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Working Paper 263

May 1987

**IDENTIFYING TRAFFIC PROBLEMS
IN A HEAVILY TRAFFICKED URBAN
ENVIRONMENT
- REFERENCE TO SOWERBY BRIDGE**

**P G Hopkinson, A D May,
B Berrett, G R Leake**

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1.1 BACKGROUND

This study was commissioned by the Civic Trust to identify new approaches to traffic management solutions for Sowerby Bridge. The objective of the overall study was to identify low cost, innovative solutions to problems created by high volumes of traffic using the A58. This road is the main shopping street in Sowerby Bridge. In our brief it was stressed that any new road construction such as a by-pass was not a feasible or acceptable solution due to the severe vertical gradients surrounding Sowerby Bridge.

Further, the town is on the brink of a major programme of regeneration. A nationally important canoe slalom has been created; the riverside mill area fronting onto the River Calder is being developed for commercial and leisure use and there is a proposal to reopen the Rochdale Canal. In view of this it is essential to ensure that traffic on the A58 is managed so as to minimise its effect on the environment and trade, without adversely affecting local access. In writing our report we have separated the problem and solution identification stages. The solution identification stage is reported in a companion report (Hopkinson et al, 1988b). A further stage of our study which involves presenting our final solutions back to the users of Sowerby Bridge for comment is to be reported in a forthcoming report, WP 265 (Hopkinson et al, 1988c).

1.2 INTRODUCTION

This Working Paper describes the methods used and findings from the first stage of our study carried out during October and November 1987 to identify the problems experienced by the users of Sowerby Bridge. Here it is intended to draw conclusions about the approach adopted to elicit people's impressions about problems, the way in which this information was interpreted and the applicability of the method to other situations.

1.3 STUDY BOUNDARY

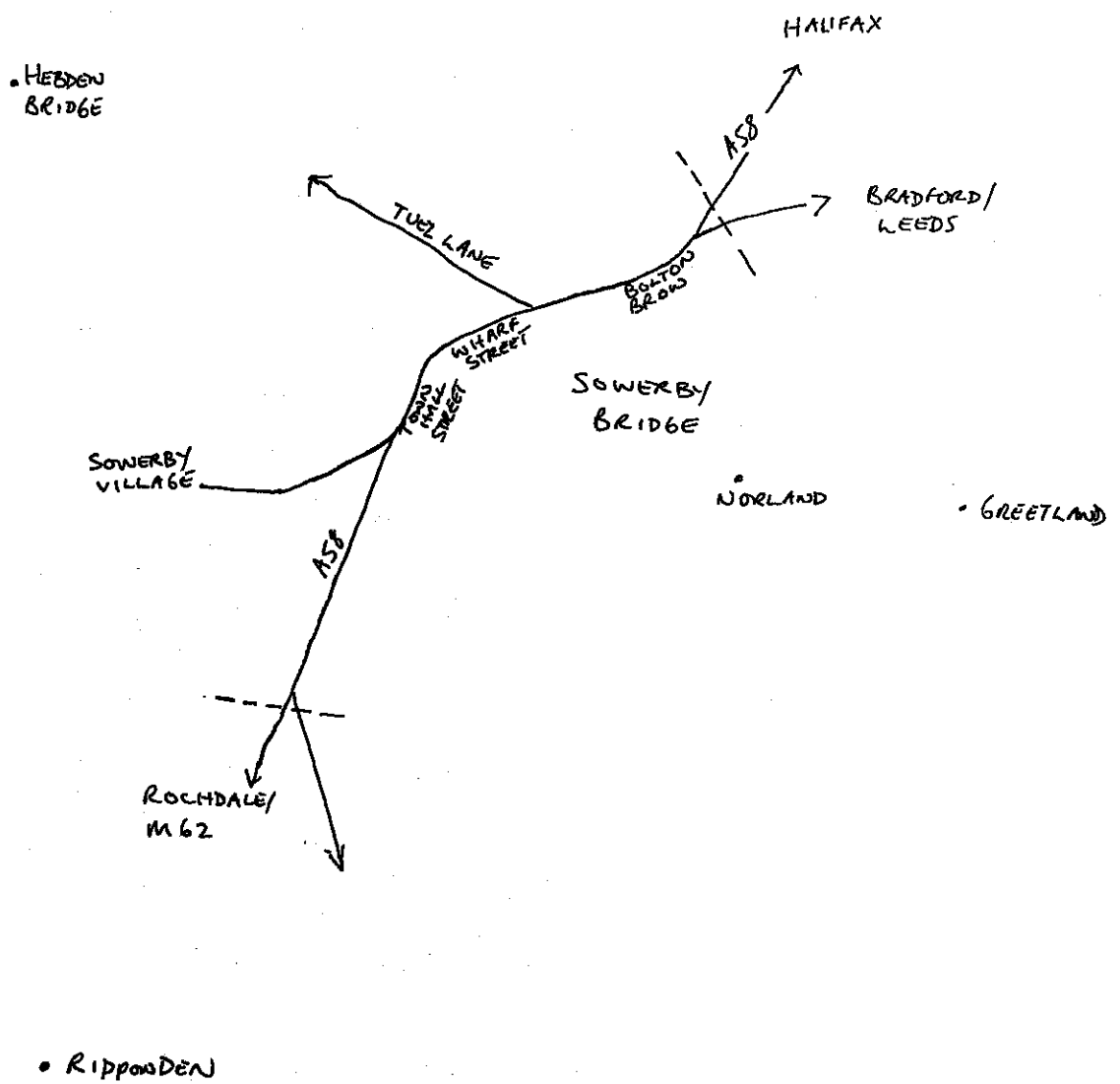
The boundary for identifying problems was set between Watson Mill Lane and the junction of Bolton Brow/Wakefield Road (see Figure 1). Our main concern was with traffic-related conditions along the A58 and in buildings fronting onto the A58. Where problems were perceived particularly related to parking away from the A58 these were noted and included in our assessment. The definition of Sowerby Bridge for classifying the catchment area of the town and local people is shown on Figure 1. Other towns and settlements which generate through traffic are also shown.

2. APPROACH TO STUDY

2.1 INTRODUCTION

In order to identify the problems perceived by the people who live and work in, visit and drive through Sowerby Bridge it is necessary to talk and listen to those people.

Figure 1: Study Area and Important Surrounding Towns
(NOT TO SCALE)



To obtain the views of local people it was therefore necessary to establish:

- a) who to talk to;
- b) the views to be elicited;
- c) the method of elicitation.

2.2 TARGETED GROUPS

It is a truism to state that the situation in which people experience 'traffic' will be an important factor on the concept of problems. A person driving through a street will perceive and experience different types of problems from a pedestrian for example. In order to capture as full a range of problems as possible in the first stage of our study it was necessary to consider which groups to target for obtaining views. A number of different target groups were initially drawn up. It was decided that our main concern was with groups who directly experience traffic conditions along the A58 either as pedestrians, in buildings or in vehicles.

It was therefore decided to approach the following for their views:

- 1) pedestrians
- 2) retailers
- 3) employees
- 4) interest groups
- 5) road-users

The first three categories were relatively straight-forward. A decision to capture the views of car and commercial vehicle drivers only in the fourth category was made since it was felt that public transport users would be captured within the first three groups.

No specific targeting of sub-classes within each group was made although recording of potentially important characteristics in exploring differences in viewpoint, such as age, presence of children, home address was made when surveying.

2.3 PROBLEM IDENTIFICATION

Whilst various sources, including our own observations, had indicated to us the broad range of traffic-related problems in the town, it was decided that we should approach the survey design as if we were virtual strangers to Sowerby Bridge and with no pre-conceived ideas about 'problems' and 'issues'. Accordingly, the objective of the survey design was to allow people to describe to us the aspects of Sowerby Bridge they liked and disliked before moving into discussions about a range of broad problem areas that were likely to be relevant to our study. Under these broad topics it was decided to ask a range of specific factual questions requiring people to rate their opinions on a measured scale to denote their strength of feeling, but also to provide scope for general comments about any aspect of the issue which the respondent felt to be important.

A conscious decision was taken to avoid the term "problem" or any

similar term in the different methods adopted since we wanted people to think about the town in their own terms rather than in terms of possible 'problems'. A decision was also made to keep the structured questions as brief and as simple as possible and not to ask people to rank or rate the importance of the issues they identified or were presented with. This decision had major implications for the interpretation by the research team of the relative importance of different problems and the way in which information was summarised (see Section 2.6 and Methodological Conclusions). Having made these decisions the next stage of the study involved the design of the actual methods to elicit people's views.

2.4 METHOD OF ELICITATION

Two methods of eliciting views from the different groups were possible within the time constraints of the first stage of the study: interviews and questionnaires. The most important considerations in selecting a method for a particular group were the feasibility of the method and the time constraints for completing the first stage of the study.

The methods and sampling approach for each group approach are discussed below.

3. SURVEY DESIGN

3.1 PEDESTRIANS

Initial consideration was given to using self-completion questionnaires to obtain pedestrians' views about conditions in Sowerby Bridge. To our knowledge this approach has not been used for this type of study. However such an approach requires considerably more time in design and organisation than an on-street interview. The Institute had just completed an extensive period of on-street interviewing of pedestrians and for this reason, as well as the shortage of time for developing a self-completion questionnaire for this group, an on-street interview approach was adopted.

The information which was considered to be relevant to the identification of problems experienced by pedestrians in Sowerby Bridge was:

- (1) positive and negative impressions and overall assessment of the main shopping street
- (2) locations where people crossed the A58 and assessment of the ease of crossing
- (3) assessment of times or days when conditions are worse
- (4) reasons for and frequency of visiting Sowerby Bridge.

Appendix 1 provides the interview form used for the pedestrian surveys. The survey form was piloted prior to the main survey period. This piloting produced some changes to the wording and ordering of questions. Interviews using the modified survey form required between 6-9 minutes to complete.

A sample size of 200 pedestrians was targeted. This was felt likely to produce a reasonable cross-section of views. Interviews were carried out at a range of locations along both sides of the A58 to ensure that individuals who were unable or chose not to visit different parts of the town would be included in the sample. Clearly by this approach we would not obtain the views of people who for whatever reason were unable or chose not to visit the town centre at all because of traffic related conditions. A decision to carry out household interviews with people registered as disabled was made to include the views of people who would be most likely to be discouraged or unable to visit the town centre (see interest groups).

On-street interviews were carried out with pedestrians at different locations along the A58 between Bolton Brow and West Street/Sowerby New Road. These interviews took place between October 16th-27th. In total 213 interviews were achieved. Interviews were carried out on both sides of the A58 to minimise any bias due to pedestrians being unable or reluctant to reach the southern side of the street. The interviews took place between 0900-1630, in cold but dry weather.

3.2 RETAILERS/BUSINESSES

A self-completion questionnaire was designed for obtaining the views of people involved in retailing and businesses fronting onto the A58. This method was selected firstly because of the time constraints imposed on people in business during a normal working day and secondly because we wanted to establish the relative merits of this approach compared to a face to face interview. The information which was considered to be relevant to the identification of problems experienced by retailers/business in Sowerby Bridge was:

- (1) positive and negative impressions and overall assessment of the main shopping strategy
- (2) assessment of conditions for: servicing; customer access; parking; journeys as part of work
- (3) times and days when premises most busy
- (4) background information on the respondent such as method of travel to work etc.

Appendix 1 provides the self-completion questionnaire. The survey form was piloted at 5 premises. The piloting produced additions to the number and form of questions included in the questionnaire.

Self-completion questionnaires were delivered on 17th-24th October. A return visit was made on up to 3 occasions to collect the questionnaires. 54 questionnaires were completed.

Questionnaires were deposited at virtually every business address fronting onto the A58. Those responding to the questionnaire were made up of the following categories: Retail Outlets (food, clothes, hardware) 21; Services (Banks, Travel Agents, Estate Agents, Insurance Brokers) 14; Restaurants (including cafes, pubs) 9; Manufacturers/Engineering 6; Newsagents/Confectioners 5; Hairdressers 2. It was felt that this distribution provided a representative cross section of the businesses fronting onto the A58. There was no reason to indicate that non-completed questionnaires distorted the sample in any way.

In view of the relatively small scale of Sowerby Bridge a decision to try and deposit questionnaires at all premises fronting onto the A58 between Foundry Street and Bolton Brow was made, as well as a random selection of premises on side streets off the A58. These questionnaires were then left with the manager/owner or most senior staff member at the premises with a letter indicating the purpose of the study and the arrangements for picking up the completed questionnaires.

In practise a total of 37 out of 115 premises called at were not open, or could not be contacted during the two afternoon periods allocated to delivering the questionnaires. Of these 54 premises completed and returned a questionnaire.

3.3 WORKERS

As well as obtaining the views of people who own or run businesses in Sowerby Bridge the views of other people who work in buildings fronting onto the A58 and who might be expected to have different interests and perspectives on issues were obtained. These we termed workers. Hopefully, this will not be interpreted as derogatory of those people included in the previous group. For reasons similar to those explained under retailers a self-completion questionnaire was designed for obtaining workers' views. This was similar in many respects to the questionnaire used for retailers/businesses although obviously questions about servicing/customer access were excluded. A copy of the questionnaire is provided in Appendix 3.

A total of 60 questionnaires were deposited randomly at the same businesses and premises along and adjacent to the A58 as for the previous group. The questionnaire was given to the first "worker" met upon entering the premises or where the owner/manager was met then a request to speak to a full-time worker was made. Often in the smaller premises the owner/manager was the sole "worker" or else employed part-time workers. Hence the lower number of questionnaires distributed. Again a letter explaining the purpose of the survey and the arrangements for picking up the completed questionnaire was given out.

Workers at addresses fronting onto the following locations were included in the sample.

West Street - Station Road	6
County Bridge - Town Hall Street	10
Hollin Mill Lane	2
Tower Hill - Wharf Street	10
Tuel Lane - Bolton Brow	4

3.4 ROAD USERS

In order to obtain the views of road users about conditions for driving through Sowerby Bridge three options were considered:

- (1) to give drivers self completion questionnaires at stop lines i.e. traffic signals
- (2) to interview drivers who parked in Sowerby Bridge
- (3) to have a kerb-side interview with drivers whilst still in their vehicles.

The first approach was considered too dangerous for survey staff considering traffic conditions in Sowerby Bridge. The second approach would have only obtained the views of people who actually stopped in Sowerby Bridge as opposed to driving through without stopping to visit. The third approach was considered most satisfactory. An arrangement with West Yorkshire Police to establish an interview station at which a sample of vehicles would be stopped for interviews.

The information which was considered relevant to identify problems experienced by drivers travelling through Sowerby Bridge was:

- (1) any difficulties experienced driving through Sowerby Bridge prior to the interview or in general
- (2) the driver's journey origin and destination and whether any alternative routes could have been taken
- (3) the purpose and frequency of travelling through Sowerby Bridge.

A copy of the interview form is shown in Appendix 3. The interview point was set up opposite the Moorings area at a point where vehicles could pull into the roadside without impeding other vehicles. The interview was timed to last no more than 3 minutes.

The interview point was set up to capture vehicles travelling eastbound on Friday 6/11/87 between 1300-1700 and was designed to allow two interviews to be carried out at a time. Vehicles were signalled into the interview bay by the police officer whenever a gap of more than 30 metres appeared in the traffic. The first two vehicles at the head of the following platoon were interviewed. When the two interviews were completed the next two vehicles following a gap in traffic were pulled in. This was felt to provide an adequate sample.

3.5 INTEREST GROUPS

From the various discussions with people around Sowerby Bridge and with members of the Steering Committee there were a number of specific people and interest groups who it was felt ought to be specifically included in the identification of problems and who had not appeared in any of the groups previously described. These people/groups included the following:

- (1) Project Officer for the Riverside Development (1)
- (2) Sowerby Bridge Traffic Sargeant (1)
- (3) Owners of major tourist attractions (6)
- (4) People who were registered disabled (4)
- (5) Freight Manager of "Brewliners" Haulage Company (1)

The approach adopted for the individuals included in this group differed from those previously described. A face-to-face interview was adopted since it was felt that information which was potentially important to identifying both problems and solutions might not be captured fully by a self-completion questionnaire and that an interview would allow more detailed discussion of specific points. Since these interviews took place after the other surveys a decision to present the problems identified from the other groups was chosen as an alternative way of eliciting viewpoints. Here 26 problem types were listed on showcards and individuals were asked whether they agreed/disagreed that the issues presented were a problem for them. They were then asked whether there were any other issues which they thought should be added to the list. For each of these issues and for those issues that they agreed were a problem

each person was asked to identify a solution to the problem or a way in which the 'problem' could be minimised. Here therefore each person was presented with a series of problem-solving tasks unlike the previous groups who had been asked to identify 'problems' only. A copy of the questionnaire is given in Appendix 1 of this report.

Apart from the members of the disabled group the individuals in the other groups were self-selecting. A local disabled driver register (orange badge stickers) was used to draw at random individuals who were disabled. In total 13 interviews were carried out in this part of the study. The breakdown of these interviews by number is shown in the brackets against the above groups.

4. PHYSICAL DATA COLLECTION

4.1 INTRODUCTION

The second strand to the identification of problems involved quantifying as far as possible measures of those problems which had been covered in the interviews. This was undertaken to establish the extent to which physical measures might be used to identify 'problems' as well as indicating the scope and limitations for solving the perceived problems. Those issues which it was felt could be measured in a quantified form were:

- 1) traffic flow characteristics;
- 2) pedestrian activities;
- 3) on-street parking;
- 4) off-street parking;
- 5) the pattern of traffic movements through the town.

The first three could be measured relatively easily using video cameras mounted at different points around the town. Such video recordings also served to provide evidence of the detailed way in which lengths of street were used, so that stated problems could be investigated in more detail later. The demand for off-street parking and the measurement of vehicle origins and destinations required different methods. The method of these and the video recording are described below.

4.2 TRAFFIC FLOW CHARACTERISTICS

Five video cameras were set up at different positions along the A58 to record traffic flow conditions throughout Friday 2/10/87 and Saturday 3/10/87. The actual positions of these cameras, the recording period and the data captured are shown below:

<u>LOCATION</u>	<u>DATE</u>	<u>TIME</u>	<u>DATA CAPTURED</u>
Tall Chimney Inn (West Street)	2/10/87 3/10/87	0900-1100 1100-1300	Traffic and Pedestrian movement characteristics West Street/Sowerby Street/Railway Bridge Junction
Accountants (Corner of Hollins Mill/ Town Hall St)	2/10/87	0900-1650	Traffic and Pedestrian characteristics in Town Hall Street
Bulls Head Hotel (Town Hall St)	2/10/87 3/10/87	0730-1830 0800-1745	Traffic and Pedestrian flow characteristics between Tower Hill and Kwik Save pelican crossing
Commercial Inn (Tuel Lane)	2/10/87 3/10/87	0845-1800 0900-1730	Traffic and Pedestrian flow characteristics Tuel Lane Junction

<u>LOCATION</u>	<u>DATE</u>	<u>TIME</u>	<u>DATA CAPTURED</u>
Prospect	2/10/87	0830-1800	Traffic turning
Veterinary	3/10/87	0900-1745	characteristics
Surgery (Bolton Brow/ Wakefield Road Junction)	3/10/87	0900-1745	Wakefield Road/Bolton Brow Pedestrian Traffic characteristics Bolton Brow/Wharf St

Limited data was collected at Tall Chimney Inn due to a camera fault. Further filming at this site was conducted on 25/10/87 between 1000-1600. In addition 5 minute manual counts every 30 minutes of pedestrian flows over County Bridge were made during Friday and Saturday lunchtime and afternoon off-peak period.

4.3 TRAFFIC MOVEMENTS THROUGH THE TOWN

Vehicle number plates and observation times were recorded manually at 6 different points for 45 minute periods on both 2 and 3/10/87. These observation points were Bolton Brow (A58); Wakefield Road; Tuel Lane/Beech Road; A58 (200m west of Watson Mill Lane); A672 (Oldham Road) and A58 (junction with A672).

On each day observations began at 0830 (10 minutes earlier at last 2 sites) recording traffic flows in one direction only. The direction of flow recorded was changed at specified times of the day. On 2/10/87 we recorded 4 periods for traffic travelling westbound and 4 periods for traffic travelling eastbound. On 3/10/87 we recorded 4 periods for traffic travelling westbound and 3 period for traffic travelling eastbound. Altogether 11.5 hours of data per observation site over the two days were collected.

4.4 PARKING DATA

The number of cars parking at the following off-street car parks were recorded on a 20 minute cycle on 2/10/87 (0830-1120; 1300-1640) and Saturday 3/10/87 (0900-1120; 1300-1640).

- Hollin Mill Lane
- Wharf Street
- Kwik Save

In addition vehicles parked on-street in Corporation Street/Tower Hill were recorded on the same basis.

The number of vehicles parked in Station Road, Victoria Road and West Street car park were recorded on an hourly cycle on both days. The video data provides information on a continuous basis of vehicles parked in Town Hall Street (Friday); Wharf Street (Friday, Saturday) and Bolton Brow/Wharf Street (Saturday).

specific features of the town which are a source of visual disamenity.

6.2 METHODOLOGICAL CONCLUSIONS

6.2.1 Introduction

The main objective of this stage of the study was to examine ways of identifying traffic problems in Sowerby Bridge. The identification of problems reported in this section involved inputs from a wide range of different groups of users of Sowerby Bridge as well as observation and recording of physical conditions in the town at different locations. A distinction needs to be made between the methods used to elicit people's views and record physical conditions in Sowerby Bridge and the interpretation of the importance of these problems. The first stage can properly be called problem identification. The second stage needs to be regarded as a distinct though logically connected stage which can be termed problem structuring. Most attention is usually given to the first stage since this involves the actual capture of data. It is often forgotten however that data capture is followed by analysis interpretation and transformation of the original information and can lead to many hidden values and assumptions entering the conclusions drawn. Equal attention has been given to this second stage and the values and assumptions which enter the analysis are made explicit as far as possible since it is this structuring process which produces the information and conceptual model for thinking about solutions. Comment and conclusions about both stages is given below.

6.2.2 Methods Used to Elicit Viewpoints

Three methods were used to elicit people's views about problems in Sowerby Bridge. These were outdoor interviews; self completion questionnaires and household interviews. The form and content of the individual methods varied depending upon the groups approached. In each method however two types of question were used:

- (1) Those which asked for general impressions about conditions in Sowerby Bridge.
- (2) Those which referred to specific activities and issues which we considered likely to be perceived as problems and involved structured measurement techniques.

The term 'problem' did not appear in any of the methods used. People were asked only to consider conditions in Sowerby Bridge as they experienced them and not to consider future conditions or solutions to those conditions. In supplying views about the town however some people naturally provided comment about what could or should be done to improve conditions.

The conclusions which have been reached about the methods used to identify problems are based upon the views and comments of those who had to use the methods, the type of views and information which were produced by the methods and our experience of carrying out the other stages of the project.

6.2.3 On-Street Interviews

The on-street interviews with pedestrians produced a diverse set of impressions about Sowerby Bridge and a range of assessments about the relative difficulty of crossing the road. The time available for an on-street interview means that there is a limited number of questions that could be asked. Since we were interested primarily in people's views about Sowerby Bridge as users, different ways of eliciting these views or more time on those questions included would have produced more revealing opinions. Questions asking people where they had visited or were likely to visit on their journey needed more time for discussion within the interview since both the interviewer and respondent were found to have difficulty in recalling and recording routes taken and likely to be taken. Ideally, this question should have been part of a separate study with more time to explore the issues. Questions asking people about the characteristics of their journey were useful in that they provided background information about the respondents familiarity with Sowerby Bridge and a relatively uncomplicated set of questions which helped to put the respondent in a frame of mind for more thoughtful questions.

The three major difficulties which were experienced with the on-street questionnaire are related. Firstly, the on-street interview involved interviewing people alongside a busy main road. Not only is this unpleasant but stopping for 10 minutes or so on a cold day is not an ideal situation for getting people to relax and think about what they like/dislike about Sowerby Bridge. Secondly, many people are not easily able to articulate their feelings when suddenly confronted by a direct question about their likes/dislikes of a town or a street. This may be because some people are less confident or less able to articulate their views; or because the actual question itself is remote from people's everyday thinking or activities. Thus approximately half of the sample interviewed could not supply a single like or dislike about Sowerby Bridge. Thirdly, where people did express their likes and dislikes it was found that they had great difficulty in expanding or articulating upon why they liked or disliked the particular feature. This may have been due to the conditions under which the interview took place and the time constraint or the form of question.

It is recommended therefore that, if similar studies are to be carried out in future:

- (1) on-street interviews are kept brief (2-3 minutes) and focus entirely either on people's impressions about a street or route choices; Questions asking about assessment of two or three likely key problems/issues should be pursued.
- (2) longer interviews which adopt different ways of eliciting people's likes/dislikes about a street and allow people to express their reasons for those likes/dislikes are carried out; the setting for these interviews should be indoors within the town centre of interest; possible locations could include libraries, pubs, community centres, shops, indoor car parks, bus and railway stations and other places

which people are familiar with and likely to have time to think and express themselves.

- (3) methods which present information to people other than in the form of questions/answers and give people the opportunity to express themselves in ways other than merely verbally should be considered; attention should be given to the recording and assessment of non-verbal behaviour as well as verbal responses with any of the methods adopted.

6.2.4 Self-Completion Questionnaires

The small scale of Sowerby Bridge meant that delivery and collection of questionnaires could be completed in a short period. Furthermore, identification of the premises included in the sample was relatively straightforward. People were generally willing to take part in the study. The self-completion questionnaire allowed people to provide their views in their own time and to their own level of detail. Observation of the completed forms shows however that people tend to write their views, where a written response was required, in a short-hand style; some people were more succinct than others using often only single words to describe a "problem". No adverse comments were received about either the form or content of the questions. In general it was felt that the self completion questionnaire produced a more detailed set of problems than the on-street interviews. This may have been due to the survey method or the type of person.

Where delivery and collection of questionnaires is relatively easy this method is used. Comparison of interview and self completion methods needs to be carried out, not only in terms of information produced but in terms of resources.

6.2.5 Household Interviews

Household interviews or interviews in the workplace offer the potential for more detailed investigation of issues in a controlled setting. This approach can therefore provide detailed commentaries and opinions on problems as well as offering the scope for examining initially at least solutions to the problems. In the approach adopted pre-structured problems, taken from the other survey methods, were used to focus on the interview. Respondents generally liked this method to assessing problems and gave people an issue either to reject or else elaborate upon.

Providing people with a set list of problems may mean that issues which the individual had not previously considered may thereafter be regarded as problems or else that respondents state that something is a problem in order to influence solutions or recommendations (policy-bias).

The main disadvantage of the approach is the time required to set-up and complete the interviews. On average interviews lasted between 45-90 minutes with a further considerable allocation of time to setting up the interview. In conclusion these interviews produced a number of interesting views on "problems" due in part to the pre-structuring of material and the people who we selected

to interview in this part of the study. We regard this approach to be most useful and appropriate following the more loosely structured interview methods used for the pedestrian group and where specific individuals' views are considered important. A limited number of these interviews with key "community" figures or people with specific responsibilities in the town should therefore form part of any methodology adopted in other studies.

6.3 PROBLEM STRUCTURING

The views of people who use Sowerby Bridge for different reasons and physical data were collected in order to identify those problems caused by traffic in Sowerby Bridge and for which solutions would be required to make Sowerby Bridge a better place to work, live and visit. We then took this information in order to produce a structure of the problems facing the town overall and their importance. In terms of the development of a methodology which could be applied in other locations several questions need consideration.

- (1) Did we need to obtain any more or less information and type than we did to structure the problems?
- (2) Is our summary and representation of the problems in Sowerby Bridge in this section in agreement with what people in Sowerby Bridge consider to be the problems?
- (3) Was the separation of problem and solution identification necessary?

We talked to nearly 400 people who live, work and/or drive through Sowerby Bridge which itself has a population of about 10,000 inhabitants. We approached most of those people on a random basis as well as talking to a number of specific people who we considered might have specific interest in our study. We collected a large amount of physical data on video which provides a permanent and detailed record of conditions in Sowerby Bridge over two days, which could be analysed in many different ways and be used to test the likely effects of any solutions we put forward. We could not talk to everyone who might have had an opinion about the problems of Sowerby Bridge. Similarly there was a limit to the location for filming and amount of recording which could be undertaken. Not all the information which we collected has been analysed or useful to the determination of 'problems'. A particularly difficult area is the attempt to relate individuals' perspective of problems to physical conditions.

In retrospect it is felt that we probably attempted to sample too many people in a similar way. The on-street interviews in particular were generally disappointing in the views people expressed. Whilst it is exceedingly difficult to say what the right number of people to interview is, looking back on the summary of problems and the information presented by the different groups we believe that the same summary and type of information could have been produced by sample sizes of half those actually used. This claim however needs further testing before any definite conclusions can be made.

On the second point our summary and interpretation of problems inevitably involves making judgements about the information from the survey methods. People were not asked to assess how important they considered different problems to be. We produced a list which represented the most frequently mentioned and severely rated problem areas. This representation is a reflection of some of the "problems" which are perceived by some of the local people. Further, many of the issues are location specific. We found that it was possible to group the problems into four types and within these categories to provide a list of locations where these problems were found. These headings and locational analysis were presented to respondents at the group discussions to identify solutions reported in Appendix 2 for comment. No adverse comments were produced. We conclude therefore that representation of problems is broadly consistent with that of the people who work, live or use Sowerby Bridge.

The third and potentially most important consideration is the way in which our study separated "problems" and "solutions". Separation of these terms has many advantages for the organisation and construction of survey methods. In retrospect however the separation of the terms appears to be unnecessary.

Our approach of collecting and structuring problems, and then identifying solutions adds a separate stage. From our work people who perceive "problems" also perceive ways of overcoming these "problems". These may be poorly thought out suggestions but they exist. There is no reason, therefore, why these should not be gathered at the same time as the problems are identified. The main advantage of collecting problems separately from "solutions" is that it means that individuals can be asked to consider not only problems they perceive but problems perceived by other people also. This advantage however is relevant only where an interview involves a one-to-one contact.

Group discussions allow the identification of problems; the collation and structuring of problems and identification of solutions in a single session. A considerable advantage of this style of survey is that people who do not perceive problems in the existing situation may perceive problems arising from the solutions suggested. The opportunity for involving people and linking the current situation to future situations is more direct than in the one-to-one situation.

7. PHYSICAL MEASURES OF PROBLEMS

7.1 ORIGIN-DESTINATION RESULTS

As a first stage in the analysis of physical data the amount of traffic travelling through the town was estimated. Initially registration plate observations were analysed for two time periods 0820-0915 (eastbound) and 0930-1015 (westbound). Table 5 shows the total number of vehicles which had their registration plate code recorded at each observation site; the percentage of these vehicles which were matched at downstream sites and the mean travel time of those vehicles.

During the period 0820-0905 it can be seen that of 207 vehicles observed at the A672 site, travelling eastbound, 52% travelled through to Watson Mill Lane taking on average 10 minutes; 29% travelled on through Bolton Brow and 6% travelled through to Wakefield Road. In total therefore 35% or 72 vehicles observed at the A672 travelled through Sowerby Bridge taking on average between 13-15 minutes to complete that part of the journey. Assuming an eastbound flow along Bolton Brow immediately east of Tuel Lane of around 700 vph means that about 10% of this flow has its origin beyond the observation point on the A672.

Of the 384 vehicles recorded at the Watson Mill Lane site 43% travelled through Sowerby Bridge to Bolton Brow taking on average approximately 7 minutes and 6% travelled through to Wakefield Road taking on average approximately 6.5 minutes for those journeys.

For the period 0930-1015 of the 331 vehicles observed at Bolton Brow travelling westbound 26% travelled through to Watson Mill Lane (mean journey time 4 minutes); 3% travelled through to Tuel Lane (mean journey time 2.5 minutes); 2% travelled through to A58 (mean journey time 9 minutes) and 16% (52 vehicles) travelled through to A672 (mean journey time 8 minutes).

Of the 158 vehicles observed at Wakefield Road 7% travelled through to Tuel Lane (mean travel time 2.5 minutes). 80% travelled through to Watson Mill Lane and 4% (only 6 vehicles) through to the A672 (mean travel time 10 minutes). Less than 1% of vehicles observed at the Wakefield Road site travelled through to the A58 (Rochdale Road) observation site. Assuming a westbound flow of around 600 vph along Bolton Brow immediately to the west of Wakefield Road junction, mean that again about 10% of this flow travel through to a point beyond the A672 observation point.

In comparison between the two count periods whilst bearing in mind the different directions of travel indicate that there is an approximate halving of journey times between the extreme observation sites, and between Watson Mill Lane and the extreme observation sites in the later time period.

Table 5

Origin and Destination Study of Vehicles
Using Ryburn Valley

0820-0925

Upstream Site	Downstream Site	Upstream Observations	Downstream Observations	Mean Travel Time
A672	Watson Mill Lane	207	52	590
A672	Bolton Brow	207	29	922
A672	Wakefield Road	207	6	756
Watson Mill Lane	Wakefield Road	384	6	404
Watson Mill Lane	Bolton Brow	384	43	421

0930-1015

Upstream Site	Downstream Site	Upstream Observations	Downstream Observations	Mean Travel Time
Wakefield Rd	Tuel Lane*	158	7	141
Bolton Brow	Tuel Lane*	331	3	141
Bolton Brow	Watson Mill Lane	331	26	233
Wakefield Rd	Watson Mill Lane	158	8	288
Wakefield Rd	A58	158	< 1	568
Bolton Brow	A58	331	2	555
Watson Mill Lane	A58	213	4	302
Wakefield Rd	A672	158	4	598
Bolton Brow	A672	331	16	483
Watson Mill Lane	A672	213	31	233

* Suspected incorrect procedure for recording number plates.

In terms of traffic travelling between the motorway and destination east of Sowerby Bridge it appears that only about 10% of the total traffic flow during the periods analysed is likely to be using the A58 as a through route. The perception of some people in Sowerby Bridge that the 'traffic problem' in Sowerby Bridge is caused by traffic travelling to and from the motorway and would be solved by banning or diverting those vehicles is not borne out. The fact that a number of heavy goods vehicles are particularly noticeable and intrusive when they travel through the town and are using the A58 to travel between Halifax and the motorway appears to have led many people to think that a large percentage of traffic is doing the same.

It is unlikely that the figure of 10% would vary at different

times of the year (other than infrequent periods when the motorway is closed down due to extreme weather conditions) or on different days. Therefore whilst some diversion and signposting of traffic away from Sowerby Bridge is possible, it is evident that about 90% of the existing traffic travelling through Sowerby Bridge would remain.

7.2 TRAFFIC FLOW CHARACTERISTICS

Having identified the problems experienced by a sample of people in Sowerby Bridge the second stage of the analysis of problems involved measuring physical indicators of those problems. As people refer in many different ways to traffic conditions - delays, congestion, chaotic, busy, noisy, and because for many of these terms there is no obvious single physical correlate to assess these different terms it was decided to measure a broad set of indicators which covered a large number of types of problems perceived:

- (a) Traffic flow and vehicle classification for different periods of the day.
- (b) Number of vehicles turning across opposing traffic streams at key junctions.
- (c) Percentage of traffic travelling through Sowerby Bridge to and from the motorway.

By measuring (a) it would also be possible to make an assessment of kerbside and indoor noise levels using standard predictive expressions.

Traffic flow characteristics were measured from the video for 5 minute intervals over 1 hour periods for the following time bands 0830-0930; 1200-1300; 1615-1715 at different points along the A58. Table 8 shows the peak 5 minute and half hourly flow in either direction, the percentage of buses and goods vehicles and the start of the analysis period for four locations. These are:

- (A) Bolton Brow north of Wakefield Road junction;
- (B) Wharf Street east of Tuel Lane junction;
- (C) Wharf Street west of Tuel Lane junction; and
- (D) West Street west of Sowerby Street junction.

Apart from flows measured at site (B) during the afternoon peak the half hourly flows are higher in the eastbound direction than the westbound direction. Flows are at sites A, B (westbound) and D the morning and afternoon peaks five minute flows are higher than during the lunchtime peak. At the other observation points the lunchtime flows are higher than the morning and afternoon peak flows. The peak half hourly flows at each site in either directions are higher than the peak half hourly flows at the lunchtime period. The peak five minute flow measured at any site was 93 vehicles travelling westbound at between 1700-1705 immediately to the east of the Tuel Lane junction. The peak half hourly flow recorded was 419 vehicles travelling eastbound along Wharf Street between 1630-1700 immediately to the west of the Tuel Lane.

The lower flows measured at West Street (D) are probably partly explained by the fact that due to camera breakdown the video recorded only between 0900-1615 and thereby missed the early morning and evening peak period. It should be noted however that a considerable volume of traffic enters and leaves the main flow of traffic at Sowerby Street and does not travel along West Street (see turning movements).

In terms of traffic travelling between the motorway and destination east of Sowerby Bridge it appears that only about 10% of the total traffic flow during the periods analysed is likely to be using the A58 as a through route. The perception of some people in Sowerby Bridge that the 'traffic problem' in Sowerby Bridge is caused by traffic travelling to and from the motorway and would be solved by banning or diverting those vehicles is not borne out. The fact that a number of heavy goods vehicles - particularly the 'brewliner' company, are particularly noticeable and intrusive when they travel through the town and are using the A58 to travel between Halifax and the motorway appears to have led many people to think that a large percentage of traffic is doing the same.

These findings must be treated with some caution however since they represent analysis for only two time periods on one day and for specific locations.

It is unlikely that the figure of 10% would vary at different times of the year (other than infrequent periods when the motorway is closed down due to extreme weather conditions) or on different days. Therefore whilst some diversion and signposting of traffic away from Sowerby Bridge is possible, it is evident that about 90% of the existing traffic travelling through Sowerby Bridge would remain.

Table 8

Peak Five Minute and Half Hourly Traffic Flows
by Location and Time of Day

(Friday 2/10/87)

Site	Maximum 5 Minute Flow		Maximum Half Hourly Flow		
	Start Time	Total	Start Time	Total	

0830-0930					
A	W	0845	57	0840	280
	E	0840	71	0840	363
B	W	0840	76	0840	376
	E	0855	72	0840	409
C	W	0840	64	0840	394
	E	0855	68	0840	412
D	W	0910	39	0910	179
	E	0910	41	0910	206

1215-1315					
A	W	1255	49	1240	265
	E	1305	46	1240	225
B	W	1300	63	1245	248
	E	1235	74	1235	343
C	W	1300	53	1245	276
	E	1235	82	1235	336
D	W	0945	32	0945	164
	E	1010	38	0945	197

1615-1715					
A	W	1705	68	1640	314
	E	1645	69	1640	334
B	W	1700	93	1645	394
	E	1630	80	1630	410
C	W	1700	91	1645	413
	E	1630	82	1630	419
D	W	1615	46	1600	211
	E	1625	46	1600	210

W = Westbound E = Eastbound

From these figures the volume of traffic travelling through Sowerby Bridge reaches around 1600 vph in the centre of the town. These volumes are well above the design capacity of the road and clearly indicates why the amount of traffic is perceived as a major problem in the town. The formation of solutions to traffic problems in Sowerby Bridge therefore needs to take into account peak two way flows of around 1600 vph and flows that average between 1000-1300 vph throughout the day (0900-1700).

7.3 TRAFFIC TURNING MOVEMENTS

A major likely cause of traffic congestion in West Street/Town Hall Street and Wharf Street is vehicles turning into and out of junctions. Right turning movements in particular are likely to cause delays and congestion due to the high flows of on-coming vehicles. A number of junctions were identified as leading to delays and congestion to other vehicles. These were:

- (1) Sowerby New Street/West Street
- (2) Station Road/West Street
- (3) Hollins Mill Lane/Town Hall Street
- (4) Tower Hill/Town Hall Street
- (5) Tuel Lane/Wharf Street
- (6) Wakefield Road/Bolton Brow

Table 9 shows the average hourly flow of traffic turning at these junctions for specified time periods. Figure 3 shows the direction of the turning movement.

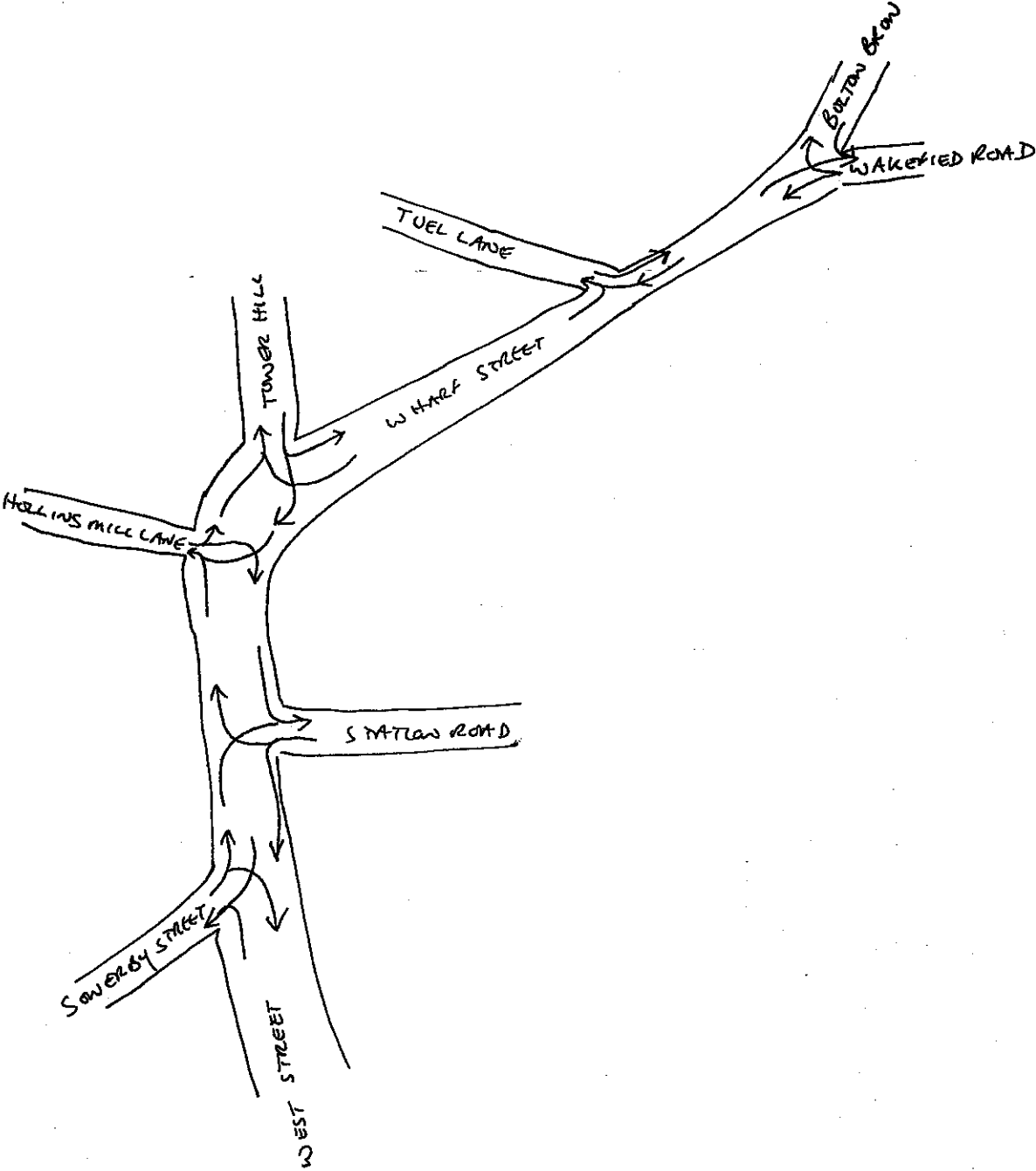
The locations with the highest number of turning movements are at the Wakefield Road/Bolton Brow junction for the Tuel Lane/Wharf Street junction, West Street/Station Road junction and West Street/Sowerby Street junction. Flows into and out of Tower Hill and Hollins Mill Lane are much lower although being located in the areas of highest flows and narrowest areas of carriageway are likely to produce delays and congestion disproportionate to the actual number of turning movements.

Table 9

Traffic Turning at Different Junctions

	Five Minute		Half Hour	
	Start Time	Peak Flow	Start Time	Peak Flow
Wakefield Road - Bolton Brow	1645	449	1640	219
Bolton Brow - Wakefield Road	1640	34	0835	159
Bolton Brow/Wharf Street - Tuel Lane	1700	36	1645	168
Tuel Lane - Bolton Brow/Wharf Street	0855	46	0840	227
Tower Hill - Wharf Street	0840	11	1215	54
Wharf Street - Tower Hill	1220	12	1215	50
Hollins Mill Lane - Town Hall Street	0930	4	0910	18
Town Hall Street - Hollins Mill Lane	1215	5	1215	23
Station Road - West Street	0930	20	0910	97
West Street - Station Road	0925	20	0910	107
West Street - Sowerby Street	0930	45	0910	152
Sowerby Street - West Street	1630	23	0910	111

Figure 3: Director of Turning Movements for Vehicle Flow Count



7.4 PEDESTRIAN ACTIVITY IN SOWERBY BRIDGE

Pedestrian flow counts both along pavements and crossing the road were taken from the video and from manual counts. Figure 2 shows the locations where counts were taken. In addition pavement widths were measured in Town Hall Street and Wharf Street.

7.4.1 Pavement Flow

Sample 20-minute counts of the numbers of people walking along pavements on either side of Wharf Street, Town Hall Street and County Bridge were taken from the video recording during two time periods 1030-1345 and 1630-1650. These two time periods had from other work been found to experience peak levels of pedestrian activity (May et al, 1987). These counts included all pedestrians crossing in both directions an imaginary screen line across a pavement at a specified location. The locations of these screen lines are shown in figure 4.

In addition to the video counts, manual counts of pedestrian numbers crossing over County Bridge on either side of the roadway were taken for three twenty minute periods through the day. All counts shown in Table 6 are for Friday 2/10/87. Table 6 shows for each pavement the twenty minute two-way pedestrian flow counts for each pavement. An average hourly two-way flow for the period 1100-1400 for both pavements combined has been calculated for Town Hall Street and Wharf Street. The average hourly two way flow for County Bridge is for the time period 1200-1600.

Average hourly pavement flows are between 559-764 throughout the study area. Pedestrian flows are highest in Wharf Street.

The number of pedestrians on the north side (A) of the A58 in Town hall Street and Wharf Street is generally greater than on the south side (B). This is probably due to the presence of the supermarket and main residential areas. Pavement flows across County Bridge are heavier on the south side (B) indicating that pedestrians cross from the north side of Town Hall Street/Wharf Street prior to County Bridge.

7.4.2 Pavement Widths

Pavement widths along the south side of Town Hall Street and Wharf Street range between 1-2 metres, although at one location the pavement width narrows to 0.5m. The pavement area to the area overlooking the Riverside area is generally wider 2-3 metres although a bus stop here creates greater numbers of pedestrian movement. Whilst pedestrian flows along the south side of the A58 are not especially high wherever pairs of pedestrians approach each other from opposite directions then one group has to give way to another or else one or more persons has to step into the carriageway.

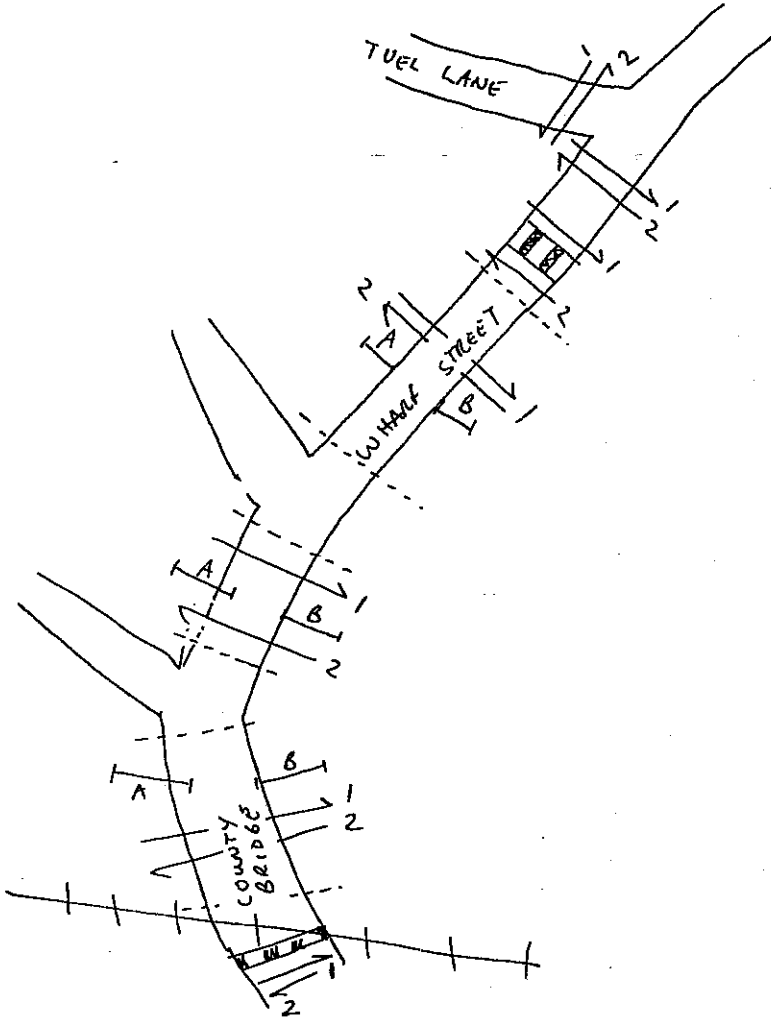
Table 10

Pavement Flow Along Town Hall Street, Wharf Street
and County Bridge

(2/10/87)

		1030- 1050	1130- 1150	1230- 1250	1325- 1345	1630- 1650		Average Hourly Flow
County Bridge	A	45	-	77	93	104)	623 (1200- 1600)
	B	90	-	139	115	95)	
Town Hall St	A	-	107	99	140	136)	612 (1100 1400)
	B	-	100	116	50	102)	
Wharf Street	A	-	178	222	171	92		764 (1100 1400)
	B	-	54	57	82	44		

Figure 4: Location of Counts for Pedestrian Flow & Crossing Measures



Pavement widths to the northside of Town Hall Street are generally wider than on the south side 1.5-2.0m. Pavement widths to the north side of Wharf Street are approximately twice the width of those to the south side and in the area between the Centre for Adult Education and the entrance to the Kwik Save Car Park are between 3-4m in width.

In spite of these wider pavements, the higher pedestrian flows on the north side of Town Hall Street/Wharf Street produces similar problems wherever groups of pedestrians converge from different directions. This is particularly so in the area to the immediate east/west of Tower Hill. Overall the pavement width in Town Hall Street and Wharf Street, especially to the south side, create difficulties even for the number of pedestrians who use them now.

7.4.3 Crossing Flow

Sample 20 minute counts of the number of people crossing at the controlled crossings at Tuel Lane, Wharf Street and the Railway Bridge and unassisted in Town Hall Street and Wharf Street were taken from the video recording for the time periods 1100-1400 and 1600-1700. The boundary of the area for the unassisted crossing counts are shown below in figure 4. In addition manual counts of pedestrians crossing the A58 in the area of County Bridge were recorded.

Table 11 shows for each crossing location the twenty minute two-way crossing flow. An average hourly two way flow for the period 1100-1400 for each crossing location has been calculated.

The greatest level of pedestrian activity occurs at the Railway Bridge pedestrian crossing with an estimated peak crossing flow of 336 pedestrians per hour. Crossing flows across Wharf Street at the traffic signal control immediately to the East of the Tuel Lane junction are extremely low. Surprisingly the rate of crossing across Tuel Lane immediately to the north of Wharf Street is very low with an average around 30 pedestrians per hour. On average the hourly rate of crossing Wharf Street at the controlled crossing (opposite the entrance to the Kwik Save car park) is higher (181) than at the signal control at the junction with Tuel Lane (82). The average hourly rate of crossing in a 70m length of Wharf Street (unassisted) is slightly lower (147) than at the controlled crossing opposite the Kwik Save car park entrance. Unassisted crossings in Wharf Street are an average greater than unassisted crossings in an equivalent length than in Town Hall Street (114). Finally there is a relatively constant flow, considering the considerable difficulties and danger in crossing, across County Bridge (44 pedestrians per hour).

Whilst there is no way of quantifying without more detailed study the number of pedestrians who do not cross or would like to cross the A58 but for the road traffic conditions there was sufficient evidence from the on-street interviews, anecdotal information and observation to suggest that there are likely to be a considerable number of suppressed crossing trips. This does not include people who do not visit Sowerby Bridge because of the existing conditions.

Table 11

Pedestrian Rate of Crossing at Different Locations
in Sowerby Bridge

		1130- 1150	1230- 1250	1325- 1345	1610- 1620	Average 2-way crossing flow
Tuel Lane/ Wharf Street	Dir 1	0	1	0	1	3
	Dir 2	0	0	2	2	
Tuel Lane	Dir 1	1	3	11	10	30
	Dir 2	7	5	3	5	
Wharf Street	Dir 1	21	22	12	24	82
	Dir 2	12	5	10	9	
Kwik Save	Dir 1	35	28	26	33	181
	Dir 2	36	32	24	27	
Wharf Street	Dir 1	30	24	17	16	147
	Dir 2	20	34	22	24	
Town Hall Street	Dir 1	18	25	18	17	114
	Dir 2	17	23	13	10	
County Bridge	Dir 1	6	7	13	4	44
	Dir 2	6	4	8	7	
Railway Bridge*	Dir 1	66	-	-	57	336*
	Dir 2	49	-	-	50	

* Hourly crossing flow based on two twenty minute observations only.

7.4.4 Conclusions

Pedestrian activity along the A58 is concentrated in an area between the Railway Bridge and the Tuel Lane/Wharf Street junction. Pedestrian movements along pavements are higher on the northside pavements particularly in the area between Tower Hill/Town Hall Street and the entrance to the Kwik Save car park. The Railway Bridge zebra crossing experiences the highest flows of pedestrians. The pavement widths in Town Hall Street and Wharf Street particularly the south side of the A58 are generally inadequate for the number of existing pedestrians. Further increases as a result of tourist development will inevitably make conditions for passing more difficult.

7.5 PARKING IN SOWERBY BRIDGE

Figure 3 shows the locations and boundaries of the areas for counting off-street and on-street parked vehicles.

7.5.1 Off-Street Parking - Demand for parking space

The number of cars parked in three off-street parking areas; Kwik Save; Stanley Street; Hollins Mill Lane; were counted on a twenty minute cycle between 0840-1140 and 1300-1700 on Friday 2/10/87 and between 0900-1140 and 1300-1700 on Saturday 3/10/87. Less frequent counts every hour were taken in the car park on West Street. Table 11 shows the number of vehicles parked and percentage of the capacity of the car park for those observed periods. On Friday 2/10/87 the Kwik Save car park was at least two-thirds of capacity on 17 of the 21 observation counts. During the period 1000-1120 82% or more of the available parking space was taken with virtual capacity being reached at 1020. It would appear that during the afternoon period there is about 25% (approximately 20 vehicles) available parking spaces. During the morning period there is generally less parking spaces available. In the Stanley Street car park demand exceeded during the observation periods 80% of capacity on one occasion and 60% of capacity on another four occasions. These occasions were all during the afternoon time period. During the morning period demand for spaces at the Stanley Street car park was about 50% or below. During the afternoon period demand was at its highest between 1300-1420 thereafter returning to the morning demand levels.

Examining both the Kwik Save and Stanley Street car parks together as the main parking areas in the east side of the town there would appear to be during the morning period 0940-1120 between 22-42 car parking spaces available, the majority of these in the Stanley Street car park. During the afternoon period 1300-1600 there are 35-60 car spaces available at any one time, these being located in both car parks fairly evenly. The Hollins Mill Lane car park next to the Fire Station is virtually at capacity throughout the day. The West Street car park is under 50% capacity throughout the day. Demand for off-street car parking on Saturday (3/10/87) is generally lower than on the Friday (see Table 13). Peak demand in the Kwik Save car park on Saturday reached a maximum 70% of capacity compared.

Figure 5: Locations of Observed Car Parking Areas

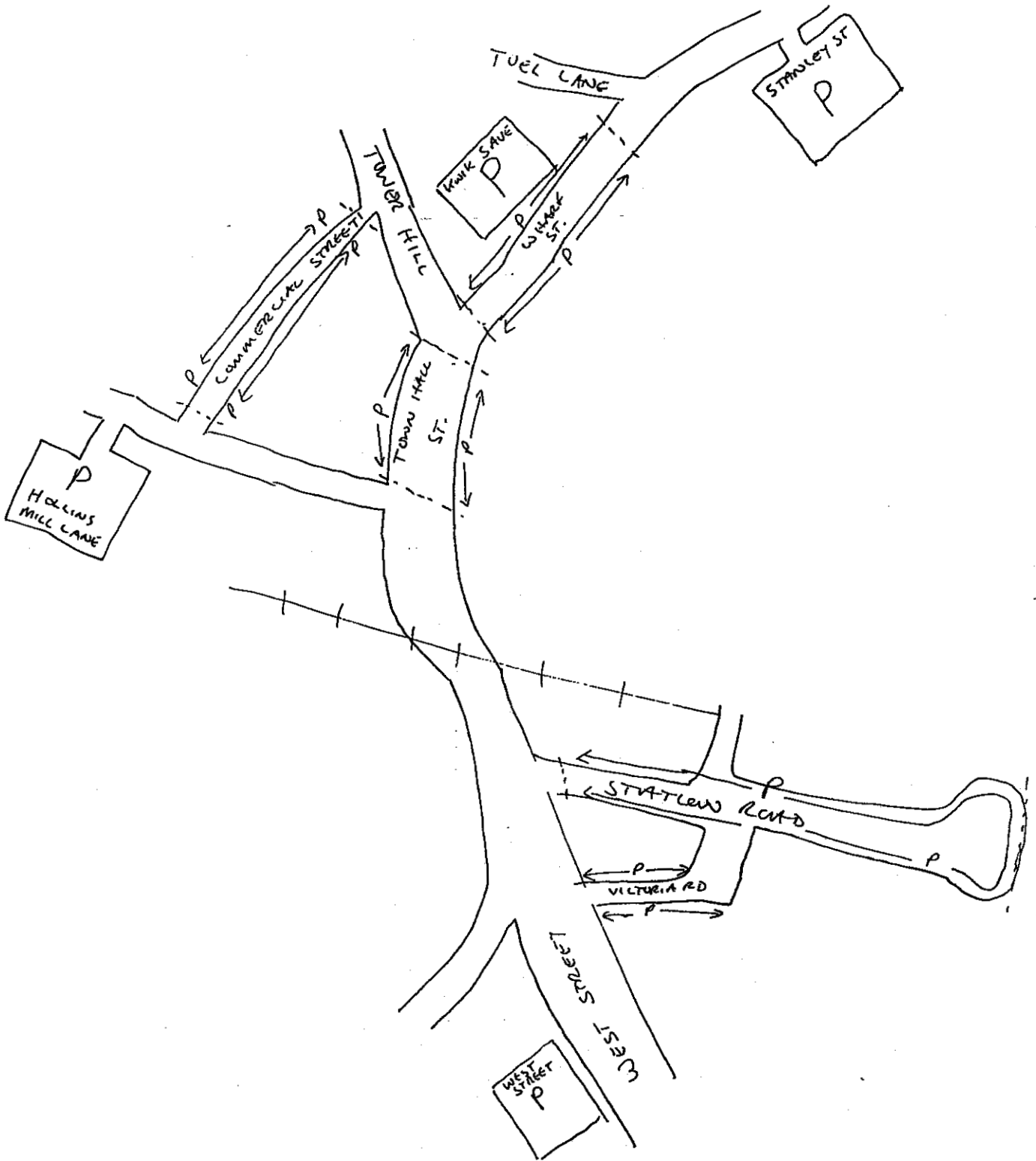


Table 11

Number of Vehicles and Percentage of Capacity
at Four Off-Street Car Parks (Friday 2/10/87)

Time	KWIK SAVE		STANLEY STREET		HOLLINS MILL LANE		WEST STREET	
	Number Vehicles	% Cap	Number Vehicles	% Cap	Number Vehicles	% Cap	Number Vehicles	% Cap
0840	34	40	5	15	15	100		
0900	45	54	10	29	13	86	10	43
0920	56	66	13	38	13	86		
0940	63	75	14	41	14	93		
1000	77	92	14	41	15	100	9	21
1020	83	98	14	41	15	100		
1040	76	90	18	53	15	100		
1100	74	88	19	56	15	100	8	35
1120	69	82	16	47	15	100		
1300	57	68	24	70	12	80	6	26
1320	57	68	28	82	14	93		
1340	64	76	18	53	13	86		
1400	66	78	23	68	15	100	9	39
1420	61	73	21	62	13	86		
1440	59	70	19	56	13	86		
1500	60	71	18	53	14	93	8	35
1520	65	77	13	38	14	93		
1540	55	65	14	41	13	86		
1600	68	81	14	41	14	93	2	8
1620	60	71	14	41	13	86		
1640	47	56	11	32	11	73		

Table 12

Number of Vehicles and Percentage of Capacity
at Four Off-Street Car Parks (Saturday 2/10/87)

Time	KWIK SAVE		STANLEY STREET		HOLLINS MILL LANE		WEST STREET	
	Number Vehicles	% Cap	Number Vehicles	% Cap	Number Vehicles	% Cap	Number Vehicles	% Cap
0900	40	47	10	29	10	66	-	
0920	42	50	10	29	8	53		
0940	35	41	14	41	10	66		
1000	53	63	11	32	10	66	16	69
1020	46	55	14	41	12	80		
1040	48	57	10	29	13	86		
1100	55	65	10	29	13	86	14	61
1120	56	66	12	35	12	80		
1300	59	70	20	58	8	53	10	43
1320	36	43	11	32	15	100		
1340	40	48	12	35	15	100		
1400	30	36	12	35	15	100	10	43
1420	40	48	19	56	15	100		
1440	38	45	20	58	15	100		
1500	37	44	21	62	15	100	9	39
1520	38	45	22	65	15	100		
1540	37	44	14	41	15	100		
1600	37	44	7	21	-		-	
1620	20	24	6	18	6	40		
1640	20	24	6	18	6	40		

to 98% on Friday). On average demand in the Kwik Save car park on Saturday was around 50% capacity. Demand at the Stanley Street car park reached a maximum 65% of capacity (82% on Friday). Taking these two car parks together for the period 0900-1640 there were between 40-92 spaces available at the observed time periods, higher than on the Friday. The Hollins Mill Lane car park was again at or near capacity throughout the day, particularly during the period 1320-1540.

Demand at the West Street car park was higher than on the Friday due probably to overspill from the market area where there were more on-street vehicles parked on the Saturday compared to the Friday.

Taken together these results, the following conclusions can be drawn:

- (1) there is little available off-street parking at the Hollins Mill area;
- (2) there is spare car parking space on West Street but this is probably due more to its poor location relative to facilities;
- (3) there is spare car parking in Stanley Street particularly during the morning period;
- (4) there is spare car parking in Kwik Save during the afternoon periods;
- (5) demand for parking is lower on Saturday than on Friday.

7.5.2 On-Street Parking

The number of cars parked in five streets was recorded from video or manually (see Tables 14 and 15). The number of parked cars in Commercial Street at the observed times on both Friday and Saturday is at or near to the maximum (space for 12 vehicles, parking on one side of the street), throughout the day.

There are more vehicles parking in Wharf Street compared to Town Hall Street at the observed times. Although the number of vehicles parked in either street is not especially high the width of Wharf Street in parts and Town Hall Street means that even one parked vehicle can lead to significant interruptions to the traffic flow. Where vehicles park on opposite sides of Wharf Street, as is often the case, then delays and congestion to other vehicles occurs. For the number of vehicles parking at any one time the effects on traffic movements can be considerable.

On both Friday and Saturday (both Market days) both Station Road and Victoria Road provide space for between 72 and 110 vehicles. The majority of these vehicles are parked in Station Road. Whilst it is difficult to determine the precise capacity for parked vehicles under the current parking arrangements it is likely that 110 vehicles represents the saturated level.

Table 14

Number of Vehicles Parked On-Street at Five Sites (Friday 2/

<u>Time</u>	<u>Commercial Street</u>	<u>Wharf Street</u>	<u>Town Hall Street</u>	<u>Station Road</u>	<u>Victoria Road</u>
0840	5	4	2		
0900	8				
0900	8	7	2		
0940	10				
1000	11	6	3	62	29
1020	12				
1040	10				
1100	10	6	2	59	28
1120	10				
1300	10	4	2	55	26
1320	10				
1340	10	4	1		
1400	11			49	21
1420	8				
1440	12				
1500	9				
1520	8				
1540	7	4	3		
1600	9				
1620	9			49	23
1640	12	6	4		

Table 15

Number of Vehicles Parked On-Street at 5 Sites

Time	Commercial Street	Station Road	Victoria Road
0900	2	-	
0920	3		
0940	8		
1000	10	73	37
1020	9		
1040	12		
1100	12	66	34
1120	11		
1300	8	69	38
1320	12		
1340	12		
1400	12	72	39
1420	12		
1440	10		
1500	12	68	33
1520	12		
1540	8		
1600	-	55	27
1620	7		
1640	7		

8. CONCLUSIONS

The conclusions to the identification of problems in Sowerby Bridge can be considered in two parts. Firstly, the method used to elicit the problems, secondly the problems elicited and their importance and extent. Five different groups of people were approached for their views on problems in Sowerby Bridge - pedestrians, retailers, workers, road users and specific interested parties. Views were elicited using either a questionnaire (face to face), a self completion questionnaire or an interview. The self completion questionnaire was generally more satisfactory than the on-street interview, in producing detailed comments upon problems. In part this may have been due to the type of people approached by either method - the self completion questionnaire being used for retailers and workers. The face to face interview provided the most detailed views but is resource-intensive. It was concluded that if a study is unaware of the problems in a town and wishes to contact a large number of people in an area for the sake of representativeness then a short on-street questionnaire approach is adequate. If a more detailed understanding and elaboration of problems is required then either a self-completion or face to face interviews should be conducted.

The main problems identified in Sowerby Bridge were difficulty crossing the A58 (pedestrians); customer access - 'severence' (retailers); stop-start driving (road-users; noise in buildings (workers/retailers); and appearance of Wharf Street/Town Hall Street (all groups). The most extensive problem in Sowerby Bridge in terms of the number of people allocated is pedestrian safety/difficulty crossing the road and congestion/delays for road-users.