 3.4.1) and this was summarised in the TPP in July. (Despite this advance it was evident that other sections of the TPP had not altered in accordance with the new policy. For example, the road safety analysis and proposals, immediately following the section on cycling, omitted any mention of bicycles or cyclists).

The cycling section in the 1984 TPP was virtually a verbatim reproduction of the previous year except for one detail: the start date for construction of the North Birmingham Cycle Route (the only programmed scheme) was changed to 1989/90, a deferral of 4 years and well beyond the life of the soon-to-be-abolished County Council. No reference to the change was made and no explanation was given.

No change was made in the 1985 TPP except the addition of one sentence which states that urban programme funds are being sought for cycleways at Hockley in Birmingham, Foleshill in Coventry and at Willenhall in Walsall over the next 7 years. All three schemes are on disused railway lines.

3.3.4 Local Plans

The intention of the 1971 Town and Country Planning Act was that local plans should be drawn up for all districts within the Structure Plan area. The procedures for local plans are similar to those for the Structure Plan. ie The local authorities publish proposals which are then subject to public consultation. If there are sustained objections an inquiry may be called and the authorities then decide whether they will accept the recommendations of the Inspector. Unlike the structure plan, a local plan does not require approval of the Secretary of State although it must be consistent with the structure plan.

Birmingham Central Area Local Plan

The Birmingham Central Area Local Plan covers the area within the Middle Ring Road and therefore includes the central business district and the hub of the road system - the heart of the city. Following a public inquiry at which Pushbikes presented a well-researched and detailed objection, the authorities accepted proposal Tp 7 Cycling. This contains comprehensive proposals for a network of advisory cycle routes and cycle parking facilities that would enable cyclists to cross the Middle Ring Road in comparative safety and to circulate and park in the city centre. Moreover, it accepts the need to take cyclists into account in new highway schemes and to exempt them wherever possible from road closures and one-way systems.

The Plan was formally adopted by Birmingham City Council and West Midlands County Council and became effective on 12 November 1984.

Small Heath Local Plan

Published in 1984, the Small Heath Local Plan Proposals contained no reference to cycling. Pushbikes lodged a formal objection and proposed a series of measures. Following the precedent of the Central Area Local Plan, the authorities agreed to a cycling proposal in advance of the inquiry, enabling Pushbikes to withdraw its objection.

Proposal Tp 9 Cycling contains 7 items, including a commitment on the part of the authorities to investigate and remedy several dangerous junctions on the newly-constructed Small Heath By-Pass.

The Plan became effective on 24 March 1986.

3.3.5 Inner Area Studies

Five inner area studies have been drawn up by the City Council in place of area plans. They are updated annually and provide a more flexible and responsive mechanism for planning control and public participation than the once-and-for-all approach of the local plan.

Pushbikes has submitted proposals for inclusion in several inner area studies based on the report "A Cycle-Friendly Birmingham" (Newson and Norris 1985). These proposals have been incorporated in the published studies as part of the response by the public. In each case the following three general principles are included:

- Considering fully cyclists' needs in highway improvements.
- Exempting cyclists from road closures and one-way streets.
- Providing adequate cycle-parking facilities.

In each case the City Council undertakes to consider the proposals and to raise them with the County Council (the Highway Authority). However, no commitment exists on the part of the local authorities to implement the proposals unless they are already part of council policy, such as the crossings on the Middle Ring Road which were accepted in the Central Area Local Plan.

Handsworth/Soho/Lozells Inner Area Study 1985/86

Four Pushbikes proposed cycle routes enter the Study Area:

- Handsworth Park to Aston University (3 miles)

- Lozells to City Centre (1.75 miles)
- Aston Hall to Lozells route (2 miles)
- Winson Green to Handsworth (1.5 miles)

Saltley/Washwood Heath Inner Area Study 1985/86

Pushbikes proposals centre on:

- Alum Rock Road/Washwood Heath Road junction.
- Ward End Park.
- Ludlow Road/Churchill Road bridge.

Balsall Heath/North Moseley Inner Area Study 1985/86

Problems for cyclists in the area and improvements suggested by Pushbikes include the following locations:

- Crossings of the Middle Ring Road at Gooch Street/Longmore Street and Moseley Road/Leopold Street.
- Haden Way/Moseley Road junction.
- Tindal Street road closure.
- River Rea cycle route.
- Moseley to River Rea link.
- Calthorpe Park cycle route.

In addition to the proposals from Pushbikes there is support for cycling measures from the Moseley Society.

3.4 Pushbikes' Interaction with the Local Authorities

3.4.1 Introduction

This section narrates and interprets Pushbikes interaction with the local authorities since the formation of the campaign in 1979. Included in the term "local authorities" are the West Midlands County Council, Birmingham City Council, the West Midlands Police and the Regional Department of Transport. In addition, the discussions with other transport user groups such as the pedestrians and the blind are described.

As an action researcher, I was closely involved in events between 1983 and 1986. This meant representing Pushbikes at meetings and in the media, helping formulate policy and strategy, corresponding with the local authorities and producing reports. Sometimes the demands of the campaign made it difficult for me to present an image of a researcher (important for obtaining information) as the local authorities saw me increasingly as a protagonist of the cyclists' cause. This, I believe, is the perennial dilemma of the action researcher (discussed in 1.5) and it called for difficult calculations to be made, weighing the immediate demands of the campaign against the future cooperation of the authorities.

The interaction is described here in detail because, in the short term at least, the political and institutional factors proved to be more significant than the technical, financial or safety factors. The analysis of the "West Midlands Scene" which this chapter presents would be quite incomplete if it was resticted to the statistics and formal plans of the previous section. It is the political and perhaps personal factors which explain why the West Midlands in general and Birmingham in

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particular has made such little progress in the field of planning for cycling.

Most of section 3.4 is devoted to describing Pushbikes' relationship with the County Council. There are two reasons for this: Firstly, the County Council was the Strategic Planning Authority and the Highway Authority. Secondly, in Birmingham, highway work was not contracted out to the City Council under an agency agreement as in the other districts of the County. The County Council, therefore, was the crucial authority to win over to Pushbikes' cause. It will be seen, however, that the County Council did not present a unified response to Pushbikes demands. The County Planner's Department and the County Surveyor's Department pursued almost opposite policies, the former consistently supporting cycling, the latter taking a luke-warm approach at best.

The history of this interaction falls into four reasonably distinct periods:

- Making Contacts (September 1979 - August 1982)
- Working Together (September 1982 - January 1984)
- Breakdown and Antagonism (February 1984 - April 1985)
- Abolition and a Fresh Start (May 1985 - May 1986)

These periods are explained below.

3.4.2 Making Contacts (September 1979 - August 1982)

In the three years following the establishment of Pushbikes, contacts were made with officers and councillors in both the County and City Council. These contacts comprised letters, telephone calls and meetings and were a mixture of deliberate lobbying and opportunistic action when the situation permitted. They ranged from general pleas that cyclists should be included in local transport planning to specific complaints about potholes and individual junctions. Although there was some detailed and sustained negotiations concerning allowing cyclists to use the pedestrian concourse at Five Ways - a very heavily trafficked roundabout with no convenient alternative route - it is probably reasonable to say that Pushbikes objectives at this stage in their discussions with the local authorities were not clearly defined.

Meetings were held with officers of the County Surveyor's Department and the County Planner's Department to explore the issues, seek opportunities for influencing transport policy and obtaining funds. Pushbikes received a positive response from the Recreation Team within the latter department and this led to the publication on a very large scale of the "West Midlands Cycle Route" leaflets and to support and co-operation with this research project regarding the West Midlands Cycling Survey. The County Surveyor's Department was less enthusiastic and generally reactive rather than innovative. Never the less, the officers persisted with the Five Ways cycle scheme despite opposition from the police and even produced a video which graphically showed the dangers to cyclists using the roundabout.

Perhaps the most tangible sign of relations becoming formalised and between Pushbikes and the local authorities was the County Council's invitation to the campaign to become a member of the Highways Advisory Group (a non-policy making consultative forum attached to the Highways Committee). This also seemed to indicate that, in the County Council's view, cyclists had a legitimate case and that Pushbikes was a credible representative.

3.4.3 Working Together (September 1982 - January 1984)

At the September 1982 meeting of the Highways Advisory Group, Pushbikes presented a 30+ page report entitled "Towards a Cycling Policy for the West Midlands" (Pettitt 1982). This contained a reasoned case for the integration of cycling measures with general highways policy. It represented the most coherent statement of Pushbikes demands and aims to date and required a response from the County Council. The following month Pushbikes staged a demonstration in the city centre at which the Highways Committee Chairman, a Labour Party Councillor, received a petition signed by approximately 4,000 people calling for a better deal for West Midlands cyclists.

The Chairman assured the demonstration that County Council officers were studying Pushbikes' proposals. He expressed his support for measures to help cyclists and made it clear that this was an issue for which he would assume the lead County Council role. He duly visited Peterborough to see the cycle facilities that had been provided and he sought information from other members of the Association of Metropolitan Authorities. In February 1983 he and the Deputy Chairman of the Strategic Planning Committee, also a Labour Party Councillor, attended a special Pushbikes meeting at which members put to them their hopes and concerns about cycling in Birmingham. The evening was not entirely successful: the Deputy Chairman of the Strategic Planning Committee, though conciliatory and apparently relaxed, took a back-seat role. The Highways Committee Chairman seemed ill at ease in the makeshift surroundings of the Friends of the Earth building. Uncertain of his hosts, he concentrated on insisting that everything possible was being done rather than listening to his interlocutors. The councillors departed looking as if they had received an unsympathetic hearing, leaving Pushbikes members feeling frustrated and dissatisfied.

At the March Highways Committee meeting the County Council responded to Pushbikes' policy document and adopted a formal cycling policy for the first time in the County's history. It was certainly not the same as Pushbikes had proposed and it contained no strategy for implementation. However, it appeared to be a start, at least.

While still wondering how best to proceed in negotiations with the County Council, Pushbikes was taken by surprise by a telephone call form the County Surveyor's Department, inviting representatives at short notice to a meeting with the Chairman of the Highways Committee and the Assistant County Surveyor. I and one other Pushbikes member attended. We were told that £25,000 would be allocated for cycle parking facilities, that two experimental side street cycle routes would be signed and monitored and that the County Council intended to press ahead with the £250,000 North Birmingham Cycle Route. If successful, side street routes would be implemented elsewhere in the county. There was no intention on the part of the Council to negotiate around this position. However, the news seemed so positive that we could scarcely believe it. We felt happy to "agree" to such a programme.

What we did not appreciate at the time was lack of resources and determination with which the proposals would be pursued. It was left almost entirely to Pushbikes to find suitable side street routes that fitted the County Council's criteria: in Birmingham, on the highway, involving no significant engineering measures, parks or pedestrian subways. These criteria proved very restrictive and the second six months of 1983 saw a series of letters, telephone calls and meetings. between key members of Pushbikes and officers of the County Surveyor's

Department who had been allocated responsibilities for liaison on cycling issues. Pushbikes favourite scheme, the River Rea cycle route, was rejected because it passed through Cannon Hill Park, thereby requiring the agreement of the City Council. Difficulties were found with almost all other suggestions until the only worthwhile scheme remaining was the Moseley to City Centre route. The Council's only suggestion was an alternative route to the busy Stratford Road. This had been identified because one member of the County Surveyor's Department used it on his way to work. No survey work had been carried out and, on investigation, Pushbikes rejected it as wholly unacceptable without signalised crossings at two locations at least.

Whereas 1983 had started in a positive manner, relations between Pushbikes and the County Surveyor's Department deteriorated during the second half. Not only did discussions regarding a suitable trial route prove frustrating but also a number of highway schemes were implemented which made Pushbikes doubt the County Council's commitment. In June the Highways Committee finally decided not to proceed with the Five Ways cycle scheme due to opposition form the police and lack of support form the Regional Department of Transport. In November the County Council rejected any cycle crossing facility on the Small Heath By-Pass and shortly after it confirmed that the pedestrianisation of Erdington High Street would exclude cyclists whilst allowing access for delivery vehicles. Other examples also occurred which indicated that the Council was in no hurry to rethink existing plans or to allow its new cycling policy to impinge on general highway design. Moreover, in Birmingham where the County Council had responsiblity for installing the cycle parking stands none had appeared. This lack of progress might have been more easily understood by Pushbikes if the attitude of the officers in the County Surveyor's Department had been more encouraging. The reality was that the engineer in charge of liaison with Pushbikes and responsible for pursuing the cycling policy initiative was strongly opposed to pressure groups in general and to Pushbikes in particular. He objected to the fact that Pushbikes communicated both with councillors and with council officers - something he regarded as "going behind his back". Indeed, it was reported to me by at least three independent, reliable sources that this officer's stated belief was that "cyclists should be given a free bus-pass and a statue of a bicycle for their mantelpiece". It was against his better professional judgement that any special provision should be made for cyclists in the West Midlands.

January 1984 saw a great boost to Pushbikes, against the general trend of the previous six months, with a major victory at the Public Inquiry into the Birmingham Central Area Local Plan. Having objected to the totally inadequate proposal on cycling in the Draft Plan, Pushbikes presented a detailed and well-researched case to the Inspector. An expert witness (a transport planning consultant) appearing voluntarily for Pushbikes, took the County Council witness completely by surprise and he was unable to respond. During an adjournment, and with the encouragement of the Inspector, the authorities agreed to incorporate the Pushbikes' recommendations almost unchanged into the Plan. Pushbikes members were jubilant: at last a very positive and substantial set of cycling measures had been accepted by both the County and City Councils in a formal plan.

A full transcript of Pushbikes' objection and the Council's response at the inquiry is given in Appendix 6. As no official transcript is normally made at local plan inquiries of this kind, it was necessary for me to obtain the Inspector's permission to make this one. My role in the objection and Inquiry was one of advisor, presenter and overall manager: it fell to me to construct Pushbikes' case, to arrange surveys and plans of a network of possible advisory cycle routes; liaise with Pushbikes witnesses and present the objection at the Inquiry. In many ways, this was an ideal role for an action researcher.

It was an important affair for Pushbikes as it demonstrated that, given a fair hearing before an independent arbiter, the case for making provision for cyclists in Birmingham was a sound one and one that both the City and County Councils had to accept.

3.4.4 Breakdown and Antagonism (February 1984 - April 1985)

While the local media was happily reporting this breakthrough for Birmingham cyclists and Pushbikes members were absorbing the good news, trouble was brewing at County Hall! On 7th February the County Surveyor wrote to inform Pushbikes that due to the County's Rate Support Grant and Supplementary Grant allocations for 1984/85

> "money is unable to be provided (sic) for any on-highway cycling schemes for the coming year. Also the scheme to prove (sic) a sided street cycle route parallel to the Moseley Road and programmed for the current year will not be proceeded with."
>
> "This does mean that all work, at present being undertaken to provide cycling facilities, on the highway, has had to be curtailed."
> (S N Mustow, West Midlands County Surveyor, 7 February 1984)

This blunt statement confirmed Pushbikes worst fears about the intentions of the County Surveyor. Telephone calls to his department made it plain that the officers were under instructions to spend the minimum amount of time dealing with cycling. The message was clear: Don't contact us until next year.

Disapppointed that our work on the side street routes had come to nothing and faced with the totally unacceptable prospect of no progress for at least a year, Pushbikes decided to respond strongly. The perception was that there was nothing to lose and everything to gain.

The Chairperson of Pushbikes wrote immediately to Chairman of the Highways Committee who replied that the County Council was still committed to helping cyclists but he offered nothing substantive, only "jam tomorrow". Accordingly, Pushbikes launched a major campaign to gather support for reinstating cycling schemes into the Highway programme for 1984/85. Letters were sent to County Councillors, Birmingham MPs, the Department of Transport and national campaign groups such as Friends of the Earth, the Cyclists' Touring Club and Transport 2000. A demonstration was staged before the March meeting of the County Council Highways Committee and the conflict received prominent press and radio coverage.

The Highways Committee Chairman responded in angry fashion. In a live BRMB radio interview he furiously attacked Pushbikes' protests as "eyewash, nonsense and factually inaccurate" and complained of being persecuted by the "Moseley Mafia" - a reference to the liberal left-wing reputation of Moseley where a number of Pushbikes members live. What seemed to most upset the councillor was a detailed letter sent to the Secretary of the West Midlands County Labour Party, explaining Pushbikes' total frustration with recent events.

Clearly, he was in no mood to back down. In fact, he saw to it that cycling was given an even lower priority in the County Surveyor's Department for the remainder of the Council's life. The North Birmingham Cycle Route - the Chairman's oft quoted "major commitment" to cycling - was deferred by 4 years and ranked 9 on a priority scale of

1-10. No cycle stands ever appeared in Birmingham and communication between the County Surveyor and Pushbikes virtually ceased.

It should not be forgotten that, during this same period, staff in the County Planner's Department were continuing to work hard at implementing the Birmingham to Wolverhampton Cycle route along the disused railway line, though encountering obstacles in the way of British Rail and West Midlands Passenger Transport Executive. (They also had interests in the line and felt no duty to assist in the provision of a cycle route). In addition, at the time of the greatest bitterness between Pushbikes and the County Highways Chairman, the County Planner's Department were cooperating on a number of cycling initiatives, particularly the West Midlands Cycling Survey (Chapters 5 and 6).

3.4.5 Abolition and a Fresh Start (May 1985 - March 1986)

By early 1985 it was clear that so long as the particular councillor remained in control of the Highways Committee there would be no progress regarding cycling measures on the roads in Birmingham. Not only was Pushbikes being treated in a dismissive fashion, particularly at meetings of the Highways Advisory Group, but Cyclists' Touring Club representatives were being similarly treated. Even in Coventry where the District Council was the Highway Authority under an agency agreement, officers were aware that the County Council would give a low priority to cycle schemes because of the Chairman's antipathy to Pushbikes.

At this time it was also increasingly likely that the Conservative Government would succeed with its legislation to abolish the metropolitan county councils and the Greater London Council. This made it very difficult to have meaningful discussions with County Hall staff because many were leaving for new posts and there was little incentive to plan for the period beyond March 1986.

Accordingly, Pushbikes shifted its attention to the City Council which would become the successor Highway Authority in Birmingham. Relations with the City Planning Department were already established and, since the Birmingham Central Area Local Plan Inquiry, they seemed positive, respectful and promising. Pushbikes was also anxious to avoid a second confrontation with councillors and log-jam.

During National Bike Week of May 1985 Pushbikes launched a major report "A Cycle-Friendly Birmingham" (Newson and Norris 1985) which contained proposals for a network of advisory cycle routes and a strategy for its implementation. The report was conceived and guided by me (though a team of Pushbikes members helped in its production). It was primarily the result of my involvement in the Public Inquiry into the Birmingham Central Area Local Plan which made me realise that Pushbikes had the skills and resources to produce a high quality, proactive report which would largely obviate the need for ad hoc responses to local plans and transport schemes in the future. "A Cycle-Friendly Birmingham" proposed the following:

> "1) That the City and County Councils should make a commitment to establishing a network of 'advisory cycle routes,' by carrying out modifications to minor roads, junctions and footpaths, so that much safer cycling, particularly to the city centre is possible.
>
> 2) That, wherever possible, dangerous junctions should be made safer and cycle access made easier by exempting bikes from road closures and other traffic management restrictions.
>
> 3) That unnecessary 'no cycling' restrictions should be removed, experiments made with shared use of footpaths and subways and cycling routes be designated through parks and open spaces.

4) That cycle parking facilities be provided at popular destinations.

5) That both City and County Councils should allocate a budget for cycling and draw up plans for capital expenditure.

6) That both authorities appoint a full-time cycling officer to co-ordinate progress across the areas for which they have responsiblity.

7) That a Cycling Forum be set up to monitor the cycling policy and ensure participation from cyclists' organisations and close liaison with the relevant local authority departments."
(Newson and Norris 1985 p16)

The document was carefully targeted at the City Council, ignoring County Hall. It received a favourable response from the City Planning Officer and certain members of the Planning Committee, particularly the Vice Chairman. Subsequent dialogue between Pushbikes and the Council has been largely based on the proposals in the document.

On 1st March 1986 the County Council was abolished under the Local Government Act 1986 and Pushbikes now waits to see how the City Council will respond as the new Highway Authority.

3.4.6 Other Local Authorities and Interested Parties

Pushbikes saw the County Council and, to a lesser extent, the City Council as the bodies most crucial to the campaign. However, some contacts were made with the Police, the West Midlands Region Department of Transport, local representatives of the blind and the Birmingham Pedestrian Association. The Highways Advisory Group also presented an opportunity to meet representatives of other transport and civic interests such as the Automobile Association and the Civic Trust. The first four groups were most important to cycling as they were perceived by the County Council as actual or potential objectors to cycle facilities, particularly where pedestrian subways were involved.

Pushbikes contact with both the Police and the Regional Department of Transport was amicable but went no further than the exchange of information. The more problematic issue of cycle facilities, particularly the Five Ways scheme, was never properly raised.

Greater efforts were made to discuss the such issues with representatives of the National Federation of the Blind and with the local Pedestrian Association. In both cases Pushbikes reassured the groups that the interests of cyclists, the blind and pedestrians were more in common than opposed. Good relations were felt to exist and the Earlsdon to Coventry City Centre cycle route (which involved the conversion of a pedestrian subway to shared use) received the approval of local representatives of the blind. However, in Birmingham the relations were never tested as no schemes were introduced.

3.5 Conclusions

The range of material covered in this chapter is broad and presents both national and local data. At national level it is concluded from the surveys of county councils that relatively little money (about 0.2% of transport budgets) is being invested directly in schemes to assist cyclists. Similarly, analysis and policy on cycling issues is unsophisticated and fails to make important links with, for example, transport and environmental issues. The 1981 Census data and the official accident statistics show large variations between counties in the importance of cycling and the dangers to cyclists yet this is often not reflected in the local transport policies. The casualty rates for cyclists between 1974 and 1984 show a deteriorating situation despite the rise in cycle traffic which, it is suggested here, should reduce the cylist casualty rate. This rise is attributed to a worsening of conditions such as greater volumes of motor traffic, higher speed limits, inferior road surfaces and other factors.

Given this context, the West Midlands still compares unfavourably with other counties in respect of the local authority measures to assist cyclists, expenditure on cycling-related schemes and the relations between cyclist groups and the County Council. The increasing number and severity of cyclist casualties gives no grounds for complacency although the casualty index suggests that, in aggregate, the county is no more dangerous than other metropolitan counties.

Analysis of the Census shows that cycling is still an important means of travel to work. More West Midlands residents cycle to work than go by train. It is especially important for those in manual socio-economic groups and non-car owners than for other groups in the working population. This suggests that on the grounds of social equity cycling should be given a higher priority by policy makers. Moreover, it appears that cycling is losing its image as an inferior means of transport as an increasing proportion of cyclists are from professional and non-manual households.

The extracts from local plans presented here serve to illustrate the advances in planning terms that Pushbikes has made since the Inquiry into the Birmingham Central Area Local Plan. Not only did this set a valuable precedent but also it highlighted areas of inadequate knowledge and research regarding local plans for cycling. It was a major impetus to produce the strategy document "A Cycle-Friendly Birmingham" (Newson and Norris 1985) which has provided the basis of subsequent planning input from Pushbikes. The experience provides a model for other cyclist groups that may be considering participation in the local planning inquiry process.

There is a word of warning, however, from Ampt (1984) who traced the history of Australian Bikeplans. She found that "with unsettling frequency" the plan became a substitute for implementation. Plans that featured an integrated approach and were based on needs were likely to be implemented whilst plans which concentrated on physical opportunities were unlikely to ever be implemented.

Pushbikes' successes with local plans did not occur in a political vacuum: on the contrary, they were an intrinsic part of the chequered and changing relationship between Pushbikes and the local authorities, particularly the County Surveyor's Department and the Highways Committee Chairman. In terms of concrete results, such as the cycle routes implemented by other metropolitan authorities, Pushbikes largely failed to persuade the County Council to act. The serious antagonism that arose could be construed as a tactical error on the part of the campaign. However, there is reason to believe that in the long term Pushbikes' tactics were correct.

The experiments with side steet routes that the County Council curtailed were most unlikely to prove successful in terms of either attracting cyclists or reducing accidents. Detailed surveys by two Aston University undergraduates suggested that the proposed Moseley route was inferior to the use of the main road. The delay has at least allowed more knowledge to be accumulated from the experience of other areas. Pushbikes is now considerably clearer in its demands and the local authorities should be more technically competent.

The other benefit of the conflict is that cycling has a far higher political profile in Birmingham. It is seen as an issue that interests the media and one which cannot be readily dismissed. Pushbikes is perceived as a voluble and technically skilled lobby and recognised as the representative voice of local cyclists. The Highways Committee Chairman did not distinguish between the lobby and ordinary cyclists: he chose to penalise all cyclists because of his irritation with one cyclist organisation. There is a likelihood that both Pushbikes and the new highway authority, the City Council, will avoid such unprofitable conflict.

Perhaps the major lesson to be learned from the period 1983-1985 is that, despite presenting well researched and credible arguments, and despite employing classic pressure group tactics in a skilful and consistent manner, the politicians and officers were still able to resist Pushbikes' demands. This could be attributed to the personalities of key individuals; certainly, their influence on events played a crucial role. Had these individuals been more committed to the cyclists' cause and had a better understanding of the issues, things might have gone quite differently.

Yet it also highlights how cycling is seen as a marginal activity by the highway authorities and that they consider planning for cyclists to be an "optional extra". It shows the political and economic weakness of the cyclists' lobby when confronted by intransigent politicians and engineers. No other major road user group could be so completely ignored. Most of all, it implies that, if cycling is to become integrated into transport planning on a genuine as opposed to token basis, more fundamental changes are required than the persuasion of local councillors.

CHAPTER FOUR: WEST MIDLANDS CYCLING SURVEY - SURVEY DESIGN

Contents

Outline

The origins, design and execution of the West Midlands Cycling Survey are described. The methodological issues are interspersed with the practicalities of conducting a large survey with limited resources and experience, whilst trying to satisfy the differing demands of the West Midlands County Council, academic research and Pushbikes.

4.1 Introduction

At an early stage in the research project the idea of a local survey of cycling was raised. In a meeting between myself, a Senior Planner of the Recreation Section and his assistant, it emerged that the County Council lacked information on what it termed the "demand side of cycling" and would consider funding a survey on this matter. Pushbikes was also keen on the idea of a survey as it offered the prospect of ending the fruitless dispute over the true level of cycling in the county and demand for facilities. In addition, it was clear to me that insufficient data was available, particularly at local level to answer many of the key questions about planning for cyclists in the West Midlands.

4.2 Aims and Hypotheses

4.2.1 Aims

The survey was needed to provide information at County and District level to assist in planning for cyclists. In particular, the aims were to assess at local level

- bicycle ownership
- bicycle use
- demand for cycling facilities
- problems encountered by cyclists
- attitudes towards cycling and cyclists

4.2.2 Hypotheses

From the aims (which were relatively easy to determine) the following set of hypotheses was derived which gave a sharper focus to the survey.[1]

- Cycle use is higher for members of lower socio-economic groups and disadvantaged groups such as the unemployed.
- Bicycle ownership is rising faster amongst the higher socio-economic groups and those in employment.
- Use of bicycles by owners is low compared with use of other vehicles by owners.
- The determinants of bicycle ownership and use are attitudinal and socio-economic as well as physical.
- Demand for cycle facilities is high amongst both bicycle owners and non-bicycle-owners.

4.3 Method

4.3.1 Selection of Method

In theory, a number of methods were available for collection of the data and considerable discussion went into to selecting the correct one. It was important that the method chosen took account of the following requirements. It had to

- be accurately representative of the West Midlands population

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[1] It would be misleading, however, to see the survey primarily as a tool to answer these hypotheses. Indeed, it is questionable how important formal hypotheses are in an action research project such as this. Certainly, no central hypothesis (or even set of hypotheses) could be identified as essential to Pushbikes or the West Midlands County Council. Hypotheses are probably more appropriate at a more advanced stage of research when there is greater certainty regarding basic data. In a live problem situation such as this a set of exploratory questions were more necessary than the testing of specific hypotheses.

- cover all 7 metropolitan districts
- be sufficiently large to provide statistically significant results
- allow comparison with other data sources (eg the Census)
- allow computer analysis of the data
- include both cyclists and non-cyclists
- be addressed to individuals (for attitudinal questions)
- meet time and cost constraints

A postal questionnaire seemed to best meet these requirements. It would be ideal for reaching a sample that was geographically dispersed throughout the county, without excessive cost. Given a suitable sample frame, such as the register of electors, it would be possible to select a precise sample sufficiently large for statistical analysis and representative of the adult population. A pre-coded questionnaire would avoid transcription of the answers and allow computer analysis.

At this initial stage an interview survey was rejected because of the substantial extra cost, the greater amount of time required and the possibility of undue interviewer bias. Moreover, it was felt that interviews would be less convenient for the people selected compared with completing a postal questionnaire. It might also be substantially more difficult to obtain interviews with named respondents than to obtain their answers by questionnaire.

It was further decided to split the survey into two separate phases, the first to be undertaken in the Spring and the second in the Summer. This offered the advantages of obtaining a more representative response and reducing seasonal bias which could be significant in relation to an outdoor activity such as cycling.

The problem of non-respondents was not fully resolved. It was agreed that a postal reminder to all non-respondents would be administratively difficult and not cost-effective as the response to such follow ups is usually poor. It was agreed that no follow up would be undertaken but that an assessment would be made of the representativeness of the response when presenting the results.

4.3.2 Pilot Survey

In order to test its suitability, a pilot questionnaire was drafted (several times) and sent in August 1983 to 198 people (66 per ward) systematically sampled[2] from the registers of electors for Moseley, Soho and Sutton Coldfield Wards, all within the Birmingham District. The results provided valuable information on the likely response rate and ambiguities in the layout and wording of questions.

The economically depressed inner city ward Soho had a response rate of only 18% whilst the affluent Royal Borough of Sutton Coldfield had a response rate more than twice as high at 39%. Overall, a 30% response rate was obtained without any follow up, which was very encouraging. Some questions were revised and the range of pre-coded choices altered on the basis of the responses. Perhaps most useful of all was that it gave me first hand experience of undertaking a (limited) survey, thus giving me a better indication of what the full survey might entail.

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[2] The total number of electors was divided by the number required for the pilot study (66 per ward). From a random start point in the register of electors every nth name was then selected until the the required total was reached.

The experience of carrying out the pilot survey made me realise just how time consuming the mechanics of the survey could be. Selecting the names from the electoral roll, transcribing them to a list, addressing the envelopes, folding the questionnaires ..... All this took the best part of two days for a sample of under 200. It was clear that if I undertook the main survey without assistance other important aspects of the research project would be seriously neglected.

The County Council suggested obtaining lists of addresses from the Post Office based on their computerised post code data base. However, these lists were of addresses only and did not contain names. As an important part of the survey was to obtain information about individuals, including opinions, the household approach was inadequate. The only other publicly available source of names and addresses were the registers of electors and, although no computerised listing was available, it was decided that these would be used as the sample frame.

Direct Mail Firms

After consulting various business directories and telephoning a number of direct mail firms for quotations it seemed that the routine part of the survey could be contracted out at a reasonable cost and with substantial time saving benefits. A Leamington based company was selected to address and fill the envelopes. A written quotation was obtained for £181.00 (£45 plus VAT per thousand names) for selecting names and addresses from the lists of electors in accordance with my instructions, addressing the envelopes and inserting the covering letter and questionnaire. This proved to be less than perfect as I explain in 4.4.4 but at the time it appeared to be excellent value for money.

Early County Council suggestions of substantial financial support for the survey failed to materialise. After many months of implying that they would pay for the addressing, printing and postage costs, they eventually agreed only to do the printing, provide the envelopes and pay £250 towards the other survey costs. This left the survey budget with a considerable deficit and necessitated a number of economy measures. In particular, there was insufficient money to pay for the postage on 3,500 postal questionnaires.

The problem was resolved by a dozen Pushbikes members who agreed to hand-deliver the questionnaires for the meagre sum of 4p per item. Needless to say, most of the deliveries were made by bicycle. This proved a cost-effective arrangement with the added advantage that the deliverers reported back on addresses which were incorrect, or where a house was boarded up, or the voter had moved or died. Its one disadvantage was that the questionnaires were delivered over a period of several weeks. This, however, was not material to any of the questions in the survey.

4.3.3 Revising the Method

As the completed questionnaires began to arrive, it became clear that a rethink was needed regarding the second half of the survey. Firstly, and most importantly, there were methodological weaknesses in simply repeating the postal questionnaire with a new sample. The respondent bias and the lack of information about non-respondents would remain, despite the larger total sample. Secondly, there were practical problems. The exhausting experience of the first half left the deliverers (and me) quite unenthusiastic about repeating the process.

In fact, I am sure they would have refused to deliver a further 3,500 questionnaires even at double the pay[3]. Equally problematic, when the invoice from the direct mail firm arrived it was for £281, one hundred pounds higher than the sum quoted. After some discussion I refused to pay any more than the quoted amount but clearly I could not expect to get the second half of the work done at the originally quoted (lower) price.

Consequently, it was decided that instead of further postal questionnaires an alternative method should be found which would satisfy these new parameters.

Follow-up Interviews

Although interviews had been rejected for the initial phase of the survey as too costly and of no significant benefit, it was decided that we should attempt face to face interviews with the non-respondents, using the questionnaire as the interview schedule. This would avoid obtaining further responses from the same type of respondent (assuming some form of bias existed in the response) and allow direct comparison between those who answered the questionnaire and those who did not. In order to do this, interviewers had to be recruited and trained and Pushbikes agreed to meet this cost from its research budget as it was unlikely that the County Council would provide any further money. The

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[3] One deliverer, aged almost 60, claimed that he nearly suffered a heart attack when a gang of youths locked him in a public toilet on the Kingshurst estate, Solihull. He was released when a passing bus driver heard his cries.

County did, however, honour their agreement to print the additional interview schedules.

The interviews were carried out during July and August 1984 by myself and 18 part-time paid interviewers. The interviewers were mostly students and they received £1.00 per completed interview and 50p per part interview. In addition they were paid 50p per hour plus travel expenses.

Interviewing was a more time consuming and expensive method of data collection than the postal questionnaire. Whereas each questionnaire response cost an average of 50p, each interview response cost at least £1.50. It required considerable management on my part to recruit, train, organise and monitor the interviewers, despite their co-operation and goodwill. However, the interviews produced valuable information that gives greater validity to the survey results, both quantitatively and qualitatively. Face to face interviews also give the researcher a "feel" for the replies and the respondents' interest in the questions, which cannot be gleaned from the returned questionnaires.

4.4 Sample

4.4.1 Sample Size

In the light of the possible abolition of West Midlands County Council (now, of course, a fact), it was considered prudent to have the potential for district level analysis which would be of greater interest to the seven district councils. In addition the possibility for inter-district comparisons was also an advantage of this larger sample size. Thus, the minimum level at which the results needed to be statistically significant was set at metropolitan district level and there were seven districts.

The calculation of the sample size is given in Figure 4.1. It is based on the criteria that the result for question 9 (If cycle facilities were provided would you use them?) at district level should be accurate within two standard errors at the 95% confidence level. This means that if 25% of respondents stated they would use cycle facilities, as in the pilot survey, we could be 95% certain that the true percentage for the population lay within the 20% to 30% range.

On the assumption of a 30% response rate to the postal questionnaire and a further 30% response by interview, the total sample was calculated at 3,500 (500 x 7 districts).

FIGURE 4.1
WEST MIDLANDS CYCLING SURVEY: CALCULATION OF SAMPLE SIZE

Assumptions

1) Response rate 60%. (30% from questionnaire as per pilot survey, 30% from interviews).

2) Statistical significance required at District level.

3) Statistical significance required for question no. 9.

(Q9 If safer cycling facilities such as these were provided on relatively quiet side street routes, do you think you would use them? 25% of respondents in pilot answered 'yes').

Calculation

$$\text{Standard Error} = \sqrt{\frac{p\,q}{n}}$$

where p = positive responses to question no. 9 and q = 1-p and n = sample size.

$$SE = \sqrt{\frac{0.25 \times 0.75}{n}}$$

To find a sample size where 2 x SE = 0.05
(i.e. $p < 0.30$ and $q > 0.20$ at 95% confidence level).

$$2 \times \sqrt{\frac{0.25 \times 0.75}{n}} = 0.05$$

$$\frac{0.25 \times 0.75}{n} = (0.025)^2$$

$$n = \frac{0.25 \times 0.75}{(0.025)^2}$$

$$n = 300$$

Assuming 60% response rate, 500 questionnaires will need to be distributed in order to obtain 300 responses. This means 3,500 questionnaires are required, 500 for each of the seven Districts.

TABLE 4.1
WEST MIDLANDS CYCLING SURVEY : STRUCTURE OF SAMPLE

LEVEL	SELECTED
Population	West Midlands Metropolitan County - 2.7 million people
Sample Stratification	Seven Metropolitan Districts
Sub-stratification	21 Census Wards (3 per District)
Sample Frame	Electoral Registers for 21 County Electoral Divisions (equivalent to Census Wards).
Sample	3,480 named electors
Respondents	1,157 (Questionnaire) 983 (Interview) 2,140 Total

Definition of Survey Terms

Throughout this thesis the following terms and defintions have been used in the description of the West Midlands Cycling Survey.

Population — The population of the West Midlands Metropolitan County.

Sample Frame — The Registers of Electors from which the Sample was selected.

Sample — The 3,480 adults systematically selected from the Sample Frame to whom questionnaires were sent.

Respondents — Those members of the Sample that responded to the questionnaire or to the interview.

Note that the Sample refers to both respondents and non-respondents whilst Respondents refers only to those who replied.

1981 CENSUS WARDS

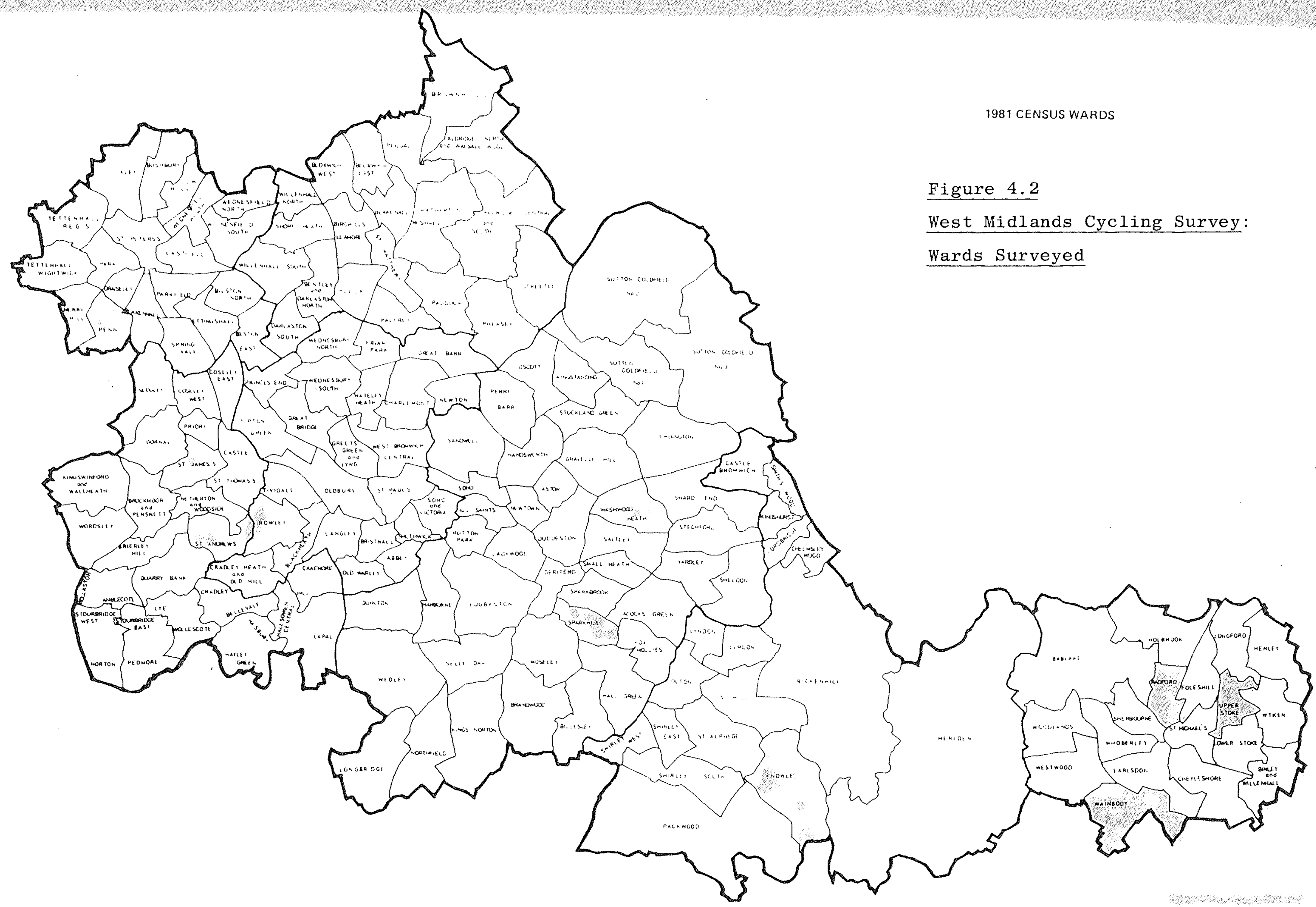
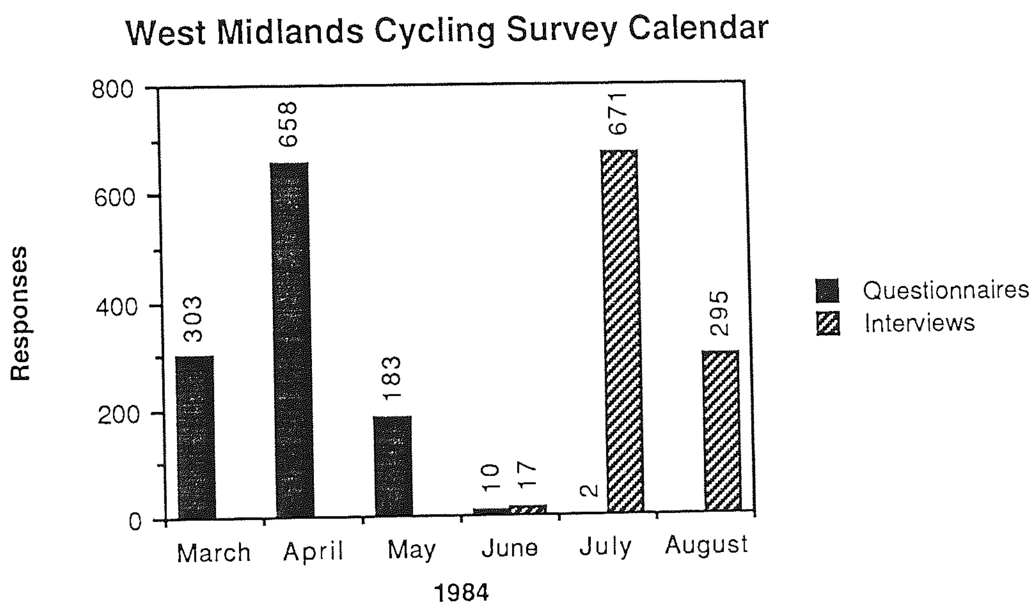


Figure 4.2

West Midlands Cycling Survey: Wards Surveyed

Figure 4.3


West Midlands Cycling Survey Calendar
Responses
800
600
400
200
0
303
658
183
10
17
2
671
295
March
April
May
June
July
August
1984
Questionnaires
Interviews

4.4.2 Sample Structure

The sample structure is summarised and the survey terms defined in Table 4.1. Within each of the seven West Midlands districts, three census wards were selected and approximately 167 electors chosen per ward. The reasons for this structure and the methods of selection are explained below.

4.4.3 Sample Selection Method

A two stage systematic sampling method was employed:

a) The census wards for each district were ranked in order of bicycle use for the work journey, as measured by the 1981 Census. From randomly selected starts, each list of wards was divided into three equal segments and the first ward in each segment selected. Thus, 21 wards were chosen (Figure 4.2) which included a high, medium and low cycling area in each district. In all but one district (Dudley) this method also gave a satisfactory geographical spread of wards. Because in Dudley two of the selected wards were adjacent thus reducing the geographical spread, one was replaced by the next ward on the list.

The use of census wards allowed the selection of a representative cross-section of cycling areas. It also allowed the possibility of direct comparison between the census data and survey data at a very local level. Grouping the sample by ward made it financially possible to deliver the questionnaires by hand and to conduct interviews. This would not have been feasible if the sample had been randomly scattered throughout the County. Systematic sampling, correctly undertaken, approximates sufficiently closely to random sampling to allow standard statistical tests based on the normal distribution and gives the researcher greater control over the sample.

b) The 21 census wards had the same boundaries as 21 County Electoral Divisions (the County Council electoral unit). The registers of electors for these divisions were used as the sample frame and 167 voters systematically selected from each register after random start points (Table 4.2).

A further advantage of using a limited number of wards was that a limited number of electoral registers were required.

TABLE 4.2
WEST MIDLANDS CYCLING SURVEY: SAMPLING RATES

District	Ward	Total Electors	Selected Number	(%)
Birmingham	Handsworth	16,482	162	(0.98)
	Sparkhill	16,509	158	(0.96)
	Washwood Heath	17,980	176	(0.98)
Coventry	Radford	13,727	165	(1.20)
	Upper Stoke	13,581	168	(1.24)
	Wainbody	11,799	153	(1.30)
Dudley	St James's	9,981	160	(1.60)
	Wordsley	10,814	179	(1.66)
	St Andrews	9,540	165	(1.73)
Sandwell	Rowley	9,960	162	(1.63)
	Smethwick	10,165	168	(1.65)
	Wednesbury South	10,028	165	(1.65)
Solihull	Chelmsley Wood	9,094	167	(1.84)
	Kingshurst	7,132	168	(2.36)
	Knowle	8,197	160	(1.95)
Walsall	Aldridge North & Walsall Wood	9,574	168	(1.75)
	Birchills Leamore	10,481	169	(1.61)
	Darlaston South	10,285	169	(1.64)
Wolverhampton	Bilston North	11,203	166	(1.48)
	Penn	10,428	166	(1.59)
	Wednesfield Heath	9,297	166	(1.79)
TOTAL		236,257	3,480	(1.47)

TABLE 4.3
WEST MIDLANDS CYCLING SURVEY: SUMMARY OF SAMPLE AND SEX BIAS

District	Ward	Male	(%)	Female	(%)	Total	(%)
Birmingham	Handsworth	107		55		162	
	Sparkhill	130		28		158	
	Washwood Heath	124		52		176	
Total		361	(73)	135	(27)	496	(100)
Coventry	Radford	149		16		165	
	Upper Stoke	149		19		168	
	Wainbody	130		23		153	
Total		428	(88)	58	(12)	486	(100)
Dudley	St James's	96		64		160	
	Wordsley	137		42		179	
	St Andrew's	136		29		165	
Total		369	(73)	135	(27)	504	(100)
Sandwell	Rowley	135		27		162	
	Smethwick	137		31		168	
	Wednesbury South	136		29		165	
Total		408	(82)	87	(18)	495	(100)
Solihull	Chelmsley Wood	90		77		167	
	Kingshurst	108		60		168	
	Knowle	105		55		160	
Total		303	(61)	192	(39)	495	(100)
Walsall	Aldridge North and Walsall Wood	140		28		168	
	Birchills Leamore	114		55		169	
	Darlaston South	127		42		169	
Total		381	(75)	125	(25)	495	(100)
Wolverhampton	Bilston North	123		43*		166	
	Penn	124		42*		166	
	Wednesfield South	123		43*		166	
Total		370	(74)	128	(26)	498	(100)
TOTAL	WEST MIDLANDS	2,620	(75)	860	(25)	3,480	(100)

*Figures are for the original sample selected. The additional sample (mostly female) is not included.

4.4.4 Sample Bias

The first stage of selecting the sample was carried out by myself. The second stage was contracted out to the direct mail company as they were able to complete the work considerably more quickly than I could have done working unassisted. The registers of electors and the questionnaires, envelopes, etc. were delivered to the company by me personally. I gave written and verbal instructions as to exactly how the 167 electors should be selected from each register in accordance with the systematic sampling techniques described in 4.4.3.

Three weeks later the job was done and I collected the boxes of addressed questionnaires from Leamington. Most of them were handed immediately to the deliverers and those for Coventry were posted. Only later did the problem of bias emerge.

It was pointed out to me by one of the deliverers that there were considerably more questionnaires addressed to men than women. I checked this against the marked registers of electors and discovered, to my horror, that this was indeed true. Instead of selecting every "nth" name as I had instructed, the company had frequently selected the nearest male name when the "nth" name was female.

The direct mail company were unable to offer any explanation and as I had already paid them, albeit less than they demanded, there was little I could do. More fundamental to the survey, the questionnaires were already distributed and being returned.

The extent of the sex bias in the sample is shown in Table 4.3. It varies between a low of 12% female in Coventry and a high of 39% female in Solihull. Overall, the sample contained three males for every one female.

Clearly this was a major distortion of what was intended to be a carefully structured, representative sample. The problem was discussed at length and four decisions were made:

a) The interviews of non-respondents were of great importance and the sample, although flawed, had to be used for this purpose.

b) To reduce the sex bias, special efforts would be made to interview the females in the sample.

c) In Wolverhampton where the response to the questionnaire was highest, a fresh sample of predominantly females would be selected for interview in order to provide a larger female sample overall.

d) The results would not be weighted (to produce a representative sample) but would be analysed separately for males and females.

A further deficiency of the sample as selected by the direct mail company was the <u>apparent</u> tendency for electors with long or complicated foreign names to be omitted. This was by no means absolute and, unlike the sex bias, the effect on the overall results was probably immaterial. However, it is possible that ethnic minorities were slightly under-represented in the sample.

Finally, whilst the register of electors is the best available sample frame it is not a perfect list of adult residents. Only UK citizens are entitled to register; not all adults are registered and some may remain on the register even after they have moved from the area or died. Only those seventeen year olds reaching their 18th birthday by a certain date are eligible for registration and minority groups are known to be under-represented.

TABLE 4.4
WEST MIDLANDS CYCLING SURVEY: RATES OF RESPONSE

Area	Questionnaire Response (%)	Interview Response (%)	Total Response (%)	Sample Size (%)
Handsworth	48	51	99	162
Sparkhill	49	37	86	158
Washwood Heath	46	54	100	176
BIRMINGHAM	143 (28.8)	142 (28.6)	285 (57.5)	496 (100)
Radford	48	29	77	165
Upper Stoke	44	54	98	168
Wainbody	68	33	101	153
COVENTRY	160 (32.9)	116 (23.7)	275 (56.8)	486 (100)
St James	48	39	87	160
Wordsley	70	32	102	179
St Andrews	55	47	102	165
DUDLEY	173 (34.3)	118 (23.4)	291 (57.7)	504 (100)
Rowley	48	62	110	162
Smethwick	51	48	99	168
Wednesbury South	39	55	94	165
SANDWELL	138 (28.1)	165 (33.3)	304 (61.4)	495 (100)
Chelmsley Wood	45	67	112	167
Kingshurst	58	47	105	168
Knowle	71	32	103	160
SOLIHULL	174 (35.2)	146 (29.3)	320 (64.4)	495 (100)
Aldridge North	65	34	99	168
Birchills Leamore	42	51	93	169
Darlaston South	40	60	100	169
WALSALL	147 (29.1)	145 (28.7)	292 (57.7)	506 (100)
Bilston North	50	48	98	166
Penn	82	42	124	166
Wednesfield Heath	60	61	121	166
WOLVERHAMPTON	192 (38.6)	151 (33.3)	343 (68.9)	498 (100)
Others*	30	-	30	-
WEST MIDLANDS	1,157 (33.2)	983 (28.2)	2,140 (61.5)	3,480 (100)

* Others include questionnaires received with no respondent's address and questionnaires received from areas outside the 21 survey areas, presumably forwarded to people recently moved.

4.5 Response

4.5.1 Rates of Response

Overall Rates of Response

The overall rate of response to the West Midlands Cycling Survey was 61.5% (Table 4.4). From a sample of 3,480, 2,140 responses were obtained. In addition, between 200 and 300 of the sample can be discounted as they never received the questionnaire due to errors in the registers of electors, wrongly addressed questionnaires, difficulties in locating the house and people having moving away or died. This represents as much as 10% of the sample. If the response were to be adjusted for these people who cannot properly be considered as non-respondents the overall response rate would be between 65% and 67%. However, the conservative figures of 3,480 and 61.5% have been used throughout this thesis.

Response To the Questionnaire

The response to the postal questionnaire varied from 28.8% in Birmingham to 38.6% in Wolverhampton. Across the County a 33.2% response was obtained which proved the pilot survey response rate of 30% to be an excellent prediction.

Figure 4.3 shows the period during which the questionnaires were returned. With the exception of 13, all were received within 10 weeks but because they were not all delivered on the same day it is not possible to say exactly how long respondents took to reply. One, however, did not reply until September, at least five months after delivery of the questionnaire.

Response To the Interview

A further 28.2% of the total sample was interviewed during July and August 1984. At least 1,939 calls were made to the homes of non-respondents during July and August (Table 4.5). 786 full interviews and 28 part interviews were obtained. In addition, 175 interviews were obtained from other members of the household when the named householder could not be interviewed. This was necessary in the case of people who were unable or unwilling to answer the questions due to other commitments, illness, shift work, etc. In these cases only strictly factual questions were asked.

It is not meaningful to compare the response rate for the postal questionnaire with the percentage response obtained by interview as the latter depended very much on the amount of time, skill and effort shown by the interviewer as well as the interviewee's availability and willingness to be interviewed. Moreover, more resources were devoted to interviewing in wards where the response to the questionnaire was lower than average. Thus, for example, the 23.4% interview rate for Dudley is a partial function of the above average response to the questionnaire. It cannot be compared with, say, the 28.7% interview response in Walsall as Walsall had a below average response to the questionnaire. Nor should it be concluded that because an area has a different levels of response to the two survey methods the respondents necessarily preferred one method to the other. The objective of the interviews was to obtain a total response rate of around 60% at district level.

The experience of the interviewers was mostly encouraging: people were mostly friendly and prepared to answer the questions. The interviewers were frequently invited into the interviewee's home and even offered refreshment. Far from appearing antagonistic or suspicious as we feared might be the reaction, many interviewees seemed glad to be asked for their views. Table 4.5 shows the results of the 1,939 calls made.

TABLE 4.5
WEST MIDLANDS CYCLING SURVEY : INTERVIEW RESPONSES

Result of Call	1st Call	2nd Call	3rd Call	Total
1. Full Interview	693	77	16	786
2. Part Interview	22	6	-	28
3. Details from another	169	5	1	175
4. Answered Questionnaire	35	2	-	37
5. Respondent out	46	5	1	52
6. No answer	396	89	17	502
7. House empty	23	1	-	24
8. Moved away	86	6	1	93
9. Wrong address	6	1	-	7
10. Cannot locate address	29	1	-	30
11. Refusal: too busy	55	1	1	57
12. Refusal: not interested	80	3	1	84
13. Refusal: antagonistic	6	-	-	6
14. Refusal: suspicious	8	2	-	10
15. Refusal: ill health	14	2	-	16
16. Refusal: no reason	14	1	-	15
17. Language difficulty	1	-	-	1
18. Access problems	6	1	-	7
19. Deceased	9	-	-	9
TOTAL	1,698	203	38	1,939

* Full and Part Interviews total 989 over the three calls. This shows that 6 respondents were interviewed twice because only limited responses (ie part interviews) were obtained at the first call. Total respondents giving full or part interviews is 983.

4.5.2 Representativeness of the Response

Although a response was obtained from almost two thirds of all people who received a questionnaire and although the size of the survey ensures a high degree of statistical significance for most results, it is still important to check that the response is representative of the population. Section 4.4.4 explained the sex bias in the sample due to a deviation from the systematic sampling instructions. However, even if the sample frame had been perfectly representative of the population and the sample had been correctly selected, one would still have expected bias in the response. Such bias might be due to different levels of literacy, propensity to answer questionnaires and interest in the survey subject matter. In order to check these possiblities two sets of comparisons were conducted.

1) Comparison of respondents to the questionnaire with respondents to the interview.

These are summarised in Tables 4.6 to 4.8 and the full comparisons are presented as crosstabulations in Appendix 10, Tables 7.1 to 7.9. Chi Square is used to test for relationships between the survey method (questionnaire and interview) and the respondents socio-demographic characteristics. A Chi Square value giving a significance of less than 0.05 (ie 95%) is considered "significant" for the purposes of these tests. With the exception of marital status, all the characteristics tested showed a significant relationship to the survey method.

2) Comparison of total respondents with the population where population values are known.

The population values for sex, age, marital status and household car ownership are taken from the 1981 Census and the comparisons are summarised in Tables 4.9 and 4.10. The Chi Square test was used to measure differences between the respondents (observed values) and the population (expected values)[4].

Comparison of Questionnaire and Interview Respondents

Sex

It is not meaningful to compare the percentage of female respondents that answered the questionnaire with the percentage of female respondents that were interviewed as extra efforts were made to obtain interviews with women because they were known to be under represented in the sample. There was no significant difference between men and women in their propensity to answer the questionnaire. The response from men who received the questionnaire was 32.3% and from women it was 34.1% (a difference of only 0.597 standard errors, not significant at the 95% level).

Age

Younger respondents (under 40 years) were more likely to answer the questionnaire than be interviewed whereas respondents over 64 years were less likely to answer the questionnaire than to be interviewed. (Appendix 10, Table 7.3).

Marital Status

Marital status was not a significant influence on the response to

[4]There is some dispute regarding the suitability of Chi Square in tests where the population values are known. (See Nie et al 1976 p224). Notwithstanding these differing views, Chi Square has been used here because it is offers a readily understandable statistical assessment of the degree to which the distribution of the respondents, in terms of key socio-demographic characteristics, differs significantly from the population distribution.

the questionnaire. 53.3% of married respondents and 56.6% of single respondents answered the questionnaire. (Appendix 10, Table 7.2).

Employment

Employed, unemployed and student respondents answered the questionnaire more readily than housewives and retired respondents who were mostly interviewed. (Appendix 10, Table 7.4).

Occupation

Respondents in managerial and professional occupations replied to the questionnaire rather than the interview. Those respondents in manual and intermediate non-manual occupations were more likely to be interviewed than to answer the questionnaire. (Appendix 10, Table 7.5).

Household Car Ownership

Respondents living in a household with one or more cars answered the questionnaire more readily than the interview. Respondents living in a household with no car were more likely to be interviewed than to answer the questionnaire. (Table 4.6 and Appendix 10, Table 7.7).

Bicycle Ownership

71.9% of respondents who owned a bicycle replied to the questionnaire whilst respondents who did not own a bicycle responded slightly more readily to the interview than to the questionnaire. (Table 4.7 and Appendix 10, Table 7.6).

Pedestrian-Cyclist Accident

82.4% of respondents that, as a pedestrian, had been involved in an accident with a cyclist replied to the questionnaire. This compares with the 55.1% of respondents not involved in a pedestrian-cyclist accident who answered the questionnaire. (Table 4.8 and Appendix 10, Table 7.9).

TABLE 4.6
WEST MIDLANDS CYCLING SURVEY: COMPARISON OF RESPONSE TO QUESTIONNAIRE AND INTERVIEW BY HOUSEHOLD CAR OWNERSHIP

	Car Owners (%)	Non-Car Owners (%)
Responded to Questionnaire	57.8	45.9
Responded to Interview	42.2	54.1
Total	100.0	100.0

TABLE 4.7
WEST MIDLANDS CYCLING SURVEY: COMPARISON OF RESPONSE TO QUESTIONNAIRE AND INTERVIEW BY BICYCLE OWNERSHIP

	Bicycle Owners (%)	Non-Bicycle Owners (%)
Responded to Questionnaire	71.9	49.1
Responded to Interview	28.1	50.9
Total	100.0	100.0

TABLE 4.8
WEST MIDLANDS CYCLING SURVEY: COMPARISON OF RESPONSE TO QUESTIONNAIRE AND INTERVIEW BY INVOLVEMENT IN A PEDESTRIAN-CYCLIST ACCIDENT

	Accident (%)	No Accident (%)
Responded to Questionnaire	82.4	55.1
Responded to Interview	17.6	44.9
Total	100.0	100.0

Conclusion

The above comparisons show that the questionnaire elicted a stronger response from certain population groups than from others. In particular, young people, those in professional and managerial occupations, those living in car-owning households, those owning bicycles and those pedestrians who had been involved in an accident with a cyclist were most likely to answer the questionnaire.

This shows the importance of the second (interview) stage of the survey. If the interviews of non-respondents had not been carried out a very unrepresentative set results would have been obtained.

Comparison of Respondents with the Population

The respondents (to both questionnaire and interview) were compared with the population for known characteristics, as given in the 1981 Census.

Sex

The response is not representative of the population in terms of sex. This was inevitable from the sample. Whereas the adult population (aged 17 and over) contains slightly more women than men, only three out of ten respondents are women (Table 4.9). With the exception of Wolverhampton where a different sample was selected for interview, women are under-represented amongst respondents in all Districts. To eliminate this distortion, the results are analysed separately from men and women where sex is an influencing factor.

Age

The age distribution of the women respondents is not significantly different to the age distribution of the West Midlands adult population of women. However, a significant difference does exist between the age distribution of male respondents and the age distribution of the male population. The response under-represents men in the 17-20 years age group and women of over 64 years (Table 4.10).

The most likely explanation is that a lower proportion of people in this age group are registered to vote compared with people in older age groups. Additionally, the register of electors contains only 17 year olds entitled to vote by a certain date whereas the 1981 Census enumerates all 17 year olds. 17 year olds are under-represented amongst respondents when compared with the population.

The lower than expected proportion of women over 64 amongst respondents is probably due to their greater fear of being interviewed and their low incidence of bicycle ownership.

Marital Status

Single men are under-represented by 7% amongst respondents, probably due to the under-representation of 17-20 year olds in the sample as explained above. The response for women is within 1% of the population distribution. (Table 4.10).

Household Car Ownership

Household car ownership is almost 14% higher amongst respondents than amongst the population (Table 4.9). 30.7% of respondents live in households with no car compared with 44.30% of the population which lived in households without a car. This is probably due to a combination of factors. Firstly, men are over-represented in the sample and they are more likely than women to own a car. Secondly, it may partly due to inadequate understanding of the term household by respondents. For example, individuals living together may have considered themselves as a household but the 1981 Census defines a household as living together and "having meals prepared together and with common housekeeping". Although the definition in the West Midlands

Cycling Survey was intended to be the same as the Census definition, it was less rigorously enforced.

TABLE 4.9 WEST MIDLANDS CYCLING SURVEY: COMPARISON OF RESPONDENTS AND POPULATION BY SEX AND HOUSEHOLD VEHICLE OWNERSHIP

Sex	Respondents (%)	Population (%)
Male	70.30	48.50
Female	29.70	51.50
Total	100.00	100.00
Household Car Ownership		
No Car	31.48	44.30
1 Car	47.62	42.80
2 Cars	17.22	11.10
>2 Cars	3.68	1.80
Total	100.00	100.00

TABLE 4.10 WEST MIDLANDS CYCLING SURVEY: COMPARISON OF RESPONDENTS AND POPULATION BY AGE AND MARITAL STATUS

	Respondents (%)		Population (%)	
Age	Men	Women	Men	Women
17-20	6.8	9.3	9.52	8.74
21-29	17.3	18.5	17.68	15.99
30-39	18.9	18.5	18.09	16.61
40-49	16.4	15.6	15.88	14.52
50-59	16.3	14.0	16.72	15.68
60-64	8.7	6.8	7.19	7.32
>64	15.5	17.4	14.92	21.13
Total	100.0	100.0	100.00	100.00
Marital Status				
Married	74.5	64.0	67.14	63.08
Single	25.5	36.0	32.86	36.92
Total	100.0	100.0	100.00	100.00

4.5 Conclusions

The West Midlands Cycling Survey took 18 months from inception to execution and further time for collation, verification and analysis of the results. It is the largest survey on cycling to have been conducted in the West Midlands County and possibly the largest on the specific issues of bicycle ownership, bicycle use and attitudes to cycling to have been conducted in Britain to date. It was designed and structured using scientific sampling methods in order to provide a controlled sample and response in which any material bias would be known and quantifiable. The combination of questionnaires and interviews would seem to be a novel method yet one which proved cost effective and satisfactory from the data collection perspective. It allowed a wide geographical area to be covered and provided a good rate of response.

Practical and methodological problems emerged in the course of the survey. The resource and finance limitations demanded flexibility and cost-effectiveness in method. The sex bias in the sample and the need to obtain data from people not responding to the questionnaire demanded changes in the second part of the survey: accordingly, an additional sample of women was selected for interview in Wolverhampton and follow up interviews of non-respondents were carried out in all areas. The subsequent analysis of the questionnaires proved that substantial differences existed between responses to the questionnaire and responses to the interview. The two groups of respondents differred significantly in terms of age, occupation, employment status, car ownership and bicycle ownership. This confirmed the importance of the interviews of non-respondents, despite the greater costs. In all variables where sex was a significant influence the results have been analysed separately for men and women. This was deemed preferable to weighting the results.

Overall, the West Midlands Cycling Survey provides a large, well structured, carefully designed sample and set of responses with any bias identified. Although the response is different to the population in several respects, these differences are, with the exception of sex, quite small. It is the large sample size that makes the differences statistically significant rather than the size of the differences. In other words, differences which are not due to chance do exist between the population and the respondents. However, these differences do not materially affect the results as will be shown in the following chapter and Appendix 9 where the survey results are tested for sensitivity to reweighting certain factors.

CHAPTER FIVE: WEST MIDLANDS CYCLING SURVEY - RESULTS

Contents

Outline

This chapter presents the summarised results of the West Midlands Cycling Survey described in the previous chapter. The full results (frequency counts), sensitivity tests, crosstabulations and tests for statistical significance) are listed in Appendices 8-10. Seven aspects of the survey are considered under the headings shown in the contents above. In each case the interesting results are highlighted, significant relationships noted and the results briefly discussed in relation to the hypotheses previously formulated. The chapter ends with a more general discussion of the survey results.

Figure 5.1

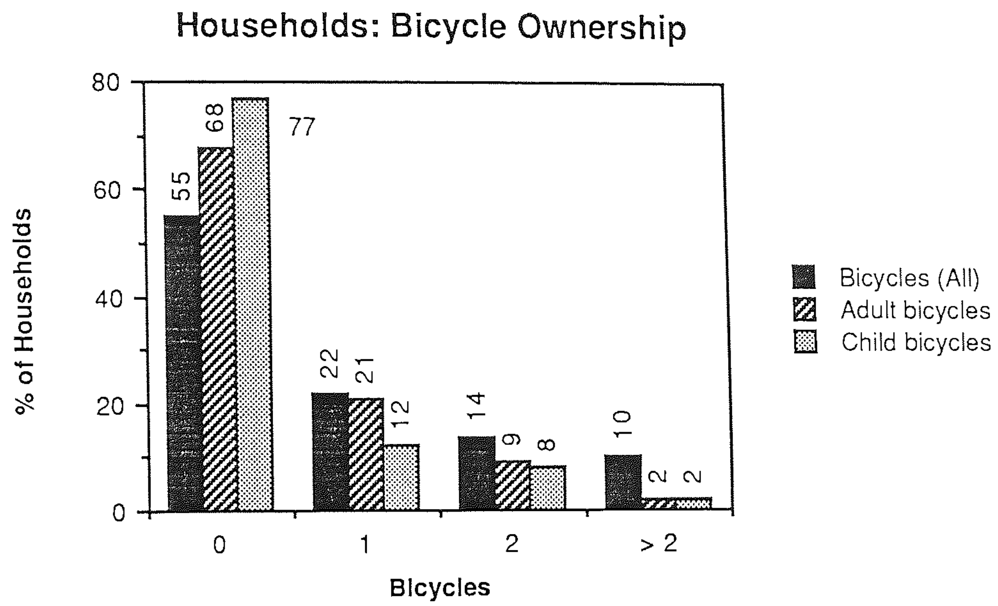


Figure 5.2

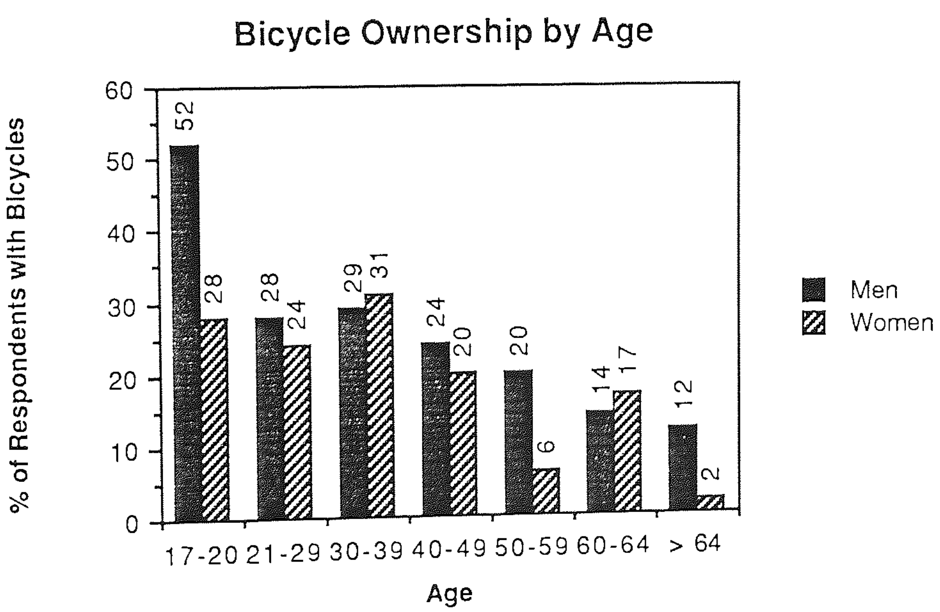


Figure 5.3

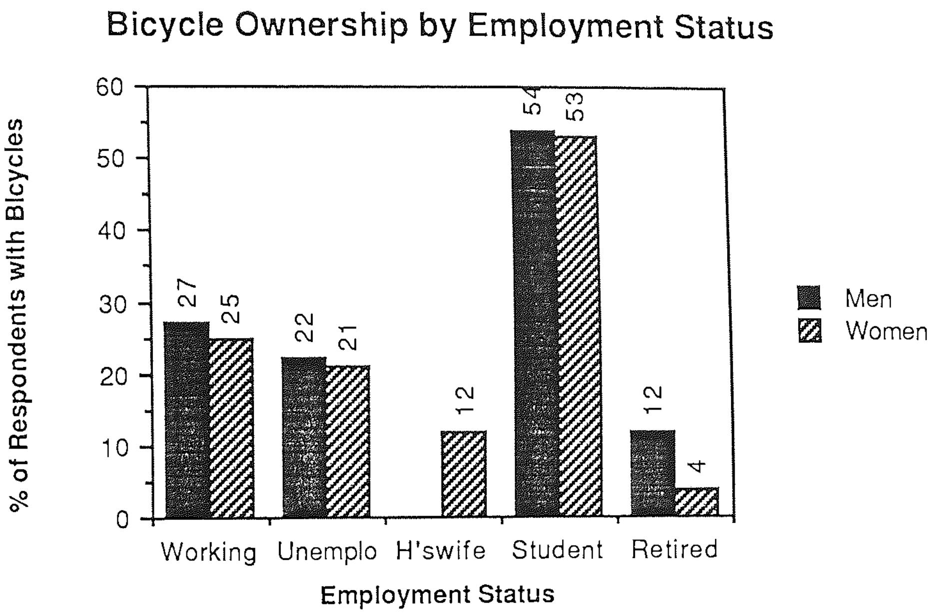
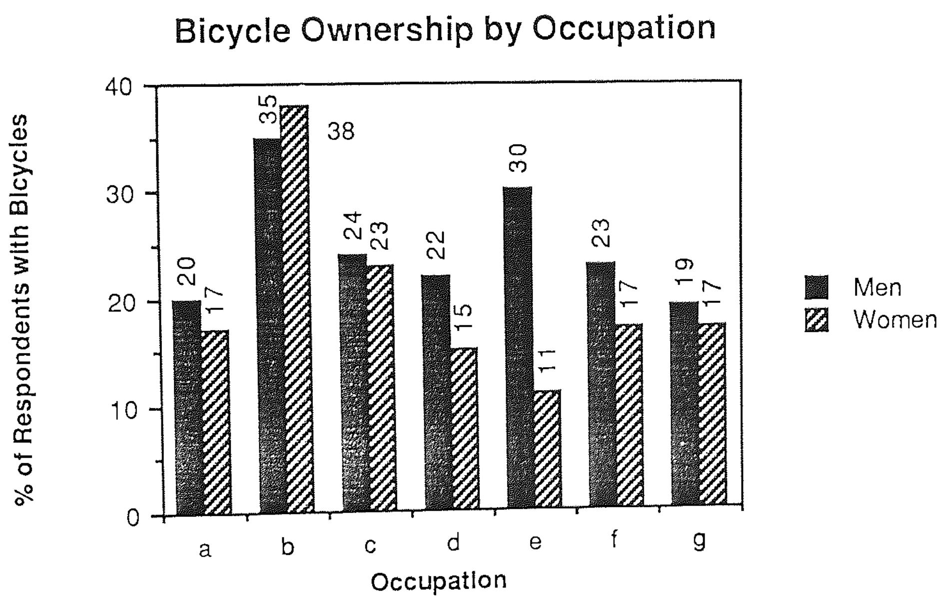


Figure 5.4



a = Managerial b = Professional c = Non-manual d = Skilled Manual
e = Semi-skilled Manual f = Unskilled Manual g = Other

5.1 Ownership of Bicycles

The West Midlands Cycling Survey provides data in terms of both household and individual bicycle ownership. This is valuable in building a profile of West Midlands cyclists and thereby answering two questions: What sort of people own bicycles and who depends on them most? The questions are answered in the following sections.

5.1.1 Ownership of Bicycles by Households

The West Midlands Cycling Survey shows that 45% of respondents' households have one or more bicycles (Figure 5.1). 32% of households have at least one adult's bicycle while 23% of households have at least one child's bicycle. Toy bicycles not used on the roads are excluded from the survey.

There is a significant relationship between household bicycle ownership and household car ownership. Households with a car are more likely to own a bicycle than households with no car (Appendix 10, Tables 2.1 and 2.2).

5.1.2 Ownership of Bicycles by Individuals

Amongst respondents, 24% of men and 18% of women own a bicycle. However, ownership varies with age, marital status, employment status, occupation, car ownership and other factors. These variations are shown in Figures 5.2 to 5.4 and the crosstabulations and Chi Square tests for relationships between bicycle ownership and these factors are listed in Appendix 10, Tables 2.3 - 2.21.

Age

Bicycle ownership from age 17 years is shown in Table 5.2. Bicycle ownership is strongly related to age for both men and women respondents: broadly speaking, bicycle ownership declines with age. For men, ownership peaks at 52% in the 17-20 year age group, falls sharply after in the twenties and thereafter declines more gradually until reaching 12% in the over 64 year age group. For women, bicycle ownership does not peak until the 30-39 year age group when it reaches 31%. It ultimately declines to 2% in the over 64 year age group. Ownership shows a slight rise for both men and women in the 30-39 year age group compared with the 21-29 year age group. (Appendix 10, Tables 2.6 and 2.7).

Marital Status

Single people are almost 40% more likely to own a bicycle than are married people. 30% of single men and 21% of single women own a bicycle compared with 22% and 16% respectively of married men and women. This may partly reflect the age distribution of married and single people. The relationship between bicycle ownership and marital status is statistically significant for men but not for women (Appendix 10, Tables 2.4 and 2.5).

Employment Status

Employment status is significantly related to bicycle ownership. Students and working people are considerably more likely to own bicycles than housewives, the unemployed or the retired (Figure 5.3 and Appendix 10, Tables 2.8 and 2.9).

Occupation

Bicycle ownership varies significantly with occupation. Professionals, clerical/intermediate non-manual workers and semi-skilled manual males have higher levels of bicycle ownership than other occupational groups (Figure 5.4). Within occupational groups, the differences between men and women in terms of bicycle ownership are not large, with the exception of semi-skilled manual workers. (Appendix 10, Tables 2.10 and 2.11).

Other Factors

Individual car ownership and driving licence ownership appear to be associated differently to bicycle ownership for men and women. Whereas men owning a car or a driving licence are somewhat less likely to own a bicycle, women owning a car or a driving licence are more likely to own a bicycle than their non-driving counterparts.

Respondents with travelcards are marginally less likely to own a bicycle than respondents without travelcards. The relationship is statistically significant for women but not for men. (Appendix 10, Tables 2.12 to 2.21).

TABLE 5.1 WEST MIDLANDS CYCLING SURVEY: COMPARISON OF THE TYPICAL BICYCLE OWNER AND THE TYPICAL RESPONDENT

Typical Male Bicycle Owner

Modal Group	Bicycle Ownership
Age 17-26	28%
Married	68%
Working	70%
Skilled Manual	37%
Driving Licence	67%
Car Owner	55%
No Travel Card	83%
Car in Household	70%

Typical Male Respondent

Modal Group	Bicycle Ownership
Age 30-39	19%
Married	75%
Working	63%
Skilled Manual	42%
Driving Licence	73%
Car Owner	62%
No Travel Card	80%
Car in Household	71%

Typical Female Bicycle Owner

Modal Group	Bicycle Ownership
Age 30-39	31%
Married	57%
Working	62%
Clerical Worker	43%
Driving Licence	55%
Non Car Owner	57%
No Travel Card	81%
Car in Household	84%

Typical Female Respondent

Modal Group	Bicycle Ownership
Age 30-39	18%
Married	64%
Working	43%
Clerical Worker	37%
Driving Licence	39%
Non Car Owner	70%
No Travel Card	72%
Car in Household	66%

Note "Typical" is used to refer to the modal group for any given characteristic. For example, the largest group of male bicycle owners (and respondents) in terms of occupation is the skilled manual worker group.

Figure 5.5

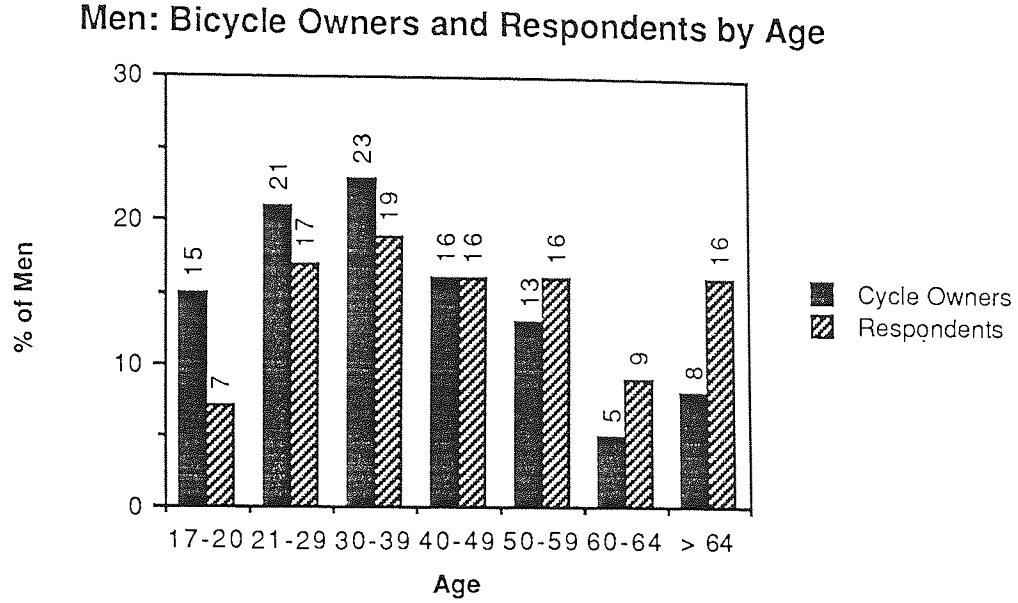


Figure 5.6

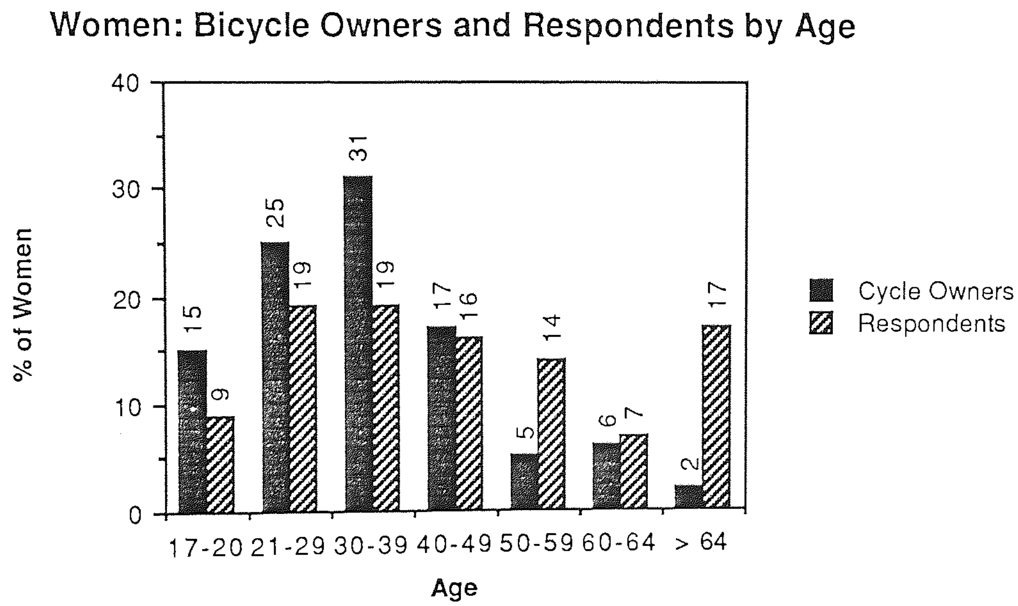


Figure 5.7

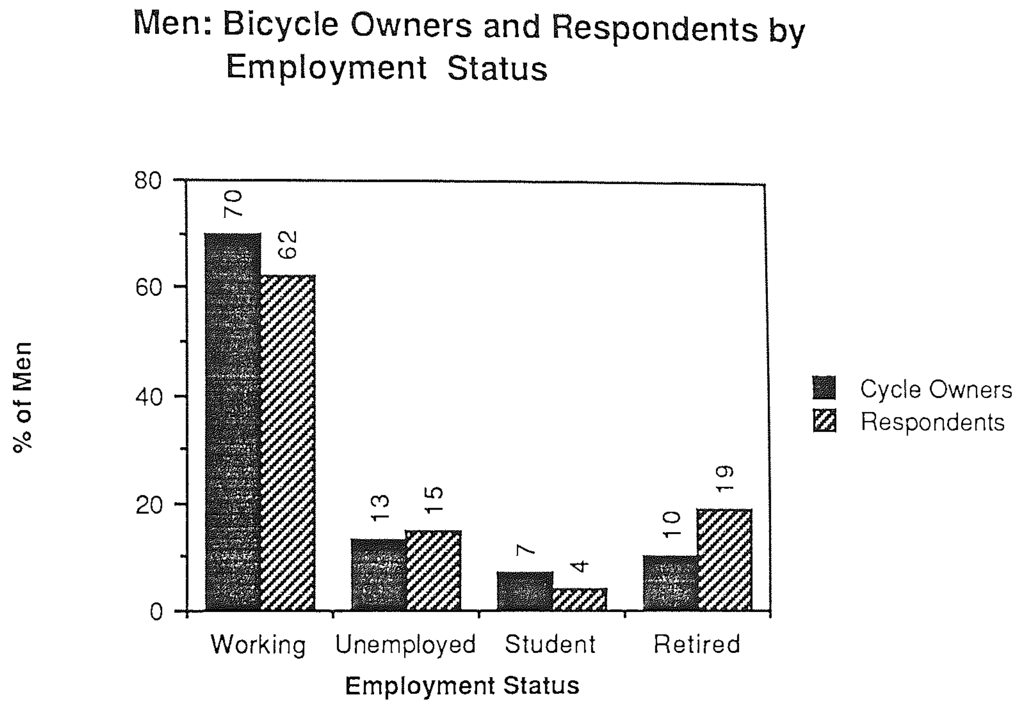


Figure 5.8

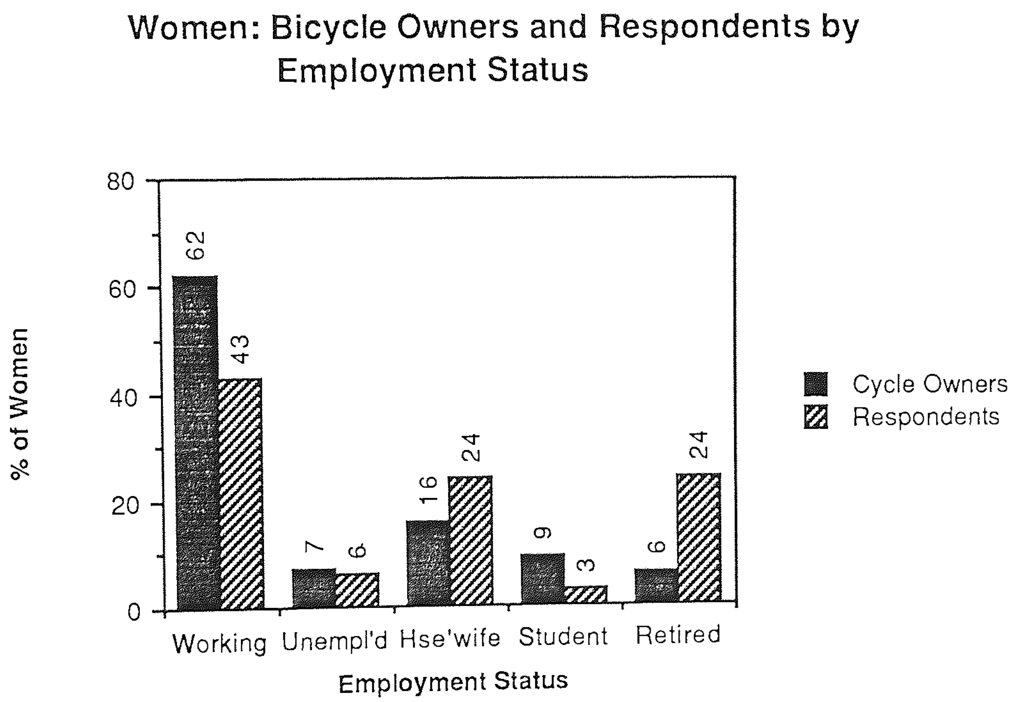
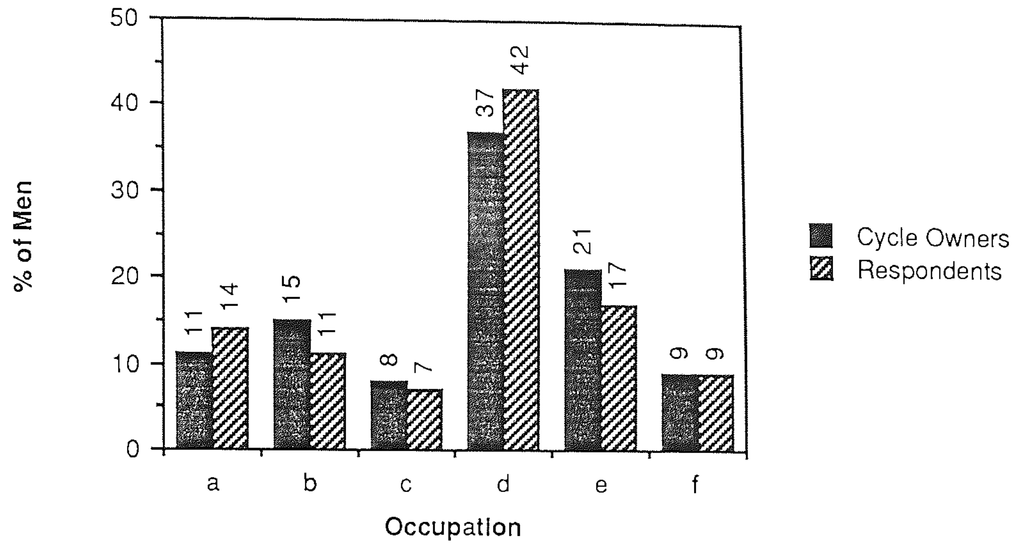


Figure 5.9

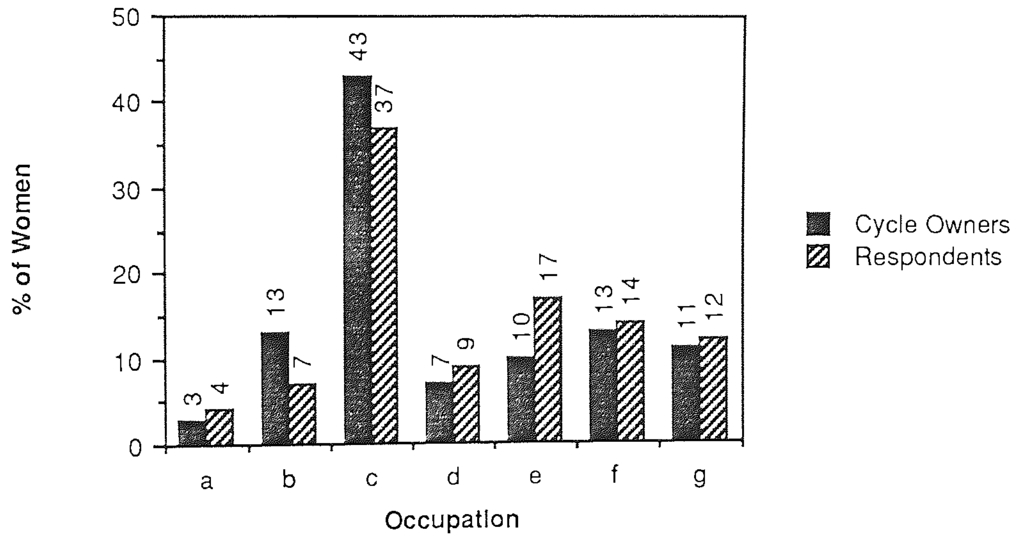
Men: Bicycle Owners and Respondents by Occupation



a = Managerial b = Professional c = Non-manual d = Skilled Manual
e = Semi-skilled Manual f = Unskilled Manual

Figure 5.10

Women: Bicycle Owners and Respondents by Occupation



a = Managerial b = Professional c = Non-manual d = Skilled Manual
e = Semi-skilled Manual f = Unskilled Manual g = Other

5.1.3 Bicycle Owners

Table 5.1 compares the "typical" male and female bicycle owner with the "typical" male and female respondent. ("Typical" is used to refer to the modal group for a range of characteristics). Whilst some differences do exist, it can be seen the typical bicycle owner is typical of respondents in most respects. That is, a married man, in skilled manual work, holding a driving licence and owning a car. He is, however, younger than most respondents. In the case of women, both the typical respondent and the typical bicycle owner is married, age 30-39 years, in clerical/intermediate non-manual employment, does not have her own car but lives in a household with a car. Only in regard to driving does any difference exist: female bicycle owners are likely to have a driving licence whilst most female respondents do not.

Figures 5.5 - 5.10 give a more detailed comparison of bicycle owners and all respondents in terms of the distribution across age groups, employment status and occupation.

5.1.4 Trends in Ownership of Bicycles

56% of bicycle owners acquired their bicycle within the 5 years prior to the survey. ie Between 1980 and August 1984. The mean length of ownership is 7 years (1977) and the mode is 1 year (1983). This supports the findings of a substantial increase in household bicycle ownership noted earlier.

The survey provides no conclusive evidence to support the hypothesis that bicycle ownership is rising faster amongst the higher socio-economic groups and amongst those in work. No significant difference exists in the length of ownership between manual and nonmanual workers or between the employed and the unemployed. (Appendix 10, Tables 6.1 to 6.9).

5.1.5 Reasons for Non-Ownership

Almost half of the respondents without a bicycle had no physical reason for not owning one. That is, they did not have difficulties riding a bicycle (age, handicap, balance, etc.) nor did they have problems of finding somewhere to keep one. (Appendix 8, Table 1.36). This suggests that socio-economic and attitudinal factors are important influences on bicycle ownership. If half of the respondents who are not too old or unable to cycle were to acquire a bicycle, bicycle ownership by individuals would nearly double. Clearly, considerable potential exists to widen bicycle ownership amongst the adult community of the West Midlands.

5.1.6 Sensitivity of Results

As noted in 4.4.2, certain population groups are under represented amongst respondents: women, single people, men aged 17-20 years, women aged over 64 years and those living in households with no car. Moreover, non-respondents cannot be assumed to be identical to respondents. The survey results for bicycle ownership by households and by individuals are tested for sensitivity to these known biases in Appendix 9. As these variables are the two that differ most between questionnaire and interview, it seems likely that they will be more sensitive to survey bias than other survey variables.

The calculations indicate that household bicycle ownership lies between 41.9% and 44.8%. Reweighting the respondents for the over representation of households with a car reduces household ownership of bicycles by 1.9%. Reweighting for age reduces the figure by 0.7%. A further adjustment can be made to estimate the effect of non-respondents who, it seems likely (see 4.4.2), have a lower level of household bicycle ownership than respondents. On the assumption that non-respondents have the same (lower) number of bicycles per household as the interviewees (who did not answer the questionnaire, of course), the figure for the population of the West Midlands is reduced by approximately 2.8%. The sex and marital status of the respondent makes virtually no difference to the level of household bicycle ownership and leads to an adjustment of only -0.3%. Thus, on a worst case basis, the figure for household bicycle ownership may be revised downwards by approximately -2.8% to 42%.

The survey results for individual bicycle ownership are also tested for sensitivity in Appendix 9. They indicate that bicycle ownership lies between 19.9% and 25.0% for men and 15.8% and 18.0% for women, again giving quite small worst case reductions: -4.1% and -1.7% for men and women respectively.

The sensitivity tests suggest, therefore, that the survey results are, in fact, extremely robust and not subject to material inaccuracy.

5.2 Use of Bicycles.

5.2.1 Use of Bicycles by all Respondents

Some 14% of male respondents and 10% of female respondents use a bicycle, on average, 2 or more days per week. Not surprisingly, use of bicycles varies greatly with ownership of bicycles. Whereas 82% of male and 76% of female respondents with a bicycle cycled in the previous year, only 13% of male and 7% of female respondents without a bicycle cycled in the same period. Respondents, therefore, fall into two groups: those with a bicycle who are likely to have cycled recently and those without a bicycle who are unlikely to have cycled recently. For this reason it is not particularly useful to look at regular cycle use (weekly bicycle mileage and days per week cycled) for all respondents together. It is more useful to consider when respondents last used a bicycle, which does not depend on measures of regular cycle use.

Figure 5.13 shows that 31% of male respondents and 17% of female respondents used a bicycle in the previous year. Only 3% on men and 17% of women had never ridden a bicycle in their lives. The characteristics most associated with bicycle use are shown in Appendix 10, Tables 2.1 to 2.21. Respondents most likely to have used a bicycle within the previous year are:

- bicycle owners
- male
- single people (both sexes)
- young people
- in employment or education
- men with no driving licence or car
- women with a driving licence and car
- people with no travelcard

5.2.2 Use of Bicycles by Bicycle Owners

82% of male bicycle owners and 76% of female bicycle owners used a bicycle within the previous year. Figures 5.11, 5.12 and 5.14 to 5.16

show the frequency of use in terms of the average number of days per week cycled and the average weekly mileage cycled. 62% of male and 54% of female respondents owning a bicycle cycle at least 2 days per week. Approximately the same percentages cycle 6 or more miles per week with a mean average weekly mileage of 22 miles.

A large seasonal variation in bicycle use exists: almost twice as many bicycle owners cycle during Summer compared with during Winter. The figures for Spring and Autumn are similar, midway between the Summer and Winter extremes. (Appendix 8, Tables 1.43 to 1.46).

Bicycle use by respondents owning bicycles does not appear to vary significantly with marital status, age, employment status or travelcard. However, it does vary with occupation, driving licence and car ownership (Appendix 10, Tables 4.1 to 4.19). Bicycle owners in manual jobs are more likely to use a bicycle two days or more per week than bicycle owners in non-manual jobs. Similarly, bicycle owners without a driving licence and/or a car use a bicycle more frequently than bicycle owners with a driving licence and/or a car.

If one accepts car ownership as a measure of income, there is evidence to support the hypothesis that bicycle usage is greater for those disadvantaged in terms of income and mobility. Whilst bicycle ownership rises with income, usage appears to do the opposite.

An equivalent set of results is obtained from crosstabulations of the weekly mileage cycled and the above characteristics (Tables 5.1 to 5.19). Once again, bicycle use is highest for bicycle owners in manual jobs, without a driving licence and/or a car.

Figure 5.11

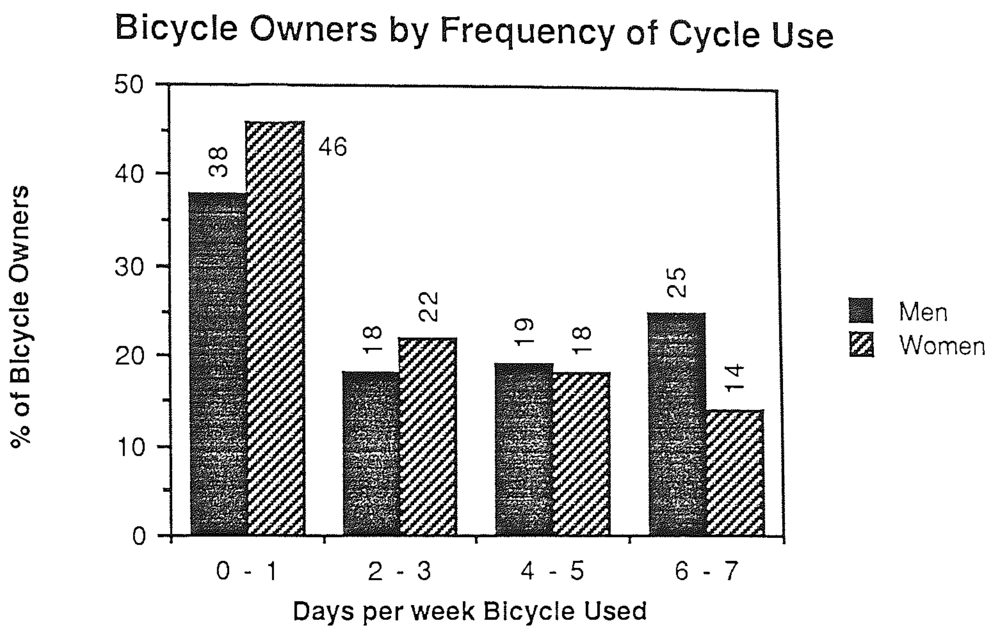


Figure 5.12

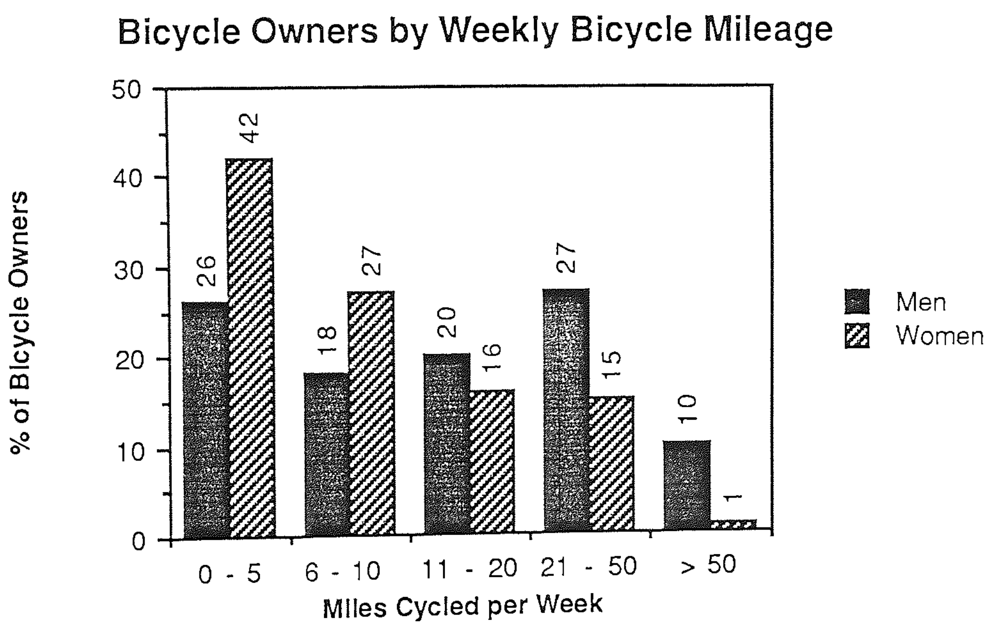


Figure 5.13

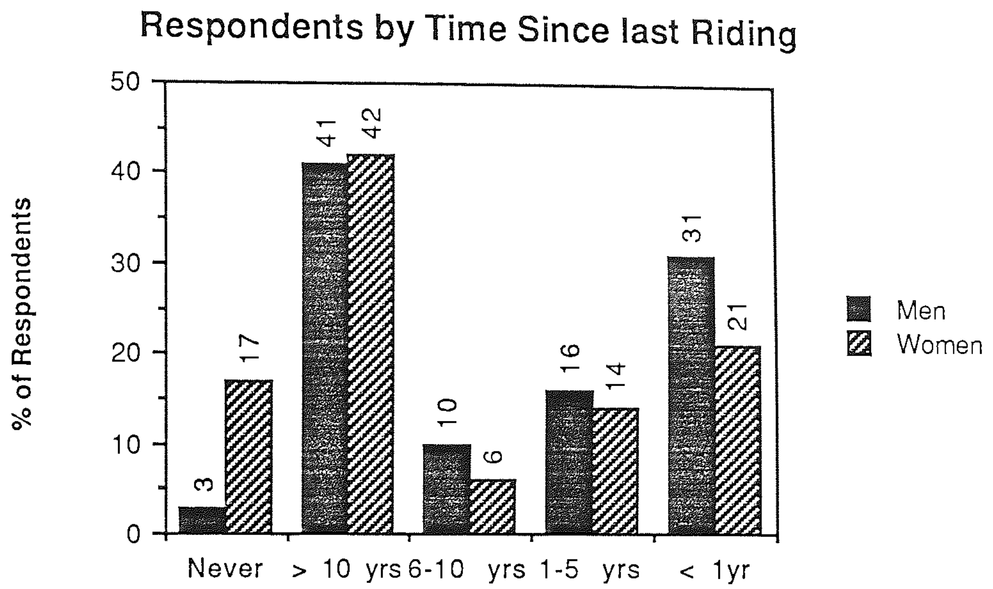


Figure 5.14

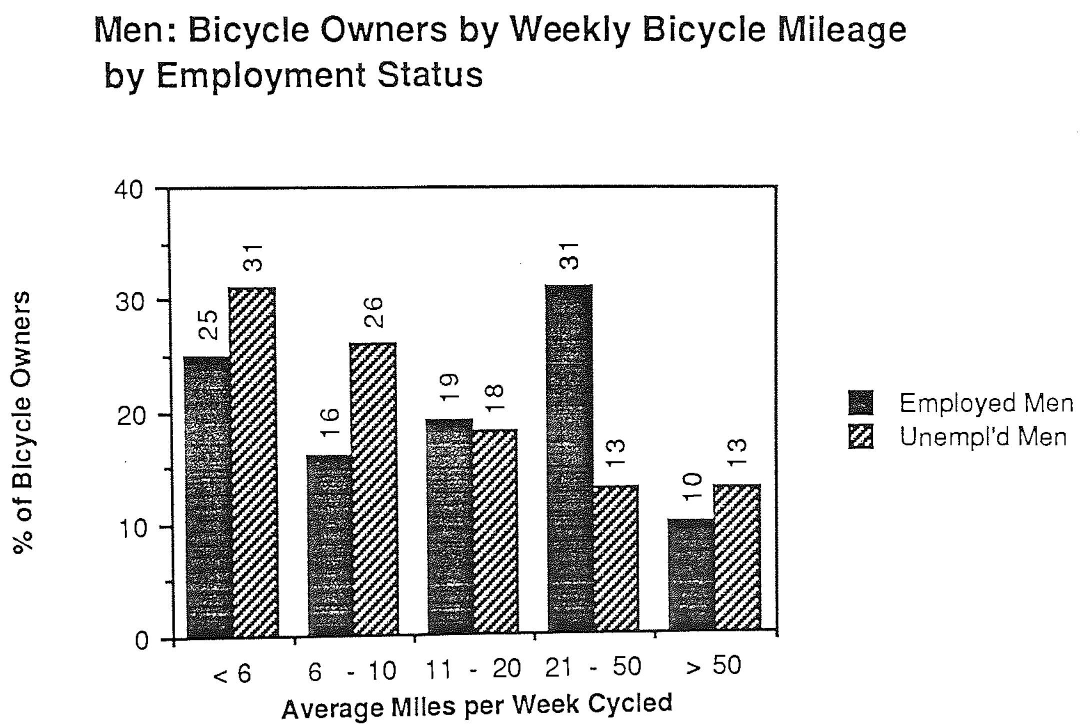


Figure 5.15

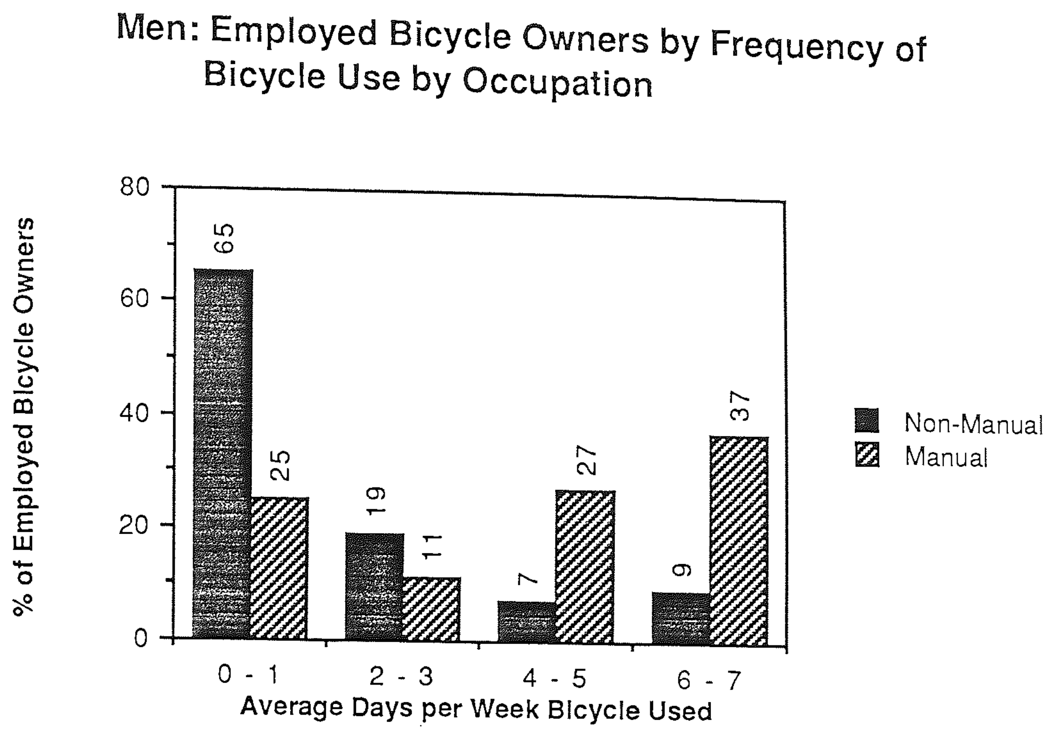
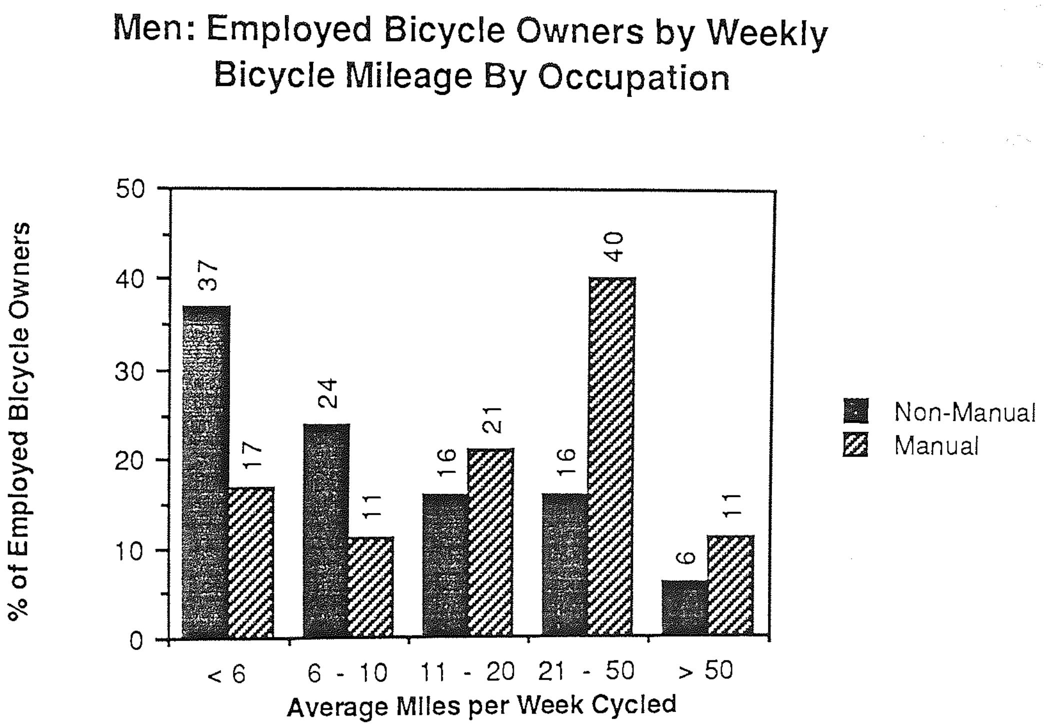


Figure 5.16



5.3 Child Cyclists

The West Midlands Cycling Survey is intended to provide information primarily about adults and cycling. Data was, however, collected from respondents with children of school age. This shows that 75% of children of school age own a bicycle. Despite this apparently high level of ownership, 83% of children never cycle to school. Some 4% of children cycle to school regularly and a further 13% cycle to school sometimes. For children with bicycles, 24% are permitted by their parents to cycle on main roads, 57% on quiet roads, 43% on pavements, 50% in parks and 36% are permitted to cycle only when accompanied.

It is inconceivable that so many children should own bicycles but not use them. Rather, it suggests that the school journey is a poor indicator of cycle use by children.

5.4 Accidents

5.4.1 Vehicle-Cyclist Accidents

Respondents who drive were asked if they had ever been involved in an accident with a cyclist: 79% stated "No accident" but 15% indicated a near accident and 5% have had at least one accident involving a cyclist. Most of the accidents resulted in no injury (45%) or a slight injury (47%) but 5% were considered serious and 3% involved a fatality. In 85% of injury accidents involving a motor vehicle and a bicycle the cyclist was the most serious casualty. (Appendix 8, Tables 1.24 to 1.26).

Respondents with a bicycle were asked if they had been involved in an accident with a vehicle whilst cycling. 69% reported no accident and 14% reported a non-injury accident whilst 15% reported an accident involving slight injuries and 2% had suffered serious injury. Overall, three bicycle owners in ten had been involved in a vehicle-cyclist accident and over half of these involved injury to the cyclist.

5.4.2 Pedestrian-Cyclist Accidents

Respondents were asked whether, as pedestrians, they had ever been involved in an accident with a cyclist on the pavement. 8% reported such an incident having happened at some stage in their life and one in four of these accidents (ie affecting 2% of the overall population) involved a slight injury to the pedestrian. There was no report what-so-ever of any serious injury accident involving a cyclist and a pedestrian. Information on injuries to cyclists resulting from these accidents was not sought. (Appendix 8, Tables 1.22 and 1.23).

5.4.3 Response to Accident Questions

Intuitively, it seems likely that drivers may have been reticent to offer information about accidents which involved injury to cyclists. One irate respondent even wrote that this was "a sneaky way to give information to the police"! Set against this is the higher than average response to the survey by car owners. Conversely, respondents who, as a pedestrian, had been involved in an accident with a cyclist responded strongly to the questionnaire, suggesting that pedestrian-cyclist accidents are not under-reported by the survey from the pedestrian side at least. (Appendix 10, Table 7.9).

5.5 Problems Perceived by Cyclists.

Few bicycle owners used a bicycle because they had no alternative. Most used it for enjoyment, exercise and convenience; economy was also an important reason. (Appendix 8, Tables 1.52 to 1.57). Amongst bicycle owners that had not cycled during the previous year, almost three quarters said they now preferred to use other modes of transport or were no longer interested in cycling or were too old to cycle. One quarter said it was because traffic conditions were too dangerous. (Appendix 8, Table 1.39).

Cyclists ranked problems involving danger above problems of theft and vandalism and access difficulties such as road closures and one-way streets. They were most concerned about danger from motor vehicles, with 4 out of 5 (78.6%) ranking this as the first or second most serious problem for cyclists. General danger from motor vehicles was perceived to be a greater problem than any specific highway feature such as large roundabouts. (Appendix 8, Tables 1.58 to 1.63).

Regarding cycle theft, 31% of people owning a bicycle at the time of the survey had suffered at least one cycle theft. The majority of thefts had occurred within the previous 7 years. (Appendix 8, Tables 1.64 and 1.65).

5.6 Attitudes of Non-Cyclists.

These were sought in relation to bicycle ownership, cycling and cyclists.

Whilst almost half of those respondents not owning a bicycle felt that nothing was likely to induce them to buy a bicycle, 18% of respondents felt that health reasons were most likely to induce them to buy one. 16% felt that safer road conditions were the major factor whilst dearer petrol or public transport fares rises affected 14%. Only

5% of respondents thought the price of a bicycle to be the major factor. (Appendix 8, Table 1.37).

A majority of respondents disagreed with the statements that cycling is old fashioned (88%) and more important as a sport than as a form of transport (54%). Opinion was divided, however, on whether or not cycling was excessively dangerous and the attractiveness or otherwise of their area for cycling. As expected, most non-bicycle owners (58%) felt that other forms of transport were preferable to cycling. (Appendix 8, Tables 1.31 to 1.35).

Regarding the issue of nuisance caused by cyclists to pedestrians, it is on pavements that most trouble occurs. Half of all respondents claimed they were frequently or occasionally troubled by cyclists riding on the pavement. In parks 23% of respondents were sometimes troubled by cyclists but subways provided little source of annoyance, partly because many pedestrians stated that they avoided using them. (Appendix 8, Tables 1.19 to 1.21).

5.7 Facilities for Cyclists.

The vast majority of respondents (87%) supported the provision of facilities for cyclists, such as cycle paths, cycle lanes and parking facilities in their area. If cycle routes were provided on quiet back streets in the respondent's area, as proposed by the West Midlands County Council, 35% of respondents thought they would use them, a further 27% replied "possibly" whilst 31% thought they would not use them and 2% preferred to cycle on the main roads. These figures are for all respondents and include people who are unlikely to cycle whatever the facilities. (Appendix 8, Tables 1.27 and 1.28).

The most popular source of money for cycle facilities was a tax on cyclists (39%) although cyclists were notably less keen on this idea and a number of respondents pointed out the impracticality of such a scheme. Central government (27%) was the next most popular source followed by transferring funds from other areas of transport expenditure (19%). 9% chose to reallocate money from the council's other budgets and 6% supported a small increase in the rates. (Appendix 8, Table 1.30).

The amount considered appropriate to spend on cycle facilities by the majority of respondents was substantially in excess of current expenditure levels. 1% of the transport budget (about £1.6 million) was deemed to be "about right" or "not enough" by 38% and 29% respectively. Only 8% of respondents felt it was "too much" although 25% admitted they did not know. (Appendix 8, Table 1.29).

Although both bicycle owners and non-owners were in favour of the provision of facilities, the former were significantly more strongly in favour. Similarly, there were significant differences between owners and non-owners in response to the other 3 questions: owners were more likely to use any facilities provided; to want more money spent on cycling; and to think that it should come from money allocated to other forms of transport than non-owners.

5.8 Conclusions

The West Midlands Cycling Survey provides data on bicycle ownership, bicycle use, accidents involving cyclists and attitudes towards cycling-related issues. The full results are presented as frequency counts in Appendix 8 and selective cross-tabulations of bicycle ownership and bicycle use are listed in Appendix 10. The sensitivity tests (Appendix 9) show that the key survey results (household and individual bicycle ownership) are not materially altered when the responses are reweighted to allow for non-respondents and the over/under representation of certain age/sex/marital groups.

The sensitivity tests show that the results are robust for both household and individual bicycle ownership (the variables most likely to be subject to respondent bias). Even allowing for low levels of bicycle ownership amongst non-respondents and correcting for bias in the sample, the West Midlands Cycling Survey indicates that 40%-45% of households own at least one bicycle. For individuals, 20%-24% of men and 16%-20% of women own a bicycle. Such ranges are narrower than the confidence interval given in the National Travel Survey 1978/9 for the West Midlands Metropolitan area which gives a 95% confidence interval of $\pm$5% ie, 17% - 27% for household bicycle ownership.

As individual bicycle ownership is the variable that differs most between questionnaire and interview respondents, it strongly indicates that other variables are not sensitive to reweighting of the respondents. Thus, the results do not appear to be materially affected by any bias in the sample or the response. The sensitivity tests on these two key variables suggest that the results are indeed reliable and that it is unnecessary to conduct similar tests on other results.

The survey result for bicycle ownership by households shows a substantial increase since the 1978/9 National Travel Survey. This holds true for even the lowest figure in the range indicated by the sensitivity tests. The number of households owning one or more bicycle appears to have almost doubled in the West Midlands Metropolitan County in the past 6 years from 22% of households in 1978/79 to over 40% in 1984. This is indeed a large rise. However, there is corroborating evidence. Bicycle ownership by households in the West Midlands Region (not Metropolitan County) rose from 21% in 1972/3 to 24% in 1975/6 and to 29% in 1978/9. A simple extrapolation of this trend would give a level of approximately 36% in 1984. However, the growth appears to have accelerated in recent years. The Greater London Travel Survey 1981 (Landrock and Holden 1984) found an increase of one quarter in the two/three years since the 1978/9 National Travel Survey. Moreover, bicycle sales between 1979 and 1983 were at record levels, totalling 8,510,000 in the 5 years - considerably higher than the 5,180,000 for the previous 5 years, 1974-78, even allowing for differences in the accounting system (Table 3.11). This would tend to suggest that nearer 35%-40% of households in the West Midlands Metropolitan County own a bicycle. The West Midlands Cycling Survey provides a result within this range.

Whatever people's motives, it seems that owning a bicycle is increasingly the norm. If such growth continues, more West Midlands households will own a bicycle than a car within the next 5-10 years.

Households are more likely to own an adult's bicycle than a child's bicycle. This implies that one third of adults now have access to an adult's bicycle. It should not be assumed, however, that one adult's bicycle is suitable for all adult members of the household anymore than one child's bicycle is suitable for all children in the household. The size and type of bicycle may prevent other householders from using it. Bicycles are usually bought for an individual member of the household not for the household as a whole. Thus, the extent to which a bicycle may be shared by others is dependent on these factors.

In their analysis of the Greater London Travel Survey, Landrock and Holden question the merits of data on individual bicycle ownership compared with household bicycle ownership.

> "A hypothesis that we would like to test, but may be unable to do so because of data limitations, is that bicycles are owned and used by only one member of the household at any one time. (Bicycles are often passed between children in the household as they grow up.) If this hypothesis is true then it argues strongly for information on individual rather than household information on bicycle ownership."
> (Landrock and Holden 1984)

This survey backs their hypothesis. Whereas the National Travel Survey and the Greater London Travel Survey measure bicycle ownership only by households, the West Midlands Cycling Survey measures bicycle ownership both by household and by individuals. Apart from the prime facie reasons for supposing that bicycle ownership by individuals is a better guide to bicycle use than bicycle ownership by households, the West Midlands Cycling Survey provides empirical evidence to support this assertion. In particular, it shows that whereas 70% of individual bicycle owners had used a bicycle within the previous year, only 50% of persons living in a household with a bicycle had used one within the same period.

A number of socio-demographic variables are shown to be associated with bicycle ownership by individuals, but sometimes differently for men and women. Whereas bicycle ownership declines with age for men, it is more stable for women, peaking in the 30-39 year age group. This may reflect the greater access to cars that men enjoy and possibly an interest in health and fitness on the part of women in the

30-39 year age group. A higher percentage of men than women, however, own bicycles after the age of 60, suggesting that they continue cycling until later in life than women. (It would be interesting to know more precisely what lies behind these variations).

Needham (1984) also notes that bicycle ownership is strongly associated with car ownership for households. However, this is explained by reference to a common factor: household income. Both bicycle ownership and car ownership are positively associated with household income. That is,

> "Household bicycle ownership is more to do with affluence than with substitution of modes (which would tend to give lower cycle ownership with increased car ownership)." (p4)

Men aged 17-20 years and women aged 30-39 years are most likely to own a bicycle; so are students, people in employment, professional and semi-skilled manual workers and people owning cars. Yet these variations should not be over-emphasised. Bicycle ownership is by no means restricted to certain population groups.

The difference in bicycle ownership between employed and unemployed people is only 5% for men and 4% for women. Similarly, ownership varies between 19% and 35% for men and 17% - 38% for women across occupational groups. Arguably not a large variation. Bicycle ownership increases with car ownership and, although Needham ascribes this to household income, Wigan (1984) finds that income has a small effect on bicycle ownership and that life-cycle has the strongest effect.

Whatever the effect of different characteristics, Table 5.1 shows that, in most respects, bicycle owners are typical of the population and that, it is perhaps misleading to try to categorise bicycle owners as a certain type or types of persons.

Needham finds that many households own bicycles but use them infrequently. Less than half the households owning bicycles recorded any bicycle trips during the survey week. The West Midlands Cycling Survey also shows a similar result for individuals: 38% of men and 46% of women with bicycles use them less than 1 day per week. Utilisation of bicycles is lower than that for cars. However, as bicycle ownership has increased considerably since 1978/79 this means that a considerably higher percentage of the population are now cycling. Figure 5.13 shows that 31% of men and 21% of women had used a bicycle within the previous year. Only 3% of men and 17% of women had never used a bicycle. Whereas the National Travel Survey found that only 7% of individuals recorded any cycling during the survey week, the West Midlands Cycling Survey found that 15% of men and 10% of women claimed to cycle at least 2 days per week on average. This increase in use is reflected in the volume of cycle traffic which rose from 3.9 billion vehicle kilometres in 1979 to 5.1 billion vehicle kilmetres in 1983 (Needham 1984, p16).

The data on use of bicycles gives support to the idea that providing for cyclists is justified on social equity grounds. Broadly speaking, bicycle use is greater amongst people who own a bicycle but whose access to a car is limited, ie, young people, those in manual socio-economic groups, those without a car or driving licence. It is true that men - who have better access to cars than women - cycle more than women. It might therefore seem that providing for cyclists would favour men. However, the 1981 census indicates that where bicycle use is high, the percentage of women cycling to work is also high. It might reasonably be concluded that women are more deterred than men by cycling in unpleasant conditions and that making cycling safer would have more impact on women than men. Whilst it is also true that there appears to be an increase in cycle use amongst the higher socio-economic groups (Murray-Clark 1984a) it is still the case that bicycle use is highest for the lower socio-economic groups.

Bicycle owners cycle for positive reasons - few claimed to have no alternative - yet they also considered danger from motor vehicles to be by far the biggest problem. It is unlikely that any other transport user group would have the same worries for personal safety. In a survey of travel problems in the London Outer Metropolitan Area, it was found that relatively few problems were mentioned by car users; bus passengers had problems regarding mobility; only pedestrians were concerned about the dangers of traffic and crossing roads. (Hillman, Henderson and Whalley 1976). Although a direct comparison between the two surveys is not posssible it does appear that cyclists are more concerned about safety than any other group.

Only limited data is (deliberately) provided by the survey on use of bicycles by children. The results show that whereas ownership is high, use in terms of the journey to school is low. This is due to a combination of factors such as the restrictions placed on the children by both parents and schools. (Some schools forbid cycling to school). However, it is inconceivable that so many bicycles could be purchased yet unused. Obviously other journeys and play account for more bicycle use by children than the school journey. This suggests that the school journey is a poor indicator of the amount of cycling by children in an area.

Respondents (with and without children) expressed a strong concern about the safety of child cyclists. Parents already place restrictions on their children, limiting many of them to cycling on quiet roads and pavements or only when accompanied. This is consistent with the other surveys:

> "Most mothers said their children would not be allowed to cycle on main roads before the age of ten, and one mother in five said they would never be allowed to do so."
> (Hillman, Henderson and Whalley 1976, p159)

The West Midlands Cycling Survey found strong support for the provision of cycle facilities such as cycle paths, cycle lanes and parking stands. Whilst support was strongest amongst bicycle owners, there was a clear majority of non-bicycle owners who were in favour of provision. No doubt many respondents did not have a clear concept of the sort of facilities that might be provided. Nor would many of them have had significant experience of cycle facilities elsewhere. The implication, therefore, is that people are not satisfied with the present situation - no doubt from the perspective of the motorist as well as the cyclist - and would support measures to improve the situation.

Spending £1.6 million or 1% of the transport budget on cycling facilities was considered "not enough" or "about right" by a large majority of respondents. Only a small percentage of respondents thought it was "too much". Although few people wanted to see an increase in rates or other council budgets reduced to pay for such facilities, it was accepted that a substantial amount of money should be spent. Apart from getting cyclists or central government to pay, diverting money from the council's transport budget was the most popular source of funds.

If cycle routes were provided on quiet side streets a majority of respondents thought they would probably or possibly use them. Again, the non-specific nature of the question allows only a general indication of the likely use of such facilities. Indeed, the Greater London Council found that, in the case of the Elephant and Castle cycle route, even questioning cyclists about a specific planned route was an imprecise guide to actual usage. However, this response once again emphasises that existing cycling conditions are considered unsatisfactory and that cyclists and non-cyclists are interested in physical improvements.

Summary

The West Midlands Cycling Survey indicates that

1. Bicycle ownership by households has risen substantially in recent years.
2. Bicycle ownership is spread throughout most sections of the population but increases with car ownership and decreases with age for men.
3. Bicycle use has increased with ownership.
4. Most bicycle owners have used a bicycle within the previous year.
5. Bicycle use is greatest for those disadvantged in terms of income and mobility. Those without a driving licence or a car use bicycles most frequently.
6. Pedestrians are troubled by cyclists on the pavements and some have suffered slight injury. However, no serious or fatal accidents were reported.

7. Although most children of school age own a bicycle, few cycle to school. Parents frequently restrict children to cycling on quiet roads, pavements or only when accompanied.
8. Bicycle owners rank danger from motor vehicles higher than problems of security or access.
9. Non-bicycle owners are most likely to purchase a bicycle for health reasons although safer road conditions and the price of alternative transport modes are also major influences.

CHAPTER SIX: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

Contents

Outline

This chapter discusses the broad implications of the action research findings, linking them to general transport policy. It considers the policy and roles of the Government, the local authorities and cycle campaign groups, drawing conclusions and recommendations for all three parties. Particular recommendations are made concerning the West Midlands authorities and Pushbikes. Further areas for research are identified.

6.1 Introduction

This thesis has reviewed a range of issues seen as important to cycle planning from the perspective of an action researcher working with a cycle campaign group in the West Midlands. Transport policy and expenditure, local planning procedures, social and physical factors influencing cycle use and the role of a cycle campaign group are covered. It provides an overview and critical analysis of national cycling policy and statistics, contrasting it with the approach of other countries, notably Germany. This in turn provides a context for assessing the situation at local level, particularly in the West Midlands, and considerable amounts of data are presented in the West Midlands Cycling Survey.

The discussion and conclusions presented here are principally based on the literature and information reviewed in previous chapters. The micro-level discussion of the West Midlands data (Chapters 3 and 5) is not repeated in detail where it has been adequately covered in previous chapters. However, the macro-level implications of the work are brought out. They are augmented by the experience gained over the research period from the numerous visits to cycle facilities (Appendix 11), conferences and meetings attended, and conversations with planners, engineers, (Appendix 12) researchers, politicians, campaigners and cyclists both in Britain and abroad. These experiences were too numerous to record in full but they form an essential part of the action research process. The frequent presentation of a set of ideas to sceptical professionals and politicians is an excellent means of testing the validity of an argument. It is also a common feature of action research.

6.2 National Transport Policy and Cycling

6.2.1 Transport Policy

Pressure groups such as Pushbikes and Friends of the Earth believe that cycling in Britain today is excessively and unnecessarily dangerous. They believe that many people would choose to cycle if conditions were made safer and more attractive. They argue that there are substantial benefits to be gained from encouraging cycling, in terms of resource allocation and social equity. If these arguments are true - and the experience of researching this thesis leads me to believe that they are largely justified - then it is necessary to look for the causes of the problems and the means of solving them.

It is my contention that these causes and solutions lie in the general transport policy followed by UK governments over many years: the problems faced by cyclists are symptomatic of wider failings of transport planning at both national and local level. As such, planning for cycling cannot be viewed in isolation from general transport planning. Cycling may be affected more by general transport, land use and fiscal policies than by measures specifically aimed at cycling.

This is not an argument to suggest that transport policy should necessarily be altered to favour cyclists. Rather, it is an argument that the current UK transport system is sub-optimal and that improvements to the system would benefit cyclists.

6.2.2 Economic Assessment

If we assess the system from an economic standpoint, the twin criteria of resource allocation and equity could be employed. That is, firstly, are resources allocated efficiently both between transport and other economic activities and between different transport modes? And, secondly, is this distribution equitable amongst the different social groups? On prima facie evidence it seems unlikely that the UK transport system (or systems) performs well on either count, to the detriment of the environment and lower income groups.

Resource Allocation

Although transport goods and services are bought and sold in the market place, there are major market distortions which make it unlikely that the resulting resource allocation is near optimal. There are two major types of market distortion: externalities and fiscal measures. Externalities are those costs that are not paid for by the (transport) consumer at the time of purchase - such as pollution, congestion and accidents - yet which impose substantial real costs on the economy, often in a diffuse and imprecise way and with time lags. Fiscal policies are taxes and subsidies. Subsidies, such as those to public transport are a 'second best' policy, partly aimed at balancing the imperfection of the existing price structure for private transport which gives rise to the externalities mentioned here. However, they are a very imprecise means of achieving optimality. Other subsidies, such as company car tax relief and flat rate Vehicle Excise Duty on cars, are quite incidental to transport yet have major transport effects.

The company car subsidy is estimated at £2 billion per annum and the effects are quantified in the 1985 TEST report. Not only does the subsidy seriously distort the UK car market but also it increases fuel consumption due to the greater mileages and engine sizes of company cars. It may also have a serious effect on road accidents as large cars tend to be invloved in more accidents than smaller cars and tend have higher average speeds.

Vehicle Excise Duty also has a distorting economic effect: levied at a flat rate for cars, it is a regressive tax that provides no incentive to reduce unnecessary marginal consumption (Wheeler 1985). If shifted to petrol tax, the private marginal cost of driving would then more closely represent the total marginal costs.

The "Fares Fare" experience of London Transport when public transport fares were increased substantially in accordance with the House of Lords ruling showed that commuters were price sensitive and prepared to change mode in response to a change in price. Cycling increased by an average of 50% in the peak with most "new" cyclists switching from London Transport rail services. (Baker 1982).

These and other distortions of the UK transport market are analysed by Plowden (1985) who recommends economic reforms rather than immediate infrastructural changes. In his view these measures will favour energy conservation, safety and the environment which today are given insufficient weight.

The resource costs of road transport in Great Britain were conservatively estimated at £40,000 million or about 17% of Gross Domestic Product in 1982 (Plowden 1985 p38). However, the true economic cost is not easily assessed as it would include not only the vehicle operating costs and the cost of road provision but also intangibles such as pollution, pain and suffering from acccidents, noise and loss of quality of life. Although the motoring and roads pressure groups insist that road users make a major net contribution to Government expenditure[1], it is not at all clear whether the costs borne by transport consumers cover the full costs to society. What is clear is that the marginal cost of a journey to the motorist does not always reflect the marginal cost to society, particularly in urban areas at peak times.

Equity

The other economic criterion suggested is equity. Are transport services equitably distributed to consumers and who benefits most from government investment? Traditionally, little attention has been paid to the issues of equity and distribution in transport provision. The system has been supply led by engineers who were more concerned with technical standards of the facilities than the distribution of benefits amongst different social groups.

Le Grand (1982) showed that higher income groups benefited most from government transport subsidies.

> "On average,the subsidy for rail travel by the highest income groups is nearly ten times that of the lowest, while that on private transport (through the provision of roads) is seventeen times. The distribution of public expenditure on bus travel is less clear. It appears to benefit more those higher up the social scale in terms of income, but those lower down in terms of occupation." (Le Grand 1982 p117)

Non-motorised modes are not examined but the people who depend most on walking and cycling are the lower socio-economic groups, households

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1. The British Roads Federation states in its FACT leaflet 'Road Transport in Great Britain' 1985 that "Road users contributed a net £8,000 million to the national exchequer in 1984/85 after all road costs such as construction, maintenace and policing have been deducted."

without access to a car, the young, the elderly and women. Yet walking and cycling receive the Cinderella's share of the transport budget.

One of the starkest assessments of transport policy and its effects on low income groups is found in a review the situation in third world countries. Although car ownership levels are far lower and disparities in wealth much greater in comparison with Great Britain, the issues are remarkably familiar.

> "Firstly, the construction of highways has diverted funds and technical resources away from transport schemes (or other forms of investment) which might have benefited the poor much more, and a continuation of resource allocation intended to benefit the private automobile could reduce the scope for more general economic and social development.
>
> Secondly, the cost to the community of motor traffic in the centres and main arteries of cities is extremely high in terms of congestion and environmental impact and in terms of the construction of new roads, whereas the marginal cost of using such roads is low. The price system has failed to maintain an efficient balance between the cost of supplying transport facilities and the demand for them, and the difficulty arises because there is no accepted way of charging directly for the use of costly urban roads apart from tolls, which are seldom applied.
>
> Thirdly, to make room for new improved highways, settlements have been swept away, sidewalks narrowed and travel on foot made dangerous and inconvenient.
>
> Fourthly, where traffic management measures have been used in lieu of or in addition to capital improvements to reduce traffic congestion, constraints have often been placed on un-motorised modes of travel (such as cycle rickshaws) and on pedestrian movement.
>
> Fifthly, and of greatest significance in the long term, accommodating motorised traffic on high-speed links has a profound impact on city form, to the great disadvantage of the poor. The problem is common to both developed and developing countries because greater mobility for the car user means less mobility for others, while the access to scattered facilities which suits the car-user reduces the range and quality of facilities which can be concentrated in any centre or sub-centre. Thus attempts to improve intersuburban accessibility, and failure to maintain city-centre accessibility, can completely change the relative accessibility of the suburbs and the city centre, thus creating a powerful inducement towards a

> different city structure: namely, the decline of the centre, the dispersion of employment and other community activities throughout the suburbs, the outward sprawl of new development, the complete dependence on private transport, the subsequent development of random home-work patterns with longer journey distances, all leading inexorably to much greater volumes of traffic and the collapse of public transport."
> (Parker 1983 p309)

Certainly, car ownership in Britain is higher than in developing countries and dependence on walking, cycling and public transport is less; nor do we have cycle rickshaws. Yet large disparities in car ownership and access to cars do exist; women, the young, the elderly, and the poor primarily depend on walking, buses and cycling for their transport needs; and the Department of Transport has banned cyclists from some trunk roads as well as motorways. And even now, four years after the Cycling Policy Statement, new traffic management schemes aimed at reducing accidents in residential areas are being implemented that totally fail to take account of cyclists[2].

Investment

It is not enough to remove the distortions from the transport market. The prices and services offered to consumers will still fail to reflect the full economic costs if the distortions in the investment process are not also removed. In the UK, the transport market is severely distorted by the road construction programme followed by successive UK governments. Van Rest (1986) reviews the British Roads

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2. The area-wide Urban Road Safety Projects in Bradford, Bristol, Nelson, Reading and Sheffield allow cyclists no exemptions from banned turns and road closures. They also include mini-roundabouts which are hazardous to cyclists.

Programme and shows how investment in inter-urban roads has been disfunctionally high in relation to investment in urban roads. Coupled with rising levels of car ownership and usage, this has resulted in more heavy goods vehicle use, a more dispersed population, inner city decay and excessive pressure on urban roads. Deteriorating urban conditions, greater traffic volumes and longer average journey distances have reduced the attractiveness and usefulness of the bicycle as a means of transport. A shift in investment from inter-urban to urban roads, perhaps by making local authorities responsible for trunk roads, would provide the opportunity for greater emphasis on environmental improvements, accident reduction and schemes to aid pedestrians, cyclists, local residents and local businesses. The proposed Channel Tunnel is, arguably, the largest and most spectacular example of this distortion of transport investment.

The relevance of these points to cycling is that removal or reduction of the market distortions would almost certainly lead to a modal shift from the private motor car to cycling, walking and public transport. This shift would probably be far greater in size than anything that might be achieved by providing cycle facilities or improving safety for cyclists or promoting cycling.

6.3 Land Use Planning and Cycling

The links between land use and transport planning are now too well established to need much comment. The depopulation of city centres and the movement (of the wealthier, more mobile classes) to the suburbs has been facilitated by a growth in car ownership and a substantial programme of motorway and inter-urban road building. Urban populations are now more dispersed and city centres are less densely populated. This has led to increased average journeys lengths, a decline in public transport provision and pressure on green belt land for development.

Local authorities and developers attach little value to the transport costs of the users of hospitals, schools, hypermarkets, DIY centres, etc. The trend towards building larger units and the commensurate loss of local amenities such as village schools, post offices and pubs also tends to increase journey lengths and dependence on the car.

The implications for cycling have not been adequately considered. Waldman (1977) showed that the size of town had an effect on cycle use but beyond this little is really known. Research is needed into the relationship between land use, settlement size, journey lengths and cycling. The effects of current trends on cycle use would seem to be mixed but, on balance, detrimental. In so far as lower population densities will mitigate against public transport provision, it is likely that those unable to travel by car will increasingly use bicycles. In so far as journey lengths increase and traffic volumes rise, cycling will become less practical and more dangerous. The greater population densities of cities in the Netherlands, Germany, Sweden and Japan where levels of cycling are higher than in British cities would seem to support this view. The Cyclists' Touring Club has taken an active role in opposing the loss of green belt land as it makes the countryside even more difficult to reach by bicycle for the city dweller.

These factors are likely to have a more fundamental and long term effect on the viability and attractiveness of the bicycle as a means of transport than the issues being addressed in the name of helping cyclists by Government, local authorities and most cycling organisations at present.

6.4 Cycling Policy

6.4.1 National Cycling Policy

If cycling is to be made safer and encouraged, it is essential that general transport and land use policies are amended as suggested above. However, it would be misleading to then conclude that no special measures are required to assist cyclists. Both are necessary but not sufficient conditions.

The evidence from Germany, the Netherlands and Scandinavia shows that it is possible to influence the level of cycle use and to improve the safety of cyclists. The assumption of post-war transportation planning that irresistible social forces would lead to the elimination of the bicycle as a mode of transport has proved false: cycle use is sensitive to a range of factors, many of which are under Government control. Unfortunately, little research has been done in the UK into the policies and policy mixes that are likely to increase cycle use.

The cycling policy - and the practice - of this government and local authorities has been critically reviewed in this thesis and found seriously wanting in both quantitative and qualitative terms. The amount of money and time allocated to cycling is but a tiny fraction of total transport expenditure and disproportionately small when compared with the level of cycle use, the number of cyclist casualties and the scale of the problem. Cycling accounts for 2% of all journey stages[3] and 8.5%[4] of all reported casualties yet it is allocated a small fraction of 1% of highways capital expenditure. Not only is this amount inadequate but it may, as Hillman and Plowden suggest, be worse than doing nothing: token gestures may disguise the facts that conditions are actually worsening for cyclists.

The scope and direction of UK cycle planning is equally poor. The integrated approach of Australia, the cycle-friendly approach of Germany and the comprehensive measures adopted by other European countries and Japan have been ignored by the UK Department of Transport; with some notable exceptions, particularly the Greater London Council, county and district councils have been little better. Early dominance of engineering measures - mostly aimed at segregating cyclists from motor traffic - has given way to an emphasis on education and publicity, mostly aimed at the vulnerable road user. Yet serious doubts exist about the effectiveness of any one approach and about an approach which treats cycling in isolation from other traffic measures. Hudson (1982), Franklin (1985) and Thompson (1986) all cast doubts on the "Facilities" approach to cycle planning and suggest the need for more general traffic management policies which would assist cyclists.

One aspect of cycle planning that the Department of Transport has accepted as its responsibility is to facilitate research, experiments, know-how and standards for cycle schemes. In conjunction with TRRL it

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3. National Travel Survey 1978/79

4. Department of Transport Press Notice 203, 17 April 1986

has monitored a variety of cycle routes and facilities such as the Peterborough Cycle Route, it has provided technical advice to local authorities and it has staged a major conference on "Ways to Safer Cycling". So far as they go, these measures have been useful but there remain important aspects of this central responsibility which have been badly neglected. In particular, the Department of Transport has failed to provide a coherent framework in which it and local authorities can plan for cyclists. The objectives, rationale and methods of the policy initiative were never adequately explained.

Firstly, the objectives of the cycling policy are far from clear: the twin aims (of the 1982 policy statement) of encouraging cycling and improving safety were never properly explained in operational terms. By how much did the government hope to encourage cycle use? And amongst which sections of the population? And for what journey purposes? Similarly, what was meant by improving safety for cyclists? Did this mean a reduction in absolute cyclist casualty numbers, a reduction in the casualty rate or perhaps a reduction in the severity index? Again, this was left unanswered. More recently the Department of Transport has dropped references to encouraging cycling in favour of reducing cyclist casualties. At the Cycling Conference, Lynda Chalker said

> "We must all therefore put greater effort into finding ways to <u>reduce the number</u> of cycling accidents."
> (my emphasis), Lynda Chalker, Minister of State for Transport, Department of Transport Ways to Safer Cycling Conference, 10 April 1985.

This emphasis on reducing the number of accidents has been continued by the present Transport Minister, Peter Bottomley and it is part of the Department of Transport's increased concern with reducing accident numbers, particularly fatalities. While it may be a proper and laudable aim, it has not been properly thought through. The recent Secretary of State for Transport suggested (jokingly?) that the way to reduce road accidents might be to ban cyclists. Indeed, Brian Oldridge, County Surveyor of Cambridgeshire, stated quite unequivocally at the Department of Transport's "Ways to Safer Cycling Conference" that, in his view, encouraging cycling by providing facilities would only lead to more accidents. (For an alternative conference perspective, see Appendix 13).

Secondly, the Department of Transport failed to provide a coherent rationale for cycle planning. It showed virtually no interest in the benefits of cycling - energy conservation, improved health, reduced pollution and congestion and greater mobility - despite the fact that these were the very reasons for the public interest that led to the policy initiative. Whereas the West German Environment Ministry commissioned research into these matters with "Fahrrad und Umwelt" (The Bicycle and the Environment) the British Transport Minister declined to do so[5]. In fact, according to Plowden (1985 p129) the Department of Transport even showed a marked ignorance of its own research by Waldman which suggested a considerable amount of bicycle use (up to 20% of work journeys in Birmingham) would result if conditions were made safe. I also found a reluctance on the part of the West Midlands Regional Office to acknowledge this work. The officer claimed that the Department was not happy with the paper. However, no new work has been sponsored on this subject despite the availability of the 1981 journey to work data.

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5. House of Commons Hansard, Written Answers 19 April 1985, col 281

As the Department of Transport has proved so reluctant to encourage cycling, it may be appropriate to involve other Government Departments which also have interests in the issues related to cycling. The benefits of cycling - improved personal health, environment, fuel savings and increased mobility for disadvantaged groups - are of relevance to the Departments of Health, Environment, Energy and others besides Transport. It may also be the case that if no Government Department feels it can unequivocally encourage cycling, it should provide funds to groups, such as the Cyclists' Touring Club, which have a greater propensity to do so. This would be analagous to the anti-smoking campaign ASH which is funded by the Department of Health.

The failure to justify the existence of cyclists and the need for special attention meant that County Surveyors were sceptical about the benefits or necessity of providing for cycling as a means of transport. Whilst the Department of Transport "encouraged" local authorities it is apparent that many subscribed to the view of Brian Oldfield that providing cycling facilities might lead to more cyclists and more cyclist casualties.

All this is not to say that a rationale cannot be provided for local authorities to plan for cyclists. Environmentalists would argue that cycling is an essential mode in a sustainable transport system and cyclists would argue that they have a right to use the roads It is therefore the duty of the local authorities to permit them to do so in safety. Evidence from the UK and other countries suggests that people choose to cycle for a number of reasons and that the provision of ad hoc cycling facilities has only a marginal impact on their propensity to cycle. Many people do choose to cycle and are likely to continue to do so: the authorities should respond to these demands by reducing the risk to cyclists where possible.

6.4.2 Local Cycling Policy

Much of what has been said above in relation to a national cycling policy applies at the local level: the integrated approach embracing the 4 E's is essential; so is the link between cycling and transport policy. This is probably best demonstrated by the example of the Greater London Council.

When the Labour administration took office at County Hall in 1981, cycle use had been rising substantially for several years, despite the absence of measures to encourage or to protect cyclists on the part of the authorities. An integrated package of measures was introduced and the necessary finance, staff and consultation were provided. The 4 E's were all included:

Engineering. Plans were drawn up to implement 1,000 miles of cycle routes on minor roads throughout Greater London. A Cycling Project Team with 20 officers was formed and 1% of the Highways capital budget allocated to cycling.

Enforcement. More emphasis was placed on regulating traffic, and on enforcing existing legislation. Examples are the heavy lorry ban and wheel clamping to prevent illegal parking.

Education. A more positive approach to road safety education was adopted which emphasised the rights of non-motorised road users and the responsibilities of drivers. Adult cycle training classes were also organised.

<u>Encouragement</u>. The Greater London Council funded approximately 50% of the London Cycling Campaign' costs and hosted Velo City (the 1984 International Cycle Planning Conference) at County Hall. Leaflets and information were generously provided once the facilities began to appear.

Not only were the Greater London Council and the London boroughs involved but also the cycling organisations were regularly and thoroughly consulted through the Cycling Coordinating Committee. By involving the cyclists in the policy, strategy, planning and design process through the Committee, the Greater London Council was able to draw on the local knowledge and political support of cyclists.

Whereas areas such as the West Midlands have resisted proposals to encourage cycling, for the Greater London Council cycling was directly complimentary to their social, environmental, economic and transport policies. Their aims were to improve mobility for non-car users by promoting public transport; to discourage commuting by car into central London; to resist highway schemes that increased the volume of traffic entering the city and allowed greater inward market penetration; and to reduce road accidents. Making cycling easier and safer was, therefore, directly related to the Council's major objectives and fundamental transport policies. It also complimented the Council's economic policies (Lester 1984). Whilst the London Cycling Campaign still had much to do in terms of influencing opinion outside the Council, particularly in some of the borough councils, it did not have to argue against the main thrust of transport policy.

The Greater London Council also showed that it was possible to introduce cycling facilities, including cycle lanes, protected crossings, signalled junctions and parking stands in a very heavily trafficked, crowded metropolitan area. Furthermore, they showed that cycling could become a popular and important political issue.

The situation in the West Midlands could hardly have been more different as Chapter 3 describes. Whilst great efforts were made to reverse the decline in public transport patronage, principally through fare subsidies, a major road-building programme was also pursued with little or no attempt to alter the modal split. Increasing public transport use was seen within a context of a growing travel demand, not a shift away from the use of the car. Under these policies, cycling (and walking) was seen as almost entirely irrelevant to, if not positively at odds with, the objectives of providing for increasing volumes of traffic on a high speed road network. It was not surprising, therefore, that even after adopting a policy on cycling in 1982, the County Council introduced virtually no cycle schemes and developed an antipathy towards Pushbikes. The staff at County Hall had no experience of providing cycle facilities; very little data existed on bicycle ownership, cycle flows or cyclist accidents; and there was little incentive to acquire it.

Whilst it may indeed be possible under a future administration to make some progress by way of providing cycling facilities, it remains the case that cycling is peripheral to major transport policy objectives in the West Midlands.

6.5 Safety

Whilst it is not the intention of this thesis to examine the issues of cyclist safety at any length, it is impossible to discuss planning for cyclists without reference to the safety issue partly because it is the major cycling issue for the Department of Transport and local authorities at present and because it is a real concern of current and potential cyclists. Moreover, the safety debate has become highly controversial since the 1982 introduction of compulsory seat belt wearing. The concepts of accident migration and risk compensation have now gained in acceptance and there would appear to be a paradigm shift occurring from the mechanistic to the behaviouralist school. As such, I believe there are now serious conceptual problems regarding the meaning of road safety.

Adams (1985) argues that accidents are a function of risk and that a world in which no accidents occurred would be highly undesirable as there would be no opportunity for risk taking, something clearly wanted (though to different degrees) by individuals. He further argues that the ability of engineering, education and the law to reduce aggregate road accidents is severely limited. Accidents are dependent on the level of risk desired by society and will only fall if this desire for risk falls. Whilst it may be difficult to reduce the aggregate number of road accidents for a given level of motorisation, it is possible to alter the distribution of risk amongst road users. The increasingly forgiving attitude of road safety engineers towards the accident-prone motorist has increased the danger to cyclists and pedestrians. They in turn, have reacted by reducing their exposure at the expense of their freedom to walk and cycle.

The effects of the compulsory seat belt legislation are still hotly contested. The level of cyclist fatalities rose significantly in the ensuing period and cycle use has declined slightly in the years since 1982. In the absence of any consensus on the issue, there would seem to be sufficient evidence to warrant serious research into the possible transference of risks between road users that may occur from road safety measures or from modern highway design.

At a conceptual level, Adams' views mean that safety can only be considered in relation to risk exposure and freedom; and the risks taken by one party may reduce the safety and freedom of another party. In this light, the measurements of safety used in transport planning appear to be both conceptually weak and likely to mislead. Even operational definitions such as casualty numbers or rates per kilometre conceal muddled thinking and conflicting aims.

The safety (or danger) of a road is measured by actual accidents reported. It does not incorporate any measure of perceived danger. This allows a highly trafficked, high-speed road to be deemed safer than a low volume, low speed road. Yet for whom is the first road safer?

The use of constant accident rates is also quite misleading. By this yardstick, cycling is deemed to be up to 20 times more dangerous per kilometre travelled than car travel. Leaving aside the arguments about the appropriateness of comparing accident rates per kilometre and the inclusion of child cyclists in the figures, there is still no cognisance taken of the level of cycle use. The accident rates per kilometre for both bicycle and car travel might be very different if the relative levels of both modes were different. More research is needed here. The strong correlation between the cyclist casualties index and the level of cycling to work (see 3.2) is further evidence to suggest that higher levels of cycle use are associated with lower cyclist casualty rates. Smeed's Law shows that as the level of motorisation increases so the accident rate per kilometre decreases and the same appears to be true for the level of cycling and the cyclist accident rate. The evidence from Germany (Brog and Erl 1984) supports this conclusion.

If this is true, it is further evidence that cycling can indeed be encouraged by making it safer and that higher levels of cycle use will, in themselves, provide a downward pressure on cyclist casualty rates.

The safety issue is certainly difficult and contentious - far more complicated than might be anticipated given that almost everyone would like to see road accidents reduced. It is also one full of perversity with players apparently changing sides in the current debate. During the sixties environmentalists, such as Ralph Nader, campaigned hard to force the reluctant motor industry to improve the safety of its vehicles. Today the industry uses safety features as a means of promoting car sales whilst Friends of the Earth refuses to support compulsory seat belt wearing and the Cyclist's Touring Club actively opposed the Parliamentary Bill.

6.6 Social Factors

The National Travel Survey 1978/79, the 1981 Census and the West Midlands Cycling Survey provide some insight into the social factors pertaining to bicycle ownership and use. Between them, they indicate which population groups most depend on the bicycle and which social factors are of most importance to cycling.

It is clear that children and men in manual occupations are most likely to use bicycles. It is also clear that members of households without cars make more use of bicycles than members of households with cars. This would seem to provide a strong social equity rationale for devoting resources towards cyclists. On the other hand, it might be argued that cycling is an inferior means of transport and that it is better to provide alternative means of transport for groups most dependent on the bicycle either by improving public transport or increasing car ownership. This second view is, I believe, essentially mistaken because it fails to account for the facts that

(1) the rise in cycle use amongst the higher socio-economic groups

(2) households with cars are more likely to have bicycles than households without cars

(3) many people, through choice or necessity, will not have access to a car or public transport for substantial periods of their lives and

(4) for certain journey lengths and purposes the bicycle may be considered a superior means of transport in terms of speed, price, convenience and amenity by at least some people.

Moreover, it should be remembered that cycle ownership is the greatest single influence on cycle use and that the majority of cyclists (bicycle owners) are typical of the population in so far as they are adults, in employment and living in households with a car.

The factors that determine the level of cycle use are still poorly understood but the West Midlands Cycling Survey suggests that social factors may be as equally important as physical factors. Whilst danger and unpleasant cycling conditions are major deterrents to cycle use, social, economic and psychological factors are also of great importance. This is where the German approach of creating not only a network of safe cycle routes but also a cycle-friendly culture is superior to the British experimental schemes which consist largely of isolated engineering measures.

The role of promoting cycling is not well suited to local authorities, particularly their engineering departments. Such bodies tend to be naturally cautious, bureaucratic and distant from the grass roots. It would seem sensible to fund local cycling organisations to do most of this work as they have the enthusiasm and knowledge and will almost certainly do the work more cheaply.

The fact that women use bicycles less than men, yet also are less likely to have a driving licence or access to a car, is interesting in this context. It appears that women are more sensitive than men to the community's acceptance of cycling, the degree of traffic danger and the hilliness of the area. This again suggests that current transport provision is inequitable, catering principally for men with access to a car at the expense of women who might otherwise choose to use a bicycle.

Further research is needed into the importance of cycling to disadvantaged sectors of the population, particularly women, the unemployed and those without access to a car.

6.7 Conclusions

6.7.1 Government

1. Cycling will become significantly more popular and safer only if general transport, land use and fiscal policies are altered in favour of environmental and safety objectives. The present transport market is

seriously distorted and produces a sub-optimal economic level and mix of transport services. The objective of fiscal policy relating to transport should be to equate marginal costs to the consumer with marginal costs to society.

The risk compensation theory of Adams and others has profound implications on the road safety debate. It severely undermines the discrete, mechanistic operational concepts used by current transport planners. Research is needed into the causes of accidents at a macro level in order to provide a coherent basis for policy. New measures of safety are required which accommodate the redistribution of risk between different modes.

3. The government has failed to develop its cycling policy initiative of 1982. The scope of policy and practice has been too narrow. An integrated cycling policy incorporating engineering, education, enforcement and encouragement strategies has not been adopted.

4. Cycling is still marginal to the main thrust of transport policy. The government has not demonstrated to local authorities any coherent objectives, rationales and methods for taking significant action on cycling issues.

5. The resources devoted to cycling have been inadequate to the needs and the opportunities. The Department of Transport has discouraged local authorities further from investing in cycle facilities by making cycle schemes ineligible for Transport Supplementary Grant.

6. Fully segregated cycle facilities are not practicable or even desirable in existing towns and cities. Even in New Towns where these have been provided many cyclists choose to use the roads and overall cyclist casualty rates appear to be no better than in towns without

segregated facilities. Traffic management measures, particularly the reduction of vehicle speeds, the elimination of unnecessary traffic and parking controls, are equally important engineering techniques as segregated facilities. Greater experimentation and flexibility in traffic engineering is required to find ways of assisting cyclists. The results need to be monitored and disseminated.

7. Long term and fundamental change requires considerably more and better organised public pressure than exists at present. The various groups concerned with safety, transport and environmental issues are too disparate, under-resourced and amateur to combat the industrial and political strength of the "roads lobby". Financial and professional support is needed: a suitable example of this is the anti-smoking campaign, ASH, which is funded by the Department of Health.

6.7.2 Local Authorities

1. Planning for cycling is only likely to succeed if cycling is relevant to the main thrust of a local authority's transport policy. It is likely to be relevant if higher priority is given to the issues of safety, equity, environment, health and benefits to the local population.

2. With some notable exceptions such as the Greater London Council and, lately, Nottinghamshire County Council, local authorities in Britain have failed to respond adequately to the post 1974 increase in cycle use and cyclist casualties. They have failed even more to assimilate the bicycle into the transport system and their policies for mobility, environmental improvement, health care and energy conservation.

3. Local authorities have historically concentrated on educating child cyclists and some, recently, on providing special cycle facilities. This approach is too narrow to be successful. A local authority cycling policy must be broad in scope, giving equal weight to "soft" and "hard" techniques: Engineering, Enforcement, Education and Encouragement are all essential to a successful strategy.

4. The Greater London Council showed that cycling facilities were not expensive in terms of capital but that they required considerable planning, consultation and design. Adequate staff time, finance and liaison with local cyclists' organisations was essential to a successful cycling policy.

5. Planning for cycling is not sufficiently integrated into local transport and land use planning. It is still seen as a marginal activity. The traffic, travel and accident data collected by local authorities does not provide proper information on cycling. The planners and engineers are rarely experienced in cycling issues.

6. Traffic management techniques that reduce vehicle speeds, eliminate unnecessary traffic and restrict parking offer important means of improving conditions for cyclists. Special cycle facilities are also required not only to improve cyclists safety but also to allow cyclists greater mobility and access in a road network that increasingly channels traffic onto major roads and restricts access. Both types of measure may be suitable, depending on local conditions and opportunities.

7. Local cyclists and cyclists organisations, particularly the Cyclists' Campaign Network, the Cyclists' Touring Club and Friends of the Earth, have considerable knowledge of local conditions and in many cases, a good understanding of the problems and potential for cycle

planning. By contrast, many local authorities have little relevant knowledge or experience. Councils should assist local cycling organisations, thereby harnessing the considerable potential they offer for cheap information, advice and support on cycling issues.

6.7.3 Campaign Groups

1. If cycle campaign groups are to succeed in their aims they must move onto a more stable and professional basis. The Greater Manchester Cycling Project offers a suitable model though each locality will have its own needs and opportunities. As cycling groups succeed in their aims local councils will put greater demands on them in terms of consultation, research and responsibility. The campaign is of a long term nature requiring advanced planning.

2. Broad based support is necessary to convince local authorities that they have a mandate for cycle planning. Cycle Campaign Groups should build alliances not only with other cycling organisations but also with the political parties, cycle trade, local residents groups, the pedestrians association, environmental organisations and road safety bodies.

3. The priority for cycling campaign groups should be to lobby hard to have cycling taken seriously as a form of transport, made safer and more attractive.

4. The role that only cyclists organisations can properly fulfil is to promote cycling and generate a favourable climate of public opinion - a cycling culture. This aspect should not be neglected in the campaign to convince the authorities to provide a safer cycling infrastructure. It will increase in importance if the authorities do respond.

5. Cycle campaign groups have produced a substantial amount of surveys, reports, comments, etc (often of high standard) for local planners and engineers. They have demonstrated an expertise that the professional planners and engineers do not all have. In order to maintain their ability to suggest and respond it is vital that groups spend considerable effort staying abreast of developments in cycle planning and educating their members and, as far as possible, the local community in these matters.

6. Some groups such as Cyclebag (Bristol) have become involved in constructing cycle paths. This is a time-consuming and technical matter that is not easily handled by small, unpaid groups. Whilst it may be useful for public relations or other reasons to take responsibility for construction of a particular route, it is very demanding of the groups resources. It may prove difficult to pursue the lobbying as well.

6.8 Recommendations

6.8.1 Government

1. Transport policy should be altered to give higher priority to the environment, the safety of cyclists and pedestrians, energy conservation and social equity. The Department of Transport should pay Transport Supplementary Grant for schemes which fulfil these criteria rather than for major highway schemes as it does at present. Schemes which increase the risks to pedestrians and cyclists should not be supported.

2. Fiscal policy should be altered so as to shift the incidence of tax on transport consumers closer to the point of consumption. The marginal cost to the consumer should be made to equate as nearly as possible with the marginal cost to society. As a priority, Vehicle Excise Duty should be switched to Petrol Tax and tax subsidies on company cars should be ended. Serious consideration should be given to methods of road pricing and of recouping accident costs from motorists. Investment criteria both within and between transport modes should be standardised using economic rather than financial measures.

3. Land use planning controls should be used to prevent the reduction of population densities in cities, the trend towards larger units and the development of Green Belt land.

4. An integrated cycling policy incorporating engineering, education, enforcement and encouragement strategies should be adopted, involving a greater emphasis on "soft" measures. Lessons should be learned from the experience of Germany and other countries that have developed an integrated or "cycle-friendly" approach to cycling.

5. A clear and researched rationale should be provided to local authorities, setting out in detail the importance of planning for cycling.

6. Substantially greater resources should be invested in planning for cycling. These funds should come not only from the Department of Transport but also from the other Government Departments such as Health and Environment which would benefit from an increase in cycle use.

7. Government Departments should provide financial and professional support to pedestrian, cyclist and road safety groups just as the Department of Health funds the anti-smoking campaign, ASH.

8. Research should be undertaken into various aspects of cycling as listed in 6.7.4 under the auspices of an interdepartmental government body.

6.7.2 Local Authorities

General

1. Transport and land use policy should give higher priority to the environment, the safety of cyclists and pedestrians, energy conservation and social equity. Schemes that generate vehicle traffic and increase risks to pedestrians and cyclists should be discouraged. Planning for cycling should be thoroughly integrated into local transport and land use planning.

2. Local authorities should adopt an integrated cycling policy. This should be broad in scope, giving equal weight to "soft" and "hard" techniques - the 4 E's. Local councils, Department of Transport Regional Offices, police, health authorities, sport and recreational bodies

and cyclists organisations should work together on a co-ordinated programme.

3. An interdepartmental sub-group of planners, engineers and road-safety officers should be formed to promote and co-ordinate cycling matters within each local authority. It should liaise closely with education and recreation departments and with external bodies.

4. Cycling should be integrated into local authority planning processes and not seen as an optional extra. Vehicle ownership, traffic and accident surveys and travel models should include information on cycling.

5. Considerably better training is needed for engineers and planners in the techniques and issues of planning for cycling.

6. A variety of cycling facilities and traffic management schemes should be employed to improve safety and access for cyclists. Greater emphasis should be placed on the acceptability of the schemes to local cyclists.

7. Councils should work closely with cycling organisations, particularly the local groups of the Cyclists' Campaign Network, the Cyclists' Touring Club and Friends of the Earth. They should fund them to undertake the encouragement and promotion of cycling, the production of cycling guides, maps and reports and the support services that are necessary to create a favourable climate of opinion towards cycling.

West Midlands Local Authorities

The recommendations 1-7 above apply to the seven district councils of the West Midlands. In addition, I would make the following specific recommendations:

1. A cycling policy and strategy should be drawn up on the basis of proposals in "A Cycle-Friendly Birmingham". The key factors are a team of cycling officers, a budget and a liaison group.

2. The network of advisory cycle routes contained in "A Cycle Friendly Birmingham" should be adopted as the basis for future cycle planning in the city. In Sandwell, the Pushbikes report on Safe Routes to Schools offers the best basis for improving cyclist safety and access. Similar reports should be drawn up, following consultation exercises, to cover the other districts.

3. Proposal TR7 Cycling in the Birmingham Central Area Local Plan (giving access to the City Centre) should be implemented as a priority as an integral part of the pedestrianisation scheme.

4. An independent West Midlands cycling project, similar to the Greater Manchester Cycling Project, should be funded to undertake surveys, reports, promotions and information to compliment that work done by the local authorities.

5.. The first cycle schemes to be introduced should be on-highway and avoid significant shared use of footways with pedestrians.

6. An urgent review of all roundabouts within the county should be undertaken with a view to altering layouts so as to reduce the risks to cyclists.

6.7.3 Campaign Groups

General

1. The links between cycling and general transport and land use planning need to be recognised more fully. Cycling organisations should

support efforts that seek to tackle these broader issues but should retain their distinct role as a single issue campaign.

2. Ways must be found to raise money and employ qualified staff in order to move cycling organisations onto a more stable and professional basis. The national office of the Cycle Campaign Network needs to be strengthened. Groups should recognise that their involvement will grow, not diminish, if they are successful and they should plan for a longer time horizon.

3. Cycle campaign groups should broaden their support base by building alliances not only with other cycling organisations but also with the cycle trade, local residents groups, the pedestrians association, environmental organisations and road safety bodies.

4. Cyclists' organisations should lobby even more vigorously for the rights of cyclists and for cycling to be taken seriously as a desirable mode of transport. Abolition of the metropolitan county councils presents new opportunities. Influence and consultations should be extended to include such bodies as political parties, the police, health and sporting organisations.

5. A high quality report containing proposals for policy, strategy and facilities, taking "A Cycle-Friendly Birmingham" as a model, should be a produced for all towns.

6. Groups must spend considerable effort staying abreast of developments in cycle planning and educating their members and, as far as possible, the local community in these matters.

7. Greater attention should be devoted to promoting cycling and generating a favourable climate of public opinion - a cycling culture.

8. Major involvement in the physical construction of cycle paths is not recommended as a principle function of local cycling groups.

Pushbikes

The recommendations 1-7 above apply to the Pushbikes as much as other cycle campaign groups. In addition, I would make the following specific recommendations:

1. The proposals contained in "A Cycle-Friendly Birmingham" should be pursued and form the basis of future contacts with the local authorities.

2. A Birmingham (or West Midlands) cycling project should be set up as a priority, perhaps along the lines of the Greater Manchester Cycling Project. More formal management structures will be required to plan and guide the project.

3. Contacts with the West Midlands Police, Birmingham road safety officers, the Birmingham Pedestrians Association, local residents groups, the visually handicapped and cycling clubs need to be established and/or renewed.

6.7.4 Further Research

The following are recommended as valuable subjects for further research in Great Britain:

1. The relationships between land use, settlement size, journey length and cycle use.

2. The transference of risks between different classes of road user in modern highway design.

3. The relationship between the cyclist casualty rate and the level of cycle use.

4. The levels of cycle use that could be achieved under various policy mixes.

5. The most effective methods (single and combined) of encouraging cycle use.

6. Households or individuals as the more meaningful unit for analysis of bicycle ownership and access to a bicycle.

7. The importance of the bicycle as a means of transport to disadvantaged sectors of society.

APPENDIX 1

THE CYCLE CAMPAIGN NETWORK - A SURVEY OF MEMBER GROUPS

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1. AIMS OF SURVEY

To provide an up to date and systematic overview of the structure, activities and problems of CCN groups.

2. INTRODUCTION

The Cycle Campaign Network (CCN) is a loose federation of approximately 60 cycle campaign groups in the UK.

The official CCN secretariat is provided by the London Cycling Campaign (LCC) at Tress House but the essential continuity and communication comes from the Friends of the Earth "bikes mailing", a bi-monthly package of national and local campaign news.

There are no CCN affiliation fees and membership is not clearly defined. Most of the member groups are single-issue campaign groups concerned with making cycling safer and promoting it as a means of transport. They are not, for the most part, cycling clubs which concentrate on recreational cycling. Instead, they represent the urban, utility cyclist and a particular segment of the environmental movement.

For the purposes of this survey, certain local Friends of the Earth (FoE) groups have been included. Under a stricter definition of the Cycle Campaign Network they might not be but, as these groups are the principal cycle campaigns in their areas and because the CCN has such close links with FoE, it seems pedantic and even misleading to ignore them. The survey does not, however, cover the Rights Network of the Cyclists' Touring Club as it is an entirely separate organisation with different structures, communication channels and membership, albeit with similar objectives.

3. RESEARCH METHOD

In September 1984 a pilot questionnaire was sent for comment to 20 selected individuals involved in cycle planning and campaigning. Their responses were taken into account and the revised questionnaire sent to 69 CCN groups* in February 1985. Three weeks later, 29 reminders and duplicate questionnaires were sent to groups that had not replied and by March 28, 58 questionnaires (84%) had been returned. Of the 11 groups that did not reply, three are LCC Borough groups, 2 are small FoE groups, 4 are probably defunct and only one is a mainstream campaign group. (See Table 1) A full list of groups is contained in Appendix A.

Because of the size and federal structure of the London Cycling Campaign (4,500 members and about 20 Borough groups) it has been analysed separately. The 4 FoE groups that replied to the survey have also been analysed separately in most cases.

4. FORMATION, AFFILIATIONS AND MEMBERSHIP

4.1 Formation

The first groups were set up in 1975 in Bedford, York, Lambeth and Haringey. Norwich FoE was also formed that year. The Bedford Association of Cyclists, however, has always been a small group and has now wound up, having achieved its aims, and the York Cycle Campaign did not have a formal membership until 1984.

Although the late seventies was the period when most major groups were formed, there has been no fall off in formation of new groups during the eighties and some of these have already proved highly successful. Table 1 does not, however, show all groups that formed and disbanded before the survey, only those that were thought to be active and replied to the questionnaire.

Table 1 Year in which groups were formed

	1975	1977/8	1979/80	1981/82	1983/84	Total Replies	Total in Survey
Cycle Campaign Groups	2	5	12	7	11	37	43
FoE groups	1	1		2		4	6
LCC		LCC				1	1
LCC Borough Groups	2	3	4	1	6	16	19
	5	10	16	10	17	58	69

* The list of groups (and names and addresses) was compiled from information supplied by the CCN, Friends of the Earth and the London Cycling Campaign.

4.2 Affiliations

Apart from membership of the CCN, LCC and the Scottish Cycling Campaign, individual groups are affiliated to Friends of the Earth, the Cyclists' Touring Club, RoSPA, Transport 2000, the Pedestrians Association, local cycling clubs, voluntary councils and organisations of the disabled.

Table 2 Affiliations of individual groups

Affiliation	Cycle Campaign Groups	FoE Groups
Friends of the Earth	5	4
Cyclists' Touring Club	12	2
Transport 2000	2	
Other cycling organisations	4	
Others	8	

LCC and its Borough groups are affiliated to Friends of the Earth, London Amenity and Transport Association, Transport 2000, and the European Cyclists' Federation. One LCC Borough Group is affiliated to the Cyclists' Touring Club.

4.3 Membership Size

Membership varies from a handful of people to the 4,500 members of the LCC. Some groups, eg Leigh and Reading, do not collect subscriptions, whilst four are currently moribund and have no membership. Many groups give only approximate figures for male, female and junior members.

Table 3 Membership Size

No. of Members	Cycle Campaign Groups	FoE groups	LCC*
0	5		
1-10	2	1	
11-50	16	1	
51-100	4	1	
101-200	5	1	
200-500	5		
4,500			LCC
Total	37	4	1

*LCC Borough Groups are excluded to avoid double counting.

The total number of members is estimated at 8,152, including the 4,500 LCC members. The average mean size of non-LCC groups is 101 although almost half have less than 50 members. Approximately 67% of members are male and less than 10% of members are under 18 years old. One group of over 300 members has only 10 female members.

4.4 Membership Trends

About half the groups think their membership is stable and a third think it is rising. Five groups report a falling membership and four have no active membership remaining.

Table 4 Membership Trends

Membership	Cycle Campaign Groups	FoE Groups	LCC	LCC Borough Groups
Rising	18	1	LCC	8
Stable	9	3		6
Falling	5			2
Defunct	4			
Not yet organised	1			
Total	37	4	1	16

4.5 Membership Fees

Membership fees vary from nothing in the case of several small groups, through "heavy appeals" at renewal time by Spokes, to £5.00 per annum for waged members of St Christopher's Cycling Club. £1.00 or £2.00 is most common. Over two-thirds of groups offer discounts to unwaged and junior members, LCC charges a flat rate £3.00 to all and four LCC Borough groups charge an additional membership fee of £1.00 or £2.00.

4.6 Most Significant Members

Groups were asked to assess the significance of various types of members in the activities and effectiveness of the campaign. Of the cycle campaign groups, nine consider that unemployed members play a more significant role than members with professional skills such as planners. Twelve, however, find the reverse to be the case whilst five consider them equal. Although only a handful of groups have employees, in all cases they are considered highly significant in the activities and success of the group.

Fourteen groups consider that male and female members contribute equally, fourteen consider that male members contribute more whilst two consider that female members contribute more to the group. This seems to reflect the greater number of male members in most groups.

LCC Borough groups are equally divided three ways amongst those who rely on members with professional skills, those who feel unemployed members play the greatest part and those who feel the contribution is equal. In all except one group, males either contribute equally or more significantly than female members.

4.7 Benefits to Members

Table 5 Benefits provided by groups to their members

Benefit	Cycle Campaign Groups	FoE Groups
Theft Insurance	0	0
Third-party Insurance	6	0
Legal Aid	4	0
Library	12	2
Social Events	14	2
Post-coding	6	1
Rides	24	3
Cycle Workshop/Tools	7	0
Discounts for Cycle Shops	15	0
Goods for Sale	13	1
Pothole Cards	21	3
Planning Advice	12	0
Information Service	16	2
Other	5	0

The LCC provides all the above benefits to members and therefore, in theory at least, so too do the LCC Borough groups. However, the replies suggest that some Borough groups are not aware of the full range of benefits.

5. ORGANISATION

5.1 Frequency of Meetings

The vast majority of groups hold general meetings either monthly or irregularly whenever interest and issues permit. Some groups hold additional meetings for sub-groups, working parties and special events.

Table 6 Frequency of general meetings

Frequency	Cycle Campaign Groups	FoE Groups	LCC	LCC Borough Groups
Weekly	1	0		0
Fortnightly	0	1		0
Monthly	20	3	LCC	11
Bi-monthly	0	0		2
Irregularly	11	0		2
Total	32	4	1	15

5.2 Attendance at Meetings

The average number of people attending meetings varies from 3 to 35. 69% of LCC Borough groups attract an average of between 5 and 9 people whilst cycle campaign and FoE groups show a greater variety with a higher mean average of 11 people.

Table 7 Average number of people attending general meetings

Average No Attending	Cycle Campaign Groups	FoE Groups	LCC	LCC Borough Groups
1-4	5	0		2
5-9	11	1		11
10-19	8	3		3
20-35	8	0	LCC	0
Total	32	4	1	16

5.3 Constitution

Almost half of all the groups have a written constitution. However, at least one group has mislaid it and others suggest that it has little bearing on the general running of the group.

5.4 Officers

Most groups have a chairperson, treasurer and secretary although FoE groups and LCC Borough groups prefer co-ordinators to chairpersons. Officers are not necessarily elected and in some cases one person fulfils more than one post.

Table 8 Officers

Officer	Cycle Campaign Groups	FoE Groups	LCC	LCC Borough Groups
Chairperson	20	0	LCC	5
Co-ordinator	2	3	LCC	10
Treasurer	26	4	LCC	7
Secretary	24	2		3
Membership Sec.	14	3		2
Publicity Officer	5	1		4
Other	7	1	LCC	6

Other officers include Legal Officer, Newsletter Co-ordinator, Social Secretary and Rides Organiser.

5.5 Steering Committee or Executive

Nine cycle campaign and FoE groups have a formal steering committee or executive; twenty-eight do not. At least one group has an informal steering committee. The LCC and 14 out of 16 Borough groups operate without either.

5.6 Sub-Groups

Sub-groups are almost exclusively organised on an ad hoc or informal basis and not formally constituted. They range in number between 0 and 6 per group with most having two or less.

The LCC, all 4 FoE groups and almost half the cycle-campaign groups have had sub-groups in the past. Sub-groups currently exist in the LCC, two of the FoE groups and nine of the cycle campaign groups. Only one LCC Borough group has sub-groups.

5.7 Paid Workers

Only four groups have a paid worker, making a total of 5.5 jobs. This includes one FoE co-ordinator who is not full-time on cycling matters. Workers are financed by local authority grants, membership subscriptions and sales, the Manpower Services Commission and waste-paper collections.

5.8 Permanent Office

The LCC and ten other groups have a permanent, if shared, office. None of the LCC Borough groups has its own office.

6. NEWSLETTER

6.1 Newsletter Frequency

Virtually all groups produce a newsletter, except for the very small or inactive ones. The LCC Borough groups may produce a separate newsletter or an insert in the main LCC newsletter which all members receive.

Table 9 Newsletter Frequency

Newsletter Frequency	Cycle Campaign Groups	FoE Groups	LCC	LCC Borough Groups
No newsletter	3			3
Monthly	1	1		1
Bi-monthly	2	2		2
Quarterly	12	1	LCC	1
Six-monthly	2			
Annually				1
As necessary	12			8
Total	32	4	LCC	16

6.2 Number of Newsletters Produced

Table 10 Number of newsletters produced

Number produced	Cycle Campaign Groups	FoE Groups	LCC	LCC Borough Groups
<50	2	1		1
50-99	1	2		1
100-150	4			3
200-300	10			5
400-500	4	1		2
700-800	3			
2,000-2,500	1			1
5,000-7,000	2		LCC	
Not Stated	2			
Total	29	4	LCC	13

6.3 Newsletter Distribution

Apart from members, the following people and institutions receive newsletters.

Table 11 Newsletter Distribution, showing the number of groups distributing newsletters

People/ Organisations	Cycle Campaign Groups	FoE Groups	LCC	LCC Borough Groups
MPs	7	1	LCC	3
Councillors	20	1	LCC	6
Council Officials	17	1	LCC	5
Committee Chairs	12	1		3
Local Press	16	2	LCC	6
Local Radio	14	1	LCC	1
National Press	3	1	LCC	
National Radio	3		LCC	
Television	3	1	LCC	
Cycle Shops	26		LCC	8
Campaign Groups	18	1	LCC	8
Libraries & Others	5	1		4

7. ACTIVITIES

7.1 Planning and Discussion

Over 80% of groups have recommended a cycling policy to the council and over half have commented on the current county structure plan. Only 22% of existing active groups, however, had commented on the Transport Policies and Programme submission for 1985/86 at the time of the survey. Local plans are clearly a process in which groups get involved: almost all CCN groups have commented on at least one local plan and the majority have commented on two or more. However, relatively few cycle campaign and FoE groups and half the LCC Borough groups reach the stage of appearing at the local public inquiry. Even fewer groups have appeared at a public inquiry into trunk road proposals although the LCC and LCC Borough groups have appeared at 12 compared with 9 attended by cycle campaign and FoE groups.

The London groups also have a better history of consultation and discussion with local authorities than the provincial groups. They are more likely to be allowed to represent cyclists on a council committee and most London groups regularly discuss cycling with councillors and council officers whilst the provincial groups tend to meet councillors more occasionally than regularly (Table 16). All groups discuss cycling more frequently with council officers than with councillors. Sixteen groups (32% of English groups) have had discussions with the Department of Transport Regional Cycling Officer and these discussions have all been occasional, not regular.

7.2 Route Guides and Events

At least 24 groups have produced urban cycle-route guides and 13 have produced guides to rural routes. Not surprisingly, few London groups have produced rural route guides.

The events staged by groups are varied and innovative. Over two-thirds of groups hold mass rides for the public although the number of participants ranges widely from a few dozen to thousands. Thirteen groups have organised events for minority groups, notably tandem rides for the blind and disabled. There have also been women-only and joint cyclist-pedestrian events. 57% of groups state that they have organised direct actions, including "bike-ins", removing cycle barriers, cycling in parks contrary to byelaws, and cycling through bus-only junctions. Some groups have listed demonstrations and lobbying of meetings as direct actions.

Fourteen groups have organised cycle-safety training of some kind and most groups organise rides designed to give greater confidence to the less experienced rider. The training may involve cycle maintenance, riding skills, road safety and competitions for young cyclists. It is often conducted in conjunction with the local road-safety team. One London group reports "little interest" but other groups are keen to take it up.

Table 12 Group Activities

Activity	Cycle Campaign Groups	FoE Groups	LCC	LCC Borough Groups	Total
Recommended a cycling policy to the Council	29	3	LCC	14	47
Commented on the current structure plan	18	3	LCC	9	31
Commented on the 1985/86 TPP	8	2		2	12
Represented cyclists on a Council Committee	13	2	LCC	10	26
Produced an urban cycle-route guide	14	1	LCC	8	24
Produced a rural cycle-route guide	11	1		1	13
Organised mass public rides	26	3	LCC	10	40
Organised events for minority groups	9	1	LCC	2	13
Organised direct actions	12	2	LCC	7	22
Organised cycle safety training	9	0	LCC	4	14

Table 13 Participation in planning procedures by Cycle Campaign and FoE Groups

	Never	Once	Twice	Thrice	More
Commented on a Local Plan	4	10	11	1	12
Taken part in a Local Public Inquiry	22	7	2	1	0
Taken part in a Trunk Road Inquiry	28	7	1	0	0

Table 14 Participation in planning procedures by LCC and LCC Borough Groups

	Never	Once	Twice	Thrice	More
Commented on a Local Plan	2	3	3	2	7
Taken part in a Local Public Inquiry	8	3	3	0	3
Taken part in a Trunk Road Inquiry	10	3	3	1	0

Table 15 Regularity of discussions between authorities and Cycle Campaign and FoE Groups

Discussed Cycling with	Never	Occasionally	Regularly
Council Officers	0	15	21
Councillors	1	22	12
Regional DTp Cycling Officer	20*	12	0

*This includes 3 English groups who replied "Who?"! Scottish, Welsh and Irish groups are excluded as the DTp is not directly responsible in these areas.

Table 16 Regularity of discussions between authorities and LCC and LCC Borough Groups

Discussed cycling with	Never	Occasionally	Regularly
Council Officers	0	4	13
Councillors	0	8	9
Regional DTp Cycling Officer	13	4	0

8. AIMS AND OBJECTIVES

8.1 Aims

In terms of major aims, groups show a high degree of homogeneity despite their different sizes, locations and styles. Almost unanimously (93%), groups want to see cycling made safer through a variety of means including special facilities, better road planning and greater safety awareness by drivers. Rather surprisingly, only 43% of groups state that they want to promote cycling either as a means of transport or for recreation. In addition, one group wishes to promote cyclists' rights, two LCC Borough groups are working for greater traffic restraint and four other London groups aim to have fun, hold rides and become clubs as soon as the campaign is won.

8.2 Objectives

Groups were asked about their specific objectives for 1985. Although three groups replied that none had yet been agreed (February/March 1985), most groups responded listing over thirty different objectives. These fell into six major categories: engineering, safety, planning and local authorities, membership, events and communication. Clearly, the priority for most groups is the implementation of a specific cycle route, scheme, or parking facility. Nine groups also intend to persuade their local authority to adopt a cycling policy or include cycling proposals in a local plan. For seventeen groups, raising membership and activity levels is seen as important whilst three groups state "survival" and "holding meetings" as their objectives for 1985. National Bike Week and similar events intended to involve the public and generate media interest are a priority for twelve groups and a further five want to achieve a higher campaign profile.

Table 17 Objectives of Cycle Campaign Network Groups for 1985

Objective	Provincial Groups	London Groups	Total
Engineering			
- Cycle routes installed	20	6	26
- Cycle parking facilities	4	1	5
- Safe routes to school	2	-	2
Safety			
- Safety campaigns	1	1	2
- Adult cycle training	-	1	1
- Traffic law enforcement	-	1	1
Planning/Local Authority			
- Cycling policy/plans adopted	7	2	9
- Liaison group/ improved communication	5	-	5
- Byelaw changes	1	-	1
- Cycling officer appointed	2	1	3
- Cycling budget/TPP schemes	2	1	3
- Retain GLC	-	2	2
Membership			
- Survival	2	1	3
- More members/activity	12	5	17
Events			
- National Bike Week	11	1	12
- Library Display	1	-	1
Communication			
- Information Service provided	1	1	2
- External relations improved	2	1	3
- Route maps published	4	2	6
- Newsletter improvements	3	-	3
- Higher campaign profile	2	3	5

9. SUCCESSES, FAILURES AND CONSTRAINTS

9.1 Successes

Almost half the groups quote the installation of specific cycle facilities amongst their major successes, with London groups showing a higher success rate than provincial groups. Seven groups consider their involvement in local plans and inquiries to be major successes and twenty-four (44%) feel they have succeeded in raising the awareness of the local authorities and the public about cycling issues.

Table 18 Major Success of Cycle Campaign Network Groups

Major Successes	Provincial Groups	London Groups	Total
Engineering			
- Cycle routes installed	11	8	19
- Cycle parking installed	6	4	10
- Potholes campaign	1	2	3
Safety			
- Maintenance classes held	1	-	1
- Speed limit lowered	-	1	1
Planning			
- Local plans modified	6	1	7
Local Authorities			
- Representation on Committee	1	2	3
- Cycling officer appointed	2	1	3
- Cycling budget/TPP schemes	1	1	2
Membership			
- Survival of group	3	-	3
- Increasing membership	2	-	2
Events			
- Rides, etc organised	7	-	7
- Fund raising	-	1	1
Communication			
- Local contacts established	4	-	4
- Recognition as significant group	-	2	2
- Local awareness raised	15	9	24
- Media support	2	-	2
- Surveys and guides published	3	2	5
- MP support for Cycle Tracks Act	1	1	2

9.2 Major Failures

Although 3 groups (all formed within the past two years) feel they have had no failures to date, other groups list over 25 different failures. However, to describe them all as major failures is, perhaps, too harsh. The overriding concern is the groups' inability to increase membership and to activate existing members - a fact cited by 13 provincial and 8 London groups. In addition, several groups are concerned at the lack of female and ethnic involvement and lack of support from traditional cycling clubs and the general public.

In terms of the aims of cycle campaigning, failures include local authority inaction and attitudes (11 groups), disappointment with the Department of Transport, Scottish Office, and police (3 groups) and lack of publicity (4 groups). Two groups are unhappy about the standard of cycle facilities provided, particularly the lack of pedestrian-cyclist segregation. A bad performance at a local inquiry is felt to have set back one group's campaign and another feels that its failure to understand local planning procedures is a hindrance. Not surprisingly, a number of groups feel that progress is too slow.

9.3 Constraints on Effectiveness

The most common and serious internal constraint on the effectiveness of all types of group is perceived to be the lack of sufficient members with the necessary skills, time and commitment (45 groups). Rather surprisingly, only

5 groups list money - or lack of it - as a major constraint. Internal organisation is a problem for six groups and one feels that its premises are unattractive.

External constraints are predominantly intransigent local authorities (19 groups), lack of support (2 groups) and even opposition from local media (1 group) and railway interests (2 groups). The law, the Government and access to information are also mentioned. One group feels no constraints.

10. POLITICAL PARTIES AND COUNCILS

Groups were asked to assess the sympathy for cycling issues shown by local political parties, councillors and council officers. Tables 19-22 show the number of groups, not councillors etc, in each category. The results suggest that the Labour party is marginally more sympathetic than the Liberal SDP Alliance whilst the Conservatives are the least interested of the major parties. District councillors in the provinces are clearly seen to be more sympathetic than county councillors but in London the situation is reversed. However, many groups comment that support for cycling varies considerably according to the interests of individual councillors and not necessarily along party-political lines. The figures should, therefore, be treated cautiously.

The results for council officers parallel those for councillors: district planners and engineers are deemed more sympathetic than their counterparts at county level except in London where the GLC Cycle Project Team is obviously popular. In almost all areas and at both tiers of local government, engineers show less interest and sympathy than planners. In fact, only 6 groups consider engineers more sympathetic than planners at either local or county level.

Table 19 Level of sympathy from political parties according to Cycle Campaign and FoE Groups

Party	Uninterested	Sympathetic	Very Sympathetic	Unclear
Alliance	4	11	5	13
Conservative	8	13	0	13
Labour	2	17	6	9

Table 20 Level of sympathy from political parties according to LCC and LCC Borough Groups

Party	Uninterested	Sympathetic	Very Sympathetic	Unclear
Alliance	2	4	4	5
Conservative	7	4	0	5
Labour	3	5	5	3

Table 21 Level of sympathy from Councils according to Cycle Campaign and FoE Groups

Council	Uninterested	Sympathetic	Very Sympathetic	Unclear
District Councillors	7	16	6	3
District Planners	2	20	9	2
District Engineers	8	10	5	7
County Councillors	10	12	2	7
County Planners	8	13	3	7
County Engineers	11	8	3	8

Table 22 Level of sympathy from councils according to LCC and LCC Borough Groups

Council	Uninterested	Sympathetic	Very Sympathetic	Unclear
Borough Councillors	3	9	2	1
Borough Planners	4	8	4	0
Borough Engineers	5	5	4	2
GLC Councillors	1	2	7	3
GLC Planners	0	3	10	1
GLC Engineers	0	1	6	7

11. CONCLUSIONS

This survey provides a considerable amount of data: it is possible to analsye it in a large number of ways and draw an equally large number of conclusions. Those set out here are not intended as a comprehensive set of answers on how to campaign successfully. Rather, they are intended to indicated topics of importance to the Cycle Campaign Network and stimulate discussion on how its aims are best achieved.

(1) The CCN is in a good state of health with new groups forming at a steady rate. Some of the smaller groups, however, lack resources and expertise. In the absence of a national cycle campaign body, the larger, better established groups could assist smaller groups in their region.

(2) The shortage of active members with the necessary skills is a problem for many groups. Whilst some groups may lack members in absolute terms, other groups find that their successes lead to greater demands on time and people. Few groups appear to have seriously considered money as a substitute for recruiting more members despite the perceived effectiveness of employees.

(3) Most groups are informally structured: the organisation adjusts to new situations, often by forming sub-groups, rather than maintaining a rigid structure. Democracy and equality are considered important - hierarchies are disliked. This form of organisation requires good communications, both internally and externally. The fact that a high percentage of members do not participate in campaign events suggests that improvements could be made.

(4) Communications with local authorities are patchy. Some groups clearly put more effort into keeping councillors and council officials informed

than others. If the campaign aims are to be achieved this will require a higher priority.

(5) Local plans are perceived as an important and fruitful area for CCN groups. Transport Policies and Programmes are more difficult to influence but no less vital. Groups should not overlook the opportunities presented by the planning process and, if necessary, look for professional advice and support.

(6) Cycle provision is not seen as a party political issue. Although the Labour party is perceived to be the most sympathetic to the aims of groups, the views of councillors vary considerably according to individual interests. CCN groups should consider ways of injecting the cycling issue into the political debate at local level through all major parties.

(7) Engineers are considered less sympathetic than planners to the aims of CCN groups. This is a serious problem as it is engineers rather than planners who are responsible for highways, where problems are greatest for cyclists. Better training for engineers is required and there should be greater input by planners to transport policy and highway design.

APPENDIX. CYCLE CAMPAIGN NETWORK GROUPS INCLUDED IN SURVEY

Aberdeen Cycling Campaign*#
Association of Bedford Cyclists*#
Association of Belfast Cyclists*#
Aston University Cyclists' Action Group*
Bath Friends of the Earth
Bradford Cyclists' Action Group
Bricycles, the Brighton Cycling Campaign*
Bristol Urban Cycling Campaign*
Canterbury Cycling Campaign*
Cardiff Cycling Campaign*
Chain, the Crewe and Nantwich Cyclists' Pressure Group*
Chelmsford Cycling Action Group*
Croydon St Christopher's Cycling Club*
Cyclebag (Bristol)*
Cyclebag (Cheltenham)*
Cyclic, the Coventry Cycling Campaign*
Derby Cycling Group*
Doncaster Cycling Campaign
Dublin Cyclefolk*
Glasgow Cycling Campaign*
Gwynedd Cycle Routes
Havant Cycling Campaign*
Inverness Campaign for Safe Cycling*
Lancaster Cycle Campaign*
Leeds Cyclists' Action Group
Leicester Spokes*
Leigh Cycling Group*
Lincoln Cycleways Promotion Committee*
Merseyside Cycling Campaign*
Milton Keynes Cycle Users' Group*
Nairn Cycle Club*
Norwich Friends of the Earth*
Pedals, the Nottingham Cycling Campaign*
Pushbikes, the West Midlands Cycling Campaign*
Reading Cycle Campaign*
Rochdale Area Cycle Campaign*#
St Albans Friends of the Earth*
Sheffield Cycle Campaign
Southampton Cycling Campaign*
Spalding Cyclists' Action Group
Spokes, the Lothian Cycling Campaign*
Sprocket, the Manchester Cycling Campaign*
Stratford-upon-Avon Friends of the Earth*
Swindon Bike Group*
Tynebikes, the Tyneside Cycling Campaign*
Watford Friends of the Earth Cycle Campaign*
Wigan Friends of the Earth
Wolverhampton Cycling Campaign*
York Cycling Campaign*

London Cycling Campaign*

LCC Borough Groups

Barnet
Camden
City*
Ealing*
Hackney*
Haringey*
Harrow*
Hounslow*
Hillingdon
Islington*
Lambeth*
Newham*
Richmond*
Southwark*
Sutton*
Tower Hamlets*
Waltham Forrest*
Wandsworth*
Westminster*

* Replied to questionnaire
\# No longer active

CYCLE CAMPAIGN GROUP SURVEY

GROUP

1. Name of Group ______________________________

2. Address ______________________________

   ______________________ Post code ____________

3. Telephone(s) ______________________________

4. Contact Person(s) ______________________________

   ____

5. When was your group formed? ______________________________

6. Is it affiliated to, or a member of, any other organisation?

   (Please specify) ______________________________

MEMBERSHIP

7. How many paid-up members does your group have? ______________

8. How many members are Male? __________ Female? __________

9. How many members are under 18? __________

10. Have you ever conducted a survey of your membership? *Yes* *No*

    If "Yes", please give brief details) ______________________________

    ____

11. In terms of your group's current activities and effectiveness, how significantly do they depend on the following members?
    (Please circle one number on the scale from 0 - 10)

		Insignificant										Very significant
(a)	Unemployed members	0	1	2	3	4	5	6	7	8	9	10
(b)	Professionals/specialists (e.g. planners)	0	1	2	3	4	5	6	7	8	9	10
(c)	Group Employees (if any)	0	1	2	3	4	5	6	7	8	9	10
(d)	Male members	0	1	2	3	4	5	6	7	8	9	10
(e)	Female members	0	1	2	3	4	5	6	7	8	9	10

12. Is your membership *rising, falling or stable?* (Please circle one).

13. What is your membership fee for (a) waged? £ _____

    (b) unwaged? £ _____

    (c) junior? £ _____

    (d) family? £ _____

14. What benefits do you offer members? (Please circle).

Theft insurance schemes, Third party insurance, Legal aid, Library, Social events, Post coding, Rides, Cycle workshop/tools, Discounts at cycle shops, Goods for sale, Pothole cards, Planning advice, Information service, Others (please specify)

____

ORGANISATION

15. How often do you hold general meetings? (Please circle)

Weekly, Fortnightly, Monthly, Bi-monthly, Irregularly, Other (please specify) ______________________________

16. What is the average attendance at these meetings? ______________

17. Do you have a written constitution? *YES NO*

18. Do you have officers? (Please circle)

Chairperson, Co-ordinator, Treasurer, Secretary, Membership-Secretary Publicity Officer, Others (please specify ______________

____

19. Do you have a formal steering committee or executive? *YES NO*

20. Have sub-groups existed in the past? *YES NO*

21. Do you currently have sub-groups? *YES NO*

22. Please list only current sub-groups ______________

____

____

23. How are the sub-groups organised? (Please circle)

Formally constituted, Adhoc, Other (please explain) ______________

____

24. Do you have any paid workers? *None, One, Two, Three,*

(Please specify if more) ______________

25. How are these workers funded? ______________

____

26. Do you have a permanent office? *YES NO*

NEWSLETTER

27. Do you produce a Newsletter? *YES* *NO*

28. How frequently?

Monthly, *Bi-monthly,* *Quarterly,* *Six-monthly,* *As necessary,*

Other (please specify) ______________________________

29. How many copies do you produce? ______________________________

30. Do you send copies to any of the following? (Please circle)

M.P.s, *Councillors,* *Council officials,* *Council Committee Chairs,*

Local Press, *Local Radio,* *National Press,* *National Radio,* *T.V.,*

Cycle shops, *Other campaign groups,* *Others (please specify)*

____

31. ACTIVITIES

(Please circle)

Has your group:

(a) Recommended a cycling policy to the Council? *YES* *NO*

(b) Commented on the current County/Regional Structure Plan? *YES* *NO*

(c) Commented on the recent (1985/86) T.P.P.? *YES* *NO*

(d) Commented on a Local Plan? *None* *One* *Two* *Three* *More* ____

(e) Taken part in a Trunk Road Public Enquiry? *None* *One* *Two* *Three* *More* ____

(f) Taken part in a Local Public Inquiry? *None* *One* *Two* *Three* *More* ____

(g) Discussed cycling with Council Officers? *Never* *Occasionally* *Regularly*

(h) Discussed cycling with Councillors? *Never* *Occasionally* *Regularly*

(i) Discussed cycling with your Regional DTp Cycling Officer? *Never* *Occasionally* *Regularly*

(j) Represented cyclists on a Council Committee? *YES* *NO*

(Please state committee(s)) ______________________________

____

32. Has your group:

(a) Produced an urban cycle route guide? *YES* *NO*

(b) Produced rural cycle route guides? *YES* *NO*

(c) Organised mass rides for the public? *YES* *NO*

(d) Organised special events for "minority" groups? YES NO

(Please give brief details) ______________________________

____

(e) Organised "direct actions"? YES NO

(Please give brief details) ______________________________

____

(f) Organised cycle riding/safety training YES NO

(Please give brief details) ______________________________

____

33. What are your groups major aims?

____

____

____

34. What are you groups specific objectives for 1985?

____

____

____

35. What are the major constraints on your group's effectiveness?

____

____

____

36. What do you consider to be the major successes of your group?

____

____

____

37. What do you consider to be the major failures of your group?

____

____

____

38. How sympathetic to your aims are the following political parties at local level? (Please circle)

(a)	Alliance	*Disinterested*	*Sympathetic*	*Very sympathetic*	*Unclear*
(b)	Conservative	*Disinterested*	*Sympathetic*	*Very sympathetic*	*Unclear*
(c)	Labour	*Disinterested*	*Sympathetic*	*Very sympathetic*	*Unclear*
(d)	Nationalist	*Disinterested*	*Sympathetic*	*Very sympathetic*	*Unclear*

39. How sympathetic to your aims are the following groups?

(a) District/Borough Councillors

Disinterested *Sympathetic* *Very sympathetic* *Unclear*

(b) District/Borough Planners

Disinterested *Sympathetic* *Very sympathetic* *Unclear*

(c) District/Borough Engineers

Disinterested *Sympathetic* *Very sympathetic* *Unclear*

(d) County Councillors

Disinterested *Sympathetic* *Very sympathetic* *Unclear*

(e) County Planners

Disinterested *Sympathetic* *Very sympathetic* *Unclear*

(f) County Engineers

Disinterested *Sympathetic* *Very sympathetic* *Unclear*

40. Please add any further information or comments here:

Many thanks for your help. Please post this back to me in the envelope provided. No stamp required.

APPENDIX 2

SURVEYS OF COUNTY COUNCIL CYCLE PLANNING (1983-1985)

Contents

Aston University

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Pages 206 – 237
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Aston University

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APPENDIX 3

BICYCLE STATISTICS FOR THE WEST MIDLANDS COUNTY

DAVID G. DAVIES

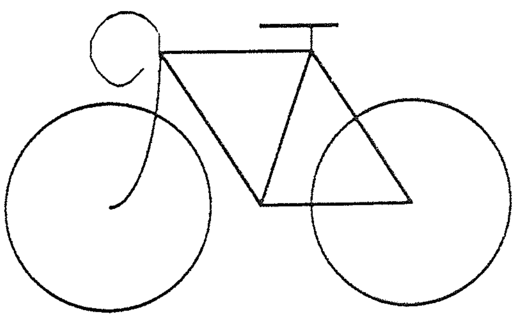
UNIVERSITY OF ASTON IN BIRMINGHAM/PUSHBIKES

JANUARY 1983

Acknowledgements

I am very grateful to the people and institutions that have supplied me with the information for this report. In particular, the officers of the West Midlands County Council and the Crime Prevention Officer of the West Midlands Police. Special thanks also to Mary Higgins for the typing.

Contents



1. Introduction.

This report has been compiled for two main purposes. Firstly, to bring together the various pieces of information on cycling in the West Midlands County into one comprehensive but manageable report. Secondly, to show the levels of cycle usage in the County and the appearance of an upward trend.

Information on other modes of transport is supplied in the excellent "West Midlands County Transport Monitor 82". Unfortunately, it supplies no information about transport by bicycle (or on foot). Hopefully, this report will remedy the situation a little and highlight the need for further data to be gathered.

2. Synopsis.

Cycling is enjoying a revival in Britain since the apparent low-point of the mid-seventies. There are indications that this is also true in the West Midlands where, for various reasons, cycle usage is below the national average. The precise level of usage is not known but 2.5% of all journeys to work and 3% of journeys to secondary schools are made by bicycle. Car, bus and walk are more highly used modes but BR train and motor cycle are less used for commuting. There is considerable range in levels of bicycle usage according to location, age sex and journey-purpose. In all, some 26 thousand people commute to work by bicycle.

The trend in usage is probably upwards, reflecting the national trend. This is not certain, however, because of the lack of data on cycle flows in the County during the past decade. Reported accidents involving cyclists increased each year between 1978 and 1981 and 94% of these accidents result in injury to the cyclist. In 1981 there were 928 injury - accidents involving a bicycle and 908 cyclist casualties. These accident statistics do suggest an increasing number of cyclist, particularly adults. Bicycle theft statistics also suggest an increase in the number of bicycles in use and are consistent with national sales of bicycles which reached a post-war record of 1.45m in 1979.

3. Means of Travel to Work.

The 1981 census included a question on the means of travel to work for people aged 16 or over in employment. The percentage of travel to work by bicycle in the West Midlands varies between 0% in certain wards in Birmingham District and 8% in Darlaston South, Walsall and Bilston North, Wolverhampton. Coventry, however, is the District with the highest percentage of commuter trips made by bicycle (5%) whilst Dudley is the lowest (1%). Some 26,000 people travel to work by bicyle throughout the County, of which 6,000 live in Birmingham, 6,000 in Coventry, 1,500 in Dudley, 2,500 in Sandwell, 2,500 in Solihull, 3,500 in Walsall and 4,000 in Wolverhampton. Over half (54%) of the people that cycle to work live in car-owning households. This varies, however, between 34% in Sandwell and 71% in Solihull. Only one in five bicycle-commuters is female.

Table 1. Means of Transport to work in the West Midlands County by District.

	Car	Bus	Train	Motor Cycle	Pedal Cycle	Walk
Birmingham	45%	34%	3%	1%	2%	13%
Coventry	49%	24%	1%	3%	5%	17%
Dudley	60%	17%	1%	2%	1%	16%
Sandwell	45%	27%	1%	2%	2%	21%
Solihull	62%	18%	5%	2%	3%	9%
Walsall	54%	22%	1%	2%	3%	16%
Wolverhampton	49%	25%	1%	2%	4%	16%
West Midlands	50%	27%	2%	2%	2%	15%

Source: 1981 Census Small Area Statistics. OPCS.

The means of transport to work data is based on the 10% sample data. ie It is calculated from a 10% random sample of the total data.

The table shows the means of travel to work by people who are "economically active" but do not work at home.

4. Travel to School

In 1976/7 the University of Aston in Birmingham conducted a survey into education trips in the West Midlands. This was done on behalf of the County Council. 208 schools and 14 colleges and universities were surveyed throughout the county. The results showed that under 1% of primary school pupils and that under 3% of secondary school pupils travelled to school by bicycle.

The results varied, however, with the size of the school and the district. Solihull pupils cycled to school more than pupils in any other district whilst pupils in Birmingham district were least likely to cycle to school. Cycle usage was positively correlated with school size and average pupil age. Thus, over 7% of secondary school pupils in Solihull district cycled to school and 2.7% of pupils in large secondary schools cycled compared with 1.7% of pupils in small secondary schools.

At the University of Aston only 1% of students living off campus travelled to the University by bicycle. The result would have been very different if the University of Birmingham had been surveyed instead. The University was surveyed in November and the schools and colleges in December. There is no note of weather conditions but it is possible that cycle and walk would have been higher if the survey had occured during the Summer term.

In general "walk" and "bus" were found to be by far the most important education trip modes in the West Midlands County. The County and District averages, however, are likely to contain significant variations depending on the size of the school, the location, the size of the catchment area and public transport facilities. Moreover, a large school of say 2,000 pupils with 3% "cycle" means some 60 bicycles to be parked at the school.

TABLE 2.

EDUCATION TRIP RATE PER SCHOOL PUPIL BY MODE, LOCAL AUTHORITY AREA AND SCHOOL TYPE (ALL SCHOOLS SAMPLED)

SCHOOL TYPE	MODE					
	CAR PASS.	BUS PASS.	TRAIN	WALK	CYCLE	MOTOR CYCLE
Birmingham						
Primary	0.1778	0.0461	0.0004	0.7742	0.0007	0.0008
Secondary	0.1033	0.3684	0.0171	0.4989	0.0104	0.0019
TOTAL	0.1333	0.2386	0.0103	0.6098	0.0065	0.0015
Coventry						
Primary	0.1869	0.0439	-	0.7648	0.0037	0.0007
Secondary	0.1085	0.5259	0.0042	0.3264	0.0309	0.0041
TOTAL	0.1311	0.3868	0.0029	0.4530	0.0230	0.0032
Dudley						
Primary	0.2289	0.0593	-	0.7074	0.0045	-
Secondary	0.2319	0.1222	0.0033	0.6046	0.0349	0.0031
TOTAL	0.2305	0.0939	0.0019	0.6508	0.0211	0.0018
Sandwell						
Primary	0.1614	0.0797	-	0.7574	0.0012	0.0003
Secondary	0.0648	0.2068	0.0005	0.7127	0.0138	0.0014
TOTAL	0.0998	0.1607	0.0003	0.7290	0.0092	0.0010
Solihull						
Primary	0.2618	0.0068	-	0.7242	0.0072	-
Secondary	0.2043	0.2005	0.0040	0.5162	0.0735	0.0015
TOTAL	0.2254	0.1295	0.0026	0.5924	0.0492	0.0009
Walsall						
Primary	0.2784	0.0859	0.0003	0.6324	0.0017	0.0013
Secondary	0.0580	0.5084	0.0006	0.4056	0.0256	0.0018
TOTAL	0.1692	0.2952	0.0004	0.5200	0.0136	0.0016
Wolverhampton						
Primary	0.1710	0.0384	-	0.7896	0.0011	-
Secondary	0.1234	0.3272	0.0003	0.5160	0.0295	0.0036
TOTAL	0.1371	0.2440	0.0002	0.5948	0.0213	0.0026

Source: Education Trip Rate Survey 1977.
The University of Aston.

TABLE 3

EDUCATION TRIP RATE PER SCHOOL PUPIL BY MODE AND SCHOOL TYPE AND SIZE (ALL SCHOOLS SAMPLED)

SCHOOL TYPE AND SIZE	MODE OF TRAVEL					
	CAR PASS.	BUS PASS.	TRAIN	WALK	CYCLE	MOTOR CYCLE
Primary						
- Small	0.3295	0.0541	0.0008	0.6140	0.0014	0.0002
- Medium	0.1630	0.0513	-	0.7837	0.0009	0.0011
- Large	0.1801	0.0520	-	0.7644	0.0031	0.0004
TOTAL	0.2018	0.0521	0.0001	0.7432	0.0022	0.0006
Secondary						
- Small	0.2154	0.3120	0.0304	0.4221	0.0168	0.0033
- Medium	0.1569	0.3180	0.0063	0.4934	0.0229	0.0025
- Large	0.0728	0.3573	0.0010	0.5397	0.0274	0.0018
TOTAL	0.1181	0.3404	0.0070	0.5064	0.0256	0.0025
TOTAL ALL SCHOOLS	0.1498	0.2312	0.0044	0.5961	0.0167	0.0018

NOTE:

Small Primary	-	Less than or equal to 200 pupils
Medium Primary	-	Greater than 200 and less than or equal to 300 pupils
Large Primary	-	Greater than 300 pupils
Small Secondary	-	Less than or equal to 500 pupils
Medium Secondary	-	Greater than 500 and less than or equal to 1000 pupils
Large Secondary	-	Greater than 1000 pupils

Source: Education Trip Rate Survey 1977.
The University of Aston.

5. CYCLIST ACCIDENTS AND CASUALTIES

The analysis is based on reported accidents recorded by the West Midlands Police and published by the West Midlands County Council. It is generally accepted that non-injury accidents and slight injuries to cyclists and pedestrians are frequently not reported. It is also impossible to estimate accident rates ie. accidents per trip or accidents per kilometre travelled, because statistics have not been collected on levels of cycle usage in the West Midlands County. This means that the reasons underlying the statistical trends can only be inferred.

Accidents. The number of cyclists involved in accidents has increased each year from 1978 to 1981. See table 4. This contrasts sharply with the decline in accidents for all other categories of vehicle except motor scooters (not motor cycles or mopeds) in the same four year period. In 1978 there were 822 cyclists involved in accidents. This rose to 928 in 1981, an increase of 13%. Yet the total number of vehicles involved in accidents fell by 9% from 16,932 to 15,485.

Casualties. In 1980 94% of reported accidents involving cyclists resulted in injury to the cyclist. It is not surprising, therefore, that cyclist casulties have also increased each year from 1978 to 1981. See table 5. In fact, cyclist casualties have increased by 15% from 791 in 1978 to 908 in 1981. Casualties for all road users for the corresponding period fell by 8%.

The severity of injuries can be gauged by a casualty severity index :

$$\frac{\text{Fatal \& Serious Injuries}}{\text{Total injuries}} = \text{Casualty severity index}$$

This was 0.234 in 1980 and has fluctuated around 0.2 since 1976. This means that approximately one in five cyclist casualties result in death within 30 days or an overnight stay in hospital. The casualty severity index was higher for pedestrians (0.33 in 1980) and for car drivers (0.26) but lower for public service vehicle passengers (0.11).

Age. Approximately half the cyclist casualties in the West Midlands County are children (0-15 years old). In particular, cyclists in the 10-15 year age group are most heavily represented in the casualty figures and thereby considered most "at risk". However, as casualty rates are not available it is not correct to deduce from the accident statistics that child cyclists are more "at risk" than other groups. It may be that cyclists in this age group represent an equally large proportion of all cyclists.

Between 1976 and 1981 the percentage of child cyclist casualties has steadily decreased from 54% to 46% of total cyclist casualties. See table 5. Total cyclist casualties have, however, risen by 8%. This is interesting and significant in two respects; it suggests that efforts to educate child cyclists by the West Midlands County Road Safety Officers have had some effect and that the number of adult cyclists has increased. It is possible that other factors e.g. increases in levels of car usage, also explain this trend. However, an increase in cycle usage by adults would be consistent with national trends monitored by the Department of Transport.

CYCLIST ACCIDENTS AND CASUALTIES

Table 4. Vehicles involved in accidents in the West Midlands County.

	1978	1979	1980	1981
Pedal Cycles	822	874	898	928
All Vehicles	16,932	16,239	16,598	15,485

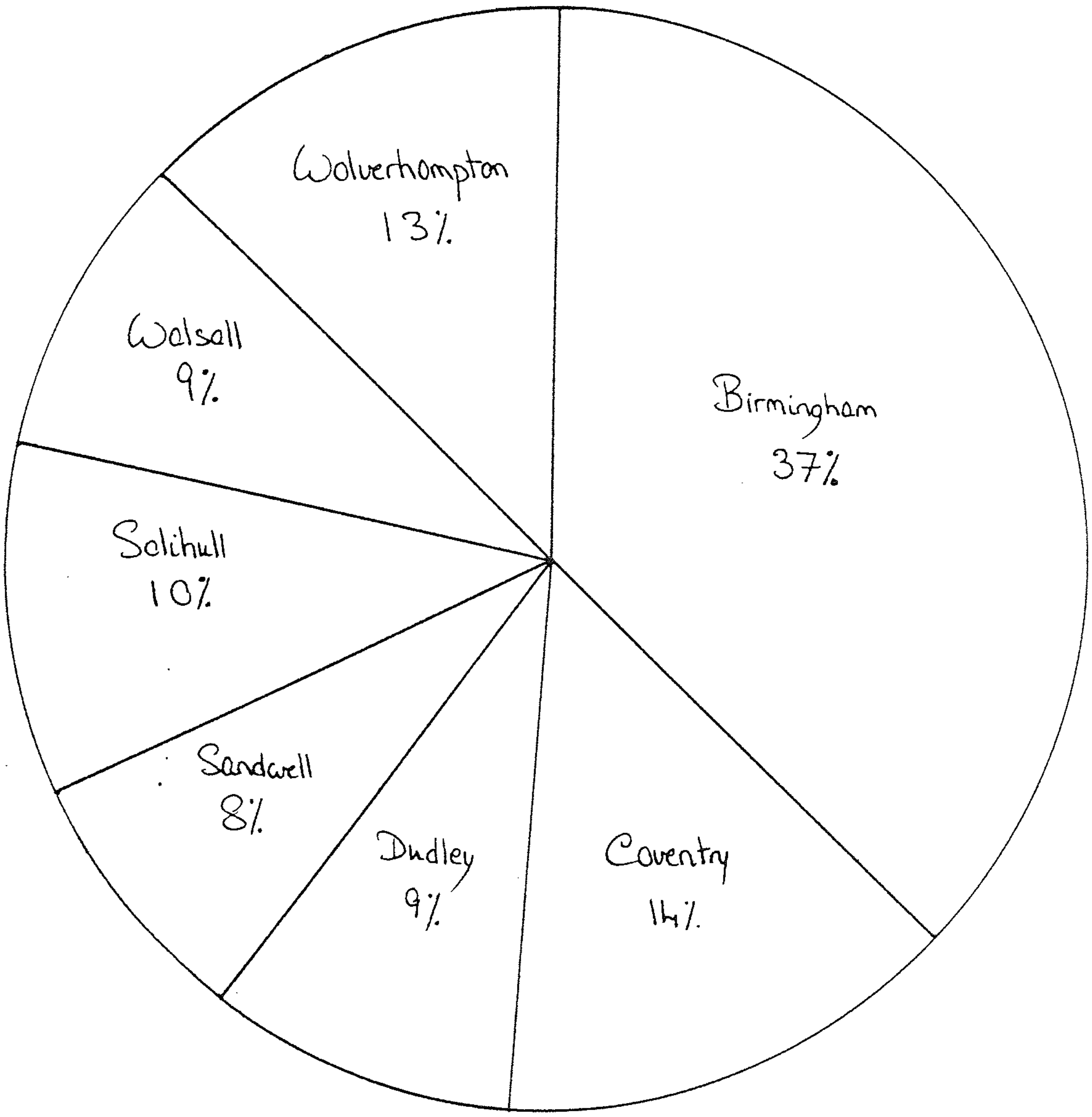
Table 5. Cyclist Casualties by Age.

	1978	1979	1980	1981
Child Cyclists	412	435	424	421
Adult Cyclists	379	416	441	487
Total	791	851	865	908

Table 6. Cyclist Casualties by Severity.

	1978	1979	1980	1981
Killed	11	5	11	6
Seriously Injured	138	159	191	199
Slightly Injured	642	687	663	703
Total	791	851	865	908

Figure 1. CYCLIST CASUALTIES BY DISTRICT.



Source: West Midlands County Council, 1981.

6. Theft of Pedal Cycles

A subject very close to the hearts of many cyclists is cycle theft. It has two particular effects on cycle usage: firstly, trips may not be made which involve leaving the cycle unattended in a place considered unsafe, or for a prolonged period of time e.g. at a railway station throughout the day; secondly, cyclists that are the victim of the theft(s) may give up cycling. The extend of the effects are not known although Transport and Road Research Laboratories are currently researching this area.

Trends in the theft of pedal cycles provide an indication - though nothing more - of trends in cycle usage. The monthly theft figures are highest in the Summer months when cycle usage is highest. Moreover, reported thefts have risen by over a third between 1980 and 1982. No doubt this reflects the general increase in all categories of theft due to socio-economic factors but it would be surprising if it did not also reflect increases in cycle-ownership and usage that other parts of England have experienced. Unfortunately, the detection rate and recovery rate are very low (15% and 6% respectively in 1981 compared with 27% and 76% for motor vehicles).

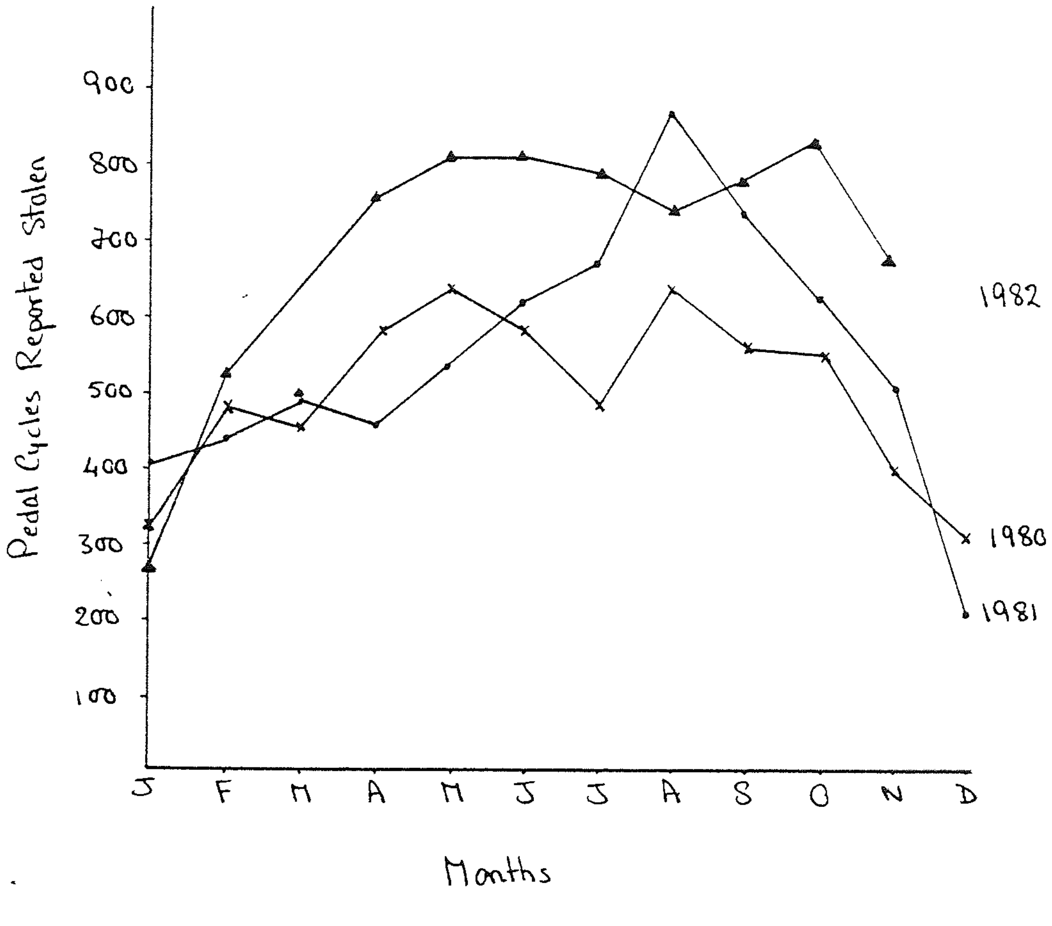
Table 7.. Theft of Pedal Cycles in the West Midlands County.

	OFFENCES REPORTED	OFFENCES DETECTED	VALUE REPORTED STOLEN	VALUE RECOVERED
1980	5,748	1,008	£367,838	£23,524
1981	6,270	916	£449,467	£26,557

Table 8. Theft/Unauthorised taking of motor vehicles in the West Midlands County

	OFFENCES REPORTED	OFFENCES DETECTED	VALUE REPORTED STOLEN	VALUE RECOVERED
1980	26,222	6,878	£17,106,586	£12,623,618
1981	28,256	7,650	£19,715,111	£15,043,786

Figure 2. Monthly trends in thefts of pedal cycles

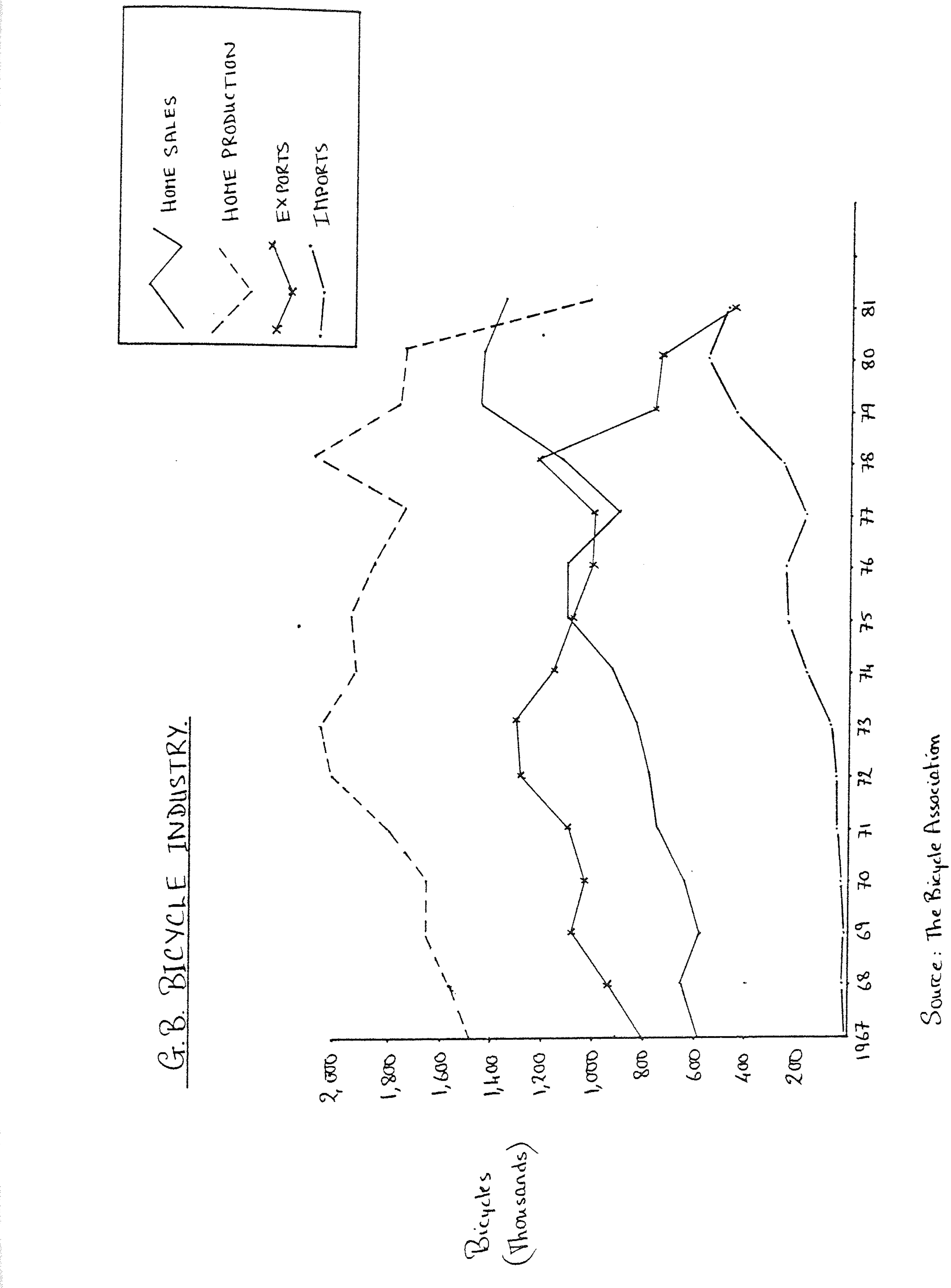


7. Bicycle Industry Statistics.

The Bicycle Association does not publish regional figures, therefore, the figures for Great Britain have been reproduced here to indicate trends.

Home sales have increased by over 100% in the past decade, reaching a peak in 1979 when they exceeded the number of new cars sold. Imports have now reached one third of the total home sales and exceeded exports for the first time in 1981.

The trends represent the general rise in material standards of living and the economic depression as well as any genuine increases in cycle usage. Whereas sales increased from 1969 onwards, cycle usage as defined by the Department of Transport did not increase until the mid-seventies, suggesting an element of repressed demand.


G.B. BICYCLE INDUSTRY.
HOME SALES
HOME PRODUCTION
EXPORTS
IMPORTS
Bicycles (Thousands)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
1967
68
69
70
71
72
73
74
75
76
77
78
79
80
81
Source: The Bicycle Association

STATISTICS AND INFORMATION ——— THE BICYCLE ASSOCIATION

Starley House Eaton Road Coventry CV1 2FH Telephone 0203 27427

Table 9.

YEAR HOME PRODUCTION EXPORTS

1967

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8. Miscellaneous.

In 1980 the Birmingham Middle Ring Cordon Count conducted by the West Midlands County Council classified bicycles separately from the other classes of vehicle. This count is conducted annually and bicycles had previously been included in a general "two-wheeler" class. Bicycles travelling acøross the middle ring road inwards to Birmingham city centre between 7.30 and 9.30 and outwards between 16.00 and 17.45 were recorded at 19 counting stations. 214 bicycles were recorded inthe morning period and 148 in the (shorter) evening period. The Transportation Department say that they do not regard these figures with any high degree of accuracy and that they don't consider this method particularly appropriate for measuring bicycle flows. The 1982 count also classified bicycles separately but these results are not yet available.

Pushbikes have conducted bicycle counts at road junctions principally in the south of Birmingham. These sites were chosen partly because bicycle flows were thought to high. The results showed flows of up to 186 bicycles in the two-hour period 16.00-18.00. This includes all bicycles passing through the junction in all directions.

Probably the most comprehensive source of information on bicycle flows in the County is contained in a survey of hundreds of school crossings, conducted by the County Council in 1981 and 1982. This information is, however, in a "raw" form and summaries and a full analysis of the results with regard to bicycles are still to be produced.

9. References.

1. Bicycle Industry Statistics.
   The Bicycle Association,
   Starley House, Eaton Road,
   Coventry CV1 2FH
   Telephone: 0203 27427

2. Crime Statistics.
   West Midlands Police,
   LLoyd House, Colmore Circus Queensway,
   Birmingham B4 6NQ.
   Telephone: 021 236 5000.

3. "Education Trip Rate Survey" 1977.
   The Joint Unit for Research on the Urban Environment,
   The University of Aston in Birmingham. A study on behalf of the West Midlands County Council,
   County Hall,
   1 Lacaster Circus,
   Birmingham B4 7DJ.
   Telephone: 021 300 5151.

4. "Road Accidents 1980" and 1981.
   Transportation and Engineering Dept.,
   West Midlands County Council.

5. "West Midlands Transport Monitor 82".
   The Joint Planning Unit,
   Transportation and Engineering Dept.,
   West Midlands County Council.

6. 1981 Census. OPCS.
   OPCS Census Division,
   St. Catherines House,
   10 Kingsway,
   London WC2B 6JP.
   Supplied by:
   The Central Statistical Information and Research Unit,
   West Midlands County Council.

APPENDIX 4

1981 CENSUS JOURNEY TO WORK DATA

TABLE 1 1981 CENSUS JOURNEY TO WORK - PERSONS AGED 16 AND OVER IN EMPLOYMENT CYCLING TO WORK BY AREA OF RESIDENCE BY SEX (10% SAMPLE)

Area of Residence	Male Cycle	Male All Modes	Female Cycle	Female All Modes	Total Cycle	Total All Modes
Birmingham	484	23,478	115	16,653	599	40,041
Coventry	446	7,591	147	5,223	593	12,814
Dudley	134	7,916	21	5,235	155	13,151
Sandwell	222	7,412	16	4,989	238	12,401
Solihull	150	5,321	93	3,611	243	8,932
Walsall	276	6,624	51	4,476	327	11,100
Wolverhampton	337	6,043	86	3,952	423	9,995
West Midlands	2,049	64,385	529	44,049	2,578	108,434
England & Wales	51,208	1,251,415	28,879	828,501	80,087	2,079,916

Source: 1981 Census - County Report (West Midlands) Part 2 and National Report (Great Britain) Part 2.

TABLE 2 1981 CENSUS JOURNEY TO WORK - PERCENTAGE OF PERSONS AGED 16 AND OVER IN EMPLOYMENT CYCLING TO WORK BY AREA OF RESIDENCE BY SEX

Area of Residence	Male Cycle	Female Cycle	Total Cycle
Birmingham	2.06%	0.69%	1.50%
Coventry	5.88%	2.81%	4.63%
Dudley	1.69%	0.40%	1.18%
Sandwell	2.99%	0.32%	1.92%
Solihull	2.82%	2.58%	2.72%
Walsall	4.17%	1.14%	2.95%
Wolverhampton	5.58%	2.43%	4.23%
West Midlands	3.18%	1.20%	2.38%
England & Wales	4.09%	3.49%	3.85%

Source: 1981 Census - County Report (West Midlands) Part 2 and National Report (Great Britain) Part 2.

TABLE 3 1981 CENSUS JOURNEY TO WORK - PERCENTAGE OF PERSONS CYCLING TO WORK BY AREA OF RESIDENCE BY SEX

Area of Residence	Males	Females
Birmingham	80.80%	19.20%
Coventry	75.21%	24.79%
Dudley	86.45%	13.55%
Sandwell	93.28%	6.72%
Solihull	61.73%	38.27%
Walsall	84.40%	15.60%
Wolverhampton	79.67%	20.33%
West Midlands	79.48%	20.52%
England & Wales	63.94%	36.06%

Source: 1981 Census - County Report (West Midlands) Part 2 and National Report (Great Britain) Part 2.

TABLE 4 1971 CENSUS JOURNEY TO WORK - PERSONS AGED 16 AND OVER IN EMPLOYMENT CYCLING TO WORK BY AREA OF RESIDENCE (10% SAMPLE)

	1971 Cycle	1971 All Modes	1971 % Cycle
Birmingham	720	50,913	1.41%
Coventry	684	15,355	4.46%
Dudley	284	14,075	2.02%
Sandwell	528	15,981	3.30%
Solihull	255	8,656	2.59%
Walsall	508	12,603	4.03%
Wolverhampton	676	12,264	5.51%
West Midlands	3,655	129,847	2.82%
England & Wales	94,799	2,159,922	4.39%

Source: 1971 Census - West Midlands County Council (Special tabulation - 1971 figures calculated for 1981 boundaries ie post 1974 Local Government Reorganisation).

TABLE 5 1981 CENSUS JOURNEY TO WORK - PERSONS CYCLING TO WORK AGED 16 AND OVER IN EMPLOYMENT NORMALLY RESIDENT IN PRIVATE HOUSEHOLDS BY HOUSEHOLD VEHICLE OWNERSHIP BY AREA OF RESIDENCE (10% SAMPLE)

	No Car		1 Car		2+ Cars		Total
	Cycle	All Modes	Cycle	All Modes	Cycle	All Modes	Cycle
Birmingham	283	11,984	259	19,838	56	7,949	598
Coventry	228	3,079	309	7,025	54	2,622	591
Dudley	68	2,392	68	7,096	19	3,643	155
Sandwell	156	3,826	68	6,482	14	2,071	238
Solihull	73	1,060	133	4,508	37	3,339	243
Walsall	188	2,481	166	5,759	23	2,835	327
Wolverhampton	196	2,544	191	5,193	36	2,228	423
West Midlands	1,192	27,366	1,144	55,901	239	24,687	2,575
England & Wales	30,137	422,873	39,983	1,077,530	9,672	555,763	79,792

Source: 1981 Census - County Report (West Midlands) Part 2 and National Report (Great Britain) Part 2.

TABLE 6 1981 CENSUS JOURNEY TO WORK - PERCENTAGE OF PERSONS CYCLING TO WORK AGED 16 AND OVER IN EMPLOYMENT NORMALLY RESIDENT IN PRIVATE HOUSEHOLDS BY HOUSEHOLD VEHICLE OWNERSHIP BY AREA OF RESIDENCE

	No Car	1 Car	2+ Cars
Birmingham	2.36%	1.31%	0.70%
Coventry	7.41%	4.40%	2.06%
Dudley	2.84%	0.96%	0.52%
Sandwell	4.08%	1.05%	0.68%
Solihull	6.89%	2.95%	1.11%
Walsall	7.58%	2.01%	0.81%
Wolverhampton	7.70%	3.68%	1.62%
West Midlands	4.36%	2.05%	0.97%
England & Wales	7.13%	3.71%	1.74%

Source: 1981 Census - County Report (West Midlands) Part 2 and National Report (Great Britain) Part 2.

TABLE 7 1981 CENSUS JOURNEY TO WORK - PERCENTAGE OF PERSONS CYCLING TO WORK AGED 16 AND OVER IN EMPLOYMENT NORMALLY RESIDENT IN PRIVATE HOUSEHOLDS BY HOUSEHOLD VEHICLE OWNERSHIP BY AREA OF RESIDENCE

Area of Residence	No Car	1 Car	2+ Cars
Birmingham	47.32%	43.31%	9.36%
Coventry	38.58%	52.28%	9.14%
Dudley	43.87%	43.87%	12.26%
Sandwell	65.55%	28.56%	5.88%
Solihull	30.04%	54.73%	15.55%
Walsall	57.49%	35.47%	7.03%
Wolverhampton	46.34%	45.15%	8.51%
West Midlands	46.29%	44.43%	9.28%
England & Wales	37.77%	50.11%	12.12%

Source: 1981 Census - County Report (West Midlands) Part 2 and National Report (Great Britain) Part 2.

TABLE 8 1971 CENSUS JOURNEY TO WORK - WEST MIDLANDS RESIDENTS CYCLING TO WORK AGED 16 AND OVER IN EMPLOYMENT BY SOCIO-ECONOMIC GROUP (10% SAMPLE)

SEGs	Cycle	All Modes	Cycle as % of SEG	SEG as % of Cycle
1,2,13	48	10,317	0.47%	1.34%
3,4,	40	3,883	1.03%	1.09%
5	102	8,082	1.26%	2.79%
6	329	26,495	1.24%	9.00%
8,9	1,718	37,508	4.58%	47.00%
7,10,15	1,063	28,895	3.68%	29.08%
11	321	9,731	3.30%	8.78%
12,14	24	3,706	0.65%	0.66%
16,17	9	1,296	0.69%	0.25%
All SEGs	3,655	129,913	2.81%	100.00%

Source: 1971 Census - Tabulation specially requested from OPCS.

TABLE 9 1981 CENSUS JOURNEY TO WORK - WEST MIDLANDS RESIDENTS CYCLING TO WORK AGED 16 AND OVER IN EMPLOYMENT BY SOCIO-ECONOMIC GROUP (10% SAMPLE)

SEGs	Cycle	All Modes	Cycle as % of SEG	SEG as % of Cycle
1,2,13	54	11,031	0.49%	2.09%
3,4,	63	3,425	1.84%	2.44%
5	169	10,051	1.68%	6.56%
6	239	22,640	1.06%	9.27%
8,9	927	25,553	3.63%	35.96%
7,10,15	890	24,219	3.68%	34.52%
11	220	6,816	3.33%	8.53%
12,14	6	3,579	0.17%	0.23%
16,17,18	10	1,120	0.89%	0.39%
All SEGs	2,578	108,434	2.38%	100.00%

Source: 1981 Census - County Report (West Midlands) Part 2.

APPENDIX 5

CYCLING PROPOSALS IN STATUTORY AND LOCAL PLANS

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APPENDIX 8

WEST MIDLANDS CYCLING SURVEY: RESULTS (FREQUENCY COUNTS)

LIST OF TABLES

TABLE 1.1 SURVEY AREA - CENSUS WARDS

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
BIRMINGHAM HANDSWORTH	99	4.6	4.6	4.6
BIRMINGHAM SPARKHILL	86	4.0	4.0	8.6
BIRMINGHAM WASHWOOD HEATH	100	4.7	4.7	13.3
COVENTRY RADFORD	77	3.6	3.6	16.9
COVENTRY UPPER STOKE	98	4.6	4.6	21.5
COVENTRY WAINBODY	101	4.7	4.7	26.2
DUDLEY ST JAMES	87	4.1	4.1	30.3
DUDLEY WORDSLEY	102	4.8	4.8	35.0
DUDLEY ST ANDREWS	102	4.8	4.8	39.8
SANDWELL ROWLEY	110	5.1	5.1	45.0
SANDWELL SMETHWICK	99	4.6	4.6	49.6
SANDWELL WEDNESBURY SOUTH	94	4.4	4.4	54.0
SOLIHULL CHELMSLEY WOOD	112	5.2	5.2	59.2
SOLIHULL KINGSHURST	105	4.9	4.9	64.1
SOLIHULL KNOWLE	103	4.8	4.8	68.9
WALSALL ALDRIDGE NORTH	99	4.6	4.6	73.6
WALSALL BIRCHILLS LEAMORE	93	4.3	4.3	77.9
WALSALL DARLASTON SOUTH	100	4.7	4.7	82.6
WOLVERHAMPTON BILSTON NORTH	98	4.6	4.6	87.1
WOLVERHAMPTON PENN	124	5.8	5.8	92.9
WOLVERHAMPTON WEDNESFIELD HEATH	121	5.7	5.7	98.6
AREA UNIDENTIFIED	17	0.8	0.8	99.4
OUTSIDE SURVEY AREA	13	0.6	0.6	100.0
TOTAL	2140	100.0	100.0	

TABLE 1.2 MONTH OF QUESTIONNAIRE RESPONSE/INTERVIEW

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
MARCH	303	14.2	14.2	14.2
APRIL	658	30.7	30.7	44.9
MAY	183	8.6	8.6	53.5
JUNE	27	1.3	1.3	54.7
JULY	673	31.4	31.4	86.2
AUGUST	295	13.8	13.8	100.0
SEPTEMBER	1	0.0	0.0	100.0
TOTAL	2140	100.0	100.0	

TABLE 1.3 SEX

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
MALE	1.	1491	69.7	70.3	70.3
FEMALE	2.	630	29.4	29.7	100.0
MISSING	0.	19	0.9	MISSING	100.0
	TOTAL	2140	100.0	100.0	

TABLE 1.4 MARITAL STATUS

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
MARRIED	1.	1480	69.2	71.3	71.3
SINGLE	2.	595	27.8	28.7	100.0
MISSING	0.	65	3.0	MISSING	100.0
	TOTAL	2140	100.0	100.0	

TABLE 1.5 AGE

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
17-20	1.	157	7.3	7.5	7.5
21-29	2.	371	17.3	17.7	25.1
30-39	3.	395	18.5	18.8	44.0
40-49	4.	338	15.8	16.1	60.0
50-59	5.	328	15.3	15.6	75.7
60-64	6.	171	8.0	8.1	83.8
65+	7.	340	15.9	16.2	100.0
MISSING	0.	40	1.9	MISSING	100.0
	TOTAL	2140	100.0	100.0	

TABLE 1.6 EMPLOYMENT STATUS

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
WORKING	1.	1167	54.5	56.6	56.6
UNEMPLOYED	2.	244	11.4	11.8	68.4
HOUSEWIFE-HUSBAND	3.	156	7.3	7.6	76.0
STUDENT	4.	63	2.9	3.1	79.0
RETIRED	5.	419	19.6	20.3	99.3
OTHER	6.	14	0.7	0.7	100.0
MISSING	0.	77	3.6	MISSING	100.0
		-------	-------	-------	
	TOTAL	2140	100.0	100.0	

TABLE 1.7 OCCUPATION

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
MANAGERIAL	1.	203	9.5	10.9	10.9
PROFESSIONAL	2.	177	8.3	9.5	20.4
CLERICAL	3.	291	13.6	15.6	36.0
SKILLED	4.	609	28.5	32.7	68.7
SEMI-SKILLED	5.	316	14.8	17.0	85.7
UNSKILLED	6.	170	7.9	9.1	94.8
OTHER	7.	96	4.5	5.2	100.0
MISSING	0.	278	13.0	MISSING	100.0
		-------	-------	-------	
	TOTAL	2140	100.0	100.0	

TABLE 1.8 FULL UK DRIVING LICENCE

		ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
LICENCE		1330	62.1	62.4	62.4
NO LICENCE		800	37.4	37.6	100.0
MISSING		10	0.5	MISSING	100.0
		-------	-------	-------	
	TOTAL	2140	100.0	100.0	

TABLE 1.9 CAR OWNERSHIP

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
OWNS	1106	51.7	52.1	52.1
DOES NOT OWN	1018	47.6	47.9	100.0
MISSING	16	0.7	MISSING	100.0
TOTAL	2140	100.0	100.0	

TABLE 1.10 MOTORCYCLE OWNERSHIP

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
OWNS	101	4.7	4.8	4.8
DOES NOT OWN	2018	94.3	95.2	100.0
MISSING	21	1.0	MISSING	100.0
TOTAL	2140	100.0	100.0	

TABLE 1.11 BICYCLE OWNERSHIP

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
OWNS	469	21.9	22.2	22.2
DOES NOT OWN	1648	77.0	77.8	100.0
MISSING	23	1.1	MISSING	100.0
TOTAL	2140	100.0	100.0	

TABLE 1.12 TRAVELCARD OWNERSHIP

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
OWNS	469	21.9	22.2	22.2
DOES NOT OWN	1644	76.8	77.8	100.0
MISSING	27	1.3	MISSING	100.0
TOTAL	2140	100.0	100.0	

TABLE 1.13 HOUSEHOLD CAR OWNERSHIP

		ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
NONE		647	30.2	30.7	30.7
ONE		1015	47.4	48.1	78.8
TWO		368	17.2	17.5	96.3
THREE		59	2.8	2.8	99.1
FOUR		11	0.5	0.5	99.6
FIVE		7	0.3	0.3	100.0
SIX		1	0.0	0.0	100.0
MISSING		32	1.5	MISSING	100.0
	TOTAL	2140	100.0	100.0	

TABLE 1.14 HOUSEHOLD MOTORCYCLE OWNERSHIP

		ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
NONE		1927	90.0	91.8	91.8
ONE		142	6.6	6.8	98.6
TWO		23	1.1	1.1	99.7
THREE		3	0.1	0.1	99.8
FIVE		2	0.1	0.1	99.9
SIX		2	0.1	0.1	100.0
MISSING		41	1.9	MISSING	100.0
	TOTAL	2140	100.0	100.0	

TABLE 1.15 HOUSEHOLD BICYCLE OWNERSHIP (ALL BICYLES)

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
NONE	0.	1159	54.2	55.2	55.2
ONE	1.	458	21.4	21.8	77.0
TWO	2.	283	13.2	13.5	90.5
OVER TWO	3.	200	9.3	9.5	100.0
MISSING	9.	40	1.8	MISSING	100.0
	TOTAL	2140	100.0	100.0	

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TABLE 1.16 HOUSEHOLD ADULT BICYCLE OWNERSHIP

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
NONE	1420	66.4	67.6	67.6
ONE	444	20.7	21.1	88.8
TWO	189	8.8	9.0	97.8
THREE	36	1.7	1.7	99.5
FOUR	6	0.3	0.3	99.8
FIVE	3	0.1	0.1	99.9
SIX	2	0.1	0.1	100.0
MISSING	40	1.9	MISSING	100.0
TOTAL	2140	100.0	100.0	

TABLE 1.17 HOUSEHOLD CHILD BICYCLE OWNERSHIP

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
NONE	1620	75.7	77.4	77.4
ONE	254	11.9	12.1	89.6
TWO	175	8.2	8.4	97.9
THREE	29	1.4	1.4	99.3
FOUR	11	0.5	0.5	99.9
FIVE	1	0.0	0.0	99.9
SIX	1	0.0	0.0	100.0
SEVEN	1	0.0	0.0	100.0
MISSING	48	2.2	MISSING	100.0
TOTAL	2140	100.0	100.0	

TABLE 1.18 TIME SINCE LAST RIDING A BICYCLE

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
<1 YEAR	543	25.4	27.8	27.8
1-5 YEARS	296	13.8	15.1	42.9
6-10 YEARS	172	8.0	8.8	51.7
>10 YEARS	811	37.9	41.5	93.1
NEVER	134	6.3	6.9	100.0
MISSING	184	8.6	MISSING	100.0
TOTAL	2140	100.0	100.0	

TABLE 1.19 PEDESTRIANS TROUBLED BY CYCLISTS ON PAVEMENT

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FREQUENTLY	349	16.3	18.3	18.3
OCCASIONALLY	600	28.0	31.5	49.8
RARELY	372	17.4	19.5	69.3
NEVER	584	27.3	30.7	100.0
MISSING	235	11.0	MISSING	100.0
TOTAL	2140	100.0	100.0	

TABLE 1.20 PEDESTRIANS TROUBLED BY CYCLISTS IN SUBWAYS

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FREQUENTLY	61	2.9	3.9	3.9
OCCASIONALLY	153	7.1	9.9	13.8
RARELY	198	9.3	12.8	26.6
NEVER	1136	53.1	73.4	100.0
MISSING	592	27.7	MISSING	100.0
TOTAL	2140	100.0	100.0	

TABLE 1.21 PEDESTRIANS TROUBLED BY CYCLISTS IN PARKS

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FREQUENTLY	102	4.8	6.4	6.4
OCCASIONALLY	262	12.2	16.3	22.7
RARELY	246	11.5	15.3	38.0
NEVER	994	46.4	62.0	100.0
MISSING	536	25.0	MISSING	100.0
TOTAL	2140	100.0	100.0	

TABLE 1.22 PEDESTRIAN-CYCLIST ACCIDENT

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
ACCIDENT	153	7.1	7.6	7.6
NO ACCIDENT	1858	86.8	92.4	100.0
MISSING	129	6.0	MISSING	100.0
TOTAL	2140	100.0	100.0	

TABLE 1.23 PEDESTRIAN INJURY

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
SLIGHTLY INJURED	36	23.5	24.0	24.0
SHOCKED ONLY	55	35.9	36.7	60.7
UNHARMED	59	38.6	39.3	100.0
MISSING	3	2.0	MISSING	100.0
TOTAL	153	100.0	100.0	

TABLE 1.24 VEHICLE-CYCLIST ACCIDENT

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
NO ACCIDENT	947	69.2	79.4	79.4
NEAR ACCIDENT	183	13.4	15.4	94.8
ONE ACCIDENT	57	4.2	4.8	99.6
MORE THAN ONE ACCIDENT	5	0.4	0.4	100.0
MISSING	177	12.9	MISSING	100.0
TOTAL	1369	100.0	100.0	

TABLE 1.25 INJURY SEVERITY

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FATAL INJURY	2	3.2	3.3	3.3
SERIOUS INJURY	3	4.8	4.9	8.2
SLIGHT INJURY	28	45.2	45.9	54.1
NO INJURY	28	45.2	45.9	100.0
MISSING	1	1.6	MISSING	100.0
TOTAL	62	100.0	100.0	

TABLE 1.26 MOST SERIOUS CASUALTY

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
DRIVER	4	11.8	12.1	12.1
PASSENGER	1	2.9	3.0	15.2
CYCLIST	28	82.4	84.8	100.0
MISSING	1	2.9	MISSING	100.0
TOTAL	34	100.0	100.0	

TABLE 1.27 SUPPORT FOR PROVIDING CYCLE FACILITIES

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
STRONGLY IN FAVOUR	1.	1034	48.3	53.3	53.3
IN FAVOUR	2.	657	30.7	33.8	87.1
NEUTRAL	3.	178	8.3	9.2	96.3
AGAINST	4.	41	1.9	2.1	98.4
STRONGLY AGAINST	5.	31	1.4	1.6	100.0
MISSING	0.	199	9.3	MISSING	100.0
	TOTAL	2140	100.0	100.0	

TABLE 1.28 LIKELY USE OF SIDE-STREET CYCLE ROUTES

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
YES	1.	656	30.7	34.9	34.9
POSSIBLY	2.	505	23.6	26.8	61.7
NO	3.	586	27.4	31.1	92.8
PREFER MAIN ROADS	4.	40	1.9	2.1	95.0
DON'T KNOW	5.	95	4.4	5.0	100.0
MISSING	0.	258	12.1	MISSING	100.0
	TOTAL	2140	100.0	100.0	

TABLE 1.29 1% OF TRANSPORT BUDGET FOR CYCLING

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
TOO MUCH	1.	148	6.9	7.7	7.7
NOT ENOUGH	2.	554	25.9	28.8	36.5
ABOUT RIGHT	3.	739	34.5	38.4	74.9
DON'T KNOW	4.	483	22.6	25.1	100.0
MISSING	0.	216	10.1	MISSING	100.0
	TOTAL	2140	100.0	100.0	

TABLE 1.30 SOURCE OF MONEY FOR CYCLING FACILITIES

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
INCREASE RATES	1.	122	5.7	6.4	6.4
OTHER TRANSPORT SPENDING	2.	359	16.8	18.9	25.3
OTHER COUNCIL BUDGETS	3.	167	7.8	8.8	34.1
GOVERNMENT	4.	519	24.3	27.3	61.4
TAX ON CYCLISTS	5.	735	34.3	38.6	100.0
MISSING	0.	238	11.1	MISSING	100.0
	TOTAL	2140	100.0	100.0	

TABLE 1.31 CYCLING IS OLD FASHIONED

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
STRONGLY AGREE	34	2.1	2.4	2.4
SLIGHTLY AGREE	52	3.2	3.7	6.1
NEUTRAL	86	5.2	6.1	12.2
SLIGHTLY DISAGREE	208	12.6	14.8	27.0
STRONGLY DISAGREE	1027	62.3	73.0	100.0
MISSING	241	14.6	MISSING	100.0
TOTAL	1648	100.0	100.0	

TABLE 1.32 CYCLING IS TOO DANGEROUS

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
STRONGLY AGREE	191	11.6	13.5	13.5
SLIGHTLY AGREE	318	19.3	22.5	36.1
NEUTRAL	149	9.0	10.6	46.6
SLIGHTLY DISAGREE	295	17.9	20.9	67.5
STRONGLY DISAGREE	458	27.8	32.5	100.0
MISSING	237	14.4	MISSING	100.0
TOTAL	1648	100.0	100.0	

TABLE 1.33 OTHER FORMS OF TRANSPORT ARE PREFERABLE

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
STRONGLY AGREE	456	27.7	32.9	32.9
SLIGHTLY AGREE	347	21.1	25.0	57.9
NEUTRAL	325	19.7	23.4	81.3
SLIGHTLY DISAGREE	129	7.8	9.3	90.6
STRONGLY DISAGREE	131	7.9	9.4	100.0
MISSING	260	15.8	MISSING	100.0
TOTAL	1648	100.0	100.0	

TABLE 1.34 THIS AREA IS NOT ATTRACTIVE FOR CYCLING

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
STRONGLY AGREE	378	22.9	26.9	26.9
SLIGHTLY AGREE	259	15.7	18.4	45.3
NEUTRAL	200	12.1	14.2	59.6
SLIGHTLY DISAGREE	229	13.9	16.3	75.9
STRONGLY DISAGREE	339	20.6	24.1	100.0
MISSING	243	14.7	MISSING	100.0
TOTAL	1648	100.0	100.0	

TABLE 1.35 CYCLING IS MORE IMPORTANT AS A SPORT

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
STRONGLY AGREE	253	15.4	17.9	17.9
SLIGHTLY AGREE	155	9.4	11.0	28.9
NEUTRAL	241	14.6	17.1	46.0
SLIGHTLY DISAGREE	265	16.1	18.8	64.7
STRONGLY DISAGREE	498	30.2	35.3	100.0
MISSING	236	14.3	MISSING	100.0
TOTAL	1648	100.0	100.0	

TABLE 1.36 PHYSICAL REASONS FOR NOT OWNING A BICYCLE

	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
RIDING DIFFICULTY	104	6.3	7.1	7.1
NO STORAGE SPACE	36	2.2	2.5	9.6
CYCLE AVAILABLE TO BORROW	204	12.4	13.9	23.5
TOO OLD TO CYCLE	414	25.1	28.3	51.8
NONE OF THE ABOVE REASONS	706	42.8	48.2	100.0
MISSING	184	11.2	MISSING	100.0
TOTAL	1648	100.0	100.0	

TABLE 1.37 MAIN INDUCEMENT TO BUY A BICYCLE

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
HEALTH	1.	250	15.2	18.1	31.1
HIGHER PETROL PRICES	2.	136	8.3	9.8	39.4
HIGHER FARES	3.	61	3.7	4.4	43.1
SAFER ROADS	4.	222	13.5	16.0	56.6
CHEAPER BICYCLES	5.	66	4.0	4.8	60.6
NOTHING	6.	650	39.4	46.9	100.0
MISSING	0.	263	16.0	MISSING	16.0
	TOTAL	1648	100.0	100.0	

TABLE 1.38 YEAR BICYCLE ACQUIRED

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
PRE-1980	79.	185	39.4	43.8	43.8
1980	80.	44	9.4	10.4	54.3
1981	81.	38	8.1	9.0	63.3
1982	82.	64	13.6	15.2	78.4
1983	83.	70	14.9	16.6	95.0
1984	84.	21	4.5	5.0	100.0
MISSING	0.	47	10.0	MISSING	100.0
	TOTAL	469	100.0	100.0	

MEAN	77.334	STD ER	0.435	MEDIAN	80.091
MODE	83.000	STD DE	8.935	VARIAN	79.843
KURTOS	19.923	SKEWNE	-3.793	RANGE	77.000
MINIMU	7.000	MAXIMU	84.000		

TABLE 1.39 MAIN REASON FOR NOT USING BICYCLE DURING PAST YEAR

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
TOO DANGEROUS	1.	14	14.3	24.6	24.6
ROAD SURFACES	2.	1	1.0	1.8	26.3
PREFER OTHER TRANSPORT	4.	31	31.6	54.4	80.7
NO LONGER INTERESTED	5.	3	3.1	5.3	86.0
TOO OLD	6.	4	4.1	7.0	93.0
AREA UNATTRACTIVE	8.	4	4.1	7.0	100.0
MISSING	0.	41	41.8	MISSING	100.0
	TOTAL	98	100.0	100.0	

TABLE 1.40 AVERAGE WEEKLY BICYCLE USE

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
0-1 DAY	1.	152	32.4	40.0	40.0
2-3 DAYS	2.	72	15.4	18.9	58.9
4-5 DAYS	3.	72	15.4	18.9	77.9
6-7 DAYS	4.	84	17.9	22.1	100.0
MISSING	0.	89	19.0	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.41 AVERAGE WEEKLY BICYCLE MILEAGE

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
>6 MILES	1.	101	21.5	29.7	29.7
6-10 MILES	2.	67	14.3	19.7	49.4
11-20 MILES	3.	63	13.4	18.5	67.9
21-50 MILES	4.	83	17.7	24.4	92.4
51-100 MILES	5.	21	4.5	6.2	98.5
>100 MILES	6.	5	1.1	1.5	100.0
MISSING	999.	129	27.5	MISSING	100.0
	TOTAL	469	100.0	100.0	

MEAN	22.282	STD ER	1.759	MEDIAN	11.167
MODE	10.000	STD DE	32.444	VARIAN	1052.581
KURTOS	39.878	SKEWNE	5.134	RANGE	350.000
MINIMU	0.000	MAXIMU	350.000		

TABLE 1.42 LENGTH OF TIME A CYCLIST

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
1 YEAR	1.	15	3.2	3.9	3.9
2 YEARS	2.	19	4.1	4.9	8.7
3 YEARS	3.	11	2.3	2.8	11.6
4 YEARS	4.	6	1.3	1.5	13.1
>4 YEARS	5.	338	72.1	86.9	100.0
MISSING	0.	80	17.1	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.43 BICYCLE USED DURING SPRING

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
DO NOT CYCLE	0.	187	39.9	39.9	39.9
CYCLE	1.	282	60.1	60.1	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.44 BICYCLE USED DURING SUMMER

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
DO NOT CYCLE	0.	100	21.3	21.3	21.3
CYCLE	1.	369	78.7	78.7	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.45 BICYCLE USED DURING AUTUMN

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
DO NOT CYCLE	0.	211	45.0	45.0	45.0
CYCLE	1.	258	55.0	55.0	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.46 BICYCLE USED DURING WINTER

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
DO NOT CYCLE	0.	285	60.8	60.8	60.8
CYCLE	1.	184	39.2	39.2	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.47 BICYCLE USED FOR WORK TRIPS

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
NO	0.	71	15.1	28.9	28.9
YES	1.	175	37.3	71.1	100.0
MISSING	9.	223	47.5	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.48 BICYCLE USED FOR COLLEGE TRIPS

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
NO	0.	114	24.3	88.4	88.4
YES	1.	15	3.2	11.6	100.0
MISSING	9.	340	72.5	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.49 BICYCLE USED FOR SHOPPING TRIPS

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
NO	0.	81	17.3	36.0	36.0
YES	1.	144	30.7	64.0	100.0
MISSING	9.	244	52.0	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.50 BICYCLE USED FOR SPORT OR RECREATION TRIPS

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
NO	0.	70	14.9	26.8	26.8
YES	1.	191	40.7	73.2	100.0
MISSING	9.	208	44.3	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.51 BICYCLE USED FOR SOCIAL TRIPS

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
NO	0.	87	18.6	36.1	36.1
YES	1.	154	32.8	63.9	100.0
MISSING	9.	228	48.6	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.52 REASON FOR CYCLING - ENJOYMENT

RANKING	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FIRST	1.	97	20.7	28.2	28.2
SECOND	2.	74	15.8	21.5	49.7
THIRD	3.	66	14.1	19.2	68.9
FOURTH	4.	47	10.0	13.7	82.6
FIFTH	5.	43	9.2	12.5	95.1
SIXTH	6.	17	3.6	4.9	100.0
MISSING	0.	125	26.7	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.53 REASON FOR CYCLING - EXERCISE

RANKING	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FIRST	1.	100	21.3	27.9	27.9
SECOND	2.	110	23.5	30.7	58.7
THIRD	3.	60	12.8	16.8	75.4
FOURTH	4.	49	10.4	13.7	89.1
FIFTH	5.	29	6.2	8.1	97.2
SIXTH	6.	10	2.1	2.8	100.0
MISSING	0.	111	23.7	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.54 REASON FOR CYCLING - ECONOMY

RANKING	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FIRST	1.	68	14.5	21.8	21.8
SECOND	2.	72	15.4	23.1	44.9
THIRD	3.	62	13.2	19.9	64.7
FOURTH	4.	47	10.0	15.1	79.8
FIFTH	5.	43	9.2	13.8	93.6
SIXTH	6.	20	4.3	6.4	100.0
MISSING	0.	157	33.5	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.55 REASON FOR CYCLING - CONVENIENCE

RANKING	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FIRST	1.	88	18.8	27.2	27.2
SECOND	2.	53	11.3	16.4	43.5
THIRD	3.	78	16.6	24.1	67.6
FOURTH	4.	72	15.4	22.2	89.8
FIFTH	5.	33	7.0	10.2	100.0
MISSING	0.	145	30.9	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.56 REASON FOR CYCLING - NO ALTERNATIVE

RANKING	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FIRST	1.	10	2.1	4.0	4.0
SECOND	2.	15	3.2	6.0	9.9
THIRD	3.	14	3.0	5.6	15.5
FOURTH	4.	20	4.3	7.9	23.4
FIFTH	5.	28	6.0	11.1	34.5
SIXTH	6.	165	35.2	65.5	100.0
MISSING	0.	217	46.3	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.57 REASON FOR CYCLING - QUICK

RANKING	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FIRST	1.	26	5.5	8.7	8.7
SECOND	2.	43	9.2	14.4	23.1
THIRD	3.	60	12.8	20.1	43.1
FOURTH	4.	52	11.1	17.4	60.5
FIFTH	5.	93	19.8	31.1	91.6
SIXTH	6.	25	5.3	8.4	100.0
MISSING	0.	170	36.2	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.58 CYCLISTS' PROBLEMS – DANGER FROM MOTOR VEHICLES

RANKING	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FIRST	1.	196	41.8	51.0	51.0
SECOND	2.	106	22.6	27.6	78.6
THIRD	3.	47	10.0	12.2	90.9
FOURTH	4.	19	4.1	4.9	95.8
FIFTH	5.	10	2.1	2.6	98.4
SIXTH	6.	6	1.3	1.6	100.0
MISSING	0.	85	18.1	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.59 CYCLISTS' PROBLEMS – BAD ROAD SURFACES

RANKING	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FIRST	1.	118	25.2	31.3	31.3
SECOND	2.	114	24.3	30.2	61.5
THIRD	3.	56	11.9	14.9	76.4
FOURTH	4.	49	10.4	13.0	89.4
FIFTH	5.	29	6.2	7.7	97.1
SIXTH	6.	11	2.3	2.9	100.0
MISSING	0.	92	19.6	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.60 CYCLISTS' PROBLEMS – THEFT AND VANDALISM

RANKING	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FIRST	1.	35	7.5	9.7	9.7
SECOND	2.	50	10.7	13.9	23.7
THIRD	3.	69	14.7	19.2	42.9
FOURTH	4.	58	12.4	16.2	59.1
FIFTH	5.	80	17.1	22.3	81.3
SIXTH	6.	67	14.3	18.7	100.0
MISSING	0.	110	23.5	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.61 CYCLISTS' PROBLEMS - ACCESS PROBLEMS

RANKING	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FIRST	1.	1	0.2	0.3	0.3
SECOND	2.	10	2.1	3.0	3.3
THIRD	3.	18	3.8	5.5	8.8
FOURTH	4.	55	11.7	16.7	25.5
FIFTH	5.	90	19.2	27.4	52.9
SIXTH	6.	155	33.0	47.1	100.0
MISSING	0.	140	29.9	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.62 CYCLISTS' PROBLEMS - LARGE ROUNDABOUTS

RANKING	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FIRST	1.	23	4.9	6.4	6.4
SECOND	2.	52	11.1	14.4	20.8
THIRD	3.	95	20.3	26.4	47.2
FOURTH	4.	87	18.6	24.2	71.4
FIFTH	5.	75	16.0	20.8	92.2
SIXTH	6.	28	6.0	7.8	100.0
MISSING	0.	109	23.2	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.63 CYCLISTS' PROBLEMS - TURNING RIGHT

RANKING	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
FIRST	1.	15	3.2	4.3	4.3
SECOND	2.	57	12.2	16.2	20.5
THIRD	3.	92	19.6	26.1	46.6
FOURTH	4.	79	16.8	22.4	69.0
FIFTH	5.	53	11.3	15.1	84.1
SIXTH	6.	56	11.9	15.9	100.0
MISSING	0.	117	24.9	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.64 BICYCLE STOLEN?

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
YES	1.	123	26.2	30.5	30.5
NO	2.	280	59.7	69.5	100.0
MISSING	0.	66	14.1	MISSING	100.0
	TOTAL	469	100.0	100.0	

TABLE 1.65 YEAR IN WHICH BICYCLE WAS STOLEN

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
PRE-1980	79.	70	56.9	58.3	58.3
1980	80.	10	8.1	8.3	66.7
1981	81.	7	5.7	5.8	72.5
1982	82.	16	13.0	13.3	85.8
1983	83.	14	11.4	11.7	97.5
1984	84.	3	2.4	2.5	100.0
MISSING	0.	3	2.4	MISSING	100.0
	TOTAL	123	100.0	100.0	

TABLE 1.66 CYCLIST ACCIDENT

	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
SERIOUS INJURY	1.	9	1.9	2.4	2.4
SLIGHT INJURY	2.	57	12.2	14.9	17.3
NOT INJURED	3.	53	11.3	13.9	31.2
NO ACCIDENT	4.	263	56.1	68.8	100.0
MISSING	0.	87	18.6	MISSING	100.0
	TOTAL	469	100.0	100.0	

APPENDIX 9

WEST MIDLANDS CYCLING SURVEY - SENSITIVITY OF RESULTS

1. Explanation

In order to establish whether bias in the sample or response has affected the results of the survey, the key variables (Household Bicycle Ownership and Individual Bicycle Ownership) are tested for sensitivity to known bias in sex, age, marital status and household car ownership using 1981 Census data. This is done by reweighting the survey data:

$$\text{Bicycle Owners} \times \frac{\%\ \text{distribution in 1981 Census}}{\%\ \text{distribution in Survey}}$$

An estimate is also made for the effect of non-respondents. It is assumed for the purpose of these calculations that non-respondents have the same levels of household bicycle ownership and individual bicycle ownership as those would did not reply to the questionnaire but were interviewed.

No adjustment is made for the estimated 200 - 300 questionnaires which were undelivered or returned unanswered because the addressee had died or moved away or where the address was incorrect. This is because the number is not precisely known and because the sensitivity tests are intended to err on the conservative side. If such an adjustment were made, it would reduce the sample size but not alter the number of respondents. Thus the ratio of respondents to non-respondents would rise and increase the response rate from 61.5% to approximately 66.3%. The effect on the results would be to partially offset the adjustment for non-respondents thereby slightly increasing the percentage of respondents owning a bicycle.

The figures used in these calculations are taken from cross-tabulations (Appendix 10) whereas those in Chapter 5 are taken, in most cases, from the frequency counts (Appendix 8). Due to missing data in the crosstabulations some slight differences are produced. That is, if a respondent failed to answer one of the questions used in the cross-tabulation the answers to other questions used are counted as also missing. In the frequency counts, however, those questions answered are not affected by those unanswered. These differences are extremely small and do not materially affect the resulting sensitivity tests.

2. Household Bicycle Ownership

2.1 Sex

Age	Bicycle Owners		Weighting		
Male	661	x	$\frac{48.5}{70.4}$	= 455.4)	
				)	= 932.1
Female	274	x	$\frac{51.5}{29.6}$	476.7)	

$$\text{Household Bicycle Ownership} = \frac{932.1}{2{,}083.0} = 44.7\%$$

Effect = (44.7% - 44.9%) = 0.2% Decrease

2.2 Age

Age	Bicycle Owners		Weighting			
17-20	104	x	$\frac{9.1}{7.6}$	=	124.5	
21-29	174	x	$\frac{16.8}{17.6}$	=	166.1	
30-39	252	x	$\frac{17.3}{19.0}$	=	229.4	
40-49	196	x	$\frac{15.2}{16.1}$	=	185.0	= 916.2
50-59	119	x	$\frac{16.2}{15.8}$	=	122.0	
60-64	40	x	$\frac{7.3}{8.1}$	=	36.0	
>64	47	x	$\frac{18.0}{15.9}$	=	53.2	

Household Bicycle Ownership = $\frac{916.2}{2,065.0}$ = 44.4%

Effect = (44.4% - 45.1%) = 0.7% Decrease

2.3 Marital Status

71.5% of respondents are married and 28.5% are single. 65.0% of the population are married and 35.0% are single. 674 respondents are married and live in a household with at least one bicycle. 253 respondents are single and live in a household with at least one bicycle.

Marital Status	Bicycle Owners		Weighting			
Married	674	x	$\frac{65.0}{71.5}$	=	612.7	= 923.4
Single	253	x	$\frac{35.0}{28.5}$	=	310.7	

Household Bicycle Ownership = $\frac{923.4}{2,040.0}$ = 45.3%

Effect = (45.3% - 45.4%) = 0.1% Decrease.

2.4 Household Car Ownership

30.8% of respondents live in households with no car; 44.3% of West Midlands households have no car (1981 Census). 228 respondents live in households with no car and have at least one household bicycle; 707 respondents live in a household with at least one car and have at least one household bicycle.

Car?	Bicycle Owners		Weighting		
No Car	228	x	$\frac{44.3}{30.8}$	= 327.9)	
				)	= 897.0
Car	707	x	$\frac{55.7}{69.2}$	= 569.1)	

Household Bicycle Ownership $= \frac{897}{2,094} = 42.8\%$

Effect = (42.8% - 44.7%) = 1.9% Decrease

2.5 Non-Respondents

Household Bicycle Ownership for Questionnaire respondents = 51.1%
Household Bicycle Ownership for Interviewees = 37.3%
Assumed Household Bicycle Ownership for Non-Respondents = 37.3%

Questionnaire respondents	= 1,157	x 51.1% = 591.2)	
Interview respondents	= 983)	x 37.3% = 866.5)	= 1457.7
Non-respondents	= 1,340)		
Total Sample	= 3,480		

Household Bicycle Ownership $= \frac{1,457.7}{3,480.0} = 41.9\%$

Effect = (41.9% - 44.7%) = 2.8% Decrease

2.6 Overall Result

The above effects are not summative - this would involve double counting. They vary from -0.1% to -2.8% Thus the range for Household Bicycle Ownership is 41.9% to 44.8%

3 Individual Bicycle Ownership (Men)

3.1 Age

Age	Bicycle Owners		Weighting			
17-20	51	x	$\frac{9.5}{6.7}$	=	72.3	
21-29	72	x	$\frac{17.7}{17.4}$	=	73.2	
30-39	80	x	$\frac{18.1}{18.9}$	=	76.6	
40-49	57	x	$\frac{15.9}{16.5}$	=	54.9	= 365.9
50-59	47	x	$\frac{16.7}{16.4}$	=	47.9	
60-64	18	x	$\frac{7.2}{8.8}$	=	14.7	
>64	27	x	$\frac{14.9}{15.3}$	=	26.3	

Individual Bicycle Ownership (Men) = $\frac{365.9}{1,461.0}$ = 25.0%

Effect = (25.0% - 24.1%) = <u>0.9% Increase</u>

3.2 Marital Status

Marital Status	Bicycle Owners		Weighting			
Married	240	x	$\frac{67.1}{74.5}$	=	216.2	= 359.4
Single	111	x	$\frac{32.9}{25.5}$	=	143.2	

Individual Bicycle Ownership = $\frac{359.4}{1,447.0}$ = 24.8%

Effect = (24.8% - 24.3%) = <u>0.5% Increase.</u>

3.3 Household Car Ownership

Car?	Bicycle Owners		Weighting			
No Car	104	x	$\frac{44.3}{29.0}$	=	158.9)	) = 352.7
Car	247	x	$\frac{55.7}{71.0}$	=	193.8)	

Individual Bicycle Ownership $= \frac{352.7}{1,463.0} = 24.1\%$

Effect = (24.1% - 24.0%) = 0.1% Increase

3.4 Non-Respondents

Individual bicycle ownership for Questionnaire respondents = 31.1%
Individual bicycle ownership for Interviewees = 14.6%
Assumed Individual bicycle ownership for Non-respondents = 14.6%

Questionnaire respondents	= 847	x 31.1%	= 263.4)	
Interview respondents	= 644)			) = 522.3
Non-respondents	= 1,129)	x 14.6%	= 258.9)	
Total Sample	= 2,620			

Individual Bicycle Ownership (Men) $= \frac{522.3}{2,620.0} = 19.9\%$

Effect = (19.9% - 24.0%) = 4.1% Decrease

3.6 Overall Result

The above sensitivity tests indicate adjustments of +0.9% to -4.1%. Thus, the range for Individual Bicycle Ownership (Men) is 19.9% to 25.0%

4 Individual Bicycle Ownership (Women)

4.1 Age

Age	Bicycle Owners		Weighting			
17-20	16	x	$\frac{8.7}{9.3}$	=	15.0	
21-29	27	x	$\frac{16.0}{18.8}$	=	23.0	
30-39	34	x	$\frac{16.6}{18.3}$	=	30.8	
40-49	19	x	$\frac{14.5}{15.7}$	=	17.5	= 101.7
50-59	5	x	$\frac{15.7}{13.9}$	=	5.6	
60-64	7	x	$\frac{7.3}{6.9}$	=	7.4	
>64	2	x	$\frac{21.1}{17.3}$	=	2.4	

Individual Bicycle Ownership (Women) = $\frac{101.7}{613.0}$ = 16.6%

Effect = (16.6% - 17.9%) = 1.3% Decrease

4.2 Marital Status

Marital Status	Bicycle Owners		Weighting			
Married	62	x	$\frac{63.6}{63.1}$	=	62.5	= 108.9
Single	47	x	$\frac{36.4}{36.9}$	=	46.4	

Individual Bicycle Ownership = $\frac{108.9}{605.0}$ = 18.0%

Effect = (18.0% - 18.0%) = None

4.3 Household Car Ownership

Car?	Bicycle Owners		Weighting			
No Car	17	x	$\frac{44.3}{34.0}$	=	22.2)	) = 96.5
Car	88	x	$\frac{55.7}{66.0}$	=	74.3)	

Individual Bicycle Ownership = $\frac{96.5}{612.0}$ = 15.8%

Effect = (15.8% - 17.2%) = 1.4% Decrease

4.4 Non-Respondents

Individual Bicycle Ownership for Questionnaire respondents = 25.1%
Individual Bicycle Ownership for Interviewees = 11.4%
Assumed Individual Bicycle Ownership for Non-respondents = 11.4%

Questionnaire respondents	=	293	x 25.1%	=	73.5)	
Interview respondents	=	335)				) = 138.1
Non-respondents	=	232)	x 11.4%	=	64.6)	
Total Sample	=	860				

Individual Bicycle Ownership (Women) = $\frac{138.1}{860.0}$ = 16.1%

Effect = (16.1% - 17.8%) = 1.7% Decrease

4.5 Overall Result

The above sensitivity tests indicate adjustments of 0.0% to -1.7%. Thus, the range for Individual Bicycle Ownership (Women) is 15.8% to 18.0%

APPENDIX 10

WEST MIDLANDS CYCLING SURVEY: CROSSTABULATIONS

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4.5 Age (Female)
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4.10 Full UK Driving Licence (Male)
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CROSSTABULATION OF AVERAGE WEEKLY BICYCLE MILEAGE BY:

5.1 Sex
5.2 Marital Status (Male)
5.3 Marital Status (Female)
5.4 Age (Male)
5.5 Age (Female)
5.6 Employment Status (Male)
5.7 Employment Status (Female)
5.8 Occupation (Male)
5.9 Occupation (Female)
5.10 Full UK Driving Licence (Male)
5.11 Full UK Driving Licence (Female)
5.12 Car Ownership (Male)
5.13 Car Ownership (Female)
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CROSSTABULATION OF SURVEY METHOD BY:

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7.9 Pedestrian-Cyclist Accident

TABLE 2.1

* * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
HOUSEHOLD BICYCLE OWNERSHIP BY HOUSEHOLD CAR OWNERSHIP
* *

HOUSEHOLD BICYCLE OWNERSHIP	COUNT / ROW % / COL % / TOT %	HOUSEHOLD CAR OWNERSHIP: NONE 0.	ONE 1.	TWO 2.	THREE 3.	FOUR 4.	ROW TOTAL
0.	COUNT	416	551	160	25	7	1159
	ROW %	35.9	47.5	13.8	2.2	0.6	55.3
	COL %	64.6	54.8	43.6	42.4	36.8	
	TOT %	19.9	26.3	7.6	1.2	0.3	
ONE 1.	COUNT	126	227	84	13	4	454
	ROW %	27.8	50.0	18.5	2.9	0.9	21.7
	COL %	19.6	22.6	22.9	22.0	21.1	
	TOT %	6.0	10.8	4.0	0.6	0.2	
TWO 2.	COUNT	62	147	62	7	4	282
	ROW %	22.0	52.1	22.0	2.5	1.4	13.5
	COL %	9.6	14.6	16.9	11.9	21.1	
	TOT %	3.0	7.0	3.0	0.3	0.2	
THREE 3.	COUNT	30	53	33	10	0	126
	ROW %	23.8	42.1	26.2	7.9	0.0	6.0
	COL %	4.7	5.3	9.0	16.9	0.0	
	TOT %	1.4	2.5	1.6	0.5	0.0	
FOUR + 4.	COUNT	10	27	28	4	4	73
	ROW %	13.7	37.0	38.4	5.5	5.5	3.5
	COL %	1.6	2.7	7.6	6.8	21.1	
	TOT %	0.5	1.3	1.3	0.2	0.2	
COLUMN TOTAL		644	1005	367	59	19	2094
		30.8	48.0	17.5	2.8	0.9	100.0

CHI SQUARE = 102.90200 WITH 16 DOF SIGNIFICANCE = 0.0000
NUMBER OF MISSING OBSERVATIONS = 46

TABLE 2.2

* * * * * * * * CROSSTABULATION OF * * * * * * * * *
HOUSEHOLD BICYCLE OWNERSHIP BY HOUSEHOLD CAR OWNERSHIP
* *

(SIMPLIFIED)

COUNT / ROW % / COL % / TOT %		NO CAR 0.	CAR 1.	ROW TOTAL
NO BICYCLE	0.	416	743	1159
		35.9	64.1	55.3
		64.6	51.2	
		19.9	35.5	
BICYCLE	1.	228	707	935
		24.4	75.6	44.7
		35.4	48.8	
		10.9	33.8	
COLUMN TOTAL		644	1450	2094
		30.8	69.2	100.0

CORRECTED CHI SQUARE = 31.64414 WITH 1 DOF SIGNIFICANCE = 0.0000
RAW CHI SQUARE = 32.18225 WITH 1 DOF SIGNIFICANCE = 0.0000
PHI = 0.12397
NUMBER OF MISSING OBSERVATIONS = 46

TABLE 2.3

* * * * * * * * * * CROSSTABULATION OF * * * * * * * * *
BICYCLE OWNERSHIP BY SEX
* *

BICYCLE / COUNT / ROW % / COL % / TOT %		SEX: MALE 1.	FEMALE 2.	ROW TOTAL
OWNS	1.	354	111	465
		76.1	23.9	22.1
		24.0	17.8	
		16.9	5.3	
DOES NOT OWN	2.	1122	513	1635
		68.6	31.4	77.9
		76.0	82.2	
		53.4	24.4	
COLUMN TOTAL		1476	624	2100
		70.3	29.7	100.0

CORRECTED CHI SQUARE = 9.40825 WITH 1 DOF SIGNIFICANCE = 0.0022
RAW CHI SQUARE = 9.76430 WITH 1 DOF SIGNIFICANCE = 0.0018
NUMBER OF MISSING OBSERVATIONS = 40

TABLE 2.4

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
MALE BICYCLE OWNERSHIP BY MARITAL STATUS

BICYCLE	COUNT / ROW % / COL % / TOT %	MARITAL STATUS: MARRIED 1.	SINGLE 2.	ROW TOTAL
OWNS	1.	240	111	351
		68.4	31.6	24.3
		22.3	30.1	
		16.6	7.7	
DOES NOT OWN	2.	838	258	1096
		76.5	23.5	75.7
		77.7	69.9	
		57.9	17.8	
COLUMN TOTAL		1078	369	1447
		74.5	25.5	100.0

CORRECTED CHI SQUARE = 8.72417 WITH 1 DOF SIGNIFICANCE = 0.1312
RAW CHI SQUARE = 9.14473 WITH 1 DOF SIGNIFICANCE = 0.1054
PHI = 0.07950

TABLE 2.5

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
FEMALE BICYCLE OWNERSHIP BY MARITAL STATUS

BICYCLE	COUNT / ROW % / COL % / TOT %	MARITAL STATUS: MARRIED 1.	SINGLE 2.	ROW TOTAL
OWNS	1.	62	47	109
		56.9	43.1	18.0
		16.1	21.4	
		10.2	7.8	
DOES NOT OWN	2.	323	173	496
		65.1	34.9	82.0
		83.9	78.6	
		53.4	28.6	
COLUMN TOTAL		385	220	605
		63.6	36.4	100.0

CORRECTED CHI SQUARE = 2.27815 WITH 1 DOF SIGNIFICANCE = 0.1312
RAW CHI SQUARE = 2.62216 WITH 1 DOF SIGNIFICANCE = 0.1054
NUMBER OF MISSING OBSERVATIONS = 88

TABLE 2.6

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * *

MALE BICYCLE OWNERSHIP BY AGE

BICYCLE	COUNT / ROW % / COL % / TOT %	AGE 17-20 (1.)	21-29 (2.)	30-39 (3.)	40-49 (4.)	50-59 (5.)	60-64 (6.)	65+ (7.)	ROW TOTAL
1. OWNS	COUNT	51	72	80	57	47	18	27	352
	ROW %	14.5	20.5	22.7	16.2	13.4	5.1	7.7	24.1
	COL %	52.0	28.3	29.0	23.7	19.7	14.0	12.1	
	TOT %	3.5	4.9	5.5	3.9	3.2	1.2	1.8	
2. DOES NOT OWN	COUNT	47	182	196	184	192	111	197	1109
	ROW %	4.2	16.4	17.7	16.6	17.3	10.0	17.8	75.9
	COL %	48.0	71.7	71.0	76.3	80.3	86.0	87.9	
	TOT %	3.2	12.5	13.4	12.6	13.1	7.6	13.5	
COLUMN TOTAL		98	254	276	241	239	129	224	1461
		6.7	17.4	18.9	16.5	16.4	8.8	15.3	100.0

CHI SQUARE = 75.57339 WITH 6 DOF SIGNIFICANCE = 0.0000

CRAMER'S V = 0.22744

TABLE 2.7

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * *

FEMALE BICYCLE OWNERSHIP BY AGE

BICYCLE	COUNT / ROW % / COL % / TOT %	AGE 17-20 (1.)	21-29 (2.)	30-39 (3.)	40-49 (4.)	50-59 (5.)	60-64 (6.)	65+ (7.)	ROW TOTAL
1. OWNS	COUNT	16	27	34	19	5	7	2	110
	ROW %	14.5	24.5	30.9	17.3	4.5	6.4	1.8	17.9
	COL %	28.1	23.5	30.4	19.8	5.9	16.7	1.9	
	TOT %	2.6	4.4	5.5	3.1	0.8	1.1	0.3	
2. DOES NOT OWN	COUNT	41	88	78	77	80	35	104	503
	ROW %	8.2	17.5	15.5	15.3	15.9	7.0	20.7	82.1
	COL %	71.9	76.5	69.6	80.2	94.1	83.3	98.1	
	TOT %	6.7	14.4	12.7	12.6	13.1	5.7	17.0	
COLUMN TOTAL		57	115	112	96	85	42	106	613
		9.3	18.8	18.3	15.7	13.9	6.9	17.3	100.0

CHI SQUARE = 45.31052 WITH 6 DOF SIGNIFICANCE = 0.0000

CRAMER'S V = 0.27188

NUMBER OF MISSING OBSERVATIONS = 66

TABLE 2.8

* * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * * *
MALE BICYCLE OWNERSHIP BY EMPLOYMENT STATUS

EMPLOYMENT STATUS

COUNT / ROW % / COL % / TOT %	WORKING 1.	UNEMPLOYED 2.	HOUSEWIFE-HUSBAN 3.	STUDENT 4.	RETIRED 5.	OTHER 6.	ROW TOTAL
1. OWNS	241 70.1 27.0 16.9	46 13.4 22.1 3.2	0 0.0 0.0 0.0	23 6.7 53.5 1.6	33 9.6 12.2 2.3	1 0.3 14.3 0.1	344 24.1
2. DOES NOT OWN	652 60.1 73.0 45.6	162 14.9 77.9 11.3	7 0.6 100.0 0.5	20 1.8 46.5 1.4	238 21.9 87.8 16.7	6 0.6 85.7 0.4	1085 75.9
COLUMN TOTAL	893 62.5	208 14.6	7 0.5	43 3.0	271 19.0	7 0.5	1429 100.0

CHI SQUARE = 48.51060 WITH 5 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.18425

TABLE 2.9

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * *
FEMALE BICYCLE OWNERSHIP BY EMPLOYMENT STATUS

EMPLOYMENT STATUS

BICYCLE — COUNT / ROW % / COL % / TOT %	WORKING 1.	UNEMPLOYED 2.	HOUSEWIFE-HUSBAN 3.	STUDENT 4.	RETIRED 5.	OTHER 6.	ROW TOTAL
1. OWNS	66 62.3 24.9 10.8	7 6.6 20.6 1.1	17 16.0 11.6 2.8	10 9.4 52.6 1.6	5 4.7 3.6 0.8	1 0.9 14.3 0.2	106 17.4
2. DOES NOT OWN	199 39.5 75.1 32.6	27 5.4 79.4 4.4	129 25.6 88.4 21.1	9 1.8 47.4 1.5	134 26.6 96.4 22.0	6 1.2 85.7 1.0	504 82.6
COLUMN TOTAL	265 43.4	34 5.6	146 23.9	19 3.1	139 22.8	7 1.1	610 100.0

CHI SQUARE = 48.92633 WITH 5 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.28321
NUMBER OF MISSING OBSERVATIONS = 101

TABLE 2.10

* * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * * *
MALE BICYCLE OWNERSHIP BY OCCUPATION

OCCUPATION COUNT / ROW % / COL % / TOT %		MANAGERIAL 1.	PROFESSIONAL 2.	CLERICAL 3.	SKILLED 4.	SEMI-SKILLED 5.	UNSKILLED 6.	OTHER 7.	ROW TOTAL
OWNS	1.	35	49	24	119	66	21	6	320
		10.9	15.3	7.5	37.2	20.6	6.6	1.9	24.2
		19.6	34.5	24.2	21.5	29.5	22.8	18.8	
		2.6	3.7	1.8	9.0	5.0	1.6	0.5	
DOES NOT OWN	2.	144	93	75	434	158	71	26	1001
		14.4	9.3	7.5	43.4	15.8	7.1	2.6	75.8
		80.4	65.5	75.8	78.5	70.5	77.2	81.3	
		10.9	7.0	5.7	32.9	12.0	5.4	2.0	
COLUMN TOTAL		179	142	99	553	224	92	32	1321
		13.6	10.7	7.5	41.9	17.0	7.0	2.4	100.0

CHI SQUARE = 16.48330 WITH 6 DOF SIGNIFICANCE = 0.0114
CRAMER'S V = 0.11170

TABLE 2.11

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * * *
FEMALE BICYCLE OWNERSHIP BY OCCUPATION

OCCUPATION COUNT / ROW % / COL % / TOT %		MANAGERIAL 1.	PROFESSIONAL 2.	CLERICAL 3.	SKILLED 4.	SEMI-SKILLED 5.	UNSKILLED 6.	OTHER 7.	ROW TOTAL
OWNS	1.	4	13	44	7	10	13	11	102
		3.9	12.7	43.1	6.9	9.8	12.7	10.8	19.5
		17.4	38.2	23.0	14.6	11.2	17.3	17.2	
		0.8	2.5	8.4	1.3	1.9	2.5	2.1	
DOES NOT OWN	2.	19	21	147	41	79	62	53	422
		4.5	5.0	34.8	9.7	18.7	14.7	12.6	80.5
		82.6	61.8	77.0	85.4	88.8	82.7	82.8	
		3.6	4.0	28.1	7.8	15.1	11.8	10.1	
COLUMN TOTAL		23	34	191	48	89	75	64	524
		4.4	6.5	36.5	9.2	17.0	14.3	12.2	100.0

CHI SQUARE = 14.26203 WITH 6 DOF SIGNIFICANCE = 0.0268
CRAMER'S V = 0.16498
NUMBER OF MISSING OBSERVATIONS = 295

TABLE 2.12

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * *
MALE BICYCLE OWNERSHIP BY FULL UK DRIVING LICENCE
* *

BICYCLE	CAR LICENCE COUNT / ROW % / COL % / TOT %	LICENCE 1.	NO LICENCE 2.	ROW TOTAL
1. OWNS		237 66.9 22.1 16.1	117 33.1 29.0 7.9	354 24.0
2. DOES NOT OWN		834 74.4 77.9 56.5	287 25.6 71.0 19.5	1121 76.0
COLUMN TOTAL		1071 72.6	404 27.4	1475 100.0

CORRECTED CHI SQUARE = 7.13585 WITH 1 DOF SIGNIFICANCE = 0.0076
RAW CHI SQUARE = 7.50571 WITH 1 DOF SIGNIFICANCE = 0.0062

TABLE 2.13

* * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
FEMALE BICYCLE OWNERSHIP BY FULL UK DRIVING LICENCE
* *

BICYCLE	CAR LICENCE COUNT / ROW % / COL % / TOT %	LICENCE 1.	NO LICENCE 2.	ROW TOTAL
1. OWNS		61 55.5 25.3 9.8	49 44.5 12.8 7.9	110 17.7
2. DOES NOT OWN		180 35.1 74.7 28.9	333 64.9 87.2 53.5	513 82.3
COLUMN TOTAL		241 38.7	382 61.3	623 100.0

CORRECTED CHI SQUARE = 14.99332 WITH 1 DOF SIGNIFICANCE = 0.0001
RAW CHI SQUARE = 15.84034 WITH 1 DOF SIGNIFICANCE = 0.0001
PHI = 0.15946
NUMBER OF MISSING OBSERVATIONS = 42

TABLE 2.14

* * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * *
MALE BICYCLE OWNERSHIP BY CAR OWNERSHIP
* *

BICYCLE (COUNT / ROW % / COL % / TOT %)	CAR: OWNS 1.	CAR: DOES NOT OWN 2.	ROW TOTAL
1. OWNS	192	159	351
	54.7	45.3	23.8
	21.2	28.1	
	13.0	10.8	
2. DOES NOT OWN	715	406	1121
	63.8	36.2	76.2
	78.8	71.9	
	48.6	27.6	
COLUMN TOTAL	907	565	1472
	61.6	38.4	100.0

CORRECTED CHI SQUARE = 8.94131 WITH 1 DOF SIGNIFICANCE = 0.0028
RAW CHI SQUARE = 9.32134 WITH 1 DOF SIGNIFICANCE = 0.0023
PHI = 0.07958

TABLE 2.15

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
FEMALE BICYCLE OWNERSHIP BY CAR OWNERSHIP
* *

BICYCLE (COUNT / ROW % / COL % / TOT %)	CAR: OWNS 1.	CAR: DOES NOT OWN 2.	ROW TOTAL
1. OWNS	47	63	110
	42.7	57.3	17.7
	25.1	14.4	
	7.5	10.1	
2. DOES NOT OWN	140	373	513
	27.3	72.7	82.3
	74.9	85.6	
	22.5	59.9	
COLUMN TOTAL	187	436	623
	30.0	70.0	100.0

CORRECTED CHI SQUARE = 9.55337 WITH 1 DOF SIGNIFICANCE = 0.0020
RAW CHI SQUARE = 10.27510 WITH 1 DOF SIGNIFICACE = 0.0013
PHI = 0.12842
NUMBER OF MISSING OBSERVATIONS = 45

TABLE 2.18

* * * * * * * * * * CROSSTABULATION OF * * * * * * * *
MALE BICYCLE OWNERSHIP BY TRAVELCARD OWNERSHIP
* *

BICYCLE	COUNT / ROW % / COL % / TOT %	TRAVEL CARD: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
OWNS	1.	58	292	350
		16.6	83.4	23.8
		20.1	24.7	
		3.9	19.9	
DOES NOT OWN	2.	231	889	1120
		20.6	79.4	76.2
		79.9	75.3	
		15.7	60.5	
	COLUMN TOTAL	289	1181	1470
		19.7	80.3	100.0

CORRECTED CHI SQUARE = 2.52345 WITH 1 DOF. SIGNIFICANCE = 0.1122
RAW CHI SQUARE = 2.77416 WITH 1 DOF. SIGNIFICANCE = 0.0958
PHI = 0.04344

TABLE 2.19

* * * * * * * * * * CROSSTABULATION OF * * * * * * * *
FEMALE BICYCLE OWNERSHIP BY TRAVELCARD OWNERSHIP
* *

BICYCLE	COUNT / ROW % / COL % / TOT %	TRAVEL CARD: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
OWNS	1.	21	87	108
		19.4	80.6	17.4
		12.1	19.5	
		3.4	14.0	
DOES NOT OWN	2.	152	360	512
		29.7	70.3	82.6
		87.9	80.5	
		24.5	58.1	
	COLUMN TOTAL	173	447	620
		27.9	72.1	100.0

CORRECTED CHI SQUARE = 4.15624 WITH 1 DOF. SIGNIFICANCE = 0.0415
RAW CHI SQUARE = 4.65148 WITH 1 DOF. SIGNIFICANCE = 0.0310
PHI = 0.08662
NUMBER OF MISSING OBSERVATIONS = 50

TABLE 2.20

* * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * *

MALE BICYCLE OWNERSHIP BY HOUSEHOLD CAR OWNERSHIP

BICYCLE (COUNT / ROW % / COL % / TOT %)	CAR: NONE 0.	ONE 1.	TWO 2.	THREE 3.	FOUR 4.	FIVE 5.	SIX 6.	ROW TOTAL
1. OWNS	104	156	72	16	1	2	0	351
	29.6	44.4	20.5	4.6	0.3	0.6	0.0	24.0
	24.5	21.4	28.7	35.6	14.3	40.0	0.0	
	7.1	10.7	4.9	1.1	0.1	0.1	0.0	
2. DOES NOT OWN	320	574	179	29	6	3	1	1112
	28.8	51.6	16.1	2.6	0.5	0.3	0.1	76.0
	75.5	78.6	71.3	64.4	85.7	60.0	100.0	
	21.9	39.2	12.2	2.0	0.4	0.2	0.1	
COLUMN TOTAL	424	730	251	45	7	5	1	1463
	29.0	49.9	17.2	3.1	0.5	0.3	0.1	100.0

CHI SQUARE = 10.53066 WITH 6 DOF SIGNIFICANCE = 0.1040
CRAMER'S V = 0.08484

TABLE 2.21

* * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * *

FEMALE BICYCLE OWNERSHIP BY HOUSEHOLD CAR OWNERSHIP

BICYCLE (COUNT / ROW % / COL % / TOT %)	CAR: NONE 0.	ONE 1.	TWO 2.	THREE 3.	FOUR 4.	FIVE 5.	ROW TOTAL
1. OWNS	17	58	23	5	1	1	105
	16.2	55.2	21.9	4.8	1.0	1.0	17.2
	8.2	21.5	20.2	35.7	25.0	50.0	
	2.8	9.5	3.8	0.8	0.2	0.2	
2. DOES NOT OWN	191	212	91	9	3	1	507
	37.7	41.8	17.9	1.8	0.6	0.2	82.8
	91.8	78.5	79.8	64.3	75.0	50.0	
	31.2	34.6	14.9	1.5	0.5	0.2	
COLUMN TOTAL	208	270	114	14	4	2	612
	34.0	44.1	18.6	2.3	0.7	0.3	100.0

CHI SQUARE = 21.17767 WITH 5 DOF SIGNIFICANCE = 0.0007
CRAMER'S V = 0.18602
NUMBER OF MISSING OBSERVATIONS = 65

TABLE 3.1

* * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
TIME SINCE LAST RIDING A BICYCLE BY SEX
* *

RODE	COUNT / ROW % / COL % / TOT %	SEX: MALE 1.	FEMALE 2.	ROW TOTAL
<1 YEAR	1.	418 77.8 30.5 21.5	119 22.2 20.7 6.1	537 27.6
1-5 YEARS	2.	216 72.7 15.8 11.1	81 27.3 14.1 4.2	297 15.3
6-10 YEARS	3.	136 78.6 9.9 7.0	37 21.4 6.4 1.9	173 8.9
>10 YEARS	4.	563 69.9 41.1 29.0	242 30.1 42.2 12.4	805 41.4
NEVER	5.	37 28.0 2.7 1.9	95 72.0 16.6 4.9	132 6.8
COLUMN TOTAL		1370 70.5	574 29.5	1944 100.0

CHI SQUARE = 134.62200 WITH 4 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.26315
NUMBER OF MISSING OBSERVATIONS = 196

TABLE 3.2

* * * * * * * * * C R O S S T A B U L A T I O N   O F * * * * * * * * * *

MALE   TIME SINCE LAST RIDING A BICYCLE BY MARITAL STATUS

* *

RCODE	COUNT / ROW % / COL % / TOT %	MARITAL STATUS: MARRIED 1.	SINGLE 2.	ROW TOTAL
<1 YEAR	1.	283	133	416
		68.0	32.0	30.7
		28.0	38.7	
		20.9	9.8	
1-5 YEARS	2.	140	73	213
		65.7	34.3	15.7
		13.9	21.2	
		10.3	5.4	
6-10 YEARS	3.	94	40	134
		70.1	29.9	9.9
		9.3	11.6	
		6.9	3.0	
>10 YEARS	4.	468	85	553
		84.6	15.4	40.9
		46.4	24.7	
		34.6	6.3	
NEVER	5.	24	13	37
		64.9	35.1	2.7
		2.4	3.8	
		1.8	1.0	
	COLUMN TOTAL	1009	344	1353
		74.6	25.4	100.0

CHI SQUARE = 50.90240 WITH 4 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.19396

TABLE 3.3

* * * * * * * * * C R O S S T A B U L A T I O N   O F * * * * * * * * * *

FEMALE   TIME SINCE LAST RIDING A BICYCLE BY MARITAL STATUS

* *

RCODE	COUNT / ROW % / COL % / TOT %	MARITAL STATUS: MARRIED 1.	SINGLE 2.	ROW TOTAL
<1 YEAR	1.	63	52	115
		54.8	45.2	20.6
		17.7	25.6	
		11.3	9.3	
1-5 YEARS	2.	42	39	81
		51.9	48.1	14.5
		11.8	19.2	
		7.5	7.0	
6-10 YEARS	3.	26	11	37
		70.3	29.7	6.6
		7.3	5.4	
		4.7	2.0	
>10 YEARS	4.	173	58	231
		74.9	25.1	41.4
		48.7	28.6	
		31.0	10.4	
NEVER	5.	51	43	94
		54.3	45.7	16.8
		14.4	21.2	
		9.1	7.7	
	COLUMN TOTAL	355	203	558
		63.6	36.4	100.0

CHI SQUARE = 25.67655 WITH 4 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.21451
NUMBER OF MISSING OBSERVATIONS = 229

TABLE 3.4

* * * * * * * * * * C R O S S T A B U L A T I O N   O F *
MALE TIME SINCE LAST RIDING A BICYCLE BY AGE
* *

RODE	COUNT / ROW % / COL % / TOT %	AGE 17-20 1.	21-29 2.	30-39 3.	40-49 4.	50-59 5.	60-64 6.	65+ 7.	ROW TOTAL
<1 YEAR	1.	57 13.7 62.6 4.2	99 23.8 42.3 7.3	94 22.6 36.2 6.9	71 17.1 31.8 5.2	53 12.7 24.2 3.9	17 4.1 14.2 1.2	25 6.0 11.7 1.8	416 30.6
1-5 YEARS	2.	29 13.4 31.9 2.1	62 28.7 26.5 4.6	52 24.1 20.0 3.8	28 13.0 12.6 2.1	25 11.6 11.4 1.8	8 3.7 6.7 0.6	12 5.6 5.6 0.9	216 15.9
6-10 YEARS	3.	3 2.2 3.3 0.2	43 31.6 18.4 3.2	26 19.1 10.0 1.9	17 12.5 7.6 1.2	20 14.7 9.1 1.5	11 8.1 9.2 0.8	16 11.8 7.5 1.2	136 10.0
>10 YEARS	4.	0 0.0 0.0 0.0	28 5.0 12.0 2.1	83 14.9 31.9 6.1	100 17.9 44.8 7.3	114 20.4 52.1 8.4	84 15.1 70.0 6.2	149 26.7 69.6 10.9	558 41.0
NEVER	5.	2 5.7 2.2 0.1	2 5.7 0.9 0.1	5 14.3 1.9 0.4	7 20.0 3.1 0.5	7 20.0 3.2 0.5	0 0.0 0.0 0.0	12 34.3 5.6 0.9	35 2.6
	COLUMN TOTAL	91 6.7	234 17.2	260 19.1	223 16.4	219 16.1	120 8.8	214 15.7	1361 100.0

CHI SQUARE = 344.66665 WITH 24 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.25162

ALL RESPONDENTS

TABLE 3.5

* * * * * * * * * * C R O S S T A B U L A T I O N   O F * * * * * * * * * * * * * * * * * * *
FEMALE   TIME SINCE LAST RIDING A BICYCLE BY AGE
* *

RODE	COUNT / ROW % / COL % / TOT %	AGE 17-20 1.	21-29 2.	30-39 3.	40-49 4.	50-59 5.	60-64 6.	65+ 7.	ROW TOTAL
<1 YEAR	1.	16	34	36	21	5	4	2	118
		13.6	28.8	30.5	17.8	4.2	3.4	1.7	20.7
		31.4	30.4	33.3	25.0	6.5	10.3	2.0	
		2.8	6.0	6.3	3.7	0.9	0.7	0.4	
1-5 YEARS	2.	21	24	12	15	4	4	1	81
		25.9	29.6	14.8	18.5	4.9	4.9	1.2	14.2
		41.2	21.4	11.1	17.9	5.2	10.3	1.0	
		3.7	4.2	2.1	2.6	0.7	0.7	0.2	
6-10 YEARS	3.	4	14	11	2	2	0	4	37
		10.8	37.8	29.7	5.4	5.4	0.0	10.8	6.5
		7.8	12.5	10.2	2.4	2.6	0.0	4.1	
		0.7	2.5	1.9	0.4	0.4	0.0	0.7	
>10 YEARS	4.	2	25	36	39	59	22	56	239
		0.8	10.5	15.1	16.3	24.7	9.2	23.4	42.0
		3.9	22.3	33.3	46.4	76.6	56.4	57.1	
		0.4	4.4	6.3	6.9	10.4	3.9	9.8	
NEVER	5.	8	15	13	7	7	9	35	94
		8.5	16.0	13.8	7.4	7.4	9.6	37.2	16.5
		15.7	13.4	12.0	8.3	9.1	23.1	35.7	
		1.4	2.6	2.3	1.2	1.2	1.6	6.2	
	COLUMN TOTAL	51	112	108	84	77	39	98	569
		9.0	19.7	19.0	14.8	13.5	6.9	17.2	100.0

CHI SQUARE = 197.72650 WITH 24 DOF   SIGNIFICANCE = 0.0000
CRAMER'S V = 0.29474
NUMBER OF MISSING OBSERVATIONS = 210

TABLE 3.6

* * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * * *

MALE TIME SINCE LAST RIDING A BICYCLE BY EMPLOYMENT STATUS

* *

EMPLOYMENT STATUS

RODE	COUNT / ROW % / COL % / TOT %	WORKING 1.	UNEMPLOYED 2.	HOUSEWIFE-HUSBAN 3.	STUDENT 4.	RETIRED 5.	OTHER 6.	ROW TOTAL
<1 YEAR	1.	294	57	1	25	32	1	410
		71.7	13.9	0.2	6.1	7.8	0.2	30.6
		35.3	29.8	20.0	61.0	12.2	14.3	
		21.9	4.3	0.1	1.9	2.4	0.1	
1-5 YEARS	2.	148	40	0	10	14	2	214
		69.2	18.7	0.0	4.7	6.5	0.9	16.0
		17.7	20.9	0.0	24.4	5.3	28.6	
		11.0	3.0	0.0	0.7	1.0	0.1	
6-10 YEARS	3.	88	18	1	5	22	0	134
		65.7	13.4	0.7	3.7	16.4	0.0	10.0
		10.6	9.4	20.0	12.2	8.4	0.0	
		6.6	1.3	0.1	0.4	1.6	0.0	
>10 YEARS	4.	289	70	2	1	180	4	546
		52.9	12.8	0.4	0.2	33.0	0.7	40.7
		34.7	36.6	40.0	2.4	68.7	57.1	
		21.6	5.2	0.1	0.1	13.4	0.3	
NEVER	5.	15	6	1	0	14	0	36
		41.7	16.7	2.8	0.0	38.9	0.0	2.7
		1.8	3.1	20.0	0.0	5.3	0.0	
		1.1	0.4	0.1	0.0	1.0	0.0	
	COLUMN TOTAL	834	191	5	41	262	7	1340
		62.2	14.3	0.4	3.1	19.6	0.5	100.0

CHI SQUARE = 167.08740 WITH 20 DOF SIGNIFICANCE = 0.0000

CRAMER'S V = 0.17656

TABLE 3.7

* * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * *

FEMALE TIME SINCE LAST RIDING A BICYCLE BY EMPLOYMENT STATUS

* *

EMPLOYMENT STATUS

RODE	COUNT / ROW % / COL. % / TOT %	WORKING 1.	UNEMPLOYED 2.	HOUSEWIFE-HUSBAN 3.	STUDENT 4.	RETIRED 5.	OTHER 6.	ROW TOTAL
<1 YEAR	1.	73 62.9 29.7 12.9	8 6.9 25.0 1.4	16 13.8 12.0 2.8	10 8.6 52.6 1.8	5 4.3 3.9 0.9	4 3.4 57.1 0.7	116 20.5
1-5 YEARS	2.	51 63.0 20.7 9.0	9 11.1 28.1 1.6	12 14.8 9.0 2.1	5 6.2 26.3 0.9	4 4.9 3.1 0.7	0 0.0 0.0 0.0	81 14.3
6-10 YEARS	3.	15 40.5 6.1 2.7	2 5.4 6.3 0.4	13 35.1 9.8 2.3	1 2.7 5.3 0.2	4 10.8 3.1 0.7	2 5.4 28.6 0.4	37 6.5
>10 YEARS	4.	83 34.9 33.7 14.7	6 2.5 18.8 1.1	73 30.7 54.9 12.9	0 0.0 0.0 0.0	75 31.5 58.1 13.3	1 0.4 14.3 0.2	238 42.0
NEVER	5.	24 25.5 9.8 4.2	7 7.4 21.9 1.2	19 20.2 14.3 3.4	3 3.2 15.8 0.5	41 43.6 31.8 7.2	0 0.0 0.0 0.0	94 16.6
	COLUMN TOTAL	246 43.5	32 5.7	133 23.5	19 3.4	129 22.8	7 1.2	566 100.0

CHI SQUARE = 142.18494 WITH 20 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.25060
NUMBER OF MISSING OBSERVATIONS = 234

TABLE 3.8

* * * * * * * * * * C R O S S T A B U L A T I O N   O F *
MALE TIME SINCE LAST RIDING A BICYCLE BY OCCUPATION
* *

RODE	COUNT / ROW % / COL % / TOT %	MANAGERIAL 1.	PROFESSIONAL 2.	CLERICAL 3.	SKILLED 4.	SEMI-SKILLED 5.	UNSKILLED 6.	OTHER 7.	ROW TOTAL
<1 YEAR	1.	41 10.6 24.4 3.3	47 12.2 33.8 3.8	28 7.3 31.1 2.3	154 40.0 29.7 12.5	79 20.5 38.0 6.4	25 6.5 30.5 2.0	11 2.9 36.7 0.9	385 31.2
1-5 YEARS	2.	29 14.5 17.3 2.3	25 12.5 18.0 2.0	15 7.5 16.7 1.2	78 39.0 15.1 6.3	31 15.5 14.9 2.5	18 9.0 22.0 1.5	4 2.0 13.3 0.3	200 16.2
6-10 YEARS	3.	21 16.3 12.5 1.7	11 8.5 7.9 0.9	16 12.4 17.8 1.3	46 35.7 8.9 3.7	23 17.8 11.1 1.9	5 3.9 6.1 0.4	7 5.4 23.3 0.6	129 10.4
>10 YEARS	4.	77 15.7 45.8 6.2	54 11.0 38.8 4.4	26 5.3 28.9 2.1	232 47.4 44.8 18.8	67 13.7 32.2 5.4	26 5.3 31.7 2.1	7 1.4 23.3 0.6	489 39.6
NEVER	5.	0 0.0 0.0 0.0	2 6.3 1.4 0.2	5 15.6 5.6 0.4	8 25.0 1.5 0.6	8 25.0 3.8 0.6	8 25.0 9.8 0.6	1 3.1 3.3 0.1	32 2.6
	COLUMN TOTAL	168 13.6	139 11.3	90 7.3	518 41.9	208 16.8	82 6.6	30 2.4	1235 100.0

CHI SQUARE = 64.93409 WITH 24 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.11465

TABLE 3.9

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * *
FEMALE TIME SINCE LAST RIDING A BICYCLE BY OCCUPATION
* *

RODE	COUNT / ROW % / COL % / TOT %	OCCUPATION: MANAGERIAL 1.	PROFESSIONAL 2.	CLERICAL 3.	SKILLED 4.	SEMI-SKILLED 5.	UNSKILLED 6.	OTHER 7.	ROW TOTAL
<1 YEAR	1.	3	9	49	8	16	14	10	109
		2.8	8.3	45.0	7.3	14.7	12.8	9.2	22.6
		13.6	27.3	27.1	18.2	20.0	20.6	18.5	
		0.6	1.9	10.2	1.7	3.3	2.9	2.1	
1-5 YEARS	2.	4	9	31	4	13	9	5	75
		5.3	12.0	41.3	5.3	17.3	12.0	6.7	15.6
		18.2	27.3	17.1	9.1	16.3	13.2	9.3	
		0.8	1.9	6.4	0.8	2.7	1.9	1.0	
6-10 YEARS	3.	4	1	14	4	1	2	7	33
		12.1	3.0	42.4	12.1	3.0	6.1	21.2	6.8
		18.2	3.0	7.7	9.1	1.3	2.9	13.0	
		0.8	0.2	2.9	0.8	0.2	0.4	1.5	
>10 YEARS	4.	10	12	60	17	40	29	21	189
		5.3	6.3	31.7	9.0	21.2	15.3	11.1	39.2
		45.5	36.4	33.1	38.6	50.0	42.6	38.9	
		2.1	2.5	12.4	3.5	8.3	6.0	4.4	
NEVER	5.	1	2	27	11	10	14	11	76
		1.3	2.6	35.5	14.5	13.2	18.4	14.5	15.8
		4.5	6.1	14.9	25.0	12.5	20.6	20.4	
		0.2	0.4	5.6	2.3	2.1	2.9	2.3	
	COLUMN TOTAL	22	33	181	44	80	68	54	482
		4.6	6.8	37.6	9.1	16.6	14.1	11.2	100.0

CHI SQUARE = 36.46981 WITH 24 DOF SIGNIFICANCE = 0.0494
CRAMER'S V = 0.13753
NUMBER OF MISSING OBSERVATIONS = 423

TABLE 3.10

* * * * * * * * * * C R O S S T A B U L A T I O N   O F * * * * * * * * *
MALE   TIME SINCE LAST RIDING A BICYCLE BY FULL UK DRIVING LICENCE
* *

RODE	COUNT / ROW % / COL % / TOT %	FULL UK DRIVING LICENCE: LICENCE 1.	NO LICENCE 2.	ROW TOTAL
<1 YEAR	1.	287	130	417
		68.8	31.2	30.5
		28.6	35.7	
		21.0	9.5	
1-5 YEARS	2.	164	51	215
		76.3	23.7	15.7
		16.4	14.0	
		12.0	3.7	
6-10 YEARS	3.	105	31	136
		77.2	22.8	9.9
		10.5	8.5	
		7.7	2.3	
>10 YEARS	4.	433	129	562
		77.0	23.0	41.1
		43.2	35.4	
		31.7	9.4	
NEVER	5.	14	23	37
		37.8	62.2	2.7
		1.4	6.3	
		1.0	1.7	
COLUMN TOTAL		1003	364	1367
		73.4	26.6	100.0

CHI SQUARE = 34.16226 WITH 4 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.15808

TABLE 3.11

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
FEMALE TIME SINCE LAST RIDING A BICYCLE BY FULL UK DRIVING LICENCE
* *

RODE	COUNT / ROW % / COL % / TOT %	FULL UK DRIVING LICENCE: LICENCE 1.	NO LICENCE 2.	ROW TOTAL
<1 YEAR	1.	61 51.7 26.5 10.6	57 48.3 16.6 9.9	118 20.6
1-5 YEARS	2.	48 59.3 20.9 8.4	33 40.7 9.6 5.8	81 14.1
6-10 YEARS	3.	18 48.6 7.8 3.1	19 51.4 5.5 3.3	37 6.5
>10 YEARS	4.	82 33.9 35.7 14.3	160 66.1 46.6 27.9	242 42.2
NEVER	5.	21 22.1 9.1 3.7	74 77.9 21.6 12.9	95 16.6
	COLUMN TOTAL	230 40.1	343 59.9	573 100.0

CHI SQUARE = 36.79587 WITH 4 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.25341
NUMBER OF MISSING OBSERVATIONS = 200

TABLE 3.12

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *
MALE TIME SINCE LAST RIDING A BICYCLE BY CAR OWNERSHIP
* *

RODE	COUNT / ROW % / COL % / TOT %	CAR OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
<1 YEAR	1.	226	188	414
		54.6	45.4	30.4
		26.7	36.5	
		16.6	13.8	
1-5 YEARS	2.	143	72	215
		66.5	33.5	15.8
		16.9	14.0	
		10.5	5.3	
6-10 YEARS	3.	92	44	136
		67.6	32.4	10.0
		10.9	8.5	
		6.8	3.2	
>10 YEARS	4.	375	185	560
		67.0	33.0	41.1
		44.3	35.9	
		27.5	13.6	
NEVER	5.	11	26	37
		29.7	70.3	2.7
		1.3	5.0	
		0.8	1.9	
COLUMN TOTAL		847	515	1362
		62.2	37.8	100.0

CHI SQUARE = 35.60875 WITH 4 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.16169

TABLE 3.13

* * * * * * * * * * C R O S S T A B U L A T I O N   O F * * * * * * * * * *
FEMALE TIME SINCE LAST RIDING A BICYCLE BY CAR OWNERSHIP
* *

CAR OWNERSHIP

RODE	COUNT / ROW % / COL % / TOT %	OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
<1 YEAR	1.	44	74	118
		37.3	62.7	20.6
		24.9	18.7	
		7.7	12.9	
1-5 YEARS	2.	36	45	81
		44.4	55.6	14.2
		20.3	11.4	
		6.3	7.9	
6-10 YEARS	3.	12	25	37
		32.4	67.6	6.5
		6.8	6.3	
		2.1	4.4	
>10 YEARS	4.	68	173	241
		28.2	71.8	42.1
		38.4	43.8	
		11.9	30.2	
NEVER	5.	17	78	95
		17.9	82.1	16.6
		9.6	19.7	
		3.0	13.6	
	COLUMN TOTAL	177	395	572
		30.9	69.1	100.0

CHI SQUARE = 17.57953 WITH 4 DOF SIGNIFICANCE = 0.0015
CRAMER'S V = 0.17531
NUMBER OF MISSING OBSERVATIONS = 206

TABLE 3.14

* * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * *

MALE TIME SINCE LAST RIDING A BICYCLE BY MOTORCYCLE OWNERSHIP

* *

RODE	COUNT / ROW % / COL % / TOT %	MOTORCYCLE OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
<1 YEAR	1.	33	382	415
		8.0	92.0	30.5
		39.8	29.9	
		2.4	28.1	
1-5 YEARS	2.	21	192	213
		9.9	90.1	15.7
		25.3	15.0	
		1.5	14.1	
6-10 YEARS	3.	15	120	135
		11.1	88.9	9.9
		18.1	9.4	
		1.1	8.8	
>10 YEARS	4.	14	546	560
		2.5	97.5	41.2
		16.9	42.8	
		1.0	40.2	
NEVER	5.	0	36	36
		0.0	100.0	2.6
		0.0	2.8	
		0.0	2.6	
	COLUMN TOTAL	83	1276	1359
		6.1	93.9	100.0

CHI SQUARE = 28.63438 WITH 4 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.14516

TABLE 3.15

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
FEMALE TIME SINCE LAST RIDING A BICYCLE BY MOTORCYCLE OWNERSHIP
* *

RODE	COUNT / ROW % / COL % / TOT %	MOTORCYCLE OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
<1 YEAR	1.	3 2.6 37.5 0.5	114 97.4 20.3 20.0	117 20.5
1-5 YEARS	2.	3 3.7 37.5 0.5	78 96.3 13.9 13.7	81 14.2
6-10 YEARS	3.	1 2.7 12.5 0.2	36 97.3 6.4 6.3	37 6.5
>10 YEARS	4.	1 0.4 12.5 0.2	240 99.6 42.7 42.1	241 42.3
NEVER	5.	0 0.0 0.0 0.0	94 100.0 16.7 16.5	94 16.5
	COLUMN TOTAL	8 1.4	562 98.6	570 100.0

CHI SQUARE = 7.72721 WITH 4 DOF SIGNIFICANCE = 0.1021
CRAMER'S V = 0.11643
NUMBER OF MISSING OBSERVATIONS = 211

TABLE 3.16

* * * * * * * * * * C R O S S T A B U L A T I O N   O F   * * * * * * * * *

MALE   TIME SINCE LAST RIDING A BICYCLE BY BICYCLE OWNERSHIP

* *

RODE	COUNT / ROW % / COL % / TOT %	BICYCLE OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
<1 YEAR	1.	283	132	415
		68.2	31.8	30.6
		82.0	13.0	
		20.8	9.7	
1-5 YEARS	2.	41	173	214
		19.2	80.8	15.8
		11.9	17.1	
		3.0	12.7	
6-10 YEARS	3.	7	127	134
		5.2	94.8	9.9
		2.0	12.5	
		0.5	9.4	
>10 YEARS	4.	13	546	559
		2.3	97.7	41.2
		3.8	53.9	
		1.0	40.2	
NEVER	5.	1	35	36
		2.8	97.2	2.7
		0.3	3.5	
		0.1	2.6	
	COLUMN TOTAL	345	1013	1358
		25.4	74.6	100.0

CHI SQUARE = 600.97094 WITH 4 DOF SIGNIFICANCE = 0.0000

TABLE 3.17

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
FEMALE TIME SINCE LAST RIDING A BICYCLE BY BICYCLE OWNERSHIP
* *

RODE	COUNT / ROW % / COL % / TOT %	BICYCLE OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
<1 YEAR	1.	83	33	116
		71.6	28.4	20.4
		76.1	7.2	
		14.6	5.8	
1-5 YEARS	2.	21	60	81
		25.9	74.1	14.2
		19.3	13.0	
		3.7	10.5	
6-10 YEARS	3.	1	36	37
		2.7	97.3	6.5
		0.9	7.8	
		0.2	6.3	
>10 YEARS	4.	4	237	241
		1.7	98.3	42.4
		3.7	51.5	
		0.7	41.7	
NEVER	5.	0	94	94
		0.0	100.0	16.5
		0.0	20.4	
		0.0	16.5	
	COLUMN TOTAL	109	460	569
		19.2	80.8	100.0

CHI SQUARE = 284.40667 WITH 4 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.70699
NUMBER OF MISSING OBSERVATIONS = 213

TABLE 3.18

* * * * * * * * * * C R O S S T A B U L A T I O N   O F * * * * * * * * *
MALE   TIME SINCE LAST RIDING A BICYCLE BY TRAVELCARD OWNERSHIP
* *

RODE	COUNT / ROW % / COL % / TOT %	TRAVELCARD OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
<1 YEAR	1.	59 14.3 21.3 4.4	353 85.7 32.7 26.0	412 30.4
1-5 YEARS	2.	29 13.6 10.5 2.1	185 86.4 17.1 13.6	214 15.8
6-10 YEARS	3.	28 21.1 10.1 2.1	105 78.9 9.7 7.7	133 9.8
>10 YEARS	4.	148 26.4 53.4 10.9	412 73.6 38.2 30.4	560 41.3
NEVER	5.	13 35.1 4.7 1.0	24 64.9 2.2 1.8	37 2.7
COLUMN TOTAL		277 20.4	1079 79.6	1356 100.0

CHI SQUARE = 33.04079 WITH 4 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.15610

TABLE 3.19

* * * * * * * * * * C R O S S T A B U L A T I O N   O F * * * * * * * * *
FEMALE   TIME SINCE LAST RIDING A BICYCLE BY TRAVELCARD OWNERSHIP
* *

RODE	COUNT / ROW % / COL % / TOT %	TRAVELCARD OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
<1 YEAR	1.	25 21.6 16.0 4.4	91 78.4 22.1 16.0	116 20.5
1-5 YEARS	2.	20 25.0 12.8 3.5	60 75.0 14.6 10.6	80 14.1
6-10 YEARS	3.	8 21.6 5.1 1.4	29 78.4 7.1 5.1	37 6.5
>10 YEARS	4.	69 28.8 44.2 12.2	171 71.3 41.6 30.2	240 42.3
NEVER	5.	34 36.2 21.8 6.0	60 63.8 14.6 10.6	94 16.6
COLUMN TOTAL		156 27.5	411 72.5	567 100.0

CHI SQUARE = 6.68088 WITH 4 DOF SIGNIFICANCE = 0.1537
CRAMER'S V = 0.10855
NUMBER OF MISSING OBSERVATIONS = 217

TABLE 3.20

* * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * * *

MALE TIME SINCE LAST RIDING A BICYCLE BY HOUSEHOLD CAR OWNERSHIP

* *

RODE		COUNT / ROW % / COL % / TOT %	HOUSEHOLD CAR OWNERSHIP NONE 0.	ONE 1.	TWO 2.	THREE 3.	FOUR 4.	FIVE 5.	SIX 6.	ROW TOTAL
<1 YEAR	1.	COUNT	127	188	77	16	3	2	0	413
		ROW %	30.8	45.5	18.6	3.9	0.7	0.5	0.0	30.4
		COL %	32.6	27.9	32.0	38.1	42.9	40.0	0.0	
		TOT %	9.4	13.8	5.7	1.2	0.2	0.1	0.0	
1-5 YEARS	2.	COUNT	48	103	55	8	0	2	0	216
		ROW %	22.2	47.7	25.5	3.7	0.0	0.9	0.0	15.9
		COL %	12.3	15.3	22.8	19.0	0.0	40.0	0.0	
		TOT %	3.5	7.6	4.1	0.6	0.0	0.1	0.0	
6-10 YEARS	3.	COUNT	33	73	21	4	2	1	1	135
		ROW %	24.4	54.1	15.6	3.0	1.5	0.7	0.7	9.9
		COL %	8.5	10.8	8.7	9.5	28.6	20.0	100.0	
		TOT %	2.4	5.4	1.5	0.3	0.1	0.1	0.1	
>10 YEARS	4.	COUNT	158	299	87	14	2	0	0	560
		ROW %	28.2	53.4	15.5	2.5	0.4	0.0	0.0	41.2
		COL %	40.6	44.4	36.1	33.3	28.6	0.0	0.0	
		TOT %	11.6	22.0	6.4	1.0	0.1	0.0	0.0	
NEVER	5.	COUNT	23	10	1	0	0	0	0	34
		ROW %	67.6	29.4	2.9	0.0	0.0	0.0	0.0	2.5
		COL %	5.9	1.5	0.4	0.0	0.0	0.0	0.0	
		TOT %	1.7	0.7	0.1	0.0	0.0	0.0	0.0	
COLUMN TOTAL			389	673	241	42	7	5	1	1358
			28.6	49.6	17.7	3.1	0.5	0.4	0.1	100.0

CHI SQUARE = 63.59153 WITH 24 DOF SIGNIFICANCE = 0.0000

TABLE 3.21

* * * * * * * * * * C R O S S T A B U L A T I O N O F *

FEMALE TIME SINCE LAST RIDING A BICYCLE BY HOUSEHOLD CAR OWNERSHIP

* *

HOUSEHOLD CAR OWNERSHIP

RODE	COUNT / ROW % / COL % / TOT %	NONE 0.	ONE 1.	TWO 2.	THREE 3.	FOUR 4.	FIVE 5.	ROW TOTAL
<1 YEAR	1.	28	61	22	3	1	0	115
		24.3	53.0	19.1	2.6	0.9	0.0	20.4
		14.6	24.2	21.0	27.3	33.3	0.0	
		5.0	10.8	3.9	0.5	0.2	0.0	
1-5 YEARS	2.	12	34	26	4	1	1	78
		15.4	43.6	33.3	5.1	1.3	1.3	13.8
		6.3	13.5	24.8	36.4	33.3	50.0	
		2.1	6.0	4.6	0.7	0.2	0.2	
6-10 YEARS	3.	15	15	5	2	0	0	37
		40.5	40.5	13.5	5.4	0.0	0.0	6.5
		7.8	6.0	4.8	18.2	0.0	0.0	
		2.7	2.7	0.9	0.4	0.0	0.0	
>10 YEARS	4.	89	106	43	1	0	1	240
		37.1	44.2	17.9	0.4	0.0	0.4	42.5
		46.4	42.1	41.0	9.1	0.0	50.0	
		15.8	18.8	7.6	0.2	0.0	0.2	
NEVER	5.	48	36	9	1	1	0	95
		50.5	37.9	9.5	1.1	1.1	0.0	16.8
		25.0	14.3	8.6	9.1	33.3	0.0	
		8.5	6.4	1.6	0.2	0.2	0.0	
	COLUMN TOTAL	192	252	105	11	3	2	565
		34.0	44.6	18.6	1.9	0.5	0.4	100.0

CHI SQUARE = 52.49784 WITH 20 DOF SIGNIFICANCE = 0.0001
CRAMER'S V = 0.15241
NUMBER OF MISSING OBSERVATIONS = 217

TABLE 4.1

* * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
AVERAGE WEEKLY BICYCLE USE BY SEX
* *

BICYCLE USE	COUNT / ROW % / COL % / TOT %	SEX: MALE 1.	SEX: FEMALE 2.	ROW TOTAL
1 DAY OR LESS	1.	109	43	152
		71.7	28.3	40.1
		38.2	45.7	
		28.8	11.3	
2-3 DAYS	2.	50	21	71
		70.4	29.6	18.7
		17.5	22.3	
		13.2	5.5	
4-5 DAYS	3.	55	17	72
		76.4	23.6	19.0
		19.3	18.1	
		14.5	4.5	
6-7 DAYS	4.	71	13	84
		84.5	15.5	22.2
		24.9	13.8	
		18.7	3.4	
COLUMN TOTAL		285	94	379
		75.2	24.8	100.0

CHI SQUARE = 5.83116 WITH 3 DOF SIGNIFICANCE = 0.1201
CRAMER'S V = 0.12404
NUMBER OF MISSING OBSERVATIONS = 90

TABLE 4.2

* * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
MALE AVERAGE WEEKLY BICYCLE USE BY MARITAL STATUS

BICYCLE USE	COUNT / ROW % / COL % / TOT %	MARITAL STATUS: MARRIED 1.	SINGLE 2.	ROW TOTAL
1 DAY OR LESS	1.	77	32	109
		70.6	29.4	38.4
		39.3	36.4	
		27.1	11.3	
2-3 DAYS	2.	34	16	50
		68.0	32.0	17.6
		17.3	18.2	
		12.0	5.6	
4-5 DAYS	3.	36	19	55
		65.5	34.5	19.4
		18.4	21.6	
		12.7	6.7	
6-7 DAYS	4.	49	21	70
		70.0	30.0	24.6
		25.0	23.9	
		17.3	7.4	
COLUMN TOTAL		196	88	284
		69.0	31.0	100.0

CHI SQUARE = 0.51685 WITH 3 DOF SIGNIFICANCE = 0.9152
CRAMER'S V = 0.04266

TABLE 4.3

* * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
FEMALE AVERAGE WEEKLY BICYCLE USE BY MARITAL STATUS

BICYCLE USE	COUNT / ROW % / COL % / TOT %	MARITAL STATUS: MARRIED 1.	SINGLE 2.	ROW TOTAL
1 DAY OR LESS	1.	21	22	43
		48.8	51.2	46.2
		41.2	52.4	
		22.6	23.7	
2-3 DAYS	2.	12	8	20
		60.0	40.0	21.5
		23.5	19.0	
		12.9	8.6	
4-5 DAYS	3.	11	6	17
		64.7	35.3	18.3
		21.6	14.3	
		11.8	6.5	
6-7 DAYS	4.	7	6	13
		53.8	46.2	14.0
		13.7	14.3	
		7.5	6.5	
COLUMN TOTAL		51	42	93
		54.8	45.2	100.0

CHI SQUARE = 1.51398 WITH 3 DOF SIGNIFICANCE = 0.6790
CRAMER'S V = 0.12759
NUMBER OF MISSING OBSERVATIONS = 92

TABLE 4.4

MALE

CROSSTABULATION OF AVERAGE WEEKLY BICYCLE USE BY AGE

BICYCLE USE	COUNT / ROW % / COL % / TOT %	AGE 17-20 1.	21-29 2.	30-39 3.	40-49 4.	50-59 5.	60-64 6.	65+ 7.	ROW TOTAL
1. 1 DAY OR LESS	COUNT	17	19	25	21	13	7	7	109
	ROW %	15.6	17.4	22.9	19.3	11.9	6.4	6.4	38.5
	COL %	39.5	36.5	36.8	42.9	34.2	53.8	35.0	
	TOT %	6.0	6.7	8.8	7.4	4.6	2.5	2.5	
2. 2-3 DAYS	COUNT	5	7	13	9	8	2	4	48
	ROW %	10.4	14.6	27.1	18.8	16.7	4.2	8.3	17.0
	COL %	11.6	13.5	19.1	18.4	21.1	15.4	20.0	
	TOT %	1.8	2.5	4.6	3.2	2.8	0.7	1.4	
3. 4-5 DAYS	COUNT	12	12	15	6	4	1	5	55
	ROW %	21.8	21.8	27.3	10.9	7.3	1.8	9.1	19.4
	COL %	27.9	23.1	22.1	12.2	10.5	7.7	25.0	
	TOT %	4.2	4.2	5.3	2.1	1.4	0.4	1.8	
4. 6-7 DAYS	COUNT	9	14	15	13	13	3	4	71
	ROW %	12.7	19.7	21.1	18.3	18.3	4.2	5.6	25.1
	COL %	20.9	26.9	22.1	26.5	34.2	23.1	20.0	
	TOT %	3.2	4.9	5.3	4.6	4.6	1.1	1.4	
COLUMN TOTAL		43	52	68	49	38	13	20	283
		15.2	18.4	24.0	17.3	13.4	4.6	7.1	100.0

CHI SQUARE = 11.66511 WITH 18 DOF SIGNIFICANCE = 0.8640
CRAMER'S V = 0.11722

BICYCLE OWNERS

TABLE 4.5

* * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * *

FEMALE AVERAGE WEEKLY BICYCLE USE BY AGE

* *

BICYCLE USE	COUNT / ROW % / COL % / TOT %	AGE 17–20 (1.)	21–29 (2.)	30–39 (3.)	40–49 (4.)	50–59 (5.)	60–64 (6.)	ROW TOTAL
1. 1 DAY OR LESS	COUNT	10	14	13	5	1	0	43
	ROW %	23.3	32.6	30.2	11.6	2.3	0.0	46.2
	COL %	66.7	53.8	46.4	29.4	25.0	0.0	
	TOT %	10.8	15.1	14.0	5.4	1.1	0.0	
2. 2–3 DAYS	COUNT	1	7	6	4	0	2	20
	ROW %	5.0	35.0	30.0	20.0	0.0	10.0	21.5
	COL %	6.7	26.9	21.4	23.5	0.0	66.7	
	TOT %	1.1	7.5	6.5	4.3	0.0	2.2	
3. 4–5 DAYS	COUNT	2	2	6	5	1	1	17
	ROW %	11.8	11.8	35.3	29.4	5.9	5.9	18.3
	COL %	13.3	7.7	21.4	29.4	25.0	33.3	
	TOT %	2.2	2.2	6.5	5.4	1.1	1.1	
4. 6–7 DAYS	COUNT	2	3	3	3	2	0	13
	ROW %	15.4	23.1	23.1	23.1	15.4	0.0	14.0
	COL %	13.3	11.5	10.7	17.6	50.0	0.0	
	TOT %	2.2	3.2	3.2	3.2	2.2	0.0	
COLUMN TOTAL		15	26	28	17	4	3	93
		16.1	28.0	30.1	18.3	4.3	3.2	100.0

CHI SQUARE = 18.32136 WITH 15 DOF SIGNIFICANCE = 0.2461

CRAMER'S V = 0.25626

NUMBER OF MISSING OBSERVATIONS = 93

TABLE 4.6

* * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *

MALE AVERAGE WEEKLY BICYCLE USE BY EMPLOYMENT STATUS

* *

EMPLOYMENT STATUS

BICYCLE USE	COUNT / ROW % / COL % / TOT %	WORKING 1.	UNEMPLOYED 2.	STUDENT 4.	RETIRED 5.	OTHER 6.	ROW TOTAL
1. 1 DAY OR LESS	COUNT	83	14	3	8	0	108
	ROW %	76.9	13.0	2.8	7.4	0.0	38.8
	COL %	41.1	38.9	20.0	33.3	0.0	
	TOT %	29.9	5.0	1.1	2.9	0.0	
2. 2-3 DAYS	COUNT	29	9	3	6	1	48
	ROW %	60.4	18.8	6.3	12.5	2.1	17.3
	COL %	14.4	25.0	20.0	25.0	100.0	
	TOT %	10.4	3.2	1.1	2.2	0.4	
3. 4-5 DAYS	COUNT	38	4	5	5	0	52
	ROW %	73.1	7.7	9.6	9.6	0.0	18.7
	COL %	18.8	11.1	33.3	20.8	0.0	
	TOT %	13.7	1.4	1.8	1.8	0.0	
4. 6-7 DAYS	COUNT	52	9	4	5	0	70
	ROW %	74.3	12.9	5.7	7.1	0.0	25.2
	COL %	25.7	25.0	26.7	20.8	0.0	
	TOT %	18.7	3.2	1.4	1.8	0.0	
COLUMN TOTAL		202	36	15	24	1	278
		72.7	12.9	5.4	8.6	0.4	100.0

CHI SQUARE = 12.85061 WITH 12 DOF SIGNIFICANCE = 0.3800

CRAMER'S V = 0.12413

TABLE 4.7

* * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * *
FEMALE AVERAGE WEEKLY BICYCLE USE BY EMPLOYMENT STATUS
* *

EMPLOYMENT STATUS

BICYCLE USE	COUNT / ROW % / COL % / TOT %	WORKING 1.	UNEMPLOYED 2.	HOUSEWIFE-HUSBAN 3.	STUDENT 4.	RETIRED 5.	OTHER 6.	ROW TOTAL
1. 1 DAY OR LESS	COUNT	27	3	5	6	0	0	41
	ROW %	65.9	7.3	12.2	14.6	0.0	0.0	45.6
	COL %	44.3	42.9	50.0	60.0	0.0	0.0	
	TOT %	30.0	3.3	5.6	6.7	0.0	0.0	
2. 2-3 DAYS	COUNT	15	2	1	1	1	0	20
	ROW %	75.0	10.0	5.0	5.0	5.0	0.0	22.2
	COL %	24.6	28.6	10.0	10.0	100.0	0.0	
	TOT %	16.7	2.2	1.1	1.1	1.1	0.0	
3. 4-5 DAYS	COUNT	10	1	3	1	0	1	16
	ROW %	62.5	6.3	18.8	6.3	0.0	6.3	17.8
	COL %	16.4	14.3	30.0	10.0	0.0	100.0	
	TOT %	11.1	1.1	3.3	1.1	0.0	1.1	
4. 6-7 DAYS	COUNT	9	1	1	2	0	0	13
	ROW %	69.2	7.7	7.7	15.4	0.0	0.0	14.4
	COL %	14.8	14.3	10.0	20.0	0.0	0.0	
	TOT %	10.0	1.1	1.1	2.2	0.0	0.0	
COLUMN TOTAL		61	7	10	10	1	1	90
		67.8	7.8	11.1	11.1	1.1	1.1	100.0

CHI SQUARE = 11.93421 WITH 15 DOF SIGNIFICANCE = 0.6840
CRAMER'S V = 0.21024
NUMBER OF MISSING OBSERVATIONS = 101

TABLE 4.8

* * * * * * * * * * * * * CROSSTABULATION OF * * * * * * * * * * * * * *

MALE AVERAGE WEEKLY BICYCLE USE BY OCCUPATION

* *

BICYCLE USE	COUNT / ROW % / COL % / TOT %	OCCUPATION: MANAGERIAL 1.	PROFESSIONAL 2.	CLERICAL 3.	SKILLED 4.	SEMI-SKILLED 5.	UNSKILLED 6.	OTHER 7.	ROW TOTAL
1. 1 DAY OR LESS	COUNT	16	28	15	30	9	5	1	104
	ROW %	15.4	26.9	14.4	28.8	8.7	4.8	1.0	39.7
	COL %	55.2	63.6	71.4	32.6	16.1	33.3	20.0	
	TOT %	6.1	10.7	5.7	11.5	3.4	1.9	0.4	
2. 2-3 DAYS	COUNT	8	8	1	10	13	3	2	45
	ROW %	17.8	17.8	2.2	22.2	28.9	6.7	4.4	17.2
	COL %	27.6	18.2	4.8	10.9	23.2	20.0	40.0	
	TOT %	3.1	3.1	0.4	3.8	5.0	1.1	0.8	
3. 4-5 DAYS	COUNT	2	3	3	15	20	3	0	46
	ROW %	4.3	6.5	6.5	32.6	43.5	6.5	0.0	17.6
	COL %	6.9	6.8	14.3	16.3	35.7	20.0	0.0	
	TOT %	0.8	1.1	1.1	5.7	7.6	1.1	0.0	
4. 6-7 DAYS	COUNT	3	5	2	37	14	4	2	67
	ROW %	4.5	7.5	3.0	55.2	20.9	6.0	3.0	25.6
	COL %	10.3	11.4	9.5	40.2	25.0	26.7	40.0	
	TOT %	1.1	1.9	0.8	14.1	5.3	1.5	0.8	
COLUMN TOTAL		29	44	21	92	56	15	5	262
		11.1	16.8	8.0	35.1	21.4	5.7	1.9	100.0

CHI SQUARE = 64.53226 WITH 18 DOF SIGNIFICANCE = 0.0000

CRAMER'S V = 0.28653

TABLE 4.9

* * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * *
FEMALE AVERAGE WEEKLY BICYCLE USE BY OCCUPATION
* *

BICYCLE USE	COUNT / ROW % / COL % / TOT %	MANAGERIAL 1.	PROFESSIONAL 2.	CLERICAL 3.	SKILLED 4.	SEMI-SKILLED 5.	UNSKILLED 6.	OTHER 7.	ROW TOTAL
1. 1 DAY OR LESS	COUNT	2	3	24	5	1	4	3	42
	ROW %	4.8	7.1	57.1	11.9	2.4	9.5	7.1	47.2
	COL %	50.0	27.3	61.5	71.4	12.5	36.4	33.3	
	TOT %	2.2	3.4	27.0	5.6	1.1	4.5	3.4	
2. 2-3 DAYS	COUNT	2	3	8	0	2	2	1	18
	ROW %	11.1	16.7	44.4	0.0	11.1	11.1	5.6	20.2
	COL %	50.0	27.3	20.5	0.0	25.0	18.2	11.1	
	TOT %	2.2	3.4	9.0	0.0	2.2	2.2	1.1	
3. 4-5 DAYS	COUNT	0	5	4	1	2	3	2	17
	ROW %	0.0	29.4	23.5	5.9	11.8	17.6	11.8	19.1
	COL %	0.0	45.5	10.3	14.3	25.0	27.3	22.2	
	TOT %	0.0	5.6	4.5	1.1	2.2	3.4	2.2	
4. 6-7 DAYS	COUNT	0	0	3	1	3	2	3	12
	ROW %	0.0	0.0	25.0	8.3	25.0	16.7	25.0	13.5
	COL %	0.0	0.0	7.7	14.3	37.5	18.2	33.3	
	TOT %	0.0	0.0	3.4	1.1	3.4	2.2	3.4	
COLUMN TOTAL		4	11	39	7	8	11	9	89
		4.5	12.4	43.8	7.9	9.0	12.4	10.1	100.0

CHI SQUARE = 26.35759 WITH 18 DOF SIGNIFICANCE = 0.0919
CRAMER'S V = 0.31419
NUMBER OF MISSING OBSERVATIONS = 118

TABLE 4.10

* * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
MALE AVERAGE WEEKLY BICYCLE USE BY FULL UK DRIVING LICENCE
* *

FULL UK DRIVING LICENCE

DAYUSE	COUNT / ROW % / COL % / TOT %	LICENCE 1.	NO LICENCE 2.	ROW TOTAL
1 DAY OR LESS	1.	88	21	109
		80.7	19.3	38.2
		47.3	21.2	
		30.9	7.4	
2-3 DAYS	2.	39	11	50
		78.0	22.0	17.5
		21.0	11.1	
		13.7	3.9	
4-5 DAYS	3.	29	26	55
		52.7	47.3	19.3
		15.6	26.3	
		10.2	9.1	
6-7 DAYS	4.	30	41	71
		42.3	57.7	24.9
		16.1	41.4	
		10.5	14.4	
COLUMN TOTAL		186	99	285
		65.3	34.7	100.0

CHI SQUARE = 35.47965 WITH 3 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.35283

TABLE 4.11

* * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
FEMALE AVERAGE WEEKLY BICYCLE USE BY FULL UK DRIVING LICENCE
* *

DAYUSE	COUNT / ROW % / COL % / TOT %	FULL UK DRIVING LICENCE: LICENCE 1.	NO LICENCE 2.	ROW TOTAL
1 DAY OR LESS	1.	29 69.0 55.8 31.2	13 31.0 31.7 14.0	42 45.2
2-3 DAYS	2.	14 66.7 26.9 15.1	7 33.3 17.1 7.5	21 22.6
4-5 DAYS	3.	8 47.1 15.4 8.6	9 52.9 22.0 9.7	17 18.3
6-7 DAYS	4.	1 7.7 1.9 1.1	12 92.3 29.3 12.9	13 14.0
COLUMN TOTAL		52 55.9	41 44.1	93 100.0

CHI SQUARE = 16.72804 WITH 3 DOF SIGNIFICANCE = 0.0008
CRAMER'S V = 0.42411
NUMBER OF MISSING OBSERVATIONS = 91

TABLE 4.12

* * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
MALE AVERAGE WEEKLY BICYCLE USE BY CAR OWNERSHIP
* *

BICYCLE USE	COUNT / ROW % / COL % / TOT %	CAR OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
1 DAY OR LESS	1.	81	28	109
		74.3	25.7	38.5
		54.7	20.7	
		28.6	9.9	
2-3 DAYS	2.	30	20	50
		60.0	40.0	17.7
		20.3	14.8	
		10.6	7.1	
4-5 DAYS	3.	19	35	54
		35.2	64.8	19.1
		12.8	25.9	
		6.7	12.4	
6-7 DAYS	4.	18	52	70
		25.7	74.3	24.7
		12.2	38.5	
		6.4	18.4	
COLUMN TOTAL		148	135	283
		52.3	47.7	100.0

CHI SQUARE = 48.53090 WITH 3 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.41411

TABLE 4.13

FEMALE

CROSSTABULATION OF AVERAGE WEEKLY BICYCLE USE BY CAR OWNERSHIP

BICYCLE USE	COUNT / ROW % / COL % / TOT %	CAR OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
1. 1 DAY OR LESS	COUNT	24	18	42
	ROW %	57.1	42.9	45.2
	COL %	61.5	33.3	
	TOT %	25.8	19.4	
2. 2-3 DAYS	COUNT	9	12	21
	ROW %	42.9	57.1	22.6
	COL %	23.1	22.2	
	TOT %	9.7	12.9	
3. 4-5 DAYS	COUNT	4	13	17
	ROW %	23.5	76.5	18.3
	COL %	10.3	24.1	
	TOT %	4.3	14.0	
4. 6-7 DAYS	COUNT	2	11	13
	ROW %	15.4	84.6	14.0
	COL %	5.1	20.4	
	TOT %	2.2	11.8	
COLUMN TOTAL		39	54	93
		41.9	58.1	100.0

CHI SQUARE = 10.12524 WITH 3 DOF SIGNIFICANCE = 0.0175
CRAMER'S V = 0.32996
NUMBER OF MISSING OBSERVATIONS = 93

TABLE 4.14

* * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
MALE AVERAGE WEEKLY BICYCLE USE BY MOTORCYCLE OWNERSHIP
* *

BICYCLE USE	COUNT / ROW % / COL % / TOT %	MOTORCYCLE OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
1. 1 DAY OR LESS	COUNT	13	95	108
	ROW %	12.0	88.0	38.0
	COL %	65.0	36.0	
	TOT %	4.6	33.5	
2. 2-3 DAYS	COUNT	2	48	50
	ROW %	4.0	96.0	17.6
	COL %	10.0	18.2	
	TOT %	0.7	16.9	
3. 4-5 DAYS	COUNT	1	54	55
	ROW %	1.8	98.2	19.4
	COL %	5.0	20.5	
	TOT %	0.4	19.0	
4. 6-7 DAYS	COUNT	4	67	71
	ROW %	5.6	94.4	25.0
	COL %	20.0	25.4	
	TOT %	1.4	23.6	
COLUMN TOTAL		20	264	284
		7.0	93.0	100.0

CHI SQUARE = 7.33081 WITH 3 DOF SIGNIFICANCE = 0.0621
CRAMER'S V = 0.16066

TABLE 4.15

* * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
FEMALE AVERAGE WEEKLY BICYCLE USE BY MOTORCYCLE OWNERSHIP
* *

BICYCLE USE	COUNT / ROW % / COL % / TOT %	MOTORCYCLE OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
1. 1 DAY OR LESS		3 7.1 100.0 3.2	39 92.9 43.3 41.9	42 45.2
2. 2-3 DAYS		0 0.0 0.0 0.0	21 100.0 23.3 22.6	21 22.6
3. 4-5 DAYS		0 0.0 0.0 0.0	17 100.0 18.9 18.3	17 18.3
4. 6-7 DAYS		0 0.0 0.0 0.0	13 100.0 14.4 14.0	13 14.0
COLUMN TOTAL		3 3.2	90 96.8	93 100.0

CHI SQUARE = 3.76429 WITH 3 DOF SIGNIFICANCE = 0.2881
CRAMER'S V = 0.20119
NUMBER OF MISSING OBSERVATIONS = 92

TABLE 4.16

* * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * *
MALE AVERAGE WEEKLY BICYCLE USE BY TRAVELCARD OWNERSHIP
* *

BICYCLE USE	COUNT / ROW % / COL % / TOT %	TRAVELCARD OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
1. 1 DAY OR LESS	COUNT	14	94	108
	ROW %	13.0	87.0	38.3
	COL %	33.3	39.2	
	TOT %	5.0	33.3	
2. 2-3 DAYS	COUNT	8	42	50
	ROW %	16.0	84.0	17.7
	COL %	19.0	17.5	
	TOT %	2.8	14.9	
3. 4-5 DAYS	COUNT	7	48	55
	ROW %	12.7	87.3	19.5
	COL %	16.7	20.0	
	TOT %	2.5	17.0	
4. 6-7 DAYS	COUNT	13	56	69
	ROW %	18.8	81.2	24.5
	COL %	31.0	23.3	
	TOT %	4.6	19.9	
COLUMN TOTAL		42	240	282
		14.9	85.1	100.0

CHI SQUARE = 1.41755 WITH 3 DOF SIGNIFICANCE = 0.7014
CRAMER'S V = 0.07090

TABLE 4.17

* * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * *
FEMALE AVERAGE WEEKLY BICYCLE USE BY TRAVELCARD OWNERSHIP
* *

TABLE 4.

COUNT / ROW % / COL % / TOT % — BICYCLE USE	TRAVELCARD OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
1. 1 DAY OR LESS	9 21.4 56.3 9.8	33 78.6 43.4 35.9	42 45.7
2. 2-3 DAYS	4 19.0 25.0 4.3	17 81.0 22.4 18.5	21 22.8
3. 4-5 DAYS	2 12.5 12.5 2.2	14 87.5 18.4 15.2	16 17.4
4. 6-7 DAYS	1 7.7 6.3 1.1	12 92.3 15.8 13.0	13 14.1
COLUMN TOTAL	16 17.4	76 82.6	92 100.0

CHI SQUARE = 1.63427 WITH 3 DOF SIGNIFICANCE = 0.6516
CRAMER'S V = 0.13328
NUMBER OF MISSING OBSERVATIONS = 95

TABLE 4.18

* * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * *

MALE AVERAGE WEEKLY BICYCLE USE BY HOUSEHOLD CAR OWNERSHIP

* *

BICYCLE USE (COUNT / ROW % / COL % / TOT %)	HOUSEHOLD CAR OWNERSHIP: NONE 0.	ONE 1.	TWO 2.	THREE 3.	FOUR 4.	FIVE 5.	ROW TOTAL
1. 1 DAY OR LESS	16 14.7 18.2 5.7	58 53.2 45.7 20.5	28 25.7 48.3 9.9	5 4.6 62.5 1.8	1 0.9 100.0 0.4	1 0.9 100.0 0.4	109 38.5
2. 2-3 DAYS	12 24.5 13.6 4.2	21 42.9 16.5 7.4	16 32.7 27.6 5.7	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	49 17.3
3. 4-5 DAYS	23 42.6 26.1 8.1	23 42.6 18.1 8.1	7 13.0 12.1 2.5	1 1.9 12.5 0.4	0 0.0 0.0 0.0	0 0.0 0.0 0.0	54 19.1
4. 6-7 DAYS	37 52.1 42.0 13.1	25 35.2 19.7 8.8	7 9.9 12.1 2.5	2 2.8 25.0 0.7	0 0.0 0.0 0.0	0 0.0 0.0 0.0	71 25.1
COLUMN TOTAL	88 31.1	127 44.9	58 20.5	8 2.8	1 0.4	1 0.4	283 100.0

CHI SQUARE = 42.12474 WITH 15 DOF SIGNIFICANCE = 0.0002

CRAMER'S V = 0.22275

TABLE 4.19

* * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * *
FEMALE AVERAGE WEEKLY BICYCLE USE BY HOUSEHOLD CAR OWNERSHIP
*

BICYCLE USE (COUNT / ROW % / COL % / TOT %)	HOUSEHOLD CAR OWNERSHIP: NONE 0.	ONE 1.	TWO 2.	THREE 3.	FIVE 5.	ROW TOTAL
1. 1 DAY OR LESS	5 11.9 31.3 5.5	22 52.4 44.9 24.2	10 23.8 50.0 11.0	4 9.5 80.0 4.4	1 2.4 100.0 1.1	42 46.2
2. 2-3 DAYS	4 20.0 25.0 4.4	12 60.0 24.5 13.2	4 20.0 20.0 4.4	0 0.0 0.0 0.0	0 0.0 0.0 0.0	20 22.0
3. 4-5 DAYS	4 25.0 25.0 4.4	9 56.3 18.4 9.9	3 18.8 15.0 3.3	0 0.0 0.0 0.0	0 0.0 0.0 0.0	16 17.6
4. 6-7 DAYS	3 23.1 18.8 3.3	6 46.2 12.2 6.6	3 23.1 15.0 3.3	1 7.7 20.0 1.1	0 0.0 0.0 0.0	13 14.3
COLUMN TOTAL	16 17.6	49 53.8	20 22.0	5 5.5	1 1.1	91 100.0

CHI SQUARE = 6.56056 WITH 12 DOF SIGNIFICANCE = 0.8852
CRAMER'S V = 0.15502
NUMBER OF MISSING OBSERVATIONS = 95

TABLE 5.1

* * * * * * * * * CROSSTABULATION OF * * * * * * * * *
AVERAGE WEEKLY BICYCLE MILEAGE BY SEX
* *

MILES	COUNT / ROW % / COL % / TOT %	SEX: MALE 1.	FEMALE 2.	ROW TOTAL
0-5 MILES	1.	67 66.3 26.1 19.8	34 33.7 41.5 10.0	101 29.8
6-10 MILES	2.	45 67.2 17.5 13.3	22 32.8 26.8 6.5	67 19.8
11-20 MILES	3.	50 79.4 19.5 14.7	13 20.6 15.9 3.8	63 18.6
21-50 MILES	4.	70 85.4 27.2 20.6	12 14.6 14.6 3.5	82 24.2
>50 MILES	5.	25 96.2 9.7 7.4	1 3.8 1.2 0.3	26 7.7
	COLUMN TOTAL	257 75.8	82 24.2	339 100.0

CHI SQUARE = 18.05949 WITH 4 DOF SIGNIFICANCE = 0.0012
CRAMER'S V = 0.23081
NUMBER OF MISSING OBSERVATIONS = 130

TABLE 5.2

* * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *
MALE AVERAGE WEEKLY BICYCLE MILEAGE BY MARITAL STATUS
* *

MILES	COUNT / ROW % / COL % / TOT %	MARITAL STATUS: MARRIED 1.	SINGLE 2.	ROW TOTAL
0-5 MILES	1.	51 76.1 29.3 19.9	16 23.9 19.5 6.3	67 26.2
6-10 MILES	2.	30 66.7 17.2 11.7	15 33.3 18.3 5.9	45 17.6
11-20 MILES	3.	31 62.0 17.8 12.1	19 38.0 23.2 7.4	50 19.5
21-50 MILES	4.	50 71.4 28.7 19.5	20 28.6 24.4 7.8	70 27.3
>50 MILES	5.	12 50.0 6.9 4.7	12 50.0 14.6 4.7	24 9.4
	COLUMN TOTAL	174 68.0	82 32.0	256 100.0

CHI SQUARE = 6.84185 WITH 4 DOF SIGNIFICANCE = 0.1445
CRAMER'S V = 0.16348

TABLE 5.3

* * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * *
FEMALE AVERAGE WEEKLY BICYCLE MILEAGE BY MARITAL STATUS
* *

MILES	COUNT / ROW % / COL % / TOT %	MARITAL STATUS: MARRIED 1.	SINGLE 2.	ROW TOTAL
0-5 MILES	1.	22 64.7 47.8 27.2	12 35.3 34.3 14.8	34 42.0
6-10 MILES	2.	11 50.0 23.9 13.6	11 50.0 31.4 13.6	22 27.2
11-20 MILES	3.	7 53.8 15.2 8.6	6 46.2 17.1 7.4	13 16.0
21-50 MILES	4.	6 54.5 13.0 7.4	5 45.5 14.3 6.2	11 13.6
>50 MILES	5.	0 0.0 0.0 0.0	1 100.0 2.9 1.2	1 1.2
	COLUMN TOTAL	46 56.8	35 43.2	81 100.0

CHI SQUARE = 2.66432 WITH 4 DOF SIGNIFICANCE = 0.6155
CRAMER'S V = 0.18136
NUMBER OF MISSING OBSERVATIONS = 132

TABLE 5.4

MALE

CROSSTABULATION OF AVERAGE WEEKLY BICYCLE MILEAGE BY AGE

MILES (COUNT / ROW % / COL % / TOT %)	AGE 17-20 (1.)	21-29 (2.)	30-39 (3.)	40-49 (4.)	50-59 (5.)	60-64 (6.)	65+ (7.)	ROW TOTAL
1. 0-5 MILES	10 15.2 24.4 3.9	12 18.2 26.7 4.7	16 24.2 25.4 6.3	12 18.2 26.7 4.7	9 13.6 27.3 3.5	3 4.5 30.0 1.2	4 6.1 21.1 1.6	66 25.8
2. 6-10 MILES	10 22.2 24.4 3.9	4 8.9 8.9 1.6	11 24.4 17.5 4.3	11 24.4 24.4 4.3	4 8.9 12.1 1.6	1 2.2 10.0 0.4	4 8.9 21.1 1.6	45 17.6
3. 11-20 MILES	6 12.0 14.6 2.3	10 20.0 22.2 3.9	11 22.0 17.5 4.3	6 12.0 13.3 2.3	9 18.0 27.3 3.5	4 8.0 40.0 1.6	4 8.0 21.1 1.6	50 19.5
4. 21-50 MILES	10 14.3 24.4 3.9	12 17.1 26.7 4.7	22 31.4 34.9 8.6	13 18.6 28.9 5.1	7 10.0 21.2 2.7	2 2.9 20.0 0.8	4 5.7 21.1 1.6	70 27.3
5. >50 MILES	5 20.0 12.2 2.0	7 28.0 15.6 2.7	3 12.0 4.8 1.2	3 12.0 6.7 1.2	4 16.0 12.1 1.6	0 0.0 0.0 0.0	3 12.0 15.8 1.2	25 9.8
COLUMN TOTAL	41 16.0	45 17.6	63 24.6	45 17.6	33 12.9	10 3.9	19 7.4	256 100.0

CHI SQUARE = 18.58352 WITH 24 DOF SIGNIFICANCE = 0.7738

CRAMER'S V = 0.13471

TABLE 5.5

* * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * * *

FEMALE AVERAGE WEEKLY BICYCLE MILEAGE BY AGE

* *

MILES (COUNT / ROW % / COL % / TOT %)	AGE 17-20 1.	21-29 2.	30-39 3.	40-49 4.	50-59 5.	60-64 6.	ROW TOTAL
1. 0-5 MILES	6 17.6 50.0 7.4	7 20.6 30.4 8.6	12 35.3 46.2 14.8	6 17.6 42.9 7.4	1 2.9 25.0 1.2	2 5.9 100.0 2.5	34 42.0
2. 6-10 MILES	2 9.1 16.7 2.5	7 31.8 30.4 8.6	9 40.9 34.6 11.1	4 18.2 28.6 4.9	0 0.0 0.0 0.0	0 0.0 0.0 0.0	22 27.2
3. 11-20 MILES	1 7.7 8.3 1.2	5 38.5 21.7 6.2	3 23.1 11.5 3.7	2 15.4 14.3 2.5	2 15.4 50.0 2.5	0 0.0 0.0 0.0	13 16.0
4. 21-50 MILES	2 18.2 16.7 2.5	4 36.4 17.4 4.9	2 18.2 7.7 2.5	2 18.2 14.3 2.5	1 9.1 25.0 1.2	0 0.0 0.0 0.0	11 13.6
5. >50 MILES	1 100.0 8.3 1.2	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 1.2
COLUMN TOTAL	12 14.8	23 28.4	26 32.1	14 17.3	4 4.9	2 2.5	81 100.0

CHI SQUARE = 17.51699 WITH 20 DOF SIGNIFICANCE = 0.6192
CRAMER'S V = 0.23252
NUMBER OF MISSING OBSERVATIONS = 132

TABLE 5.6

* * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *
MALE AVERAGE WEEKLY BICYCLE MILEAGE BY EMPLOYMENT STATUS
* *

MILES	EMPLOYMENT COUNT ROW % COL % TOT %	WORKING 1.	UNEMPLOYED 2.	STUDENT 4.	RETIRED 5.	OTHER 6.	ROW TOTAL
0-5 MILES	1.	50 74.6 27.5 19.8	8 11.9 26.7 3.2	1 1.5 6.7 0.4	7 10.4 29.2 2.8	1 1.5 100.0 0.4	67 26.6
6-10 MILES	2.	28 63.6 15.4 11.1	8 18.2 26.7 3.2	3 6.8 20.0 1.2	5 11.4 20.8 2.0	0 0.0 0.0 0.0	44 17.5
11-20 MILES	3.	33 66.0 18.1 13.1	6 12.0 20.0 2.4	5 10.0 33.3 2.0	6 12.0 25.0 2.4	0 0.0 0.0 0.0	50 19.8
21-50 MILES	4.	54 79.4 29.7 21.4	4 5.9 13.3 1.6	5 7.4 33.3 2.0	5 7.4 20.8 2.0	0 0.0 0.0 0.0	68 27.0
>50 MILES	5.	17 73.9 9.3 6.7	4 17.4 13.3 1.6	1 4.3 6.7 0.4	1 4.3 4.2 0.4	0 0.0 0.0 0.0	23 9.1
COLUMN TOTAL		182 72.2	30 11.9	15 6.0	24 9.5	1 0.4	252 100.0

CHI SQUARE = 13.65361 WITH 16 DOF SIGNIFICANCE = 0.6245
CRAMER'S V = 0.11638

TABLE 5.7

* * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *
FEMALE AVERAGE WEEKLY BICYCLE MILEAGE BY EMPLOYMENT STATUS
* *

MILES	COUNT / ROW % / COL % / TOT %	EMPLOYMENT: WORKING 1.	UNEMPLOYED 2.	HOUSEWIFE-HUSBAN 3.	STUDENT 4.	RETIRED 5.	ROW TOTAL
0-5 MILES	1.	19 59.4 37.3 24.4	2 6.3 28.6 2.6	7 21.9 70.0 9.0	3 9.4 33.3 3.8	1 3.1 100.0 1.3	32 41.0
6-10 MILES	2.	12 57.1 23.5 15.4	2 9.5 28.6 2.6	3 14.3 30.0 3.8	4 19.0 44.4 5.1	0 0.0 0.0 0.0	21 26.9
11-20 MILES	3.	12 92.3 23.5 15.4	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 7.7 11.1 1.3	0 0.0 0.0 0.0	13 16.7
21-50 MILES	4.	8 72.7 15.7 10.3	3 27.3 42.9 3.8	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	11 14.1
>50 MILES	5.	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 100.0 11.1 1.3	0 0.0 0.0 0.0	1 1.3
	COLUMN TOTAL	51 65.4	7 9.0	10 12.8	9 11.5	1 1.3	78 100.0

CHI SQUARE = 24.31095 WITH 16 DOF SIGNIFICANCE = 0.0829
CRAMER'S V = 0.27914
NUMBER OF MISSING OBSERVATIONS = 139

TABLE 5.8

C R O S S T A B U L A T I O N   O F

MALE   AVERAGE WEEKLY BICYCLE MILEAGE BY OCCUPATION

MILES	COUNT / ROW % / COL % / TOT %	MANAGERIAL 1.	PROFESSIONAL 2.	CLERICAL 3.	SKILLED 4.	SEMI-SKILLED 5.	UNSKILLED 6.	OTHER 7.	ROW TOTAL
0-5 MILES	1. COUNT	7	16	11	19	10	2	0	65
	ROW %	10.8	24.6	16.9	29.2	15.4	3.1	0.0	27.8
	COL %	25.9	42.1	61.1	23.5	19.2	15.4	0.0	
	TOT %	3.0	6.8	4.7	8.1	4.3	0.9	0.0	
6-10 MILES	2. COUNT	8	8	1	10	6	3	3	39
	ROW %	20.5	20.5	2.6	25.6	15.4	7.7	7.7	16.7
	COL %	29.6	21.1	5.6	12.3	11.5	23.1	60.0	
	TOT %	3.4	3.4	0.4	4.3	2.6	1.3	1.3	
11-20 MILES	3. COUNT	5	6	4	14	10	4	1	44
	ROW %	11.4	13.6	9.1	31.8	22.7	9.1	2.3	18.8
	COL %	18.5	15.8	22.2	17.3	19.2	30.8	20.0	
	TOT %	2.1	2.6	1.7	6.0	4.3	1.7	0.4	
21-50 MILES	4. COUNT	6	5	2	31	18	1	1	64
	ROW %	9.4	7.8	3.1	48.4	28.1	1.6	1.6	27.4
	COL %	22.2	13.2	11.1	38.3	34.6	7.7	20.0	
	TOT %	2.6	2.1	0.9	13.2	7.7	0.4	0.4	
>50 MILES	5. COUNT	1	3	0	7	8	3	0	22
	ROW %	4.5	13.6	0.0	31.8	36.4	13.6	0.0	9.4
	COL %	3.7	7.9	0.0	8.6	15.4	23.1	0.0	
	TOT %	0.4	1.3	0.0	3.0	3.4	1.3	0.0	
COLUMN TOTAL		27	38	18	81	52	13	5	234
		11.5	16.2	7.7	34.6	22.2	5.6	2.1	100.0

CHI SQUARE = 46.69906 WITH 24 DOF SIGNIFICANCE = 0.0036

CRAMER'S V = 0.22337

TABLE 5.9

* * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * *

FEMALE AVERAGE WEEKLY BICYCLE MILEAGE BY OCCUPATION

* *

OCCUPATION

MILES	COUNT / ROW % / COL % / TOT %	MANAGERIAL 1.	PROFESSIONAL 2.	CLERICAL 3.	SKILLED 4.	SEMI-SKILLED 5.	UNSKILLED 6.	OTHER 7.	ROW TOTAL
1. 0-5 MILES	COUNT	1	3	15	2	3	2	6	32
	ROW %	3.1	9.4	46.9	6.3	9.4	6.3	18.8	41.6
	COL %	25.0	33.3	50.0	33.3	37.5	20.0	60.0	
	TOT %	1.3	3.9	19.5	2.6	3.9	2.6	7.8	
2. 6-10 MILES	COUNT	2	4	6	1	2	5	1	21
	ROW %	9.5	19.0	28.6	4.8	9.5	23.8	4.8	27.3
	COL %	50.0	44.4	20.0	16.7	25.0	50.0	10.0	
	TOT %	2.6	5.2	7.8	1.3	2.6	6.5	1.3	
3. 11-20 MILES	COUNT	1	0	5	2	1	1	2	12
	ROW %	8.3	0.0	41.7	16.7	8.3	8.3	16.7	15.6
	COL %	25.0	0.0	16.7	33.3	12.5	10.0	20.0	
	TOT %	1.3	0.0	6.5	2.6	1.3	1.3	2.6	
4. 21-50 MILES	COUNT	0	2	4	1	2	2	0	11
	ROW %	0.0	18.2	36.4	9.1	18.2	18.2	0.0	14.3
	COL %	0.0	22.2	13.3	16.7	25.0	20.0	0.0	
	TOT %	0.0	2.6	5.2	1.3	2.6	2.6	0.0	
5. >50 MILES	COUNT	0	0	0	0	0	0	1	1
	ROW %	0.0	0.0	0.0	0.0	0.0	0.0	100.0	1.3
	COL %	0.0	0.0	0.0	0.0	0.0	0.0	10.0	
	TOT %	0.0	0.0	0.0	0.0	0.0	0.0	1.3	
COLUMN TOTAL		4	9	30	6	8	10	10	77
		5.2	11.7	39.0	7.8	10.4	13.0	13.0	100.0

CHI SQUARE = 21.80454 WITH 24 DOF SIGNIFICANCE = 0.5909

CRAMER'S V = 0.26607

NUMBER OF MISSING OBSERVATIONS = 158

TABLE 5.10

* * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
MALE AVERAGE WEEKLY BICYCLE MILEAGE BY FULL UK DRIVING LICENCE
* *

MILES	LICENCE COUNT / ROW % / COL % / TOT %	LICENCE 1.	NO LICENCE 2.	ROW TOTAL
0-5 MILES	1.	52 77.6 31.9 20.2	15 22.4 16.0 5.8	67 26.1
6-10 MILES	2.	27 60.0 16.6 10.5	18 40.0 19.1 7.0	45 17.5
11-20 MILES	3.	29 58.0 17.8 11.3	21 42.0 22.3 8.2	50 19.5
21-50 MILES	4.	44 62.9 27.0 17.1	26 37.1 27.7 10.1	70 27.2
>50 MILES	5.	11 44.0 6.7 4.3	14 56.0 14.9 5.4	25 9.7
	COLUMN TOTAL	163 63.4	94 36.6	257 100.0

CHI SQUARE = 10.75108 WITH 4 DOF SIGNIFICANCE = 0.0295
CRAMER'S V = 0.20453

TABLE 5.11

* * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * *
FEMALE AVERAGE WEEKLY BICYCLE MILEAGE BY FULL UK DRIVING LICENCE
* *

MILES	COUNT / ROW % / COL % / TOT %	LICENCE: LICENCE 1.	LICENCE: NO LICENCE 2.	ROW TOTAL
0-5 MILES	1.	23 67.6 52.3 28.4	11 32.4 29.7 13.6	34 42.0
6-10 MILES	2.	15 68.2 34.1 18.5	7 31.8 18.9 8.6	22 27.2
11-20 MILES	3.	3 23.1 6.8 3.7	10 76.9 27.0 12.3	13 16.0
21-50 MILES	4.	3 27.3 6.8 3.7	8 72.7 21.6 9.9	11 13.6
>50 MILES	5.	0 0.0 0.0 0.0	1 100.0 2.7 1.2	1 1.2
COLUMN TOTAL		44 54.3	37 45.7	81 100.0

CHI SQUARE = 13.68360 WITH 4 DOF SIGNIFICANCE = 0.0084
CRAMER'S V = 0.41101
NUMBER OF MISSING OBSERVATIONS = 131

TABLE 5.12

* * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
MALE AVERAGE WEEKLY BICYCLE MILEAGE BY CAR OWNERSHIP
* *

MILES	COUNT / ROW % / COL % / TOT %	CAR OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
0-5 MILES	1.	47 70.1 37.0 18.4	20 29.9 15.6 7.8	67 26.3
6-10 MILES	2.	25 55.6 19.7 9.8	20 44.4 15.6 7.8	45 17.6
11-20 MILES	3.	20 40.8 15.7 7.8	29 59.2 22.7 11.4	49 19.2
21-50 MILES	4.	28 40.0 22.0 11.0	42 60.0 32.8 16.5	70 27.5
>50 MILES	5.	7 29.2 5.5 2.7	17 70.8 13.3 6.7	24 9.4
	COLUMN TOTAL	127 49.8	128 50.2	255 100.0

CHI SQUARE = 20.05227 WITH 4 DOF SIGNIFICANCE = 0.0005
CRAMER'S V = 0.28042

TABLE 5.13

* * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *
FEMALE AVERAGE WEEKLY BICYCLE MILEAGE BY CAR OWNERSHIP
* *

MILES	COUNT / ROW % / COL % / TOT %	CAR OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
0-5 MILES	1.	18	16	34
		52.9	47.1	42.0
		52.9	34.0	
		22.2	19.8	
6-10 MILES	2.	10	12	22
		45.5	54.5	27.2
		29.4	25.5	
		12.3	14.8	
11-20 MILES	3.	3	10	13
		23.1	76.9	16.0
		8.8	21.3	
		3.7	12.3	
21-50 MILES	4.	3	8	11
		27.3	72.7	13.6
		8.8	17.0	
		3.7	9.9	
>50 MILES	5.	0	1	1
		0.0	100.0	1.2
		0.0	2.1	
		0.0	1.2	
	COLUMN TOTAL	34	47	81
		42.0	58.0	100.0

CHI SQUARE = 5.39394 WITH 4 DOF SIGNIFICANCE = 0.2492
CRAMER'S V = 0.25805
NUMBER OF MISSING OBSERVATIONS = 133

TABLE 5.14

* * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *
MALE AVERAGE WEEKLY BICYCLE MILEAGE BY MOTORCYCLE OWNERSHIP
* *

MILES	COUNT / ROW % / COL % / TOT %	MOTORCYCLE OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
0-5 MILES	1.	7	59	66
		10.6	89.4	25.8
		41.2	24.7	
		2.7	23.0	
6-10 MILES	2.	5	40	45
		11.1	88.9	17.6
		29.4	16.7	
		2.0	15.6	
11-20 MILES	3.	1	49	50
		2.0	98.0	19.5
		5.9	20.5	
		0.4	19.1	
21-50 MILES	4.	2	68	70
		2.9	97.1	27.3
		11.8	28.5	
		0.8	26.6	
>50 MILES	5.	2	23	25
		8.0	92.0	9.8
		11.8	9.6	
		0.8	9.0	
COLUMN TOTAL		17	239	256
		6.6	93.4	100.0

CHI SQUARE = 6.55225 WITH 4 DOF SIGNIFICANCE = 0.1615
CRAMER'S V = 0.15998

TABLE 5.15

* * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * *
FEMALE AVERAGE WEEKLY BICYCLE MILEAGE BY MOTORCYCLE OWNERSHIP
* *

MILES	COUNT / ROW % / COL % / TOT %	MOTORCYCLE OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
0-5 MILES	1.	0 0.0 0.0 0.0	34 100.0 43.0 42.0	34 42.0
6-10 MILES	2.	1 4.5 50.0 1.2	21 95.5 26.6 25.9	22 27.2
11-20 MILES	3.	1 7.7 50.0 1.2	12 92.3 15.2 14.8	13 16.0
21-50 MILES	4.	0 0.0 0.0 0.0	11 100.0 13.9 13.6	11 13.6
>50 MILES	5.	0 0.0 0.0 0.0	1 100.0 1.3 1.2	1 1.2
	COLUMN TOTAL	2 2.5	79 97.5	81 100.0

CHI SQUARE = 3.03114 WITH 4 DOF SIGNIFICANCE = 0.5526
CRAMER'S V = 0.19345
NUMBER OF MISSING OBSERVATIONS = 132

TABLE 5.16

* * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *
MALE AVERAGE WEEKLY BICYCLE MILEAGE BY TRAVELCARD OWNERSHIP
* *

MILES	COUNT / ROW % / COL % / TOT %	TRAVELCARD OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
0-5 MILES	1.	7 10.6 17.9 2.8	59 89.4 27.4 23.2	66 26.0
6-10 MILES	2.	8 17.8 20.5 3.1	37 82.2 17.2 14.6	45 17.7
11-20 MILES	3.	11 22.0 28.2 4.3	39 78.0 18.1 15.4	50 19.7
21-50 MILES	4.	7 10.3 17.9 2.8	61 89.7 28.4 24.0	68 26.8
>50 MILES	5.	6 24.0 15.4 2.4	19 76.0 8.8 7.5	25 9.8
	COLUMN TOTAL	39 15.4	215 84.6	254 100.0

CHI SQUARE = 5.82487 WITH 4 DOF SIGNIFICANCE = 0.2126
CRAMER'S V = 0.15144

TABLE 5.17

* * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *
FEMALE AVERAGE WEEKLY BICYCLE MILEAGE BY TRAVELCARD OWNERSHIP
* *

MILES	COUNT / ROW % / COL % / TOT %	TRAVELCARD OWNERSHIP: OWNS 1.	DOES NOT OWN 2.	ROW TOTAL
0-5 MILES	1.	6 17.6 42.9 7.4	28 82.4 41.8 34.6	34 42.0
6-10 MILES	2.	4 18.2 28.6 4.9	18 81.8 26.9 22.2	22 27.2
11-20 MILES	3.	2 15.4 14.3 2.5	11 84.6 16.4 13.6	13 16.0
21-50 MILES	4.	2 18.2 14.3 2.5	9 81.8 13.4 11.1	11 13.6
>50 MILES	5.	0 0.0 0.0 0.0	1 100.0 1.5 1.2	1 1.2
COLUMN TOTAL		14 17.3	67 82.7	81 100.0

CHI SQUARE = 0.26350 WITH 4 DOF SIGNIFICANCE = 0.9920
CRAMER'S V = 0.05704
NUMBER OF MISSING OBSERVATIONS = 134

TABLE 5.18

* * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * * *
MALE AVERAGE WEEKLY BICYCLE MILEAGE BY HOUSEHOLD CAR OWNERSHIP
* *

MILES	COUNT / ROW % / COL % / TOT %	NONE 0.	ONE 1.	TWO 2.	THREE 3.	FOUR 4.	FIVE 5.	ROW TOTAL
0-5 MILES	1.	13	34	16	3	1	0	67
		19.4	50.7	23.9	4.5	1.5	0.0	26.3
		15.7	29.8	32.7	42.9	100.0	0.0	
		5.1	13.3	6.3	1.2	0.4	0.0	
6-10 MILES	2.	9	24	10	1	0	1	45
		20.0	53.3	22.2	2.2	0.0	2.2	17.6
		10.8	21.1	20.4	14.3	0.0	100.0	
		3.5	9.4	3.9	0.4	0.0	0.4	
11-20 MILES	3.	20	21	8	0	0	0	49
		40.8	42.9	16.3	0.0	0.0	0.0	19.2
		24.1	18.4	16.3	0.0	0.0	0.0	
		7.8	8.2	3.1	0.0	0.0	0.0	
21-50 MILES	4.	30	26	11	3	0	0	70
		42.9	37.1	15.7	4.3	0.0	0.0	27.5
		36.1	22.8	22.4	42.9	0.0	0.0	
		11.8	10.2	4.3	1.2	0.0	0.0	
>50 MILES	5.	11	9	4	0	0	0	24
		45.8	37.5	16.7	0.0	0.0	0.0	9.4
		13.3	7.9	8.2	0.0	0.0	0.0	
		4.3	3.5	1.6	0.0	0.0	0.0	
	COLUMN TOTAL	83	114	49	7	1	1	255
		32.5	44.7	19.2	2.7	0.4	0.4	100.0

CHI SQUARE = 25.42802 WITH 20 DOF SIGNIFICANCE = 0.1855
CRAMER'S V = 0.15789

TABLE 5.19

* * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *

FEMALE AVERAGE WEEKLY BICYCLE MILEAGE BY HOUSEHOLD CAR OWNERSHIP

* *

MILES	COUNT / ROW % / COL % / TOT %	HOUSEHOLD CAR OWNERSHIP: NONE 0.	ONE 1.	TWO 2.	THREE 3.	FIVE 5.	ROW TOTAL
0-5 MILES	1.	3 9.1 20.0 3.8	22 66.7 50.0 27.5	6 18.2 35.3 7.5	1 3.0 33.3 1.3	1 3.0 100.0 1.3	33 41.3
6-10 MILES	2.	6 27.3 40.0 7.5	8 36.4 18.2 10.0	7 31.8 41.2 8.8	1 4.5 33.3 1.3	0 0.0 0.0 0.0	22 27.5
11-20 MILES	3.	4 30.8 26.7 5.0	6 46.2 13.6 7.5	2 15.4 11.8 2.5	1 7.7 33.3 1.3	0 0.0 0.0 0.0	13 16.3
21-50 MILES	4.	1 9.1 6.7 1.3	8 72.7 18.2 10.0	2 18.2 11.8 2.5	0 0.0 0.0 0.0	0 0.0 0.0 0.0	11 13.8
>50 MILES	5.	1 100.0 6.7 1.3	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	0 0.0 0.0 0.0	1 1.3
	COLUMN TOTAL	15 18.8	44 55.0	17 21.3	3 3.8	1 1.3	80 100.0

CHI SQUARE = 15.40340 WITH 16 DOF SIGNIFICANCE = 0.4953

CRAMER'S V = 0.21940

NUMBER OF MISSING OBSERVATIONS = 134

BICYCLE USE BY MALE BICYCLE OWNERS

TABLE 6.1

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *
TIME SINCE LAST RIDING A BICYCLE BY EMPLOYMENT STATUS
* *

RODE	COUNT / ROW % / COL % / TOT %	EMPLOYMENT STATUS: WORKING 1.	UNEMPLOYED 2.	ROW TOTAL
<1 YEAR	1.	197	56	253
		77.9	22.1	60.0
		84.9	29.5	
		46.7	13.3	
1-5 YEARS	2.	23	40	63
		36.5	63.5	14.9
		9.9	21.1	
		5.5	9.5	
6-10 YEARS	3.	6	18	24
		25.0	75.0	5.7
		2.6	9.5	
		1.4	4.3	
>10 YEARS	4.	6	70	76
		7.9	92.1	18.0
		2.6	36.8	
		1.4	16.6	
NEVER	5.	0	6	6
		0.0	100.0	1.4
		0.0	3.2	
		0.0	1.4	
	COLUMN TOTAL	232	190	422
		55.0	45.0	100.0

CHI SQUARE = 146.33246 WITH 4 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.58886
NUMBER OF MISSING OBSERVATIONS = 29

MALE BICYCLE OWNERS

TABLE 6.2

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *
AVERAGE WEEKLY BICYCLE MILEAGE BY EMPLOYMENT STATUS
* *

MILES		COUNT / ROW % / COL % / TOT %	EMPLOYMENT STATUS: WORKING 1.	UNEMPLOYED 2.	ROW TOTAL
	0.		7	0	7
			100.0	0.0	1.6
			2.9	0.0	
			1.6	0.0	
1-5 MILES	1.		43	12	55
			78.2	21.8	12.2
			17.8	5.7	
			9.5	2.7	
6-10 MILES	2.		28	10	38
			73.7	26.3	8.4
			11.6	4.8	
			6.2	2.2	
11-20 MILES	3.		33	7	40
			82.5	17.5	8.9
			13.7	3.3	
			7.3	1.6	
21-50 MILES	4.		54	5	59
			91.5	8.5	13.1
			22.4	2.4	
			12.0	1.1	
51-100 MILES	5.		14	3	17
			82.4	17.6	3.8
			5.8	1.4	
			3.1	0.7	
>100 MILES	6.		62	173	235
			26.4	73.6	52.1
			25.7	82.4	
			13.7	38.4	
		COLUMN TOTAL	241	210	451
			53.4	46.6	100.0

CHI SQUARE = 148.71319 WITH 6 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.57423

MALE BICYCLE OWNERS

TABLE 6.3

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
AVERAGE WEEKLY BICYCLE USE BY EMPLOYMENT STATUS
* *

DAYUSE	COUNT / ROW % / COL % / TOT %	EMPLOYMENT STATUS: WORKING 1.	UNEMPLOYED 2.	ROW TOTAL
1 DAY OR LESS	1.	83 80.6 41.1 33.1	20 19.4 40.8 8.0	103 41.0
2-3 DAYS	2.	29 72.5 14.4 11.6	11 27.5 22.4 4.4	40 15.9
4-5 DAYS	3.	38 80.9 18.8 15.1	9 19.1 18.4 3.6	47 18.7
6-7 DAYS	4.	52 85.2 25.7 20.7	9 14.8 18.4 3.6	61 24.3
COLUMN TOTAL		202 80.5	49 19.5	251 100.0

CHI SQUARE = 2.50802 WITH 3 DOF SIGNIFICANCE = 0.4738
CRAMER'S V = 0.09996
NUMBER OF MISSING OBSERVATIONS = 200

MALE BICYCLE OWNERS IN EMPLOYMENT

TABLE 6.4

* * * * * * * * * * C R O S S T A B U L A T I O N   O F * * * * * * * * *
TIME SINCE LAST RIDING A BICYCLE BY OCCUPATION
* *

RODE	COUNT / ROW % / COL % / TOT %	OCCUPATION: NON-MANUAL 1.	MANUAL 2.	ROW TOTAL
<1 YEAR	1.	77 39.5 83.7 33.6	118 60.5 86.1 51.5	195 85.2
1-5 YEARS	2.	11 47.8 12.0 4.8	12 52.2 8.8 5.2	23 10.0
6-10 YEARS	3.	2 40.0 2.2 0.9	3 60.0 2.2 1.3	5 2.2
>10 YEARS	4.	2 33.3 2.2 0.9	4 66.7 2.9 1.7	6 2.6
	COLUMN TOTAL	92 40.2	137 59.8	229 100.0

CHI SQUARE = 0.71549 WITH 3 DOF SIGNIFICANCE = 0.8696
CRAMER'S V = 0.05590
NUMBER OF MISSING OBSERVATIONS = 9

MALE BICYCLE OWNERS IN EMPLOYMENT

TABLE 6.5

* * * * * * * * * * C R O S S T A B U L A T I O N   O F * * * * * * * * * *
AVERAGE WEEKLY BICYCLE MILEAGE BY OCCUPATION
* *

OCCUPATION

MILES	COUNT / ROW % / COL % / TOT %	NON-MANUAL 1.	MANUAL 2.	ROW TOTAL
	0.	6	1	7
		85.7	14.3	2.9
		6.5	0.7	
		2.5	0.4	
1-5 MILES	1.	25	18	43
		58.1	41.9	18.1
		27.2	12.3	
		10.5	7.6	
6-10 MILES	2.	16	12	28
		57.1	42.9	11.8
		17.4	8.2	
		6.7	5.0	
11-20 MILES	3.	11	22	33
		33.3	66.7	13.9
		12.0	15.1	
		4.6	9.2	
21-50 MILES	4.	11	43	54
		20.4	79.6	22.7
		12.0	29.5	
		4.6	18.1	
51-100 MILES	5.	4	10	14
		28.6	71.4	5.9
		4.3	6.8	
		1.7	4.2	
>100 MILES	6.	19	40	59
		32.2	67.8	24.8
		20.7	27.4	
		8.0	16.8	
	COLUMN TOTAL	92	146	238
		38.7	61.3	100.0

CHI SQUARE = 27.10107 WITH 6 DOF SIGNIFICANCE = 0.0001
CRAMER'S V = 0.33745

MALE BICYCLE OWNERS IN EMPLOYMENT

TABLE 6.6

* * * * * * * * * * C R O S S T A B U L A T I O N   O F   * * * * * * * * *
AVERAGE WEEKLY BICYCLE USE BY OCCUPATION
* *

DAYS	COUNT / ROW % / COL % / TOT %	OCCUPATION: NON-MANUAL 1.	MANUAL 2.	ROW TOTAL
1 DAY OR LESS	1.	53 63.9 64.6 26.4	30 36.1 25.2 14.9	83 41.3
2-3 DAYS	2.	16 55.2 19.5 8.0	13 44.8 10.9 6.5	29 14.4
4-5 DAYS	3.	6 15.8 7.3 3.0	32 84.2 26.9 15.9	38 18.9
6-7 DAYS	4.	7 13.7 8.5 3.5	44 86.3 37.0 21.9	51 25.4
	COLUMN TOTAL	82 40.8	119 59.2	201 100.0

CHI SQUARE = 46.06648 WITH 3 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.47873
NUMBER OF MISSING OBSERVATIONS = 37

MALE BICYCLE OWNERS

TABLE 6.7

* * * * * * * * * * C R O S S T A B U L A T I O N   O F * * * * * * * * * *
YEAR BICYCLE ACQUIRED BY EMPLOYMENT STATUS
* *

ACQUIRED	COUNT / ROW % / COL % / TOT %	EMPLOYMENT STATUS: WORKING 1.	UNEMPLOYED 2.	ROW TOTAL
PRE 80	79.	87 84.5 40.1 33.6	16 15.5 38.1 6.2	103 39.8
1980	80.	26 92.9 12.0 10.0	2 7.1 4.8 0.8	28 10.8
1981	81.	20 74.1 9.2 7.7	7 25.9 16.7 2.7	27 10.4
1982	82.	32 84.2 14.7 12.4	6 15.8 14.3 2.3	38 14.7
1983	83.	41 85.4 18.9 15.8	7 14.6 16.7 2.7	48 18.5
1984	84.	11 73.3 5.1 4.2	4 26.7 9.5 1.5	15 5.8
	COLUMN TOTAL	217 83.8	42 16.2	259 100.0

CHI SQUARE = 4.91049 WITH 5 DOF SIGNIFICANCE = 0.4269
CRAMER'S V = 0.13769
NUMBER OF MISSING OBSERVATIONS = 38

MALE BICYCLE OWNERS IN EMPLOYMENT

TABLE 6.8

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
YEAR BICYCLE ACQUIRED BY OCCUPATION
* *

ACQUIRED	COUNT / ROW % / COL % / TOT %	OCCUPATION: NON-MANUAL 1.	MANUAL 2.	ROW TOTAL
PRE 80	79.	40 47.1 47.1 18.6	45 52.9 34.6 20.9	85 39.5
1980	80.	9 34.6 10.6 4.2	17 65.4 13.1 7.9	26 12.1
1981	81.	5 25.0 5.9 2.3	15 75.0 11.5 7.0	20 9.3
1982	82.	12 37.5 14.1 5.6	20 62.5 15.4 9.3	32 14.9
1983	83.	17 41.5 20.0 7.9	24 58.5 18.5 11.2	41 19.1
1984	84.	2 18.2 2.4 0.9	9 81.8 6.9 4.2	11 5.1
	COLUMN TOTAL	85 39.5	130 60.5	215 100.0

CHI SQUARE = 6.26100 WITH 5 DOF SIGNIFICANCE = 0.2816
CRAMER'S V = 0.17065
NUMBER OF MISSING OBSERVATIONS = 26

COMPARISON OF QUESTIONNAIRES AND INTERVIEWS

TABLE 7.1

* * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * *
SEX BY SURVEY METHOD
* *

SEX	COUNT / ROW % / COL % / TOT %	METHOD: QUESTIONNAIRE 1.	INTER-VIEW 2.	ROW TOTAL
MALE	1.	847	644	1491
		56.8	43.2	70.3
		74.3	65.6	
		39.9	30.4	
FEMALE	2.	293	337	630
		46.5	53.5	29.7
		25.7	34.4	
		13.8	15.9	
	COLUMN TOTAL	1140	981	2121
		53.7	46.3	100.0

CORRECTED CHI SQUARE = 18.48630 WITH 1 DOF. SIGNIFICANCE = 0.0000
RAW CHI SQUARE = 18.89834 WITH 1 DOF. SIGNIFICANCE = 0.0000
PHI = 0.09439
NUMBER OF MISSING OBSERVATIONS = 19

COMPARISON OF QUESTIONNAIRES AND INTERVIEWS

TABLE 7.2

* * * * * * * CROSSTABULATION OF * * * * * * * * * * *
MARITAL STATUS BY SURVEY METHOD

METHOD

COUNT / ROW % / COL % / TOT %		QUESTIONNAIRE 1.	INTER-VIEW 2.	ROW TOTAL
MARRIED	1.	789	691	1480
		53.3	46.7	71.3
		70.1	72.7	
		38.0	33.3	
SINGLE	2.	336	259	595
		56.5	43.5	28.7
		29.9	27.3	
		16.2	12.5	
COLUMN TOTAL		1125	950	2075
		54.2	45.8	100.0

CORRECTED CHI SQUARE = 1.58208 WITH 1 DOF. SIGNIFICANCE = 0.2085
RAW CHI SQUARE = 1.70700 WITH 1 DOF. SIGNIFICANCE = 0.1914
PHI = 0.02868
NUMBER OF MISSING OBSERVATIONS = 65

TABLE 7.3

* * * * * * CROSSTABULATION OF * * * * * * * * * * * *
AGE BY SURVEY METHOD
* *

AGE	COUNT / ROW % / COL % / TOT %	METHOD: QUESTIONNAIRE 1.	INTER-VIEW 2.	ROW TOTAL
17-20	1.	98 62.4 8.6 4.7	59 37.6 6.1 2.8	157 7.5
21-29	2.	244 65.8 21.4 11.6	127 34.2 13.2 6.0	371 17.7
30-39	3.	236 59.7 20.7 11.2	159 40.3 16.5 7.6	395 18.8
40-49	4.	169 50.0 14.9 8.0	169 50.0 17.6 8.0	338 16.1
50-59	5.	151 46.0 13.3 7.2	177 54.0 18.4 8.4	328 15.6
60-64	6.	86 50.3 7.6 4.1	85 49.7 8.8 4.0	171 8.1
65+	7.	154 45.3 13.5 7.3	186 54.7 19.3 8.9	340 16.2
	COLUMN TOTAL	1138 54.2	962 45.8	2100 100.0

CHI SQUARE = 52.29100 WITH 6 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.15780
NUMBER OF MISSING OBSERVATIONS = 40

COMPARISON OF QUESTIONNAIRES AND INTERVIEWS

TABLE 7.4

* * * * * * CROSSTABULATION OF * * * * * * * * * * * *
EMPLOYMENT STATUS BY SURVEY METHOD
* *

EMPLOYMENT STATUS	COUNT / ROW % / COL % / TOT %	METHOD: QUESTIONNAIRE 1.	METHOD: INTERVIEW 2.	ROW TOTAL
1. WORKING	COUNT	675	492	1167
	ROW %	57.8	42.2	56.6
	COL %	59.6	52.8	
	TOT %	32.7	23.8	
2. UNEMPLOYED	COUNT	139	105	244
	ROW %	57.0	43.0	11.8
	COL %	12.3	11.3	
	TOT %	6.7	5.1	
3. HOUSEWIFE-HUSBAN	COUNT	63	93	156
	ROW %	40.4	59.6	7.6
	COL %	5.6	10.0	
	TOT %	3.1	4.5	
4. STUDENT	COUNT	52	11	63
	ROW %	82.5	17.5	3.1
	COL %	4.6	1.2	
	TOT %	2.5	0.5	
5. RETIRED	COUNT	195	224	419
	ROW %	46.5	53.5	20.3
	COL %	17.2	24.1	
	TOT %	9.5	10.9	
6. OTHER	COUNT	8	6	14
	ROW %	57.1	42.9	0.7
	COL %	0.7	0.6	
	TOT %	0.4	0.3	
COLUMN TOTAL		1132	931	2063
		54.9	45.1	100.0

CHI SQUARE = 49.06112 WITH 5 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.15421
NUMBER OF MISSING OBSERVATIONS = 77

TABLE 7.5

* * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * *
OCCUPATION BY SURVEY METHOD

OCCUPATION	COUNT / ROW % / COL % / TOT %	METHOD: QUESTIONNAIRE 1.	INTER-VIEW 2.	ROW TOTAL
1. MANAGERIAL	COUNT	146	57	203
	ROW %	71.9	28.1	10.9
	COL %	15.0	6.4	
	TOT %	7.8	3.1	
2. PROFESSIONAL	COUNT	149	28	177
	ROW %	84.2	15.8	9.5
	COL %	15.3	3.2	
	TOT %	8.0	1.5	
3. CLERICAL	COUNT	139	152	291
	ROW %	47.8	52.2	15.6
	COL %	14.3	17.1	
	TOT %	7.5	8.2	
4. SKILLED	COUNT	277	332	609
	ROW %	45.5	54.5	32.7
	COL %	28.4	37.4	
	TOT %	14.9	17.8	
5. SEMI-SKILLED	COUNT	146	170	316
	ROW %	46.2	53.8	17.0
	COL %	15.0	19.1	
	TOT %	7.8	9.1	
6. UNSKILLED	COUNT	88	82	170
	ROW %	51.8	48.2	9.1
	COL %	9.0	9.2	
	TOT %	4.7	4.4	
7. OTHER	COUNT	29	67	96
	ROW %	30.2	69.8	5.2
	COL %	3.0	7.5	
	TOT %	1.6	3.6	
COLUMN TOTAL		974	888	1862
		52.3	47.7	100.0

CHI SQUARE = 140.68940 WITH 6 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.27488
NUMBER OF MISSING OBSERVATIONS = 278

COMPARISON OF QUESTIONNAIRES AND INTERVIEWS

TABLE 7.6

* * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * *
BICYCLE OWNERSHIP BY SURVEY METHOD
* *

BICYCLE	COUNT / ROW % / COL % / TOT %	METHOD: QUESTIONNAIRE 1.	INTERVIEW 2.	ROW TOTAL
OWNS	1.	337	132	469
		71.9	28.1	22.2
		29.4	13.6	
		15.9	6.2	
DOES NOT OWN	2.	808	840	1648
		49.0	51.0	77.8
		70.6	86.4	
		38.2	39.7	
	COLUMN TOTAL	1145	972	2117
		54.1	45.9	100.0

CORRECTED CHI SQUARE = 75.68457 WITH 1 DOF. SIGNIFICANCE = 0.0000
RAW CHI SQUARE = 76.60099 WITH 1 DOF. SIGNIFICANCE = 0.0000
PHI = 0.19022
NUMBER OF MISSING OBSERVATIONS = 23

COMPARISON OF QUESTIONNAIRES AND INTERVIEWS

TABLE 7.7

* * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *
HOUSEHOLD CAR OWNERSHIP BY SURVEY METHOD
* *

CAR	COUNT / ROW % / COL % / TOT %	METHOD: QUESTIONNAIRE 1.	INTERVIEW 2.	ROW TOTAL
NONE	0.	293	354	647
		45.3	54.7	30.7
		25.7	36.5	
		13.9	16.8	
ONE	1.	553	462	1015
		54.5	45.5	48.1
		48.6	47.7	
		26.2	21.9	
TWO	2.	245	123	368
		66.6	33.4	17.5
		21.5	12.7	
		11.6	5.8	
OVER TWO	3.	48	30	78
		61.5	38.5	3.7
		4.2	3.1	
		2.3	1.4	
	COLUMN TOTAL	1139	969	2108
		54.0	46.0	100.0

CHI SQUARE = 45.09287 WITH 3 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.14626
NUMBER OF MISSING OBSERVATIONS = 32

COMPARISON OF QUESTIONNAIRES AND INTERVIEWS

TABLE 7.8

* * * * * * * CROSSTABULATION OF * * * * * * * * * * *
HOUSEHOLD BICYCLE OWNERSHIP BY SURVEY METHOD
* *

BICYCLE	COUNT / ROW % / COL % / TOT %	METHOD: QUESTIONNAIRE 1.	INTERVIEW 2.	ROW TOTAL
NONE	0.	556 48.0 48.9 26.5	603 52.0 62.7 28.7	1159 55.2
ONE	1.	289 63.1 25.4 13.8	169 36.9 17.6 8.0	458 21.8
TWO	2.	159 56.2 14.0 7.6	124 43.8 12.9 5.9	283 13.5
OVER TWO	3.	134 67.0 11.8 6.4	66 33.0 6.9 3.1	200 9.5
	COLUMN TOTAL	1138 54.2	962 45.8	2100 100.0

CHI SQUARE = 46.37086 WITH 3 DOF SIGNIFICANCE = 0.0000
CRAMER'S V = 0.14860
NUMBER OF MISSING OBSERVATIONS = 40

COMPARISON OF QUESTIONNAIRES AND INTERVIEWS

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TABLE 7.9
 * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * *
              PEDESTRIAN-CYCLIST ACCIDENT BY SURVEY METHOD
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                        METHOD
            COUNT   I
            ROW %  IQUESTION INTER-      ROW
            COL %  INAIRE    VIEW        TOTAL
            TOT %  I        1.I       2.I
 INVOLVEMENT-------I--------I--------I
               1.  I   126  I    27  I    153
 ACCIDENT          I  82.4  I  17.6  I    7.6
                   I  11.0  I   3.1  I
                   I   6.3  I   1.3  I
                  -I--------I--------I
               2.  I  1024  I   834  I   1858
 NO ACCIDENT       I  55.1  I  44.9  I   92.4
                   I  89.0  I  96.9  I
                   I  50.9  I  41.5  I
                  -I--------I--------I
           COLUMN     1150      861      2011
            TOTAL     57.2     42.8     100.0

CORRECTED CHI SQUARE =    41.73567 WITH 1 DOF.  SIGNIFICANCE =  0.0000
      RAW CHI SQUARE =    42.84102 WITH 1 DOF.  SIGNIFICANCE =  0.0000
PHI =    0.14596
NUMBER OF MISSING OBSERVATIONS =      129
```

APPENDIX 11

SCHEDULE OF VISITS TO CYCLE SCHEMES

Location	Scheme
UK	
Bedford	Various
Brighton	Sussex University Route - converted footway
Cambridge	Various
Cardiff	Three Castles Route - river valley and railway path
Chelmsford	Odeon Roundabout Subway - converted pedestrian subway
Coventry	Earlsdon/City Centre Route - includes pedestrian subway
Derby	Bus/Cycle Lanes - with flow and contra flow
London	Various
Milton Keynes	Redway - 100 km cycle/pedestrian network
Nottingham	Nottingham Cycleways
Peterborough	Various
Stockton	Stockton Cycle Route
West Bromwich	West Bromwich Parkway - disused railway line
Wolverhampton	Pendeford Estate cycle/pedestrian paths
Germany	
Frankfurt) Munich)	Various advisory and segregated routes and junction schemes
Rosenheim	A Cycle-Friendly Town
Netherlands	
Amersfort	Various
Rotterdam	Cycleways - segregated network in major city
Tilburg	Woonerven - low speed residential streets
Utrecht	Various
Sweden	
Gothenburg	Traffic zones with cyclist exemptions
Stockholm	Advisory and segregated cycle routes

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APPENDIX 13

(Accepted for publication in "The Planner")

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This bibliography has been prepared both as a source of references for this thesis and as a resource for readers. The aim has been to produce a bibliography as extensive as possible and, therefore, it contains some texts which are not referred to in the thesis. A few references are marked with an asterisk (*) to indicate that they are relevant to this thesis but not to the field of bicycle planning.

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