Consumer Preferences in Urban Buses and Bus Services, Part C - Household Survey

Report

This Report presents the household part of the results of a consumer preference survey into bus design and bus service characteristics. The survey was conducted by the BTE together with the Metropolitan (Perth) Transport Trust, and consisted of two parts: household interviews carried out by the Australian Bureau of Statistics; and questionnaires distributed to travellers using the Perth suburban bus service.

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CONSUMER PREFERENCES IN URBAN BUSES AND BUS SERVICES

PART C
HOUSEHOLD SURVEY

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INTRODUCTION

The results of the household phase of the study are presented in this section of the report.

The household survey was conducted over two weeks in mid September 1975. The survey conducted by the ABS on behalf of the MTT and BTE was preceeded by a pilot study in August. The pilot survey was used to discover ambiguities and difficiencies in proposed questionnaires and to evaluate survey techniques.

Unlike the onboard survey the household phase survey is purely attitudinal. Respondents were asked along with personal and trip making information to express their attitudes on aspects of buses and bus services in the form of ranking, rating and preference questions.

Surveys of this type may be criticised on the grounds that there is no guarantee of a nexus between stated attitude and behaviour. Another problem is that respondents tend to associate the option or characteristic being evaluated with the option or characteristic as incorporated in the bus system they are familiar with. A further problem is that preferences are also influenced by the social and climatic conditions prevailing in the survey region.

Details of the survey are presented in Chapter 1 and the results in Chapter 2. The results in Chapter 2 are summarised from the detailed analyses presented in Annex CC and CE. Other information pertinent to the analysis presented in the Annex are details of:

- Survey forms
- Sample characteristics
- Respondent travel characteristics
- Survey data computer file format
- BTE suburb directory

CHAPTER C 1

DETAILS OF THE SURVEY

PERTH CHARACTERISTICS

Details of the Metropolitan (Perth) Passenger Transport Trust (MTT) operations as they affected the onboard survey are set out in Chapter B1. While the household survey is purely attitudinal, the response to the factors considered in a survey of this type are conditioned by the existing bus service characteristics. Consequently information contained in Chapter B1 and Annex BE is relevant and should be considered when reviewing the survey results. Similarly, responses to aspects of bus design related to temperature control will be conditioned by the Perth climate. Thus, any attempts to translate results of the survey must take due account of the above externalities.

In summary the following are pertinent:

- Perth is located at latitude 32^{o} 00's and a longitude of 115^{o} 50'E. At the 1971 Census, the area of the Perth Statistical Division was approximately 564,000 hectares and its population was 703,199;
- The climate is temperate seaboard, with an annual mean temperature of 18.1C and annual mean minimum and maximum temperatures of 13.1C and 23.1C respectively. The annual mean rainfall is 883 mm.
- The city and its environs are serviced by an extensive system of roads, bus services and railways along several well defined corridors. There are 1345km of bus routes on which 58,765,307 passengers were carried during the 1973-1974 fiscal year.

SURVEY SAMPLE

As the household survey phase was conducted in association with the onboard survey, the sample was limited to the Perth Statistical Division. The division contains 1034 Census Collector Districts (CCD's), of which 81 were selected.

The Australian Bureau of Statistics selected the sample CCD's and starting points within the CCD on a random basis and set the sample interval to provide a minimum of 1,000 returns. In setting the sample size to achieve the specified number of returns, due account was taken to allow for refusals, absentees and persons and dwellings out-of-scope. Persons in scope included all those present in the household on the night before the first approach who were fifteen years or older. Households in scope included all private dwellings including private co-operative boarding houses, excluded commercial boarding houses.

A map showing the distribution of sampled CCD's is presented in Figure C1.1.

PILOT SURVEY

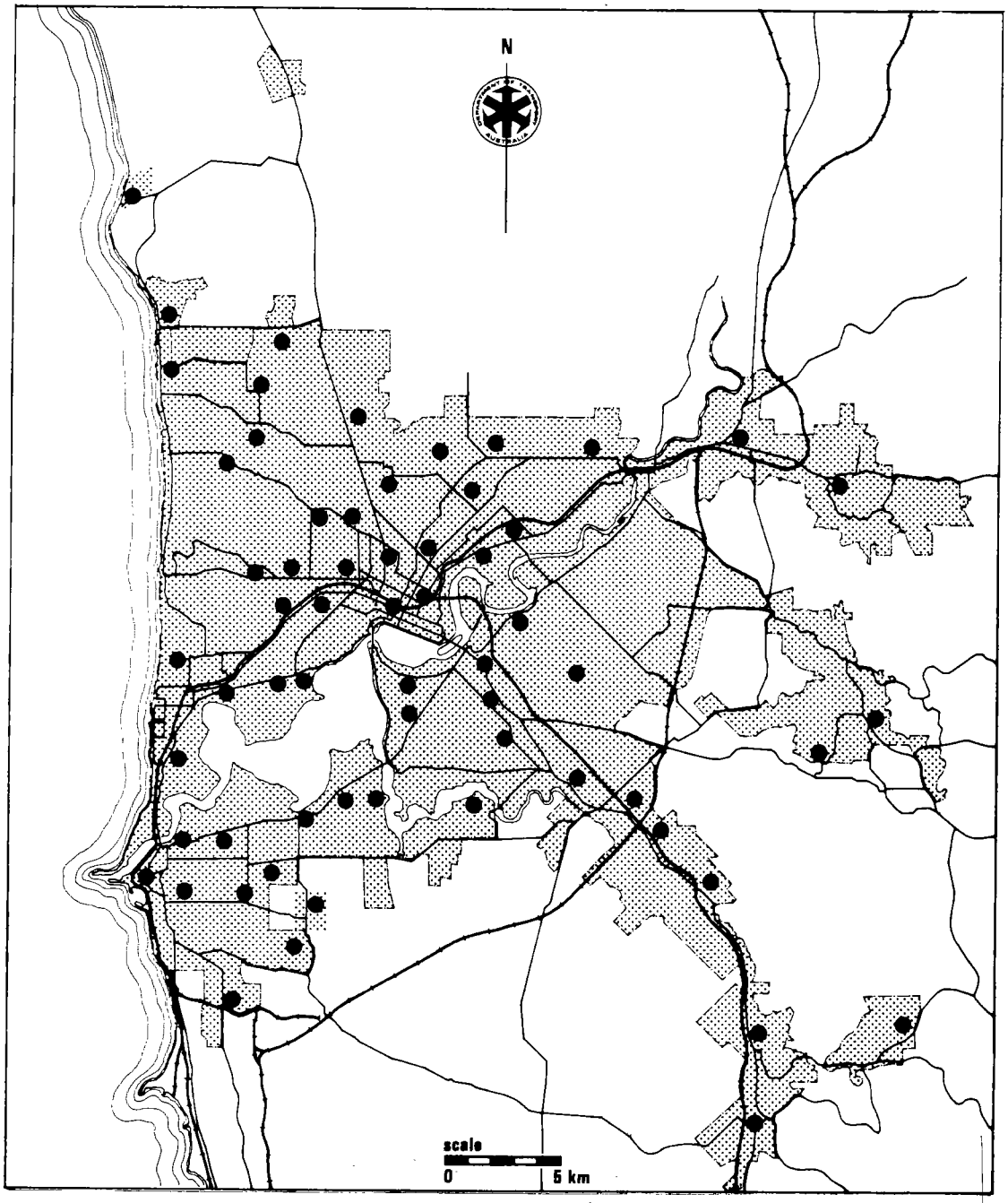
A pilot survey was conducted during the week 19 to 26 July 1974, with ten ABS interviewers. Four separate form types were evaluated; three involved interview techniques and one was a self-administered questionnaire.

The results of the survey indicated that contrary to the experience gained from the Brisbane Survey, the interview methods gave superior responses to those of the self-administered method. In addition, the interview from employing shuffle board techniques for ranking questions and prompt cards for rating questions was better received by the respondents; was easier to manage, and consequently, was adopted. Other significant refinements suggested by the results were:

- The adoption of a descriptive seven point ranking scale to be numerically coded by the interviewer and not the respondent; and,
- Reworded questions which eliminated ambiguities and possible confusion.

MAIN SURVEY

The survey proper was conducted during the period 9 to 26 September, 1974, by a team of 14 ABS interviewers



NOTE : Sample CCDS are shown thus ●
Sampled CCDS not shown are : Medina , Parmelia , Rockingham , Jarrahdale

Urban Areas are shown shaded

FIGURE C1.1
DISTRIBUTION OF SAMPLED CCDS WITHIN PERTH STATISTICAL DIVISION

(some of whom had been involved on the pilot survey). The interviewers were supplied with dwelling control forms (see Annex CA) which contained the addresses of the households to be sampled. Block plans with the locations of households were also supplied.

The demographic details of the household inhabitants was recorded by the interviewer on the dwelling control form. This information was then transferred to the personal schedule before each of the eligible respondents was interviewed. The interviewer then questioned the interviewees on an individual basis preferably in the absence of the other potential respondents. A summary of responses to the survey is presented in Table C1.1

TABLE C1.1 - RESPONSE TO THE SURVEY

Households in sample	548
Vacant out-of-scope households	92
Household refusals	39
	679
Schedules not obtained from eligible respondents	96
Schedules completed but unusable	0
Schedules satisfactorily completed	935
	1031

The overall response rate was 91 percent(1) which is equivalent to 1.70 returns per dwelling total of 1.88 returns per sampled dwelling. The above ratios represent 74 and 81 percent respectively of the approximate average number of eligible persons per dwelling in the Perth Statistical Division (an average of 3.33 persons per dwelling and 69 per-

(1) Percentage of completed schedules to total number of known eligible persons.

cent of persons in scope; i.e. over the age of 15 years, giving 2.30 eligible persons per dwelling).

These response rates are slightly higher than those obtained for the Brisbane study (probably attributable to the interview techniques adopted), and are favourable in consideration of the length of the interview. A majority of the respondents were enthusiastic and showed interest in the aims of the survey.

SURVEY QUESTIONNAIRE

The questionnaire is described in Annex CA. The questionnaire consists of sections covering the following areas of information:

Section 1: contains questions(1) relating to the respondents' relation to household head, sex, age and marital status (Questions 1-4)

Section 2: relates to the respondents' trip habits including the modes of transport used for various trip tasks, the number of bus trips made each week, and the respondents driving licence status which has a bearing on the above (Questions 5-7).

Section 3: contains two sets of bus design and bus service and travel characteristics. Respondents were asked to assign a ranking relative to the other characteristics in each set. Shuffle boards were used to assist the respondents in ranking (Questions 8-9).

Section 4: contains thirteen sets of design options which might be available as methods of achieving specific design objectives. For each option, respondents were requested to rank the option between highly undesirable through uncertain or indifferent to highly desirable. The respondents were unaware of the numeric ranking scale; the interviewer was responsible for entering the

(1) The reply to these questions was transferred from the dwelling forms.

corresponding ranking number on the questionnaire. The ranking scale used was: highly desirable (1), uncertain or indifferent (4), with highly desirable (7). Flash cards were used to provide a visual list of the design option in each set or illustrations where pictures are used to show the option (Questions 10-22).

Section 5: contained questions relating to bus exteriors, interiors and seat colour schemes. Respondents were asked to indicate their preference of colour and its shade. Provision was made for a colour preference not listed and for indicating no preference at all. Similarly, provision was made for indicating no preference in shade (Questions 23-25).

Section 6: finally requested information relating to the respondents' main activity during the previous week and the respondents' gross weekly or annual salary (Questions 26-27).

CHAPTER C2

RESULTS

PRELIMINARY PROCESSING

Completed schedules were received as a group from each household together with their Dwelling Control Form. Each dwelling was given a number which was stamped onto the Control Form and the Schedules associated with the dwelling. As the schedules were to be key punched onto two data cards, cross reference information (dwelling number, person number and card number), was added at the beginning of the schedule and at the record immediately following the last entry on the first card.

The information on the Dwelling Control Forms was transferred to the BTE Dwelling Control Data Form together with information on response rates.

The information obtained on the Personal Schedules and the Dwelling Control Data Forms was key punched directly onto data cards and spooled on magnetic tape for editing and processing. Preliminary computer processing consisted largely of checking that codes were in scope and consistent where interrelationships existed. Cross references between the information on the schedules and dwelling forms were also checked for consistency.

Finally a fully edited magnetic tape was created for analysis. A complete description of the tape records, together with associated notes on coding conventions used in the records, is given in Annex B6.

DETAILED RESULTS AND ANALYSES

The results of this phase of the study fall into four main categories:

- Analysis of sample characteristics (sections 1 and 6 of the questionnaire) including age, occupation, marital status, income distribution and household size; the results are reported in Annex CB

- Analysis of travel characteristics (section 2 of the questionnaire) including driving licence status, mode choice for various trip tasks, and number of bus trips usually made each week; the results of this analysis appear in Annex CC
- Analysis of the results of the two ranking questions (section 3 of the questionnaire) which relate to bus design features and service characteristics; results are presented in Annex CD
- Analysis of the rating scores assigned to the 63 options considered for the 13 design objectives (section 4 of the questionnaire); results presented in Annex CE.

In addition, a brief analysis of preferences for interior and exterior colour schemes is presented in Annex CF.

Variational analyses were performed on the results of the rating questions to observe response differences by respondents:

- Sex
- Age group
- Licence status
- Bus use frequency
- Occupation group
- Income group

Statistical tests were performed on the results of the ranking and rating question results to determine the significance of departures from statistically predicted or assumed results.

BUS DESIGN AND TRAVEL CHARACTERISTICS

Respondents were asked to rank two sets of characteristics. The first set contained 12 aspects of bus design, while the second set, containing 10 items, was concerned with bus service characteristics.

Travelling comfort and seat availability were ranked almost equally as the most desirable in the first set.

Bus cleanliness and ride smoothness were ranked as next important. Fare reduction was considered to have a low importance, with only interior style, colour scheme and exterior style ranking lower. It is significant to note that reduction in travel time was ranked eighth whereas frequent service was ranked first in the second question indicating an appreciation by respondents that waiting time is an important part of total trip time, and that a reduction in waiting time is preferable to a reduction in in-vehicle time.

As stated above service frequency was ranked as most important of the service characteristic set contained in the second question. Reliability of service and service safety were ranked fourth with a somewhat lower rank total. Fare reduction of vandalism and the provision of timetables ranked lowest.

Tables C2.1 and C2.2 show the ranking for the characteristics presented in the first and second set respectively. The rank total for each characteristic is also given, and within its own set is inversely related to the importance of the characteristic.

The figures presented in Tables C2.1 and C2.2 are plotted in Figures C2.1 and C2.2 respectively.

TABLE C2.1 - BUS DESIGN CHARACTERISTIC RANKING (1ST QUESTION)

Characteristic	Rank Order	Rank Total[a]
Seat availability	1	4018
Travel comfort	2	4065
Cleanliness	3	4330
Quiet and smooth ride	4	4658
Entry and exit	5	4974
Light, etc. control	6	5371
Pollution control	7	5550
Time reduction	8	5602
Fare reductions	9	6136
Interior style	10	8417
Colour scheme	11	9306
Exterior style	12	9723

(a) The lower the rank total the higher the ranking

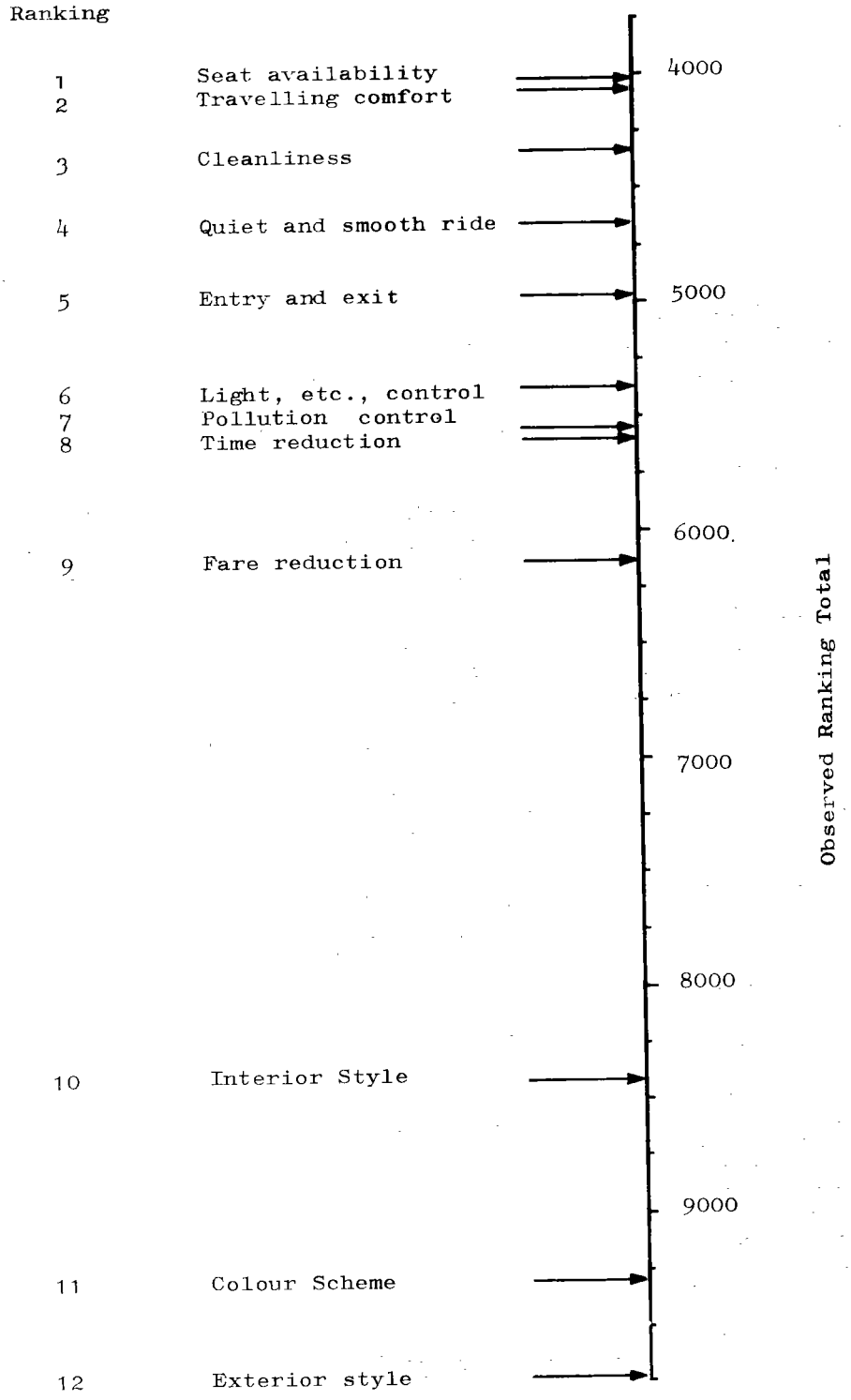


FIGURE C2.1
ORDER OF IMPORTANCE, 1ST RANKING QUESTION

TABLE C2.2 - BUS SERVICE AND TRAVEL CHARACTERISTIC RANKING 2ND QUESTION

Characteristic	Rank Order	Rank Total[a]
Frequent service	1	3449
Safety	2	3856
Reliable service	3	3867
Seat availability	4	4683
Distance to stops	5	5335
Shelters	6	5435
Express buses	7	5506
Fare reduction	8	5790
Reduced vandalism, etc	9	6532
Timetables	10	6642

(a) The lower the rank total the higher the ranking.

The results of this section of the questionnaire are remarkably similar to those obtained for rail car design options in the Brisbane Survey. Comfort and service frequency characteristics are valued ahead of reductions in fare indicating the possibility of recovering the cost of improvements to passenger comfort and service frequency by increased fares.

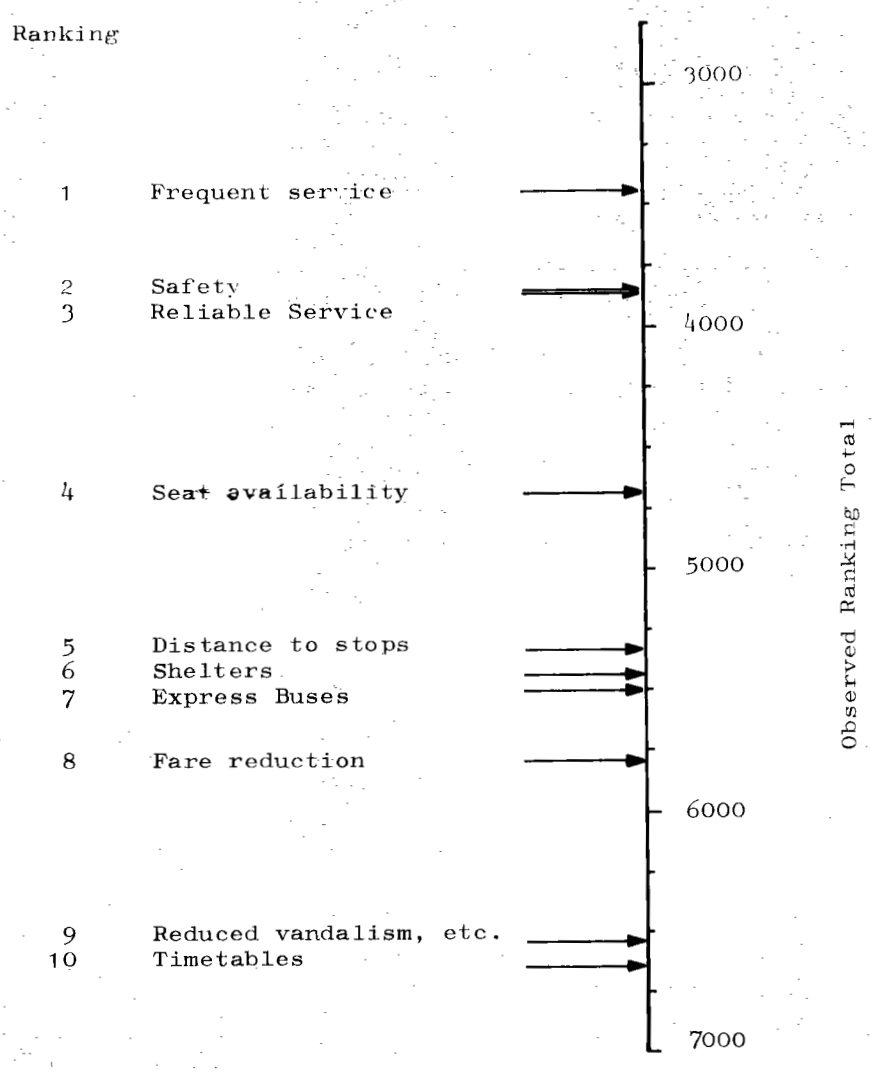


FIGURE C2.2
ORDER OF IMPORTANCE, 2ND RANKING QUESTION

DESIGN OPTIONS

Sixty three separate design options were presented for assessment in the survey questionnaire. The design options were grouped into methods of achieving thirteen service improvements objectives:

- Bus cleanliness
- Quiet and smooth ride
- Reduction in travel time
- Ease of entry
- Increasing seat capacity
- Control of light, temperature and ventilation
- Exterior design
- Seat arrangement
- Seat design
- Supports for standing passengers
- Shelter design
- Reduce vandalism and improve security
- Providing time table information

Respondents were asked to rate each available design option in terms of its desirability and implied suitability in achieving the appropriate design objective. A seven point rating scale(1) was used to grade responses. It would be possible for an individual to rate each option equally, implying an equal amount of preference for each option.

While mean response is one method of measuring the desirability or effectiveness in fulfilling the objectives, a further appreciation of the respondents' feelings on each option may be obtained from the response distributions presented in Annex CE. Another point is that while a comparison between methods presented for each objective using the mean response is expedient, it is not statistically rigorous.

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(1) The rating scale used was: highly undesirable (1), undesirable (2), slightly undesirable (3), uncertain or indifferent (4), slightly desirable (5), desirable (6), highly desirable (7).

As in the ranking questions respondents placed most emphasis on options relating to comfort and reduced travel times. In the following paragraphs, those objectives which received the highest response, are discussed in relation to the suggested methods of achieving them.

A list of the options and their ratings are presented in Table C2.3.

Bus Clearliness

Frequent cleaning of seats and interior panels together with the provision of rubbish containers in buses and the use of stain proof materials were rated higher than 'desirable'. The remaining options were all rated higher than slightly desirable. The average rating for the provision of rubbish containers is depressed by a significant number of respondents considering the option as undesirable who were possibly concerned with smells or the practicability of their use.

Quiet and Smooth Ride

Smooth starting and stopping was rated as the most effective way of achieving this objective. This is a low cost option, costing almost zero if driver training is used to effect this option. Good suspension and springing, regular attention to rattles and squeaks and a quiet engine and gearbox were also rated higher than 'desirable'. All but one of the remaining options were rated highly. The exception, windows which cannot be opened, received a rating of 2.66. This result is possibly attributable to the warm climatic conditions in Perth and the opening-window arrangement incorporated in existing MTT buses.

Reduction in Travel Time

A reliable service, i.e. with buses running on time, was considered the most desirable way of achieving reduced travel times. Frequent bus services together with close route spacings, and express services, were also rated highly.

TABLE C2.3 - RESPONSE TO DESIGN OPTIONS

Objective	Method	Order	Mean Response
BUS CLEANLINESS	Frequent Cleaning of Seats and Interior Panels	1	6.46
	Provision of Rubbish Containers in Buses	2	6.26
	Use of Stain Proof Materials	3	6.02
	Regular Inside Painting	4	5.68
	Frequent Outside Cleaning	5	5.35
	Regular Outside Painting	6	5.24
	Colours Which Do Not Show Dirt	7	5.16
	Rubbish Collection between Trips	8	4.99
QUIET AND SMOOTH RIDE	Smooth Starting and Stopping	1	6.43
	Good Suspension and Springing	2	6.29
	Regular Attention to Rattles and Squeaks	3	6.24
	Quiet Engine and Gearbox	4	6.12
	Non-slip Seat Materials	5	5.67
	Softly Padded Seats	6	5.49
	Sound Proofed Walls and Floors	7	5.34
	Firmly Padded Seats	8	4.65
	Windows which cannot be Opened	9	2.66
REDUCTION IN TRAVEL TIME	Reliable Service (Buses on Time)	1	6.54
	Frequent Bus Service	2	6.30
	Close Route Spacing	3	5.84
	Express Bus Service	4	5.79
EASE OF ENTRY	Easily Operated Doors	1	6.25
	Low Steps	2	6.18
	Quick Method of Paying Fare	3	6.14
	Wide Steps	4	5.97

TABLE C2.3 - RESPONSE TO DESIGN OPTIONS (Cont.)

Objective	Method	Order	Mean Response
INCREASING SEAT CAPACITY	More Buses During Peak Hours	1	6.08
	More Seats and Less Standing Room	2	5.62
CONTROL OF LIGHT TEMPERATURE AND VENTILATION	Insulation Against Heat and Cold	1	5.87
	Opening Windows	2	5.79
	Roof Ventilators	3	5.65
	Good Artificial Lighting	4	5.58
	Tinted Window Glass	5	5.43
	Large Windows	6	5.25
	Air Conditioning	7	5.01
	Fans	8	4.99
	Heating in Winter	9	4.74
	Pull Down Blinds	10	4.38
	Transparent Roof Panels	11	3.65
EXTERIOR DESIGN	Bus Design 1	1	5.44
	Bus Design 3	2	5.01
	Bus Design 2	3	4.73
SEATING ARRANGEMENT	Interior Layout 1	1	6.14
	Interior Layout 2	2	5.22
	Interior Layout 3	3	2.95
SEAT DESIGN	Seat Design 1	1	6.12
	Seat Design 2	2	4.35
	Seat Design 3	3	3.33
SUPPORTS FOR STANDING PASSENGERS	Handgrip Design 1	1	5.35
	Handgrip Design 3	2	5.13
	Handgrip Design 2	3	4.02
SHELTER DESIGN	Shelter Design 2	1	5.63
	Shelter Design 1	2	4.34

TABLE C2.3 - RESPONSE TO DESIGN OPTIONS (Cont.)

Objective	Method	Order	Mean Response
REDUCE VANDALISM AND IMPROVE SECURITY	Conductors on Bus	1	5.50
	Radio Communication with Base	2	5.47
	Checks by Uniformed Inspectors	3	5.46
	Checks by Plain-Clothes Inspectors	4	4.59
	Closed Circuit Television on Buses	5	3.23
PROVIDING TIME-TABLE INFORMATION	Easily Remembered Timetables	1	5.85
	Timetables at Bus Stops	2	5.78
	Timetables Supplied by Drivers	3	5.69
	Timetables on Buses	4	5.34

Ease of Entry

All the options offered as solutions to this objective were rated highly. All are low cost items although they may involve a reduced passenger capacity in buses incorporating them.

Increasing Seating Capacity

Respondents rated options which provided more seating capacity and more seats to travellers as desirable.

Control of Light and Ventilation

All the options presented for this objective were rated as slightly desirable, except for transparent roof panels which were rated as slightly undesirable. None of the options were rated higher than desirable and many exhibited bimodal responses indicating uncertainty (perhaps through a lack of technical knowledge) about the option offered.

Exterior Design

The three designs depicted for this option resembled approximately:

- Bus Design 1 - recent MTT models
- Bus Design 2 - NSWPTC Leyland Leopard
- Bus Design 3 - Washington DC tourist coach (a futuristic design in comparison with 1 and 2)

The bus resembling the MTT models was most favoured. Bus design 3 was next favoured and bus design 2 was rated last with an indifferent or uncertain rating.

Seating Arrangement

Bus design 1 which had all seats forward facing received the highest rating. The other two designs which had a decreasing number of seats received lesser ratings with design 3 having the least number of seats, rated as slightly undesirable with a mean rating of 2.95.

Seat Design

The seat design options received response ratings proportional to their apparent comfort.

Supports for Standing Passengers

The support depicted in design 1; a waist height grip incorporated with the back of the seat, was most favoured. The other designs were rated in accordance with the height of the support, with overhead straps receiving the lowest rating score.

Shelter Designs

The shelter affording the better weather protection was rated highest.

Reduce Vandalism and Improve Security

Conductors on buses was rated highest of the options considered. Checks by uniformed inspectors was rated as more effective than checks by plain-clothes inspectors. Closed circuit television was rated as slightly undesirable.

Providing Timetable Information

All the options were rated above slightly desirable with easily remembered timetables receiving the highest rating.

ANNEX CA

HOUSEHOLD SURVEY FORMS

Three forms were used in the household survey; a Dwelling Form, a Personal Schedule and Dwelling Control Data Form. Several prompt cards relating to the Personal Schedule are illustrated.

DWELLING FORM

The interviewers were issued with one Dwelling Form per sampled household which listed on the first page the household address, further location information where necessary; e.g., where street numbering was non-existent or doubtful, and Statistical area information as follows:

- Local Government Area
- Local Government Area Part
- Collector District
- Primary Sampling Unit
- Block number
- Dwelling number.

The following set of introductory remarks intended to prompt the interviewer and be used as guidelines for the explanation of the survey origins and aims were also included:

NORMAL INTRODUCTION - (NOTE THAT YOU REPRESENT THE METROPOLITAN TRANSPORT TRUST AND THE BUREAU OF TRANSPORT ECONOMICS)

THE BUREAU OF TRANSPORT ECONOMICS AND THE METROPOLITAN TRANSPORT TRUST ARE CONDUCTING A SURVEY TO FIND OUT SOME OF THE ATTITUDES THAT BUS TRAVELLERS AND OTHER PEOPLE HAVE TO BUS DESIGNS AND BUS SERVICES.

THE RESULTS OF THE SURVEY COULD HAVE A CONSIDERABLE INFLUENCE ON FUTURE BUS DESIGN AND THE OPERATION OF BUSES.

I WOULD LIKE TO OBTAIN THE OPINIONS OF THE MEMBERS OF YOUR HOUSEHOLD ON THESE SUBJECTS?

ALL DETAILS THAT YOU GIVE TO ME WILL REMAIN STRICTLY CONFIDENTIAL.

Space was then provided for personal information about the household occupants. The information required was:

- Full name (optional)
- Relationship to head
- Sex
- Age last birthday
- Marital Status
- Whether respondent was in scope
- Date personal schedule obtained from respondent.

On the reverse side of the form a table was provided for the interviewer to log a summary of household calls which included the date and time of each call for each person. An area was also provided for the interviewers use to record notes and any comments made by the respondents.

PERSONAL SCHEDULE

Introductory Remarks

THE BUREAU OF TRANSPORT ECONOMICS AND THE METROPOLITAN TRANSPORT TRUST ARE CONDUCTING A SURVEY TO FIND OUT SOME OF THE ATTITUDES THAT BUS TRAVELLERS AND OTHER PERSONS HAVE TO BUS DESIGN AND BUS SERVICES.

THE RESULTS OF THE SURVEY COULD HAVE A CONSIDERABLE INFLUENCE ON FUTURE BUS DESIGN AND THE OPERATION OF BUSES.

COULD I HAVE YOUR OPINION ON THESE SUBJECTS?

Personal Information: Section 1

This information, personal particulars of the respondent, was transferred from the Dwelling Form to the Personal Schedule by the interviewer.

Question 1 - Relation to Head

1. Head
2. Spouse
3. Son/daughter
4. Brother/sister
5. Parent/in-law
6. Visitor
7. Other

Question 2 - Sex

1. Male
2. Female

Question 3 - Age

1. 00-04
2. 05-09
3. 10-14
4. 15-19
5. 20-29
6. 30-39
7. 40-49
8. 50-59
9. 60-69
10. 70 and over

Question 4 - Marital Status

1. Now married
2. Never married
3. Other

Questions relating to the respondents trip making habits: Section 2

I WOULD NOW LIKE TO ASK SOME QUESTIONS ABOUT YOUR METHODS OF TRANSPORT

Question 5 - Do you hold a current Driver's or Motor Cyclist's License?

1. Yes
2. No
3. Not eligible

Question 6 - What Transport methods do you usually use to travel to? - (prompt: we require details of

- all the methods used in a journey
- the number of times one method is used on a journey

(Issue prompt card 1)

Activity	Mode					
	Car(1)	Tram(2)	Bus(3)	Walk(4)	Other(5)	N/A (6)
Work						
School, Uni.						
Shopping						
Social or Recreat						
Other Activities						

For the typical journey for each type of activity, the number of times each mode was used was recorded by repeating the mode number - (1), (2), etc., the appropriate number of times. A four digit code was developed for each activity containing the appropriate codes, which would include zeros. As an example, a journey involving walking, car travel and walking would be coded 4140.

Prompt Card 1 is shown in Figure CA.1 below:

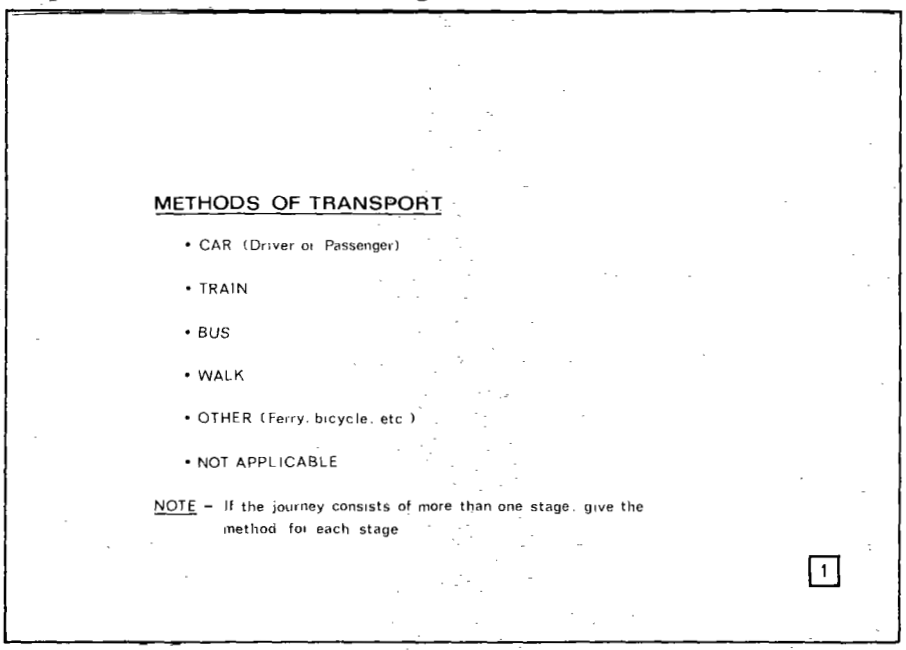


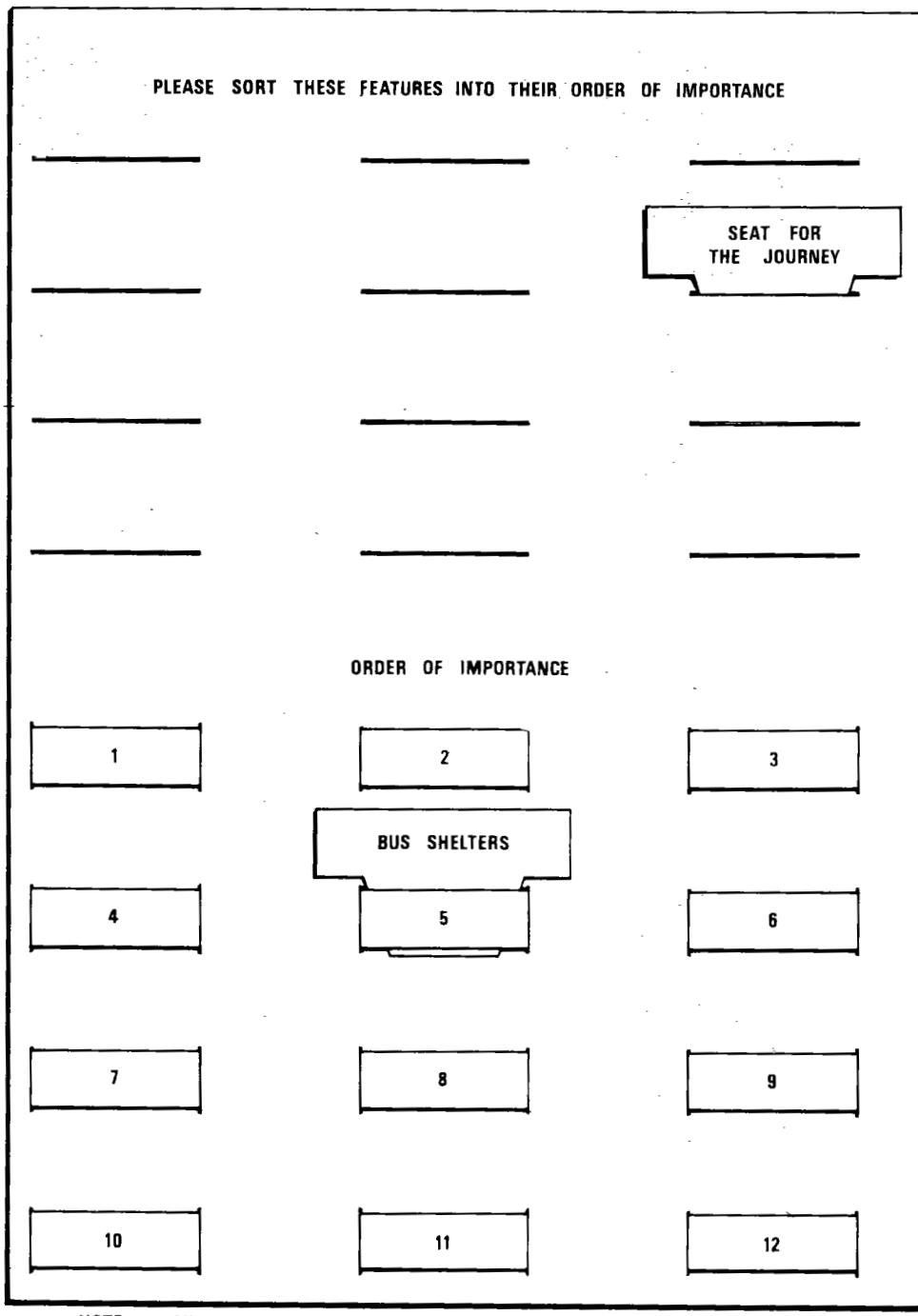
FIGURE CA.1

Question 7 - How many Bus Trips do you usually make each week?
(Prompt - a trip is a single one way journey)

Ranking Questions: Section 3

I WILL NOW GIVE YOU A BOARD WHICH SHOWS CERTAIN FEATURES OF BUS DESIGN AND TRAVEL. EACH FEATURE IS WRITTEN ON A LIFT OFF TAG - (ISSUE SUFFLE BOARD 1) WILL YOU CHOOSE THE FEATURE WHICH YOU THINK IS THE MOST IMPORTANT LIFT THE TAG OUT AND PLACE IT IN THE NUMBER 1 POSITION AT THE BOTTOM OF THE BOARD. CONTINUE SELECTING FEATURES IN THEIR ORDER OF IMPORTANCE DOWN TO THE FEATURE WHICH YOU CONSIDER IS THE LEAST IMPORTANT.

A pictorial representation of the type of shuffle board used is shown in Figure CA.2



NOTE : All the option tags (not shown here) were randomly positioned by the interviewer in the slots at the top of the board before the respondent sorted them into order immediately below .

FIGURE CA.2
RANKING QUESTION SHUFFLE BOARD

Question 8 - Bus design (first question)

Cleanliness

Quiet and Smooth Ride

Time Reduction

Entry and Exit

Seat Availability

Fare Reduction

Light, etc. Control

Exterior Style

Interior Style

Travelling Comfort

Pollution Control

Colour Scheme

I HAVE ANOTHER CARD SHOWING CHARACTERISTICS OF BUS TRAVEL. WILL YOU PLEASE SORT THESE IN A SIMILAR WAY TO THE LAST QUESTION. (Issue shuffle board 2)

Question 9 - Bus service and travel (second question)

Seat Availability

Frequent Service

Distance to Stops

Reliable Service

Safety

Fare Reduction

Shelters

Express Buses

Reduced Vandalism, etc.

Timetables

Rating Questions: Section 4

I AM NOW GOING TO ASK FOR YOUR ASSESSMENT OF A NUMBER OF FEATURES OF BUSES AND BUS SERVICES.

AS I READ OUT THESE FEATURES, I WANT YOU TO ASSESS HOW DESIRABLE OR UNDESIRABLE EACH FEATURE IS. SELECT YOUR ANSWERS FROM ONE OF THE SEVEN HEADINGS ON THIS CARD. (Issue prompt card 2)

Prompt Card 2 is shown in Figure CA.3 below:

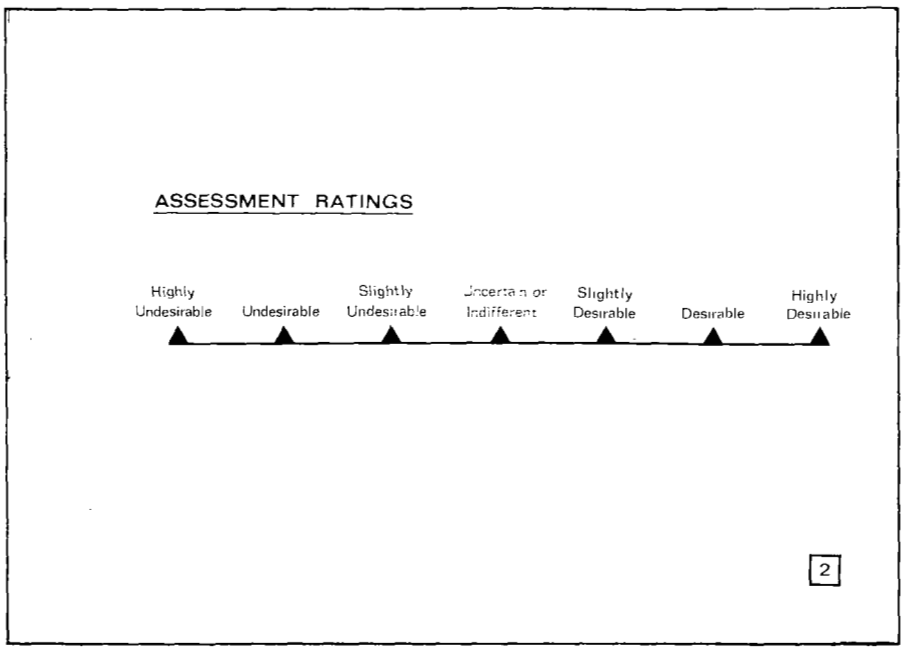


FIGURE CA.3

Question 10 - Firstly, I would like you to consider methods of achieving Bus Cleanliness. Please give me your assessment of - (Issue prompt card 3)

Prompt Card 3 is shown in Figure CA.4 below:

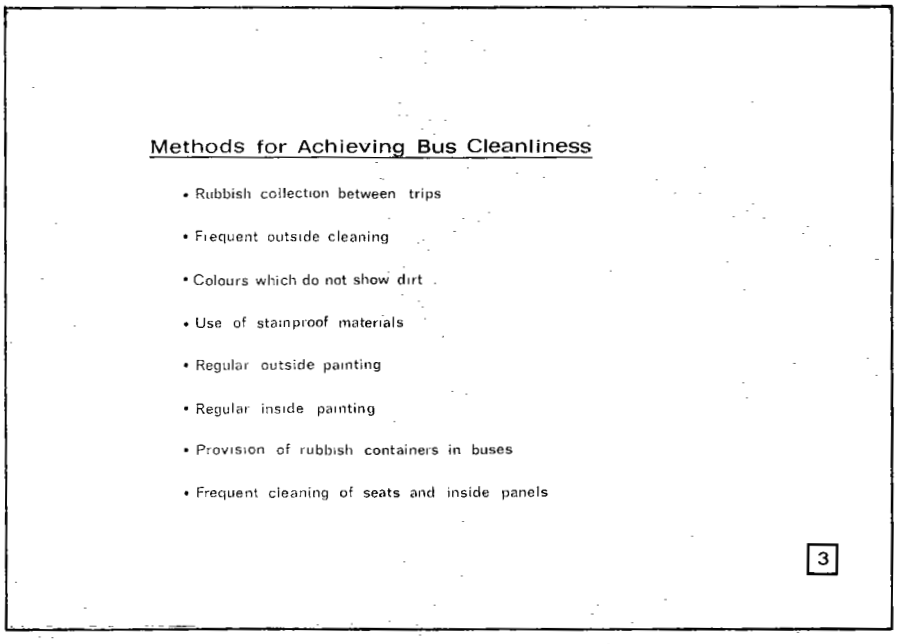


FIGURE CA.4

Question 11 - There are several ways to obtain a quiet and smooth ride in buses. What is your assessment of the following? - (Issue prompt card 4)

Prompt Card 4 is shown in Figure CA.5 below:

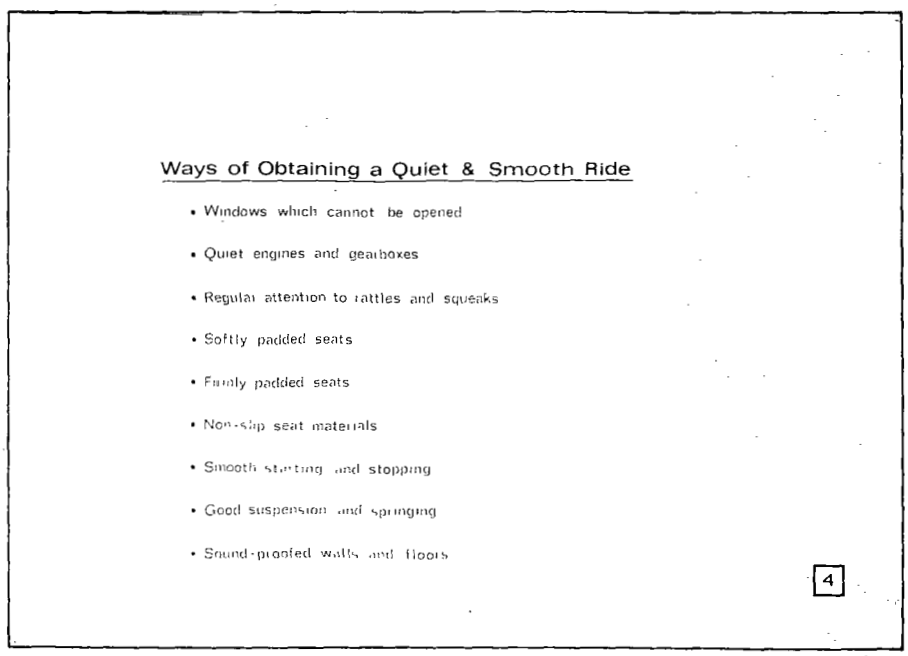


FIGURE CA.5

Question 12 - Will you now give me your assessment of the following ways to reduce travel time. (Issue prompt card 5)

Prompt Card 5 is shown in Figure CA.6 below:

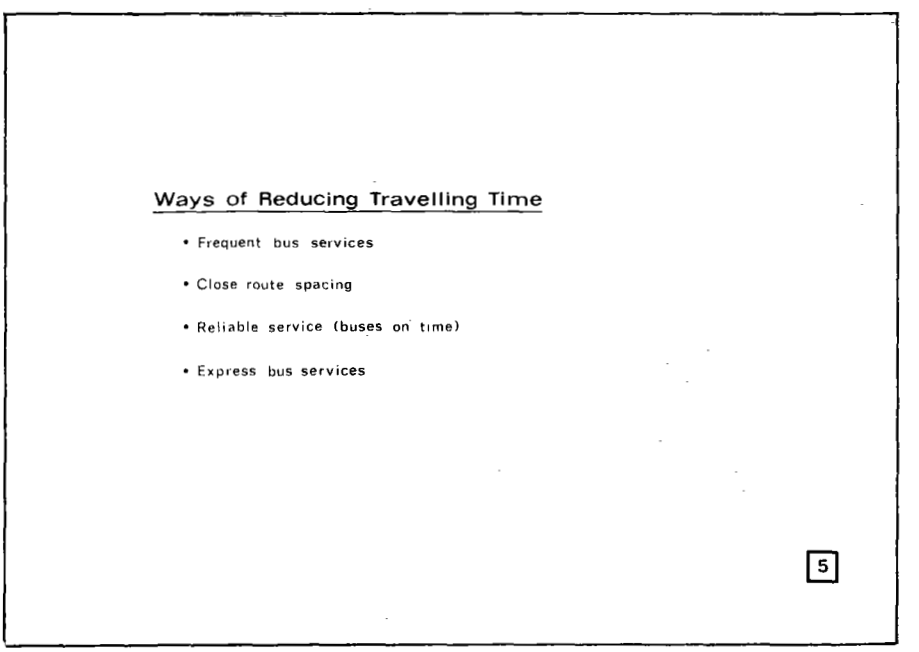


FIGURE CA.6

Question 13 - Another aspect of Bus Design is the arrangement made for passengers to enter and leave the Bus. How desirable are the following? - Issue prompt card 6)

Prompt Card 6 is shown in Figure CA.7 below:

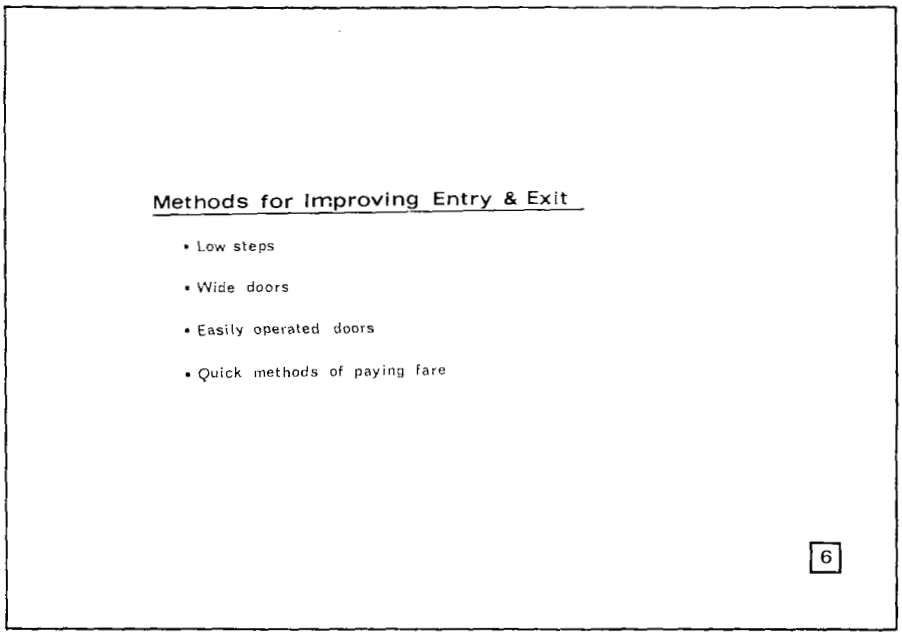


FIGURE CA.7

Question 14 - What is your assessment of the following ways to provide more seats for passengers? - (Issue prompt card 7)

Prompt Card 7 is shown in Figure CA.8 below:

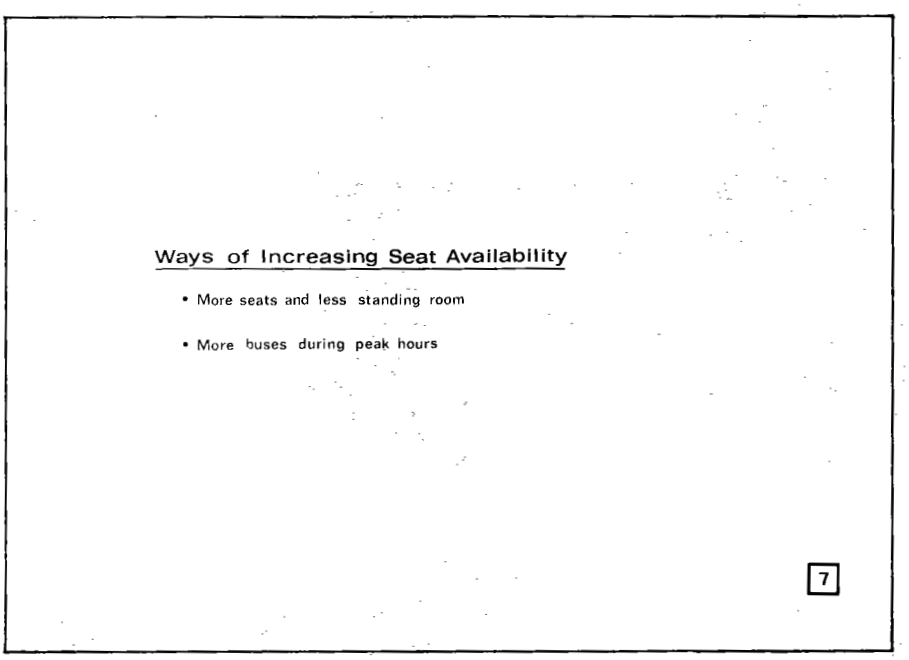


FIGURE CA.8

Question 15 - Now, will you please consider the effectiveness of the following ways to control the Light, Temperature and Ventilation in Buses - (Issue prompt card 8)

Prompt Card 8 is shown in Figure CA.9 below:

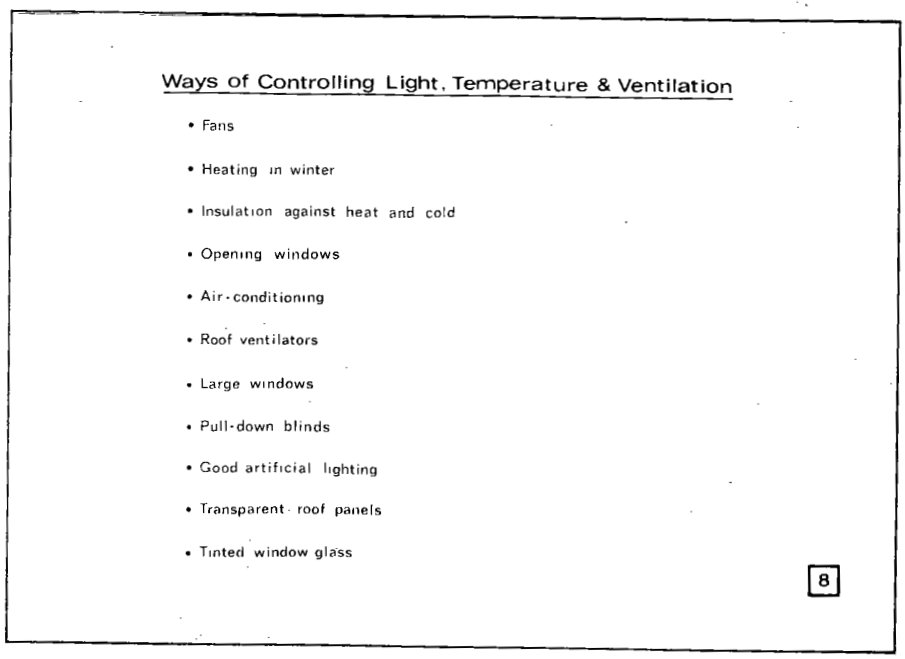


FIGURE CA.9

Question 16 - I will now show you a series of exterior designs for Buses - will you give me your assessment of each? - (Issue prompt card 9)

(a) Bus Design 1

(b) Bus Design 2

(c) Bus Design 3

Prompt Card 9 is shown below in Figure CA.10

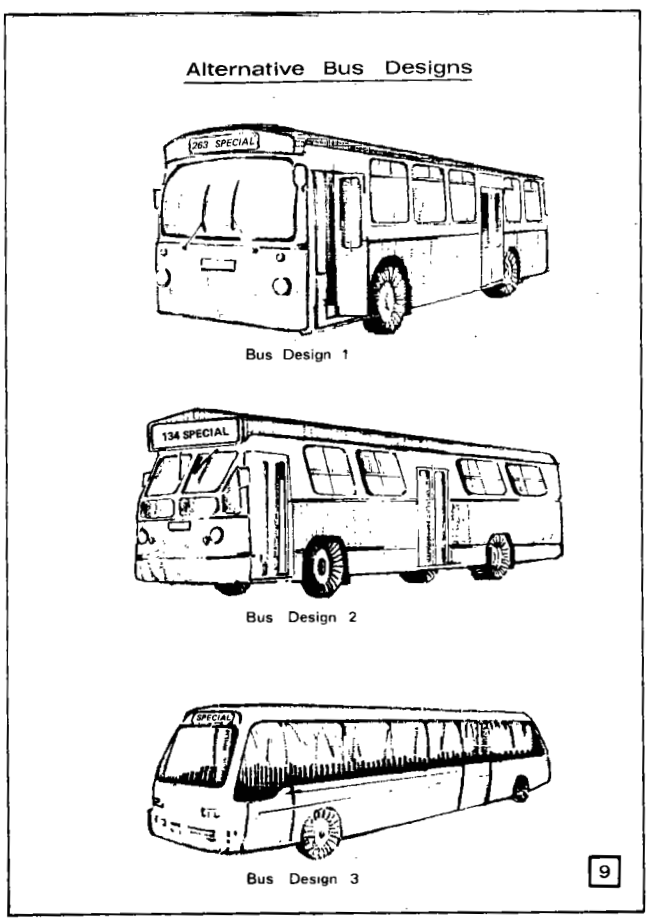


FIGURE CA.10

Question 17 - Would you now look at these three seating layouts for Buses, and give me your assessment of each. - (Issue prompt card 10)

(a) Interior Layout 1
(b) Interior Layout 2
(c) Interior Layout 3

Prompt Card 10 is shown in Figure CA.11 below:

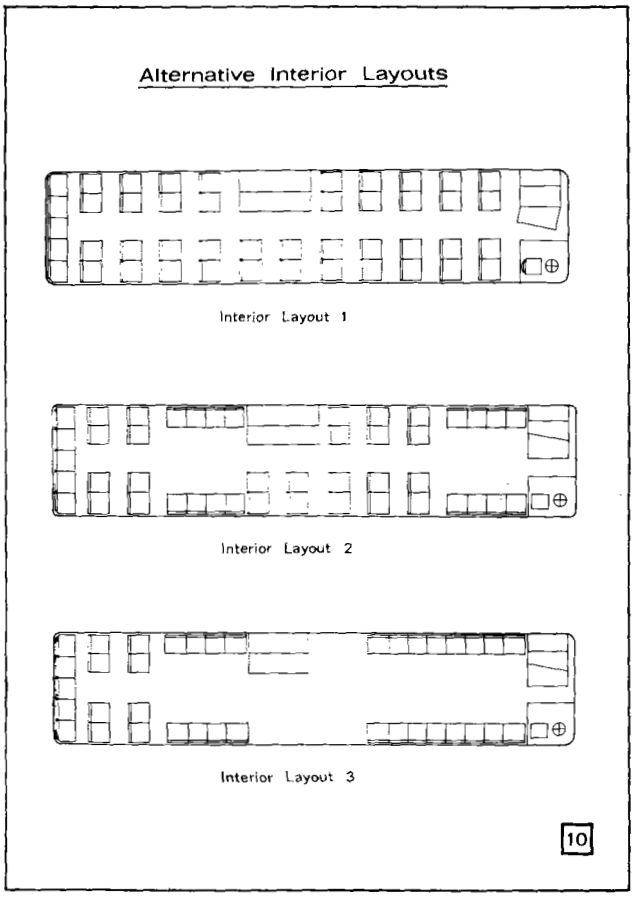


FIGURE CA.11

Question 18 - I am now going to show you three types of bus seats. Please tell me how desirable you think each one is - (Issue prompt card 11)

(a) Seat Design 1
(b) Seat Design 2
(c) Seat Design 3

Prompt Card 11 is shown in Figure CA.12 below:

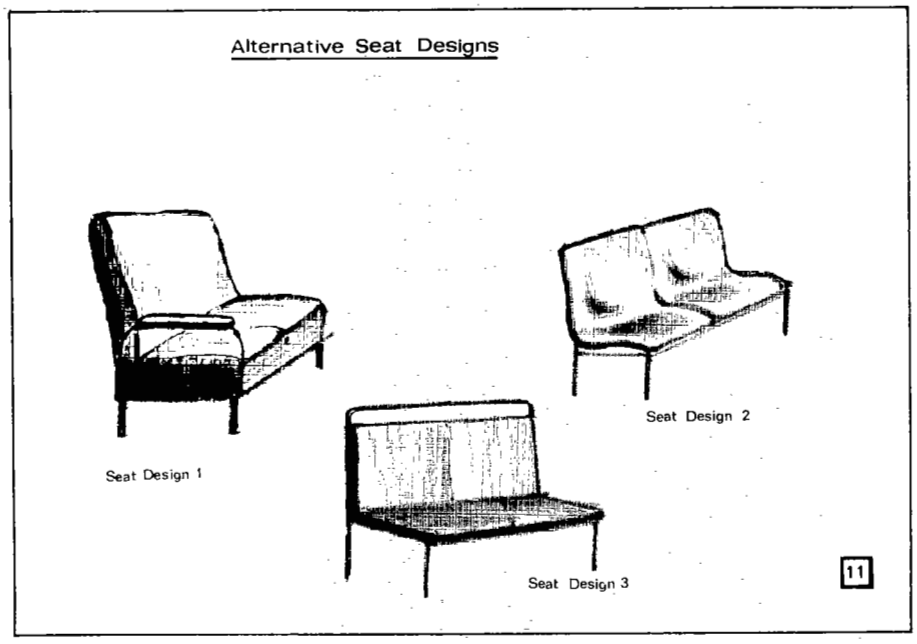


FIGURE CA.12

Question 19 - The next card shows three arrangements of bars and handgrips for standing passengers. Could you tell me your assessment of each - (Issue prompt card 12)

(a) Handgrip Design 1
(b) Handgrip Design 2
(c) Handgrip Design 3

Prompt Card 12 is shown in Figure CA.13:

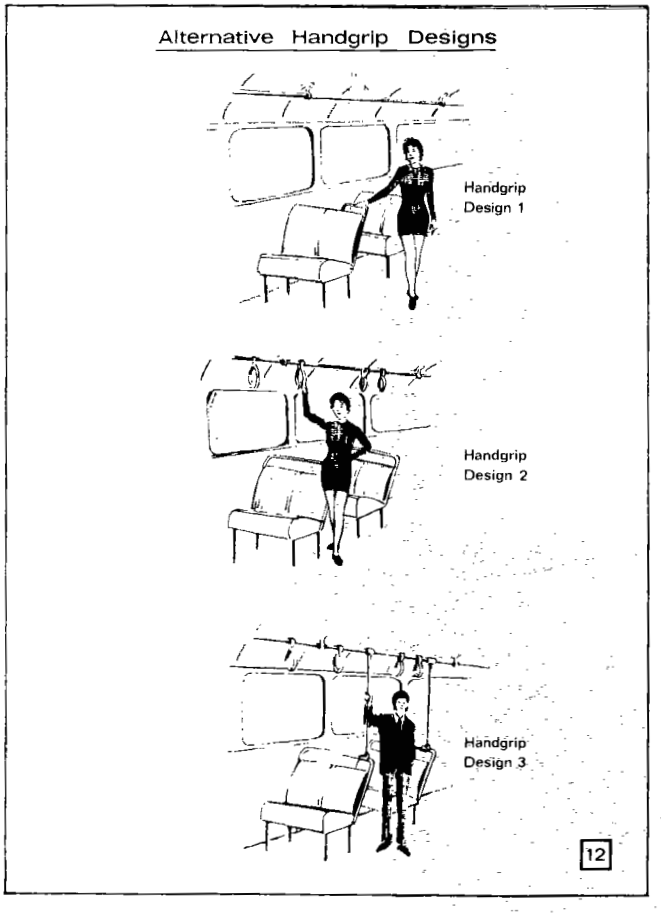


FIGURE CA.13

Question 20 - Please look at these two bus shelter designs and tell me your assessment of each - (Issue prompt card 13)

(a) Shelter Design 1

(b) Shelter Design 2

Prompt Card 13 is shown in Figure CA.14 below:

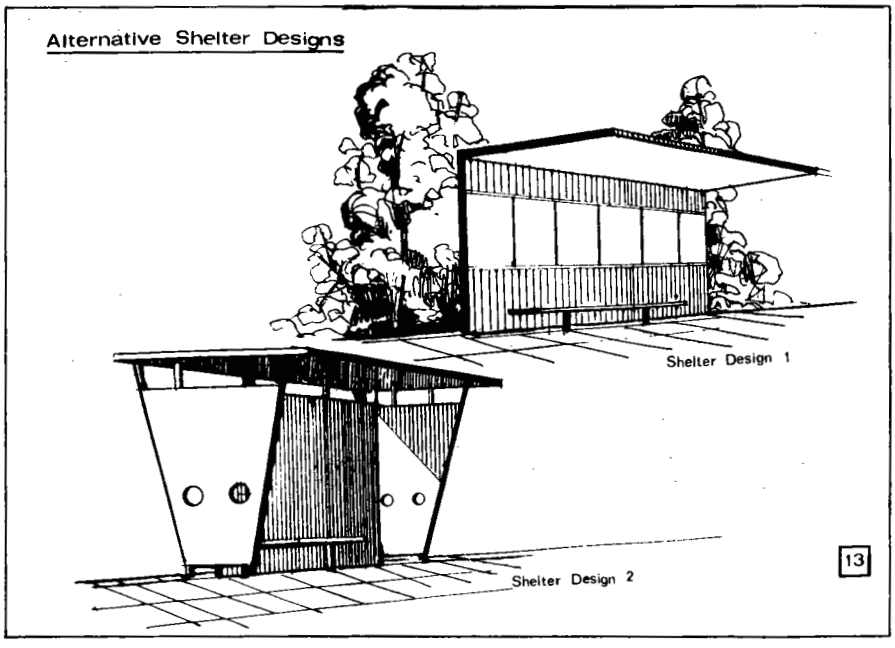


FIGURE CA.14

Question 21 - Now, if we can continue with your assessment of bus design and operation features, I would like you to consider the following methods to reduce vandalism and improve passenger security - (Issue prompt card 14).

Prompt Card 14 is shown in Figure CA.15 below:

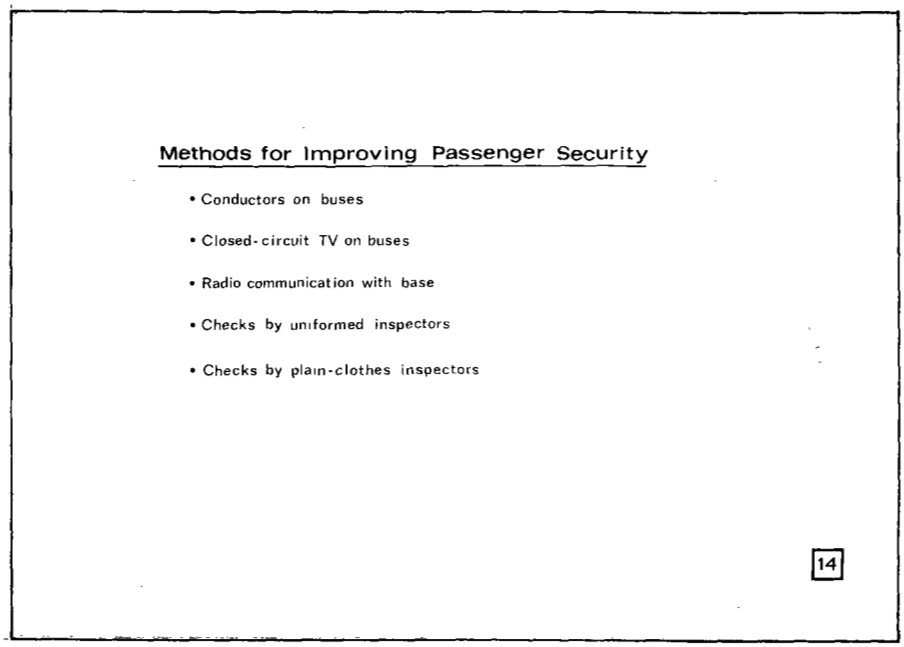


FIGURE CA.15

Question 22 - How do you assess the following ways of providing timetable information? - (Issue prompt card 15).

Prompt Card 15 is shown below in Figure CA.16:

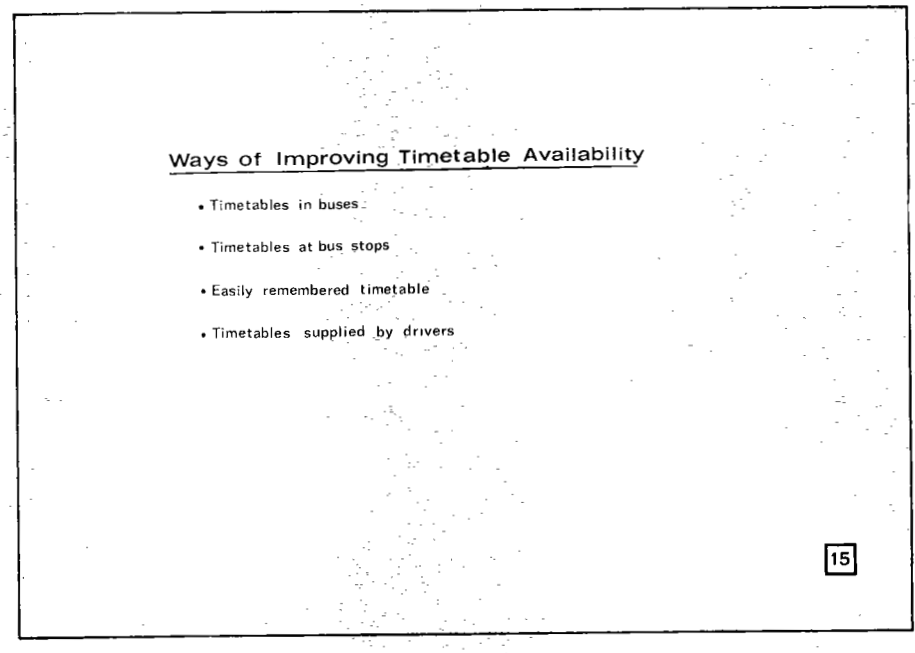


FIGURE CA.16

Colour Preference Questions: Section 5

WE WILL LEAVE THESE ASSESSMENTS OF BUS DESIGN FEATURES. I NOW WILL ASK YOU TO SELECT THE COLOURS AND SHADES THAT YOU PREFER FOR THE BUS EXTERIOR, INTERIOR AND SEATS - (Issue prompt card 16; not illustrated)

Prompt Card 16 is shown below in Figure CA.17:

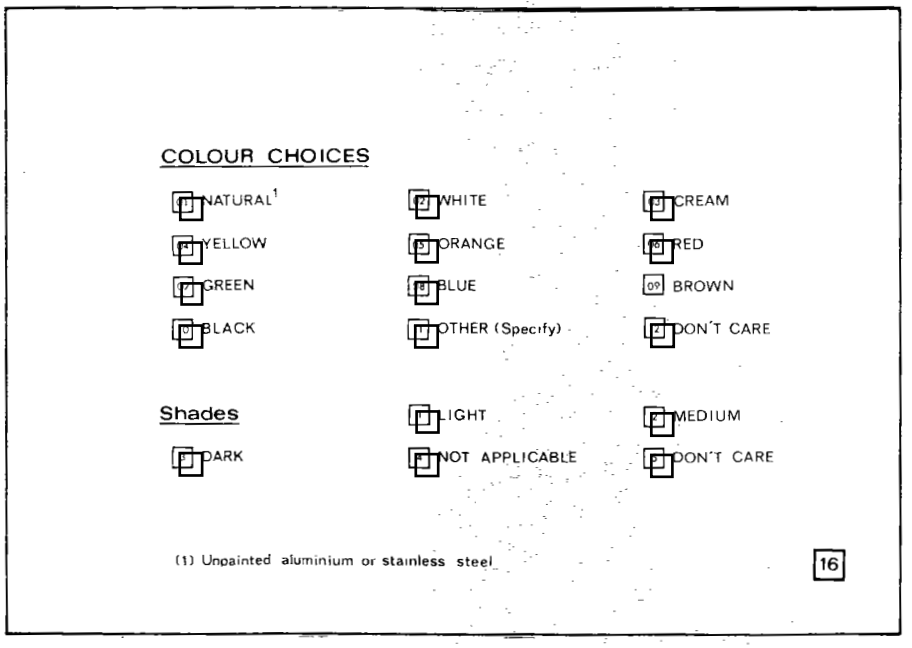


FIGURE CA.17

Question 23 - Which colour do you prefer for the outside of the Bus?

(a) COLOUR:

1	Natural(1)	7	Green
2	White	8	Blue
3	Cream	9	Brown
4	Yellow	10	Black
5	Orange	11	Other ---------- (Specify)
6	Red	12	Don't care

(b) SHADE:

1	Light	3	Dark
2	Medium	4	Not Applicable
		5	Don't Care

Question 24 - Which colour do you prefer for the inside of the Bus? (excluding the seats)

(a) COLOUR:

2	White	7	Green
3	Cream	8	Blue
4	Yellow	9	Brown
5	Orange	10	Black
6	Red	11	Other ---------- (Specify)
		12	Don't care

(b) SHADE:

1	Light	3	Dark
2	Medium	4	Not Applicable
		5	Don't care

(1) Natural is defined as unpainted aluminium or stainless steel.

Question 25 - Which colours do you prefer for Bus Seats?

(a) COLOUR:

2	White	7	Green
3	Cream	8	Blue
4	Yellow	9	Brown
5	Orange	10	Black
6	Red	11	Other ---------- (Specify)
		12	Don't care

(b) SHADE:

1	Light	3	Dark
2	Medium	4	Not Applicable
		5	Don't care

Dwelling Control Data Form

The address and personal information of household occupants contained on the Dwelling Form was transferred by the BTE to a Dwelling Control Data Form.

The additional items of information entered on the data form were:

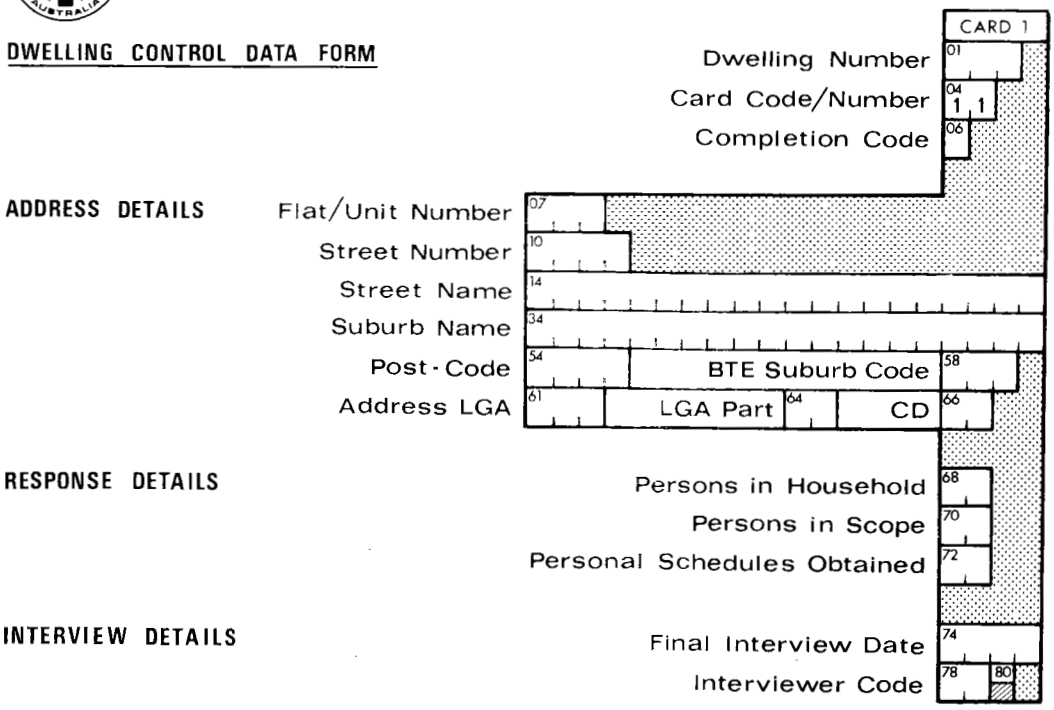
- A dwelling number arbitrarily assigned to each dwelling
- A card code/number used for data key punched card cross reference; there were two cards per Data Form, referenced 11 and 12
- A completion code to indicate survey response (see Annex CG for Code)
- An arbitrary BTE developed suburb code;
- Response details: These included the number of:
  - Persons in household
  - Persons in scope
  - Personal schedules obtained

  and
- An interviewer identification code.

A copy of the Data Form is presented in Figure CA.20.

PERTH BUS DESIGN SURVEY

DWELLING CONTROL DATA FORM



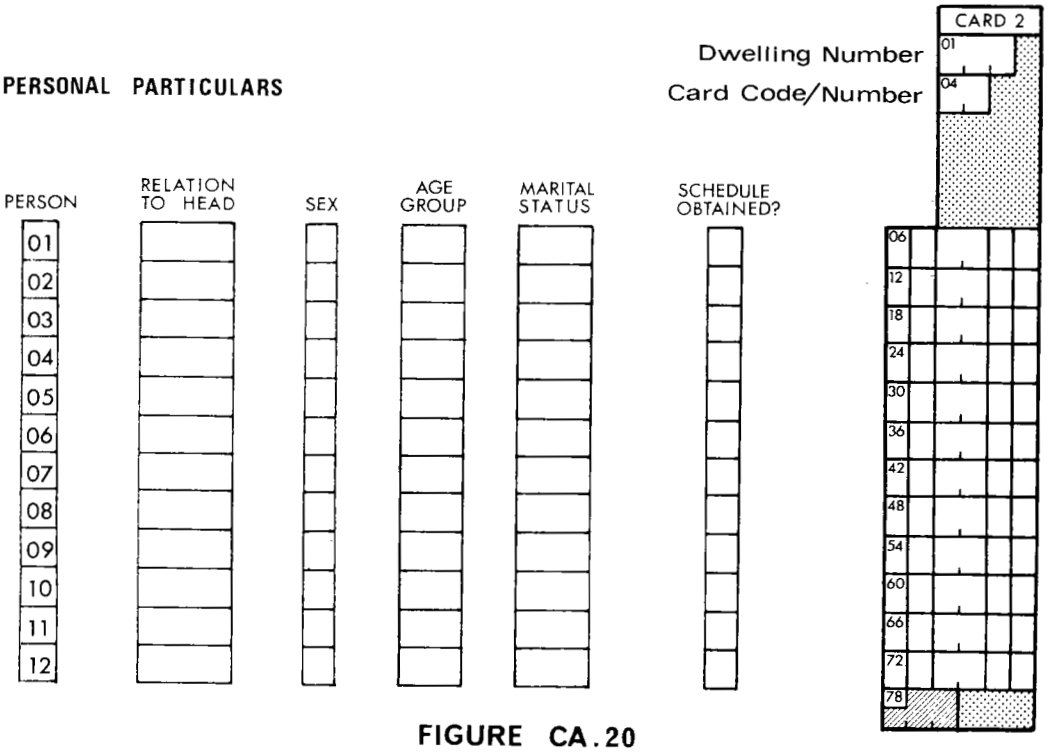


FIGURE CA.20
DWELLING CONTROL DATA FORM

ANNEX CB

SAMPLE CHARACTERISTICS AND COMPARISONS

Before commencing interviews, the interviewers were required to enter the personal particulars of every occupant of the sampled household onto a Dwelling Control Data Form. The information included:

- Relation to head
- Sex
- Age
- Marital status.

and was transferred to the Personal Schedule of each respondent. In addition the respondents were requested to supply details of their occupation and income level. In this Annex, tabulated details of this information are presented, together with comparisons with similar results for the entire Perth Statistical Division. Comments on the significance of differences between the sample and the population are also made.

In this phase of the study, respondents (i.e. those who actually completed the questionnaire) were all fifteen years of age or older.

SAMPLE CHARACTERISTICS

The major sample characteristics tabulated in the analysis of summary results were as follows:

- Age distributions (respondents and all occupants)
- Occupation distribution (respondents only)
- Marital status (respondents and all occupants)
- Income distribution (respondents only)
- Household size distribution.

Details of these distributions are presented in the following sub-sections. Distributions are categorised by sex, and relate to those households which provided completed personal schedules.

Age Distribution

Age distribution of respondents (males, females and total) are given in Table CB.1, while corresponding distributions for all occupants are given in Table CB.2.

TABLE CB.1 - AGE DISTRIBUTIONS (RESPONDENTS ONLY)

Age Groups	Number of Respondents		
	Male	Female	Total
15-19	56	73	129
20-29	108	116	224
30-39	76	89	165
40-49	73	82	155
50-59	64	64	128
60-69	38	50	88
70 and over	22	24	46
Unstated	0	0	0
Total	437	498	935

TABLE CB.2 - AGE DISTRIBUTION (ALL OCCUPANTS)

Age Groups	Number of Occupants			
	Male	Female	Unstated	Total
00-04	54	38	1	93
05-09	72	77	0	149
10-14	82	61	0	143
15-19	67	75	0	142
20-29	121	122	0	243
30-39	88	94	0	182
40-49	82	88	0	170
50-59	74	68	0	142
60-69	43	53	0	96
70 and over	27	33	0	60
Unstated	3	5	96	104
Total	713	714	97	1524

Occupation Distribution

The occupation distribution for respondents are given below in Table CB.3.

TABLE CB.3 - OCCUPATION DISTRIBUTION (RESPONDENTS ONLY)

Occupation Group	Number of Respondents		
	Male	Female	Total
Full-time employment	330	149	479
Part-time employment	8	50	58
Looking for work	7	8	15
Student	37	44	81
Pensioner or retired	40	49	89
Housewife	0	184	184
Other	13	14	27
Unstated	2	0	2
Total	437	498	935

The occupation groupings do not correspond to those normally used by the ABS. A more detailed breakup was not considered relevant to the analysis of results.

Marital Status Distribution

Marital status information is available for both respondents and sampled household occupants, and are presented in Tables CB.4 and CB.5 respectively.

TABLE CB.4 - MARITAL STATUS DISTRIBUTION (RESPONDENTS ONLY)

Marital Status	Number of Respondents		
	Male	Female	Total
Now married	313	336	649
Never married	114	112	226
Other	10	50	60
Unstated	0	0	0
Total	437	498	935

TABLE CB.5 - MARITAL STATUS DISTRIBUTION (ALL OCCUPANTS)

Marital Status	Number of Occupants			
	Male	Female	Unstated	Total
Now married	357	363	0	720
Never married	342	296	1	639
Other	13	55	0	68
Unstated	1	0	96	97
Total	713	714	97	1524

The marital status categories have also been abbreviated from the normal ABS system for simplicity. It will be noted that there was a much lower response to the category "Other", as only four percent were in this category compared with 16 percent in the household survey (Table BB.3).

Income Distribution

Income information was collected only for respondents, and related to individual income, rather than household income. The respondents' weekly income was categorised in fourteen groups incremented by $20 to $260 and over. To allow for respondents who were more familiar with their annual salary levels, the annual equivalent was also provided for each grouping. This distribution is shown for respondents below in Table CB.6.

TABLE CB.6 - INCOME DISTRIBUTION (INCOME)

Weekly Income Group	Number of Respondents		
	Male	Female	Total
0- 19	40	212	252
20- 39	27	75	102
40- 59	20	54	74
60- 79	19	43	62
80- 99	45	57	102
100-119	73	27	100
120-139	81	9	90
140-159	44	7	51
160-179	24	2	26
180-199	16	4	20
200-219	14	1	15
220-239	5	0	5
240-259	8	0	8
260 or over	12	1	13
Unstated	9	6	15
Total	437	498	935

Household Size Distribution

The distribution of household size for the sample was obtained from the dwelling information form. This distribution is presented in Table CB.7.

TABLE CB.7 - HOUSEHOLD SIZE DISTRIBUTIONS

Size of Household	Number of Households
1 Person	67
2 Persons	152
"	72
"	87
"	52
"	27
7 persons	4
8 or more persons	7
Unstated	80
Total	548

COMPARISON WITH PERTH STATISTICAL DIVISION

In order to establish differences between the survey sample and the general Perth populace, selected sample characteristics were compared with the corresponding characteristics of the entire Perth Statistical Division(1).

The basis of comparison was to generate sample and Perth fractional distributions of particular characteristics. In generating these fractional distributions for the sample, respondents or occupants whose characteristics were missing or incomplete were omitted. In addition, only complete distributions were considered (i.e. the break-up of respondents or occupants into male and female distributions was not performed). Because of the departures from the ABS, standard categorisations, only the age groups of respondents and all occupants and the household size distributions can be compared.

Age distributions for sample respondents and occupants are compared with those in Perth in Figure CB.1. The differences between the sample and Perth are insignificant - particularly in the case of respondents. There is one major differences in the 'all occupants' distribution for the 00-04 age group. This could have arisen naturally since the

(1) 1971 Census.

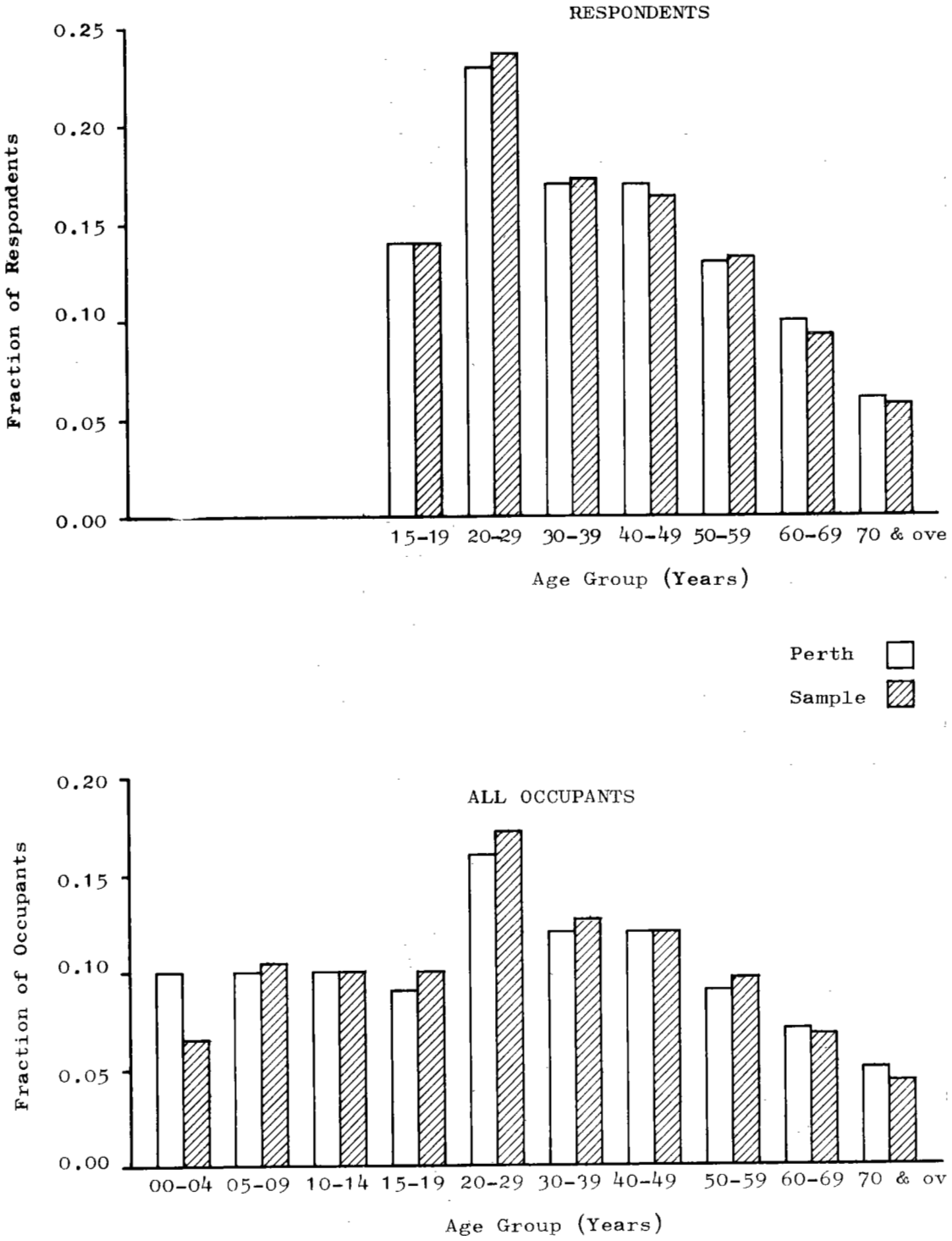


FIGURE CB.1
COMPARISONS OF AGE GROUP DISTRIBUTIONS

1971 census through a declining marriage and birth rate[1].

A comparison in household size distribution is shown in Figure CB.2. The variation appears as an increase in one and two person households and a decrease in three or more person households. Once again the departures are explainable by shifts in workforce composition and a declining birth rate i.e. more unmarrieds, more childless couples and fewer children in families.

Statistical Significance

The sample distributions were not tested for similarly to those of the Perth Statistical Division because of the difference in time between the survey and the 1971 Census. With the rigorous sampling techniques used the sample should be representative and the departure from normality random.

---

(1) Quarterly Summary of Australian Statistics, December 1974, No. 294, ABS Canberra.

Year	Marriages (WA)	Births (WA)
1971	9,382	24,239
1972	9,120	22,177
1973	9,102	20,510

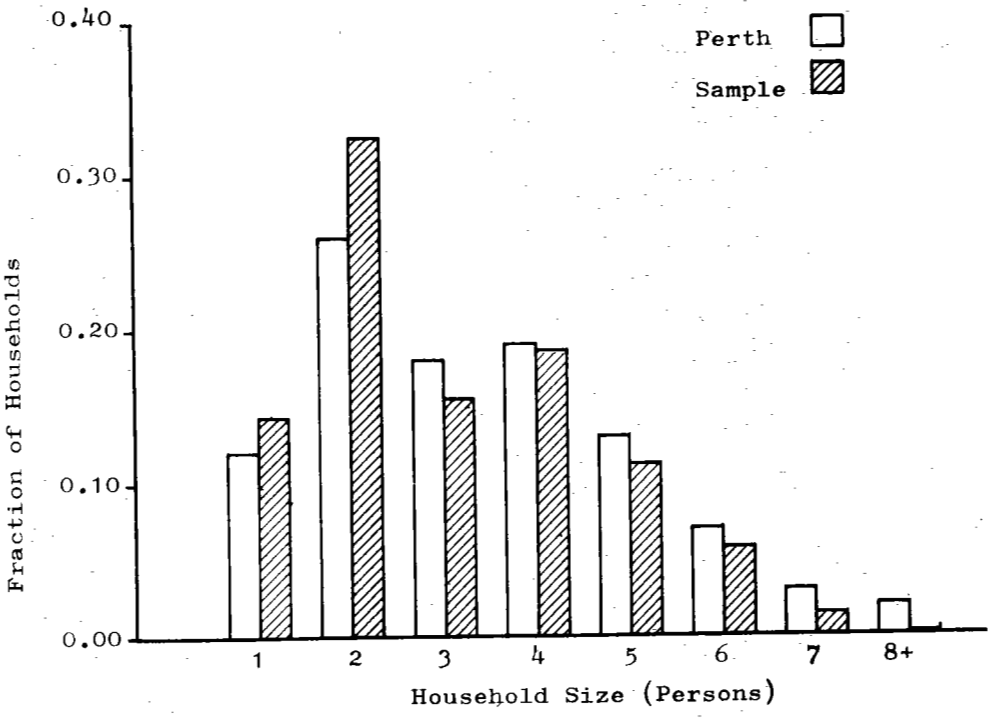


FIGURE CB.2
COMPARISON OF HOUSEHOLD SIZE DISTRIBUTION

ANNEX CC

RESPONDENTS TRAVEL CHARACTERISTICS

There were three questions in the survey relating to respondents travel characteristics. These questions included:

- Driving licence status
- Mode choice for the following five trip task categories:
  - Work
  - Education
  - Shopping
  - Social and Recreational
  - Other activities
- Number of bus trips usually made each week.

Questions of this type were included not to examine the respondents travel characteristics but to analyse their attitudes in correct context. Because of the secondary nature of the questions only the distributions are presented in this Annex.

Driving Licence Status

Three categories of driving licence status were included on the questionnaire:

- Licenced
- Not licenced
- Not eligible

The last category, perhaps an unnecessary refinement was included for those under age, with disabilities and for those disqualified. The distribution for respondents only using this categorisation is presented below in Table CC.1

TABLE CC.1 - LICENCE STATUS (RESPONDENTS ONLY)

Licence Status	Male	Female	Total
Licenced	378	287	665
Not licenced	37	179	216
Not Eligible	21	32	53
Unstated	1	0	1
Total	437	498	935

Modal Choice

In this question respondents were asked to nominate the travel methods usually used and their order of use for six trip purposes. A coding was provided for trip types not normally undertaken. The responses were analysed to determine the current modal choice for each of the activities of interest. To overcome the problem of multiple mode choise a hierarchy of modes was used to determine the dominant mode from the access or secondary modes. The mode choices considered in order of dominant mode selection and their questionnaire coding are:

Order	Mode	Code(1)
1	Train	2
2	Bus	3
3	Car	1
4	Other	5
5	Walk	4

The modal choice for males and females for each activity is presented in Table CC.2 below.

The calculated modal choice does not include details of trip frequency and therefore does not correspond to the usual modal split. Bus is the dominant public transport mode with an average of 10 percent males and 24 percent females using the mode.

(1) The Code refers to the mode number used in Question 6 of the Personal Schedule (Annex CA).

TABLE CC.2 - MODE SPLIT BY TRIP PURPOSE

Trip Purpose	Male Mode Split					Female Mode Split				
	Train	Bus	Car	Other	Walk	Train	Bus	Car	Other	Walk
Work	0.02	0.10	0.80	0.05	0.03	0.02	0.29	0.59	0.00	0.10
School, Uni	0.04	0.18	0.60	0.11	0.07	0.00	0.25	0.48	0.04	0.23
Shopping	0.01	0.07	0.84	0.02	0.06	0.02	0.21	0.62	0.00	0.15
Social or Recreational	0.02	0.08	0.86	0.02	0.02	0.01	0.17	0.79	0.01	0.01
Other Activities	0.02	0.10	0.83	0.02	0.03	0.02	0.26	0.65	0.01	0.05
Average	0.02	0.10	0.78	0.04	0.04	0.01	0.24	0.63	0.01	0.11

Trips per Month by Bus

The number of trips per month which each respondent travelled by bus has a bearing on his or her attitudes and consequently is significant when interpreting responses. Variational analyses based on this factor have been undertaken but are not reported because of space limitations. Presented below in Table CC.3 is the distribution of number of trips categorised with seven groups incrementing by ten for males and females.

TABLE CC.3 - NUMBER OF BUS TRIPS PER MONTH

Trips per Month	Male	Female	Total	Percentage
Zero trips	336	255	591	63
1-10	27	91	118	13
11-20	13	60	73	8
21-30	7	19	26	3
31-40	30	41	71	7
41-50	10	21	31	3
50 and over	14	11	25	3
Total	437	498	935	100

It is important to note that while a significant proportion of the sampled respondents make less than 10 trips per month, the findings of the survey are in no way diminished. Non users attitudes are important by the degree of their numbers if they as a group are to be attracted to future bus services.

ANNEX CD

BUS AND BUS TRAVEL CHARACTERISTICS RANKING ANALYSIS

In Section 3 of the questionnaire respondents were asked to rank two sets of bus and bus travel characteristics. After the respondents physically ranked the characteristics with the aid of a shuffly board the interviewer numerically ranked them from 1 (highest) to 12 for the first question (Question A) and to 10 for the second question (Question B). The characteristics listed for ranking in each question were:

	Question A		Question B
A1.	Cleanliness	B1.	Seat Availability
A2.	Quiet and Smooth Ride	B2.	Frequent Service
A3.	Time Reduction	B3.	Distance to Stops
A4.	Entry and Exit	B4.	Reliable Service
A5.	Seat Availability	B5.	Safety
A6.	Fare Reduction	B6.	Fare Reduction
A7.	Light, etc. Control	B7.	Shelters
A8.	Exterior Style	B8.	Express Buses
A9.	Interior Style	B9.	Reduced Vandalism, etc.
A10.	Travelling Comfort	B10.	Timetables
A11.	Pollution Control		
A12.	Colour Scheme		

ANALYSIS OF RANKINGS

Ranking analysis of this type require a full complement of rank orders for each respondent. Rankings which were not complete were rejected. On this account 10 and 6 schedules were rejected respectively from the first and second question. The rank total and the order of their ranking are presented for each question in Table CD.1 below.

TABLE CD.1 - RANKINGS

Question A			Question B		
Question	Rank Total	Rank Order	Question	Rank Total	Rank Order
A1	4330	3	B1	4683	4
A2	4658	4	B2	3449	1
A3	5602	8	B3	5335	5
A4	4974	5	B4	3867	3
A5	4018	1	B5	3856	2
A6	6136	9	B6	5790	8
A7	5371	6	B7	5435	6
A8	9723	12	B8	5506	7
A9	8417	10	B9	6532	9
A10	4065	2	B10	6642	10
A11	5550	7	-	-	-
A12	9306	11	-	-	-

SIGNIFICANCE OF RANKING

Two methods were used to test significance of the final rankings shown in Table CD.1. In the first test, a 'co-efficient of concordance' was computed. This co-efficient is a measure of agreement between respondents, and varies between zero (no agreement) and unity (complete agreement). On a null hypothesis that there is no agreement between respondents, the expected rank totals would be equal, and would have the following value:

$$E_i = N(n + 1)/2$$

where E_i is the expected rank total for characteristic i,
N is the number of respondents,
and n is the number of characteristics.

If, in fact, there were complete agreement between respondents, the sum of squares of deviation of observed rank totals from expected rank totals would be a maximum, and could be shown to have the value:

$$S' = N^2(n^3 - n)/12$$

where S' is the maximum sum of squares of deviations.

The co-efficient of concordance (W) is now defined as:

$$W = \frac{S}{S'}$$

with $S = (O_i - E_i)^2$

where S is the observed sum of square of deviations from expected rank totals

and O_i is the observed rank total for characteristics i.

In the cases under consideration, the following values apply:

Question A	Question B
N = 925	N = 929
n = 12	n = 10
E_i = 6012.5	E_i = 5109.5
$S' = 1.224 \times 10^8$	$S' = 0.7120 \times 10^8$

In Table CD.2, values of observed and expected rank totals for each characteristic are shown, together with the deviations and squares of deviations for Questions A and B respectively.

TABLE CD.2 - DEVIATIONS FROM EXPECTED RANK TOTALS

Characteristic	Observed Rank Total (O_i)	Expected Rank Total (E_i)	Deviation ($O_i - E_i$)	Square of Deviations
A1	4330	6012.5	-1682.5	2,830,806.3
A2	4658	6012.5	-1354.5	1,834,670.3
A3	5602	6012.5	- 510.5	168,510.3
A4	4974	6012.5	-1038.5	1,078,482.3
A5	4018	6012.5	-1994.5	3,978,030.3
A6	6136	6012.5	123.5	15,252.2
A7	5371	6012.5	- 641.5	411,522.3
A8	9723	6012.5	3710.5	13,767,810.3
A9	8417	6012.5	2404.5	5,781,620.3
A10	4065	6012.5	-1947.5	3,792,756.3
A11	5550	6012.5	- 462.5	213,906.3
A12	9306	6012.5	3293.5	10,947,142.3
B1	4683	5109.5	- 426.5	44,720,509.0
B2	3449	5109.5	-1660.5	275,760.3
B3	5335	5109.5	225.5	50,850.3
B4	3867	5109.5	-1242.5	1,543,806.3
B5	3856	5109.5	-1253.5	1,571,262.3
B6	5790	5109.5	680.5	463,080.3
B7	5435	5109.5	325.5	105,950.3

TABLE CD.2 - DEVIATIONS FROM EXPECTED RANK TOTALS (Cont.)

Characteristic	Observed Rank Total (O_i)	Expected Rank Total (E_i)	Deviation ($O_i - E_i$)	Square of Deviations
B8	5506	5109.5	396.5	157,212.3
B9	6532	5109.5	1422.5	2,023,506.3
B10	6642	5109.5	1532.5	2,348,556.3
				11,293,386.3

From these values, W is computed as:

Question A	Question B
0.365	0.159

These values tend towards the middle of the scale, however there is clear agreement on ranks for the more important characteristics.

The other test performed was a variance ratio or F-test. The F-statistic is computed as:

$$F = \frac{(W - 1)W'}{1 - W'}$$

where W' is a corrected derivative of W.

In this case, the correction of W to determine W' is insignificant, and:

	Question A	Question B
	F = 533	F = 173
with	V_1 = 11	V_1 = 9
	V_2 = 10285	V_2 = 8406

where V_1 and V_2 are upper and lower estimated degress of freedom, respectively.

Consultation of tables[1] of the F distribution with the values of F, V_1 and V_2 given above yields the following result:

(1) M. Abramowitz and Irene A. Stegun, Handbook of Mathematical Functions, U.S. National Bureau of Standards, 1964.

$$P \leq 0.001$$

where P is the probability that the observed deviations could have arisen by chance if there were no agreement between respondents.

This result may be interpreted by stating that it is extremely unlikely that there is not significant agreement between respondents. In general, the deficiencies in the nature of the co-efficient of concordance would indicate that the F-test is a somewhat more reliable indicator of agreement in rankings of this type.

ANNEX CE

BUS AND BUS TRAVEL CHARACTERISTICS RATING ANALYSIS

The major part of the survey questionnaire consisted of questions relating to the respondents' assessment of various methods of achieving specific design objectives. These methods were presented in Section 4 of the questionnaire (see Annex CA).

Design Options are identified by letter and number combinations which are listed in Table CE.1. Results for each of the 63 options are presented in order of their appearance in the questionnaire and each set of results occupies a page (see the latter part of this Annex).

Respondents were asked to rate the option on a seven point scale which was given a numeric equivalence by the interviewer; the ratings and their numeric equivalences are:

Description	Value
Highly undesirable	1
Undesirable	2
Slightly undesirable	3
Uncertain or indifferent	4
Slightly desirable	5
Desirable	6
Highly desirable	7

For each option, a distribution is presented by sex showing for each option the corresponding numbers of male and female respondents who rated the option at each rating scale value. At the foot of the distribution tabulation, the average numeric rating is given for each sex and for all respondents taken together.

The tabulated distribution is also presented in the form of two histograms; one for males and the other for females.

TABLE CE.1 - CORRESPONDENCE BETWEEN OPTIONS, OBJECTIVES AND METHODS

Objective	Method	Option
BUS CLEANLINESS	Rubbish Collection Between Trips	A/1
	Frequent Outside Cleaning	A/2
	Colours which do not Show Dirt	A/3
	Use of Stain Proof Materials	A/4
	Regular Outside Painting	A/5
	Regular Inside Painting	A/6
	Provision of Rubbish Containers in Buses	A/7
	Frequent Cleaning of Seats and Interior Panels	A/8
QUIET AND SMOOTH RIDE	Windows which Cannot be Opened	B/1
	Quiet Engine and Gearbox	B/2
	Regular Attention to Rattles and Squeaks	B/3
	Softly Padded Seats	B/4
	Firmly Padded Seats	B/5
	Non-slip Seat Materials	B/6
	Smooth Starting and Stopping	B/7
	Good Suspension and Springing	B/8
	Sound Proofed Walls and Floors	B/9
REDUCTION IN TRAVEL TIME	Frequent Bus Service	C/1
	Close Route Spacing	C/2
	Reliable Service (Buses on Time)	C/3
	Express Bus Service	C/4
EASE OF ENTRY	Low Steps	D/1
	Wide Steps	D/2
	Easily Operated Doors	D/3
	Quick Method of Paying Fare	D/4
INCREASING SEAT CAPACITY	More Seats and Less Standing Room	E/1
	More Buses During Peak Hours	E/2
CONTROL OF LIGHT, TEMPERATURE AND VENTILATION	Fans	F/1
	Heating in Winter	F/2
	Insulation Against Heat and Cold	F/3

TABLE CE.1 - CORRESPONDENCE BETWEEN OPTIONS, OBJECTIVES AND METHODS (Cont.)

Objective	Method	Option
CONTROL OF LIGHT, TEMPERATURE AND VENTILATION (Cont.)	Opening Windows	F/4
	Air Conditioning	F/5
	Roof Ventilators	F/6
	Large Windows	F/7
	Pull Down Blinds	F/8
	Good Artificial Lighting	F/9
	Transparent Roof Panels	F/10
	Tinted Window Glass	F/11
EXTERIOR DESIGN	Bus Design 1	G/1
	Bus Design 3	G/2
	Bus Design 2	G/3
SEATING ARRANGEMENT	Interior Layout 1	H/1
	Interior Layout 2	H/2
	Interior Layout 3	H/3
SEAT DESIGN	Seat Design 1	I/1
	Seat Design 2	I/2
	Seat Design 3	I/3
SUPPORTS FOR STANDING PASSENGERS	Handgrip Design 1	J/1
	Handgrip Design 2	J/2
	Handgrip Design 3	J/3
SHELTER DESIGN	Shelter Design 1	K/1
	Shelter Design 2	K/2
REDUCE VANDALISM AND IMPROVE SECURITY	Conductors on Bus	L/1
	Closed Circuit Television on Buses	L/2
	Radio Communication with Base	L/3
	Checks by Uniformed Inspectors	L/4
	Checks by Plain-Clothes Inspectors	L/5
PROVIDING TIMETABLE INFORMATION	Timetables in Buses	M/1
	Timetables at Bus Stops	M/2
	Easily Remebered Timetables	M/3
	Timetables Supplied by Drivers	M/4

Brief comments on the rating results are attached as a footnote to each result page. These comments include remarks on significant differences which became apparent after variational analyses were performed on categorisation distributions other than sex. Distributions also looked at were by:

- Age
- Motor vehicle licence
- Trip load
- Occupation
- Income group

Chi-square tests were performed during the variational analyses to determine whether significant differences could be assumed between respondents in different demographic groups. The results are not reported here for brevity; however, as stated above, comments are made where considered appropriate.

OPTION A/1

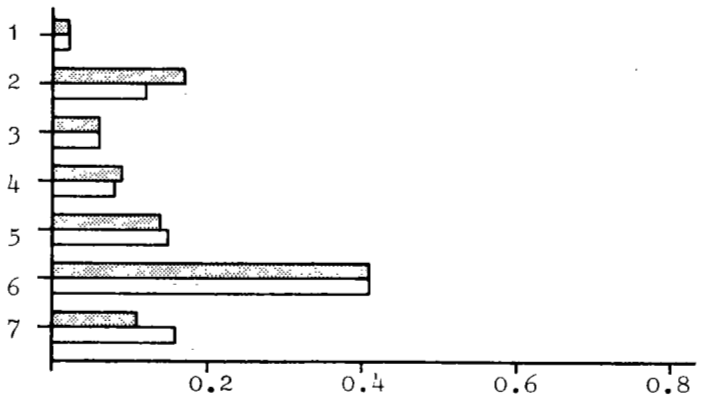
OBJECTIVE ..... BUS CLEANLINESS

METHOD ..... Rubbish Collection Between Trips

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	8	8	16
2	72	62	134
3	26	30	56
4	38	40	78
5	63	74	137
6	180	202	382
7	48	82	130
Unstated	2	0	2
Total	437	498	935
Mean	4.9	5.1	5.0

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

While this method of improving cleanliness received on average a favourable response, the bimodal distribution indicates a degree of uncertainty. The unfavourable respondents were concerned with the practicability or expense of the method.

OPTION A/2

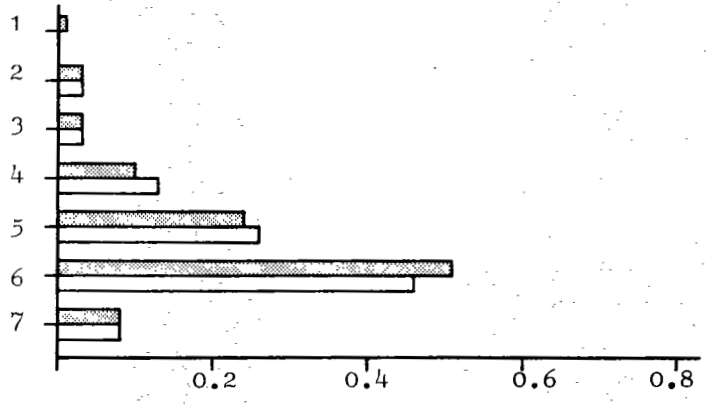
OBJECTIVE ..... BUS CLEANLINESS

METHOD ..... Frequent Outside Cleaning

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	3	2	5
2	15	16	31
3	13	16	29
4	43	64	107
5	104	130	234
6	223	229	452
7	34	41	75
Unstated	2	0	2
Total	437	498	935
Mean	5.4	5.3	5.3

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

This method was conclusively favoured by respondents. The high mean response of 5.3 indicates that it is generally regarded as a desirable measure. The MTT has already instituted this option.

OPTION A/3

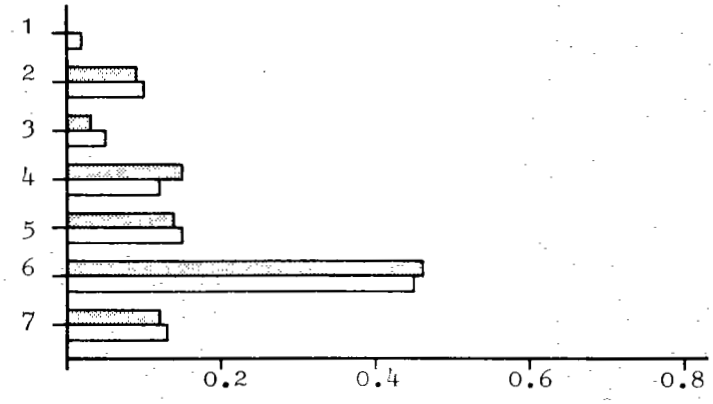
OBJECTIVE ..... BUS CLEANLINESS

METHOD ..... Colours Which Do Not Show Dirt

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	2	9	11
2	39	49	88
3	14	23	37
4	66	58	124
5	60	74	134
6	201	222	423
7	53	63	116
Unstated	2	0	2
Total	437	498	935
Mean	5.2	5.1	5.2

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

A generally favourable response is indicated for this option. However, 28 percent of respondents'indicated a neutral or unfavourable attitude to the option.

OPTION A/4

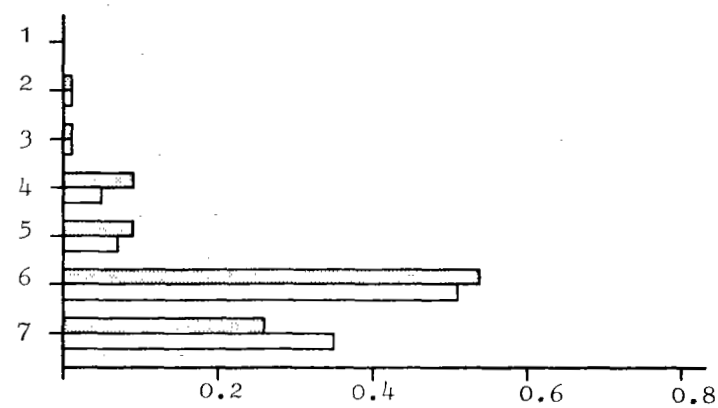
OBJECTIVE ..... BUS CLEANLINESS

METHOD ..... Use of Stain Proof Materials

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	0	0	0
2	4	5	9
3	4	4	8
4	39	27	66
5	40	36	76
6	234	254	488
7	114	172	286
Unstated	2	0	2
Total	437	498	935
Mean	5.9	6.1	6.0

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Stain proof materials received an overall mean response of 6.0 with a significant number of respondents rating the option as very desirable.

OPTION A/5

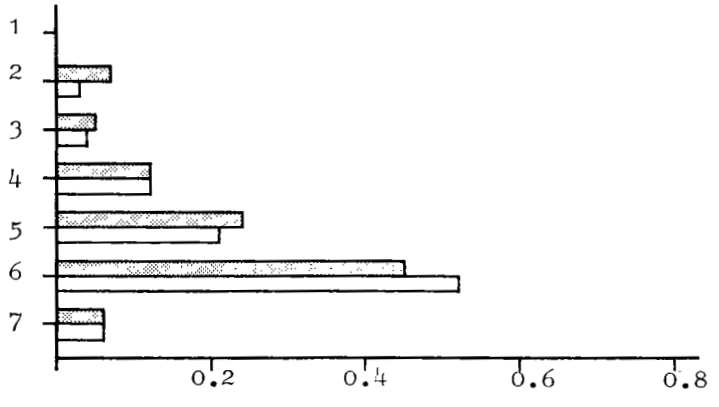
OBJECTIVE ..... BUS CLEANLINESS

METHOD ..... Regular Outside Painting

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	0	2	2
2	30	17	47
3	23	19	42
4	53	62	115
5	105	105	210
6	197	261	458
7	27	32	59
Unstated	2	0	2
Total	437	498	935
Mean	5.1	5.3	5.2

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

The overall mean response of 5.2 for this option is equivalent to a slightly desirable rating. This result may have been conditioned by the good external condition of buses in the MTT fleet.

OPTION A/6

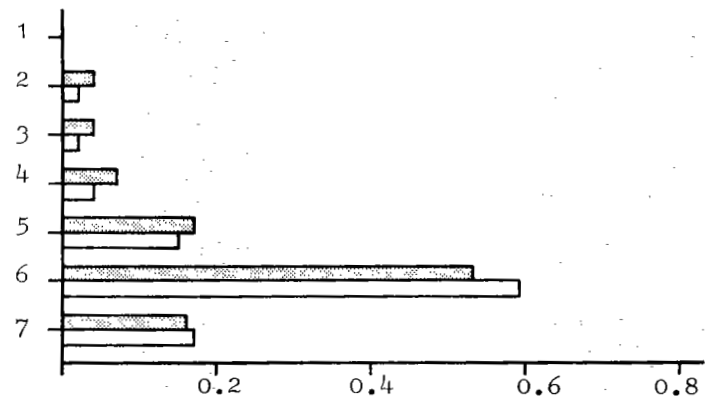
OBJECTIVE ..... BUS CLEANLINESS

METHOD ..... Regular Inside Painting

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	0	0	0
2	17	11	28
3	17	11	28
4	29	21	50
5	75	76	151
6	229	296	525
7	68	83	151
Unstated	2	0	2
Total	437	498	935
Mean	5.6	5.8	5.7

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Regular inside painting was rated higher than outside painting (mean responses respectively 5.7 and 5.2) As shown by the histogram almost 60 percent of respondents rated the option as 'desirable'.

OPTION A/7

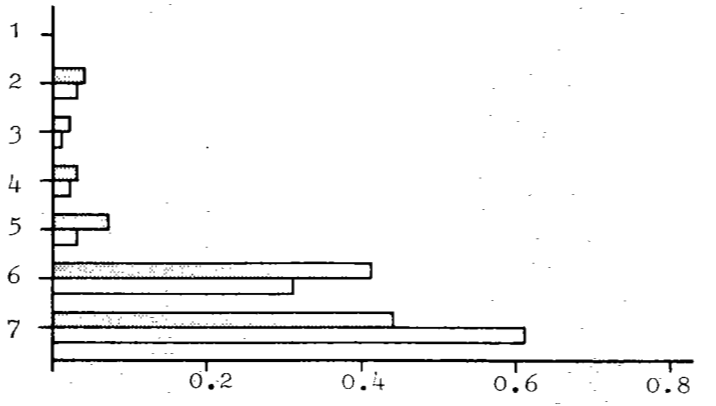
OBJECTIVE ..... BUS CLEANLINESS

METHOD ..... Provision of Rubbish Containers in Buses

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	2	0	2
2	16	13	29
3	9	3	12
4	11	9	20
5	29	15	44
6	178	156	334
7	190	302	492
Unstated	2	0	2
Total	437	498	935
Mean	6.1	6.4	6.3

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Provision of rubbish containers elicited a mean response of 6.3 with 86 percent of respondents rating the option higher than slightly desirable. Females rated the option significantly higher than males (6.4 and 6.1 respectively).

OPTION A/8

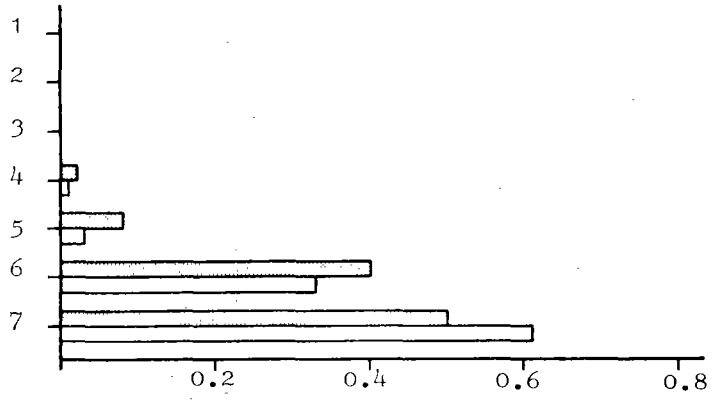
OBJECTIVE ..... BUS CLEANLINESS

METHOD ..... Frequent Cleaning of Seats and Interior Panels

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	0	0	0
2	0	2	2
3	1	2	3
4	7	6	13
5	33	17	50
6	174	166	340
7	219	304	523
Unstated	3	1	4
Total	437	498	935
Mean	6.4	6.5	6.5

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

This option received the highest mean rating of the Bus Cleanliness options with 92 percent of all responderts rating the option above slightly desirable.

OPTION B/1

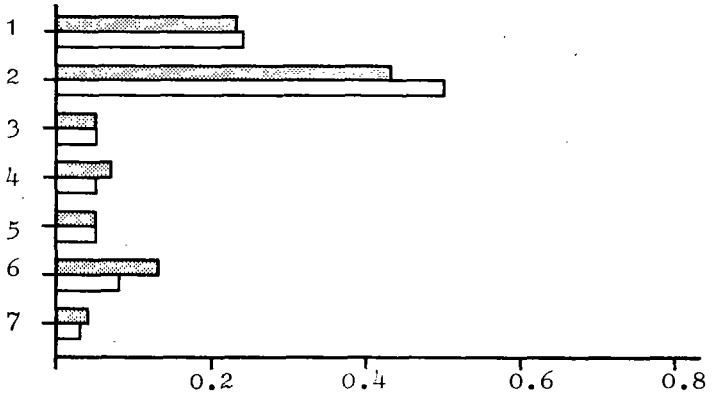
OBJECTIVE ..... QUIET AND SMOOTH RIDE

METHOD ..... Windows Which Cannot Be Opened

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	101	121	222
2	185	248	433
3	23	26	49
4	31	26	57
5	21	23	44
6	56	39	95
7	18	15	33
Unstated	2	0	2
Total	437	498	935
Mean	2.8	2.5	2.7

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

The very unfavourable rating received by this option (mean response of 2.7) is undoubtedly conditioned by the temperate climate in Perth. The few but significant number of respondents who rated the option as 'desirable' possibly had air conditioning in mind.

OPTION B/2

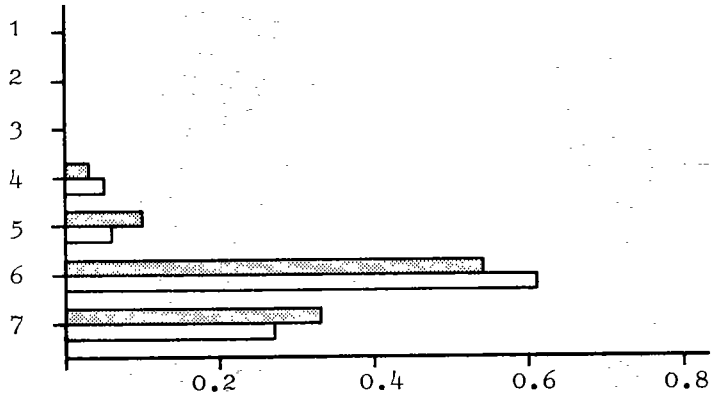
OBJECTIVE ..... QUIET AND SMOOTH RIDE

METHOD ..... Quiet Engine and Gearbox

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	0	1	1
2	0	2	2
3	1	1	2
4	12	24	36
5	43	32	75
6	237	305	542
7	142	133	275
Unstated	2	0	2
Total	437	498	935
Mean	6.2	6.1	6.1

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

This option received a very high mean rating of 6.1 with only 5 respondents considering it to be undesirable to some extent.

OPTION B/3

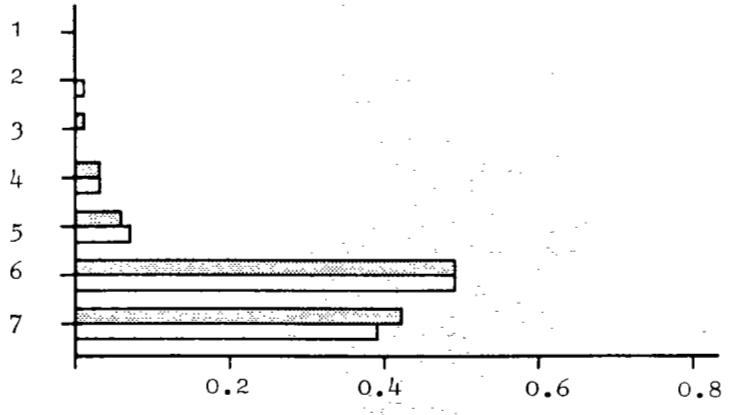
OBJECTIVE ..... QUIET AND SMOOTH RIDE

METHOD ..... Regular Attention to Rattles and Squeaks

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	1	0	1
2	0	3	3
3	3	2	5
4	13	16	29
5	25	36	61
6	212	245	457
7	181	196	377
Unstated	2	0	2
Total	437	498	935
Mean	6.3	6.2	6.2

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

The overall mean rating of 6.2 indicates that this method was considered very favourably. The option implies the regular checking of rattles and squeaks in the routine maintenance of buses.

OPTION B/4

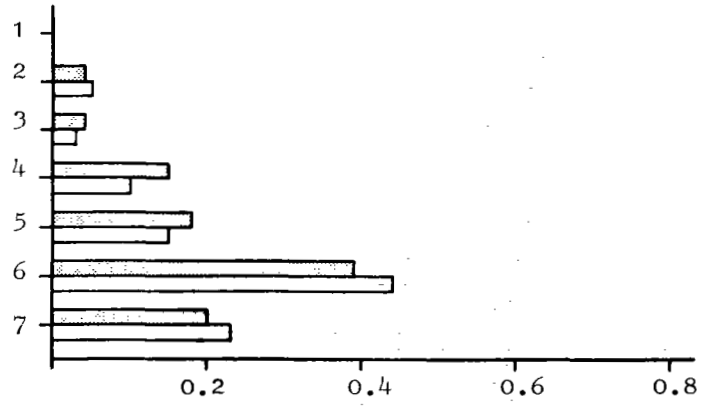
OBJECTIVE ..... QUIET AND SMOOTH RIDE

METHOD ..... Softly Padded Seats

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	1	1	2
2	19	26	45
3	19	17	36
4	65	49	114
5	77	75	152
6	168	217	385
7	86	113	199
Unstated	2	0	2
Total	437	498	935
Mean	5.4	5.6	5.5

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Softly padded seats were considered to be between desirable and slightly desirable (5.5 rating); however physical comfort considerations may have influenced the result. Females rated this option higher than males.

OPTION B/5

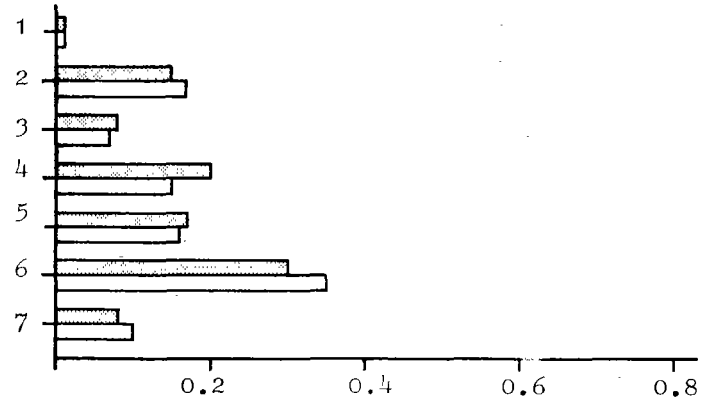
OBJECTIVE ..... QUIET AND SMOOTH RIDE

METHOD ..... Firmly Padded Seats

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	5	4	9
2	67	84	151
3	36	33	69
4	87	77	164
5	75	80	155
6	131	172	303
7	34	48	82
Unstated	2	0	2
Total	437	498	935
Mean	4.6	4.7	4.7

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Firmly padded seats were considered to rate slightly above indifferent, (mean response 4.7). The histogram displays no general tendency and because of the physical comfort externality no firm conclusion can be drawn from the result. This option received a lower rating than soft seats.

OPTION B/6

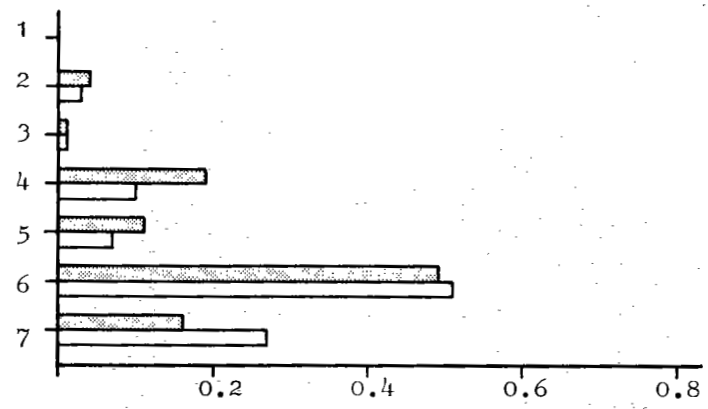
OBJECTIVE ..... QUIET AND SMOOTH RIDE

METHOD ..... Non-Slip Seat Materials

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	0	0	0
2	18	13	31
3	4	6	10
4	84	52	136
5	46	37	83
6	213	255	468
7	69	135	204
Unstated	3	0	3
Total	437	498	935
Mean	5.5	5.8	5.7

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

The overall mean response of 5.5 indicates this option is considered significant in contributing to a quiet and smooth ride. Females rated the option considerably higher than males (5.8 to 5.5 respectively) with 27 percent rating it as very desirable.

OPTION B/7

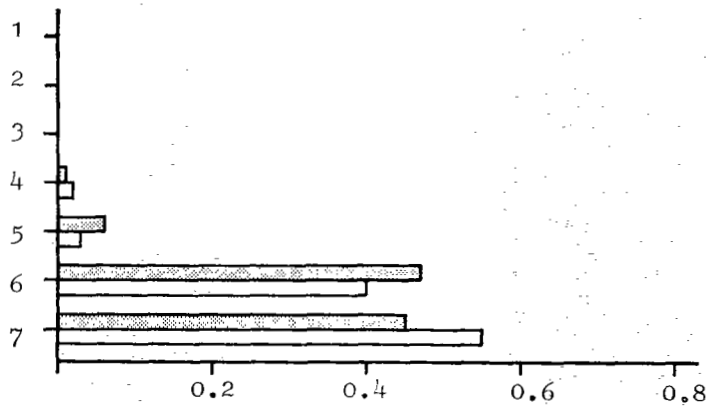
OBJECTIVE ..... QUIET AND SMOOTH RIDE

METHOD ..... Smooth Starting and Stopping

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	0	0	0
2	0	0	0
3	0	1	1
4	4	9	13
5	28	15	43
6	206	197	403
7	197	276	473
Unstated	2	0	2
Total	437	498	935
Mean	6.4	6.5	6.4

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

This option received the highest rating for the quiet and smooth ride objective with a mean response of 6.4. This underlines the need for drivers to consider the comfort of passengers, particularly those who may be standing. It also indicates the benefits to be gained from the utilization of buses which can accelerate smoothly.

OPTION B/8

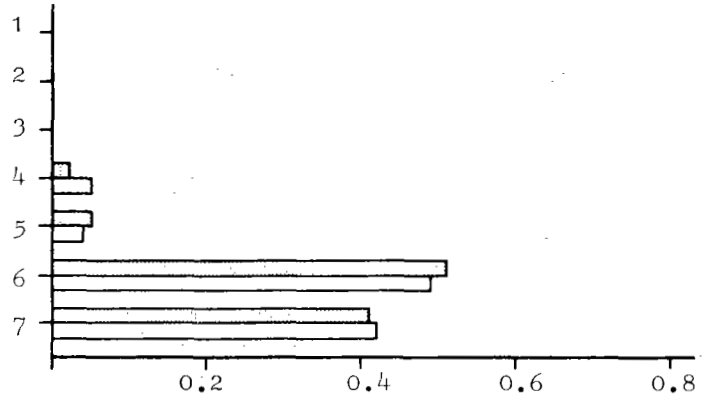
OBJECTIVE ..... QUIET AND SMOOTH RIDE

METHOD ..... Good Suspension and Springing

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	0	0	0
2	2	0	2
3	0	1	1
4	7	23	30
5	22	22	44
6	224	245	469
7	180	207	387
Unstated	2	0	2
Total	437	498	935
Mean	6.3	6.3	6.3

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

The importance which respondents attached to this option is reflected in a high mean response rate of 6.3. Respondents below the age of 30 did not rate the option as older age groups. Over 91 percent of respondents rated the question above slightly desirable.

OPTION B/9

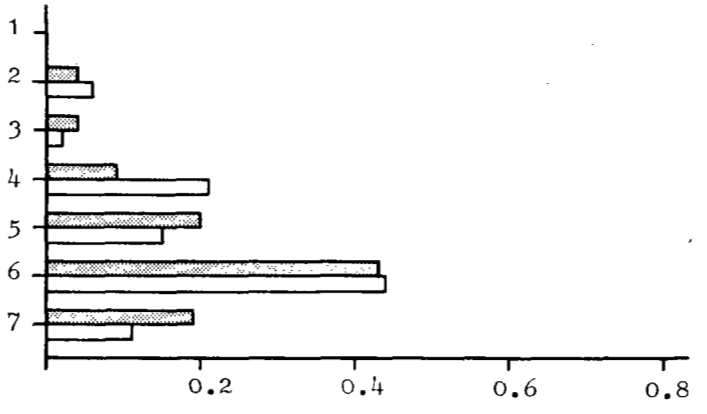
OBJECTIVE ..... QUIET AND SMOOTH RIDE

METHOD ..... Soundproofed Walls and Floors

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	1	2	3
2	18	32	50
3	19	8	27
4	41	106	147
5	86	76	162
6	189	220	409
7	81	54	135
Unstated	2	0	2
Total	437	498	935
Mean	5.5	5.2	5.3

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

The mean response of 5.3 indicates a general acceptance of this option; however, with 24 percent of respondents' indifferent or rating the option in the negative. Respondents consider options B/2 and B/3 to be more effective methods of dealing with noise.

OPTION C/1

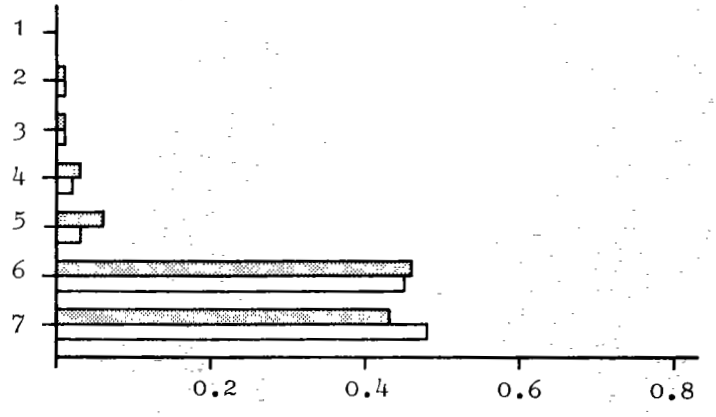
OBJECTIVE ..... REDUCTION IN TRAVEL TIME

METHOD ..... Frequent Bus Services

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	1	0	1
2	5	5	10
3	4	6	10
4	11	9	20
5	25	13	38
6	202	224	426
7	187	241	428
Unstated	2	0	2
Total	437	498	935
Mean	6.2	6.4	6.3

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Respondents were decisively in favour of this option. The average mean response rate was 6.3 with 92 percent of the respondents rating the option above slightly desirable.

OPTION C/2

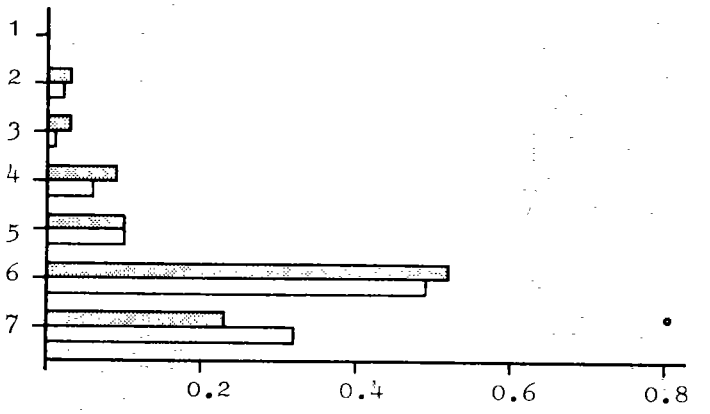
OBJECTIVE ..... REDUCTION IN TRAVEL TIME

METHOD ..... Close Route Spacing

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	1	1	2
2	15	11	26
3	15	7	22
4	38	29	67
5	43	48	91
6	225	243	468
7	98	159	257
Unstated	2	0	2
Total	437	498	935
Mean	5.7	6.0	5.8

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

The overall response rate of this method of reducing travel time was 5.84. In general females rated the method as more desirable than males (6.0 females; 5.7 males) which is significant if female patrons are to be encouraged especially in off-peak periods.

OPTION C/3

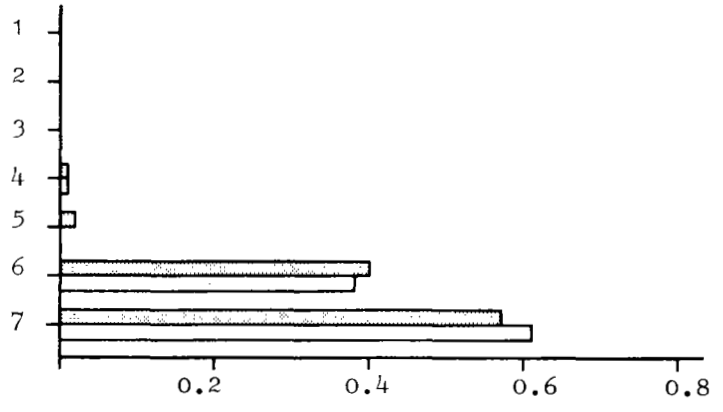
OBJECTIVE ..... REDUCTION IN TRAVEL TIME

METHOD ..... Reliable Service (Buses on Time)

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	0	1	1
2	1	2	3
3	0	0	0
4	6	3	9
5	8	2	10
6	172	187	359
7	248	303	551
Unstated	2	0	2
Total	437	498	935
Mean	6.5	6.6	6.5

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Reliability of service received the highest rating at 6.5 of all the travel time reduction options. It is important to note that this result indicates that the respondents' would have taken waiting time into account when rating the options of this objective.

OPTION C/4

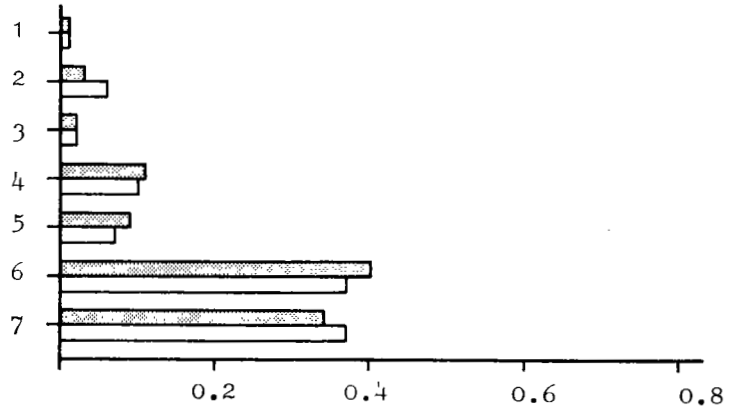
OBJECTIVE ..... REDUCTION IN TRAVEL TIME

METHOD ..... Express Bus Services

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	3	4	7
2	13	28	41
3	9	11	20
4	47	51	98
5	40	34	74
6	174	186	360
7	149	184	333
Unstated	2	0	2
Total	437	498	935
Mean	5.8	5.8	5.8

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

The histogram together with the mean response of 5.8 indicates that this option is considered desirable by respondents. Predictably younger people (20 to 40 years) and regular bus commutors (30 to 40 trips per month) rated this option higher than the other respondents.

OPTION D/1

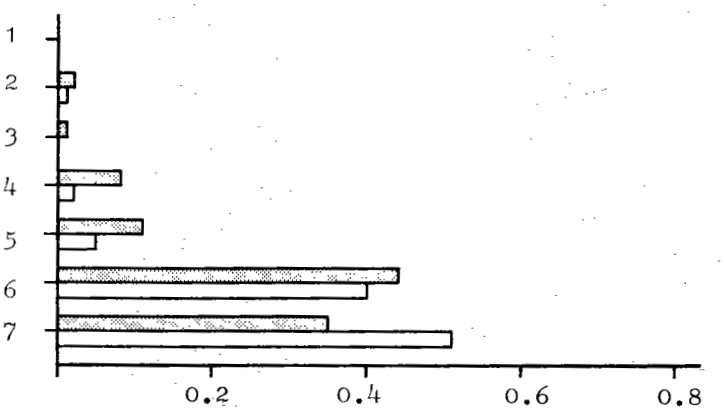
OBJECTIVE ..... EASE OF ENTRY AND EXIT

METHOD ..... Low Steps

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	0	1	1
2	7	6	13
3	5	2	7
4	34	12	46
5	48	24	72
6	190	199	389
7	151	254	405
Unstated	2	0	2
Total	437	498	935
Mean	6.0	6.3	6.2

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Low steps were rated as an effective method of achieving ease of entry and exit. The mean rating of 6.18 resulted from a high female rating (6.3 females; 6.0 males) The rating also increased with the respondents' age and decreased with the respondents' bus patronage.

OPTION D/2

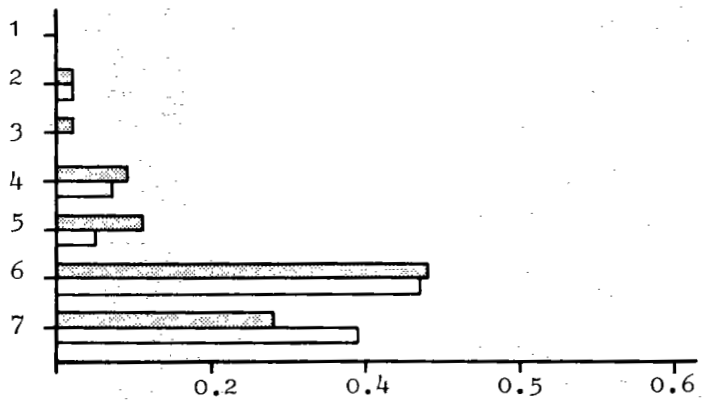
OBJECTIVE ..... EASE OF ENTRY AND EXIT

METHOD ..... Wide Steps

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	1	0	1
2	10	9	19
3	7	2	9
4	40	37	77
5	50	25	75
6	207	233	440
7	120	192	312
Unstated	2	0	2
Total	437	498	935
Mean	5.8	6.1	6.0

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

While this option received a high mean rating of 5.97 it was considered the least important of the ease of entry and exit options. As for option D/1, females rated the option higher than males (6.1 to 5.8 respectively). Respondents above the age of 50 also rated the option higher than those below this age.

OPTION D/3

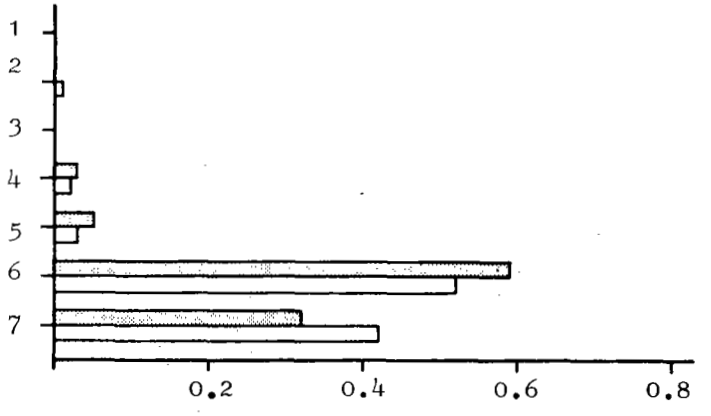
OBJECTIVE ..... EASE OF ENTRY AND EXIT

METHOD ..... Easily Operated Doors

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	0	1	1
2	2	4	6
3	0	0	0
4	15	11	26
5	22	14	36
6	256	258	514
7	140	210	350
Unstated	2	0	2
Total	437	498	935
Mean	6.2	6.3	6.3

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

With a mean response of 6.25 this option was rated as the most effective method of achieving the objective with 92 percent of responses above slightly desirable. The only significant variation in the result was a higher than average rating by respondents over the age of 60.

OPTION D/4

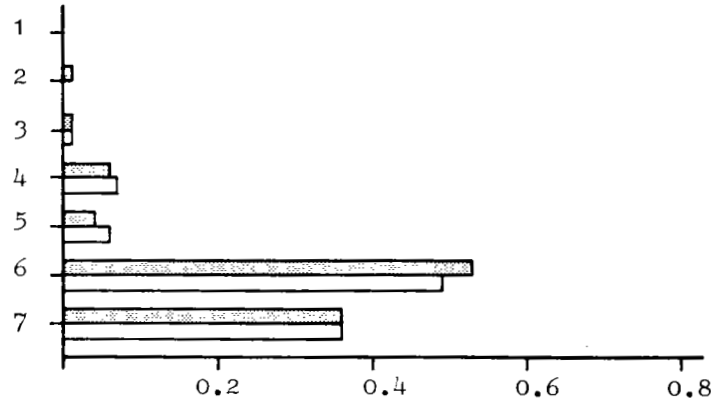
OBJECTIVE ..... EASE OF ENTRY AND EXIT

METHOD ..... Quick Method of Paying Fare

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	0	0	0
2	3	2	5
3	4	4	8
4	25	33	58
5	16	31	47
6	230	246	476
7	157	181	338
Unstated	2	1	3
Total	437	498	935
Mean	6.2	6.1	6.1

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

This option also received a high mean response rating of 6.14 with 87 percent of respondents registering a rating higher than slightly desirable.

OPTION E/1

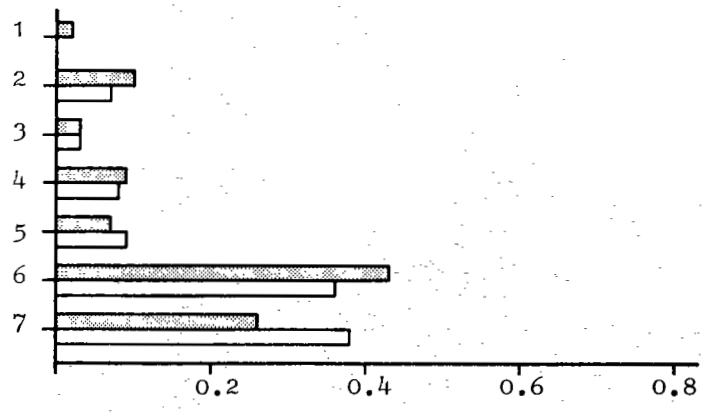
OBJECTIVE ..... INCREASING SEATING CAPACITY

METHOD ..... More Seats and Less Standing Room

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	7	1	8
2	43	34	77
3	11	13	24
4	41	40	81
5	32	43	75
6	188	177	365
7	113	190	303
Unstated	2	0	2
Total	437	498	935
Mean	5.4	5.8	5.6

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

The mean average of 5.6 recieved by this option is lower than expected. There was a large difference in the rating by males and females (5.4 and 5.8 respectively). The result may stem from the respondents' apprehension that a reduction in standing room could cause over crowding if there was no corresponding increase in the number of buses.

OPTION E/2

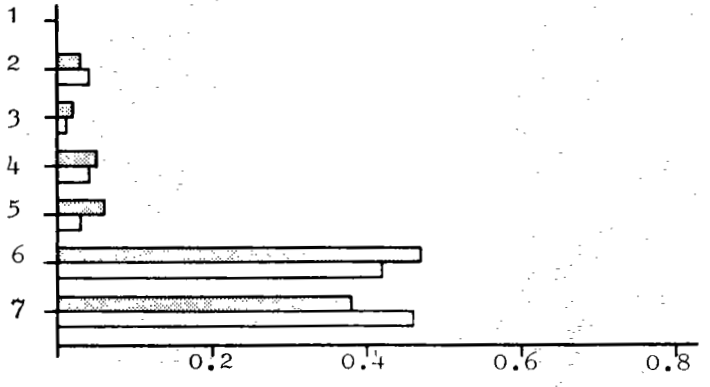
OBJECTIVE ..... INCREASING SEATING CAPACITY

METHOD ..... More Buses During Peak Hours

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	1	1	2
2	14	22	36
3	7	6	13
4	21	19	40
5	24	16	40
6	204	207	411
7	164	227	391
Unstated	2	0	2
Total	437	498	935
Mean	6.0	6.1	6.1

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Providing more buses during peak hours to increase seating capacity was favourably rated at 6.08. This result reinforces the comments made for option E/1, indicating that the respondents would prefer more buses at the present seating standard to fulfil the objective.

OPTION F/1

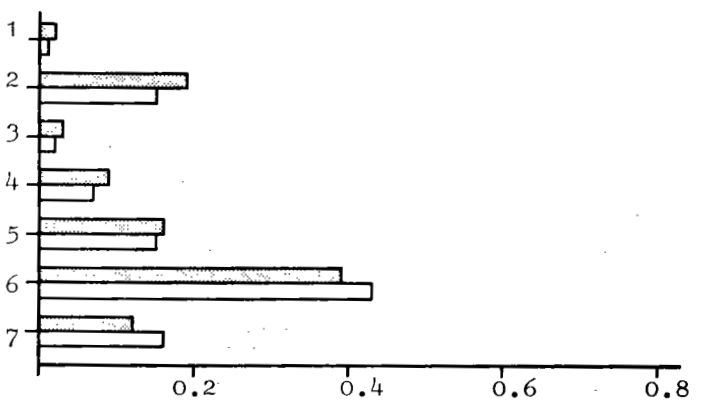
OBJECTIVE ..... CONTROL OF LIGHT, TEMPERATURE AND VENTILATION

METHOD ..... Fans

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	7	6	13
2	84	75	159
3	14	12	26
4	41	37	78
5	68	76	144
6	169	212	381
7	52	80	132
Unstated	2	0	2
Total	437	498	935
Mean	4.8	5.1	5.0

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

The histogram of results for this option displays bimodality with 17 percent of all respondents registering an undesirable rating; never the less, the mean response of 4.99 indicates that the majority of respondents are in favour of the option.

OPTION F/2

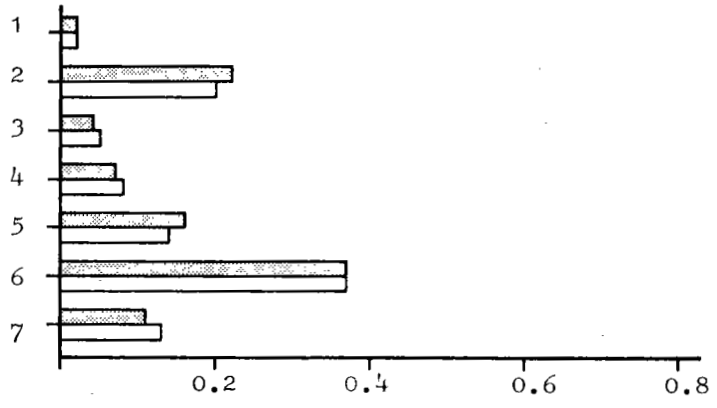
OBJECTIVE ..... CONTROL OF LIGHT, TEMPERATURE AND VENTILATION

METHOD ..... Heating in Winter

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	8	8	16
2	97	102	199
3	17	25	42
4	32	42	74
5	71	69	140
6	162	185	347
7	48	67	115
Unstated	2	0	2
Total	437	498	935
Mean	4.7	4.8	4.7

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

The Perth winter climate is very mild; however the bimodal result (4.74 mean response with 21 percent respondents rating the option as undesirable) is surprising when this comfort convenience is fitted to most automobiles as standard equipment. Respondents rating in the negative may have considered the option as involving an increase in cost.

OPTION F/3

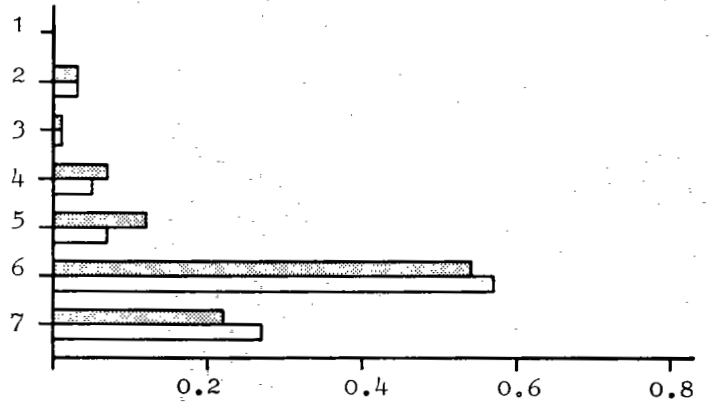
OBJECTIVE ..... CONTROL OF LIGHT, TEMPERATURE AND VENTILATION

METHOD ..... Insulation Against Heat and Cold

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	0	1	1
2	14	14	28
3	6	5	11
4	30	25	55
5	53	37	90
6	236	283	519
7	96	133	229
Unstated	2	0	2
Total	437	498	935
Mean	5.8	5.9	5.9

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

This method was rated highest in satisfying the objective (mean response 5.87) with 80 percent of respondents rating the option above slightly desirable. This result vindicates the insulation approach adopted by the MTT to control temperature.

OPTION F/4

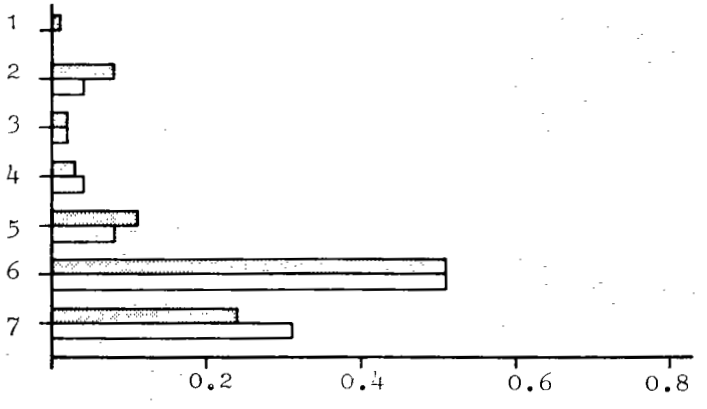
OBJECTIVE ..... CONTROL OF LIGHT, TEMPERATURE AND VENTILATION

METHOD ..... Opening Windows

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	3	2	5
2	36	19	55
3	8	8	16
4	13	20	33
5	50	41	91
6	221	256	477
7	104	152	256
Unstated	2	0	2
Total	437	498	935
Mean	5.6	5.9	5.8

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Opening windows received a favourable response (5.79 mean rating). There is a marked difference in the rating between males and females (5.6 and 5.9 respectively. Those respondents who rated the option as undesirable (7%) possibly had airconditioning in mind.

OPTION F/5

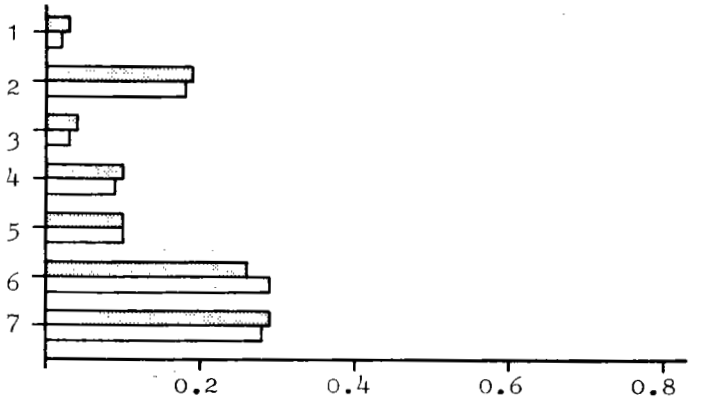
OBJECTIVE ..... CONTROL OF LIGHT, TEMPERATURE AND VENTILATION

METHOD ..... Air Conditioning

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	12	12	24
2	84	91	175
3	17	17	34
4	42	46	88
5	42	48	90
6	112	143	255
7	126	141	267
Unstated	2	0	2
Total	437	498	935
Mean	5.0	5.0	5.0

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Air conditioning was rated seventh out of the eleven methods considered for the objective. The low mean rating of 5.01 resulted from a substantial 19 percent response rating of undesirable. An explanation of the negative response to this generally attractive improvement in other applications may be reservations by respondents on its effectiveness and cost.

OPTION F/6

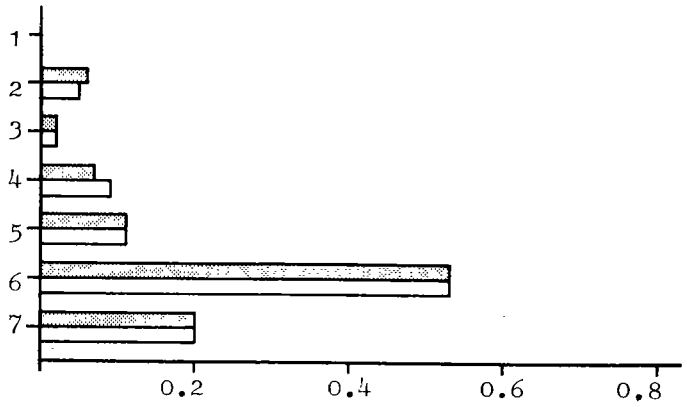
OBJECTIVE ..... CONTROL OF LIGHT, TEMPERATURE AND VENTILATION

METHOD ..... Roof Ventilators

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	0	0	0
2	26	23	49
3	9	12	21
4	32	44	76
5	48	54	102
6	232	263	495
7	88	102	190
Unstated	2	0	2
Total	437	498	935
Mean	5.6	5.7	5.7

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Roof ventilators, an option fitted to most buses in Perth, were rated (5.65 mean response) favourably with 73 percent respondents registering a rating above slightly desirable.

OPTION F/7

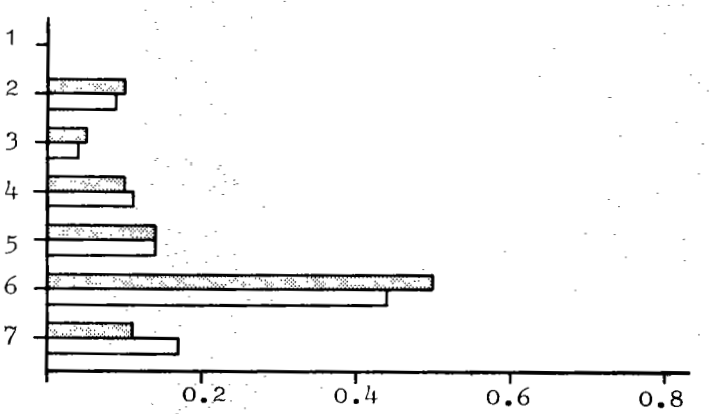
OBJECTIVE ..... CONTROL OF LIGHT, TEMPERATURE AND VENTILATION

METHOD ..... Large Windows

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	2	2	4
2	42	47	89
3	21	21	42
4	45	57	102
5	59	68	127
6	219	220	439
7	47	83	130
Unstated	2	0	2
Total	437	498	935
Mean	5.2	5.3	5.2

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

The histogram of responses for this option displays no consistent trend apart from the 53.1 percent response for the desirable rating. The mean response of 5.25 does indicate an overall approval of this option.

OPTION F/8

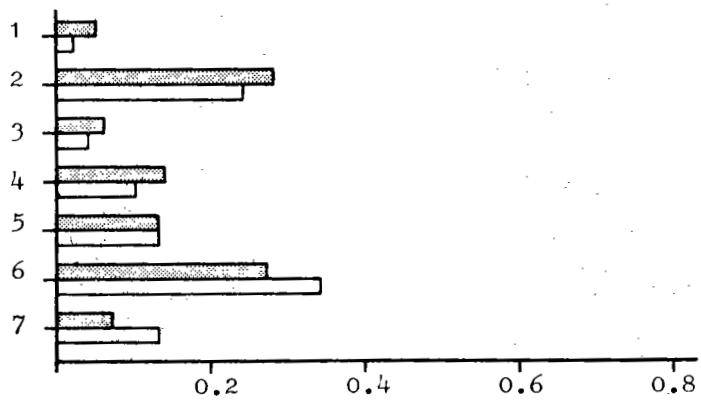
OBJECTIVE ..... CONTROL OF LIGHT, TEMPERATURE AND VENTILATION

METHOD ..... Pull-Down Blinds

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	22	10	32
2	120	120	240
3	28	21	49
4	59	52	111
5	58	63	121
6	118	168	286
7	30	64	94
Unstated	2	0	2
Total	437	498	935
Mean	4.1	4.6	4.4

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

This option displayed marked bimodality with 25.7 percent and 30.7 percent rating the option as undesirable and desirable respectively. As the **mean response** of 4.38 is only just in the affirmative, no clear preference can be gauged from this response.

OPTION F/9

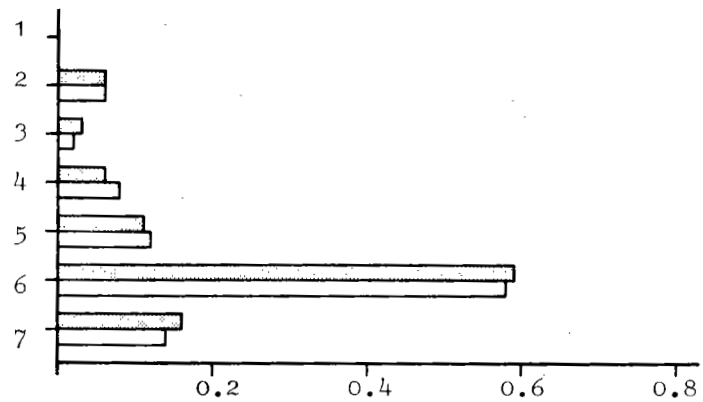
OBJECTIVE ..... CONTROL OF LIGHT, TEMPERATURE AND VENTILATION

METHOD ..... Good Artificial Lighting

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	0	0	0
2	27	29	56
3	11	11	22
4	24	41	65
5	48	58	106
6	257	289	546
7	68	70	138
Unstated	2	0	2
Total	437	498	935
Mean	5.6	5.6	5.6

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Over 58 percent of respondents rated this option as desirable. The mean response was 5.58. A small number, 6 percent, of respondents felt the option was undesirable, possibly because they preferred natural lighting.

OPTION F/10

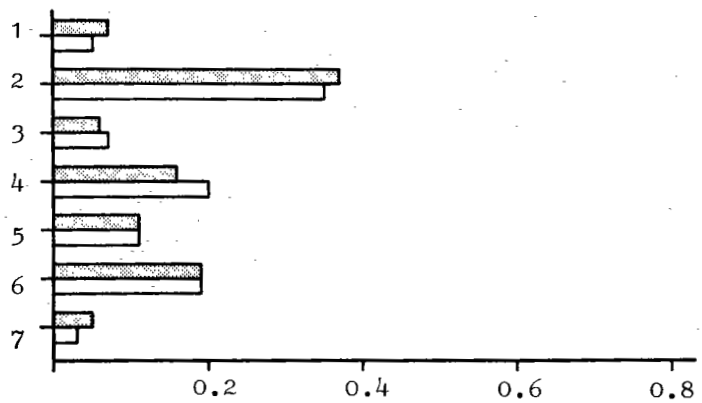
OBJECTIVE ..... CONTROL OF LIGHT, TEMPERATURE AND VENTILATION

METHOD ..... Transparent Roof Panels

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	29	23	52
2	161	176	337
3	28	34	62
4	68	98	166
5	48	55	103
6	81	97	178
7	20	15	35
Unstated	2	0	2
Total	437	498	935
Mean	3.6	3.7	3.6

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

This option with a 3.65 mean response was rated lowest of all methods canvassed for the objective. The 36 percent of respondents who rated the option as undesirable may have been influenced by the associated increase in bus interior temperature which would result with this natural light feature in the hot Perth summers.

OPTION G/2

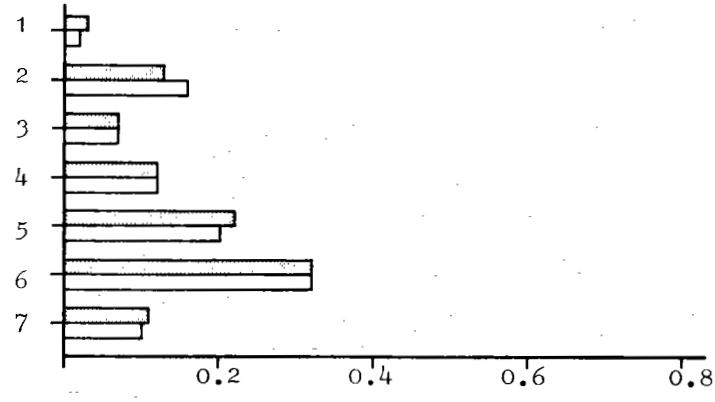
OBJECTIVE ..... EXTERIOR DESIGN

METHOD ..... Bus Design 2

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	12	11	23
2	55	82	137
3	30	36	66
4	54	60	114
5	96	98	194
6	139	159	298
7	50	51	101
Unstated	1	1	2
Total	437	498	935
Mean	4.8	4.7	4.7

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Bus design 2 received the lowest mean response with a value of 4.73. The rating distribution shown above displays a generally favourable trend with some degree of bimodality.

OPTION G/3

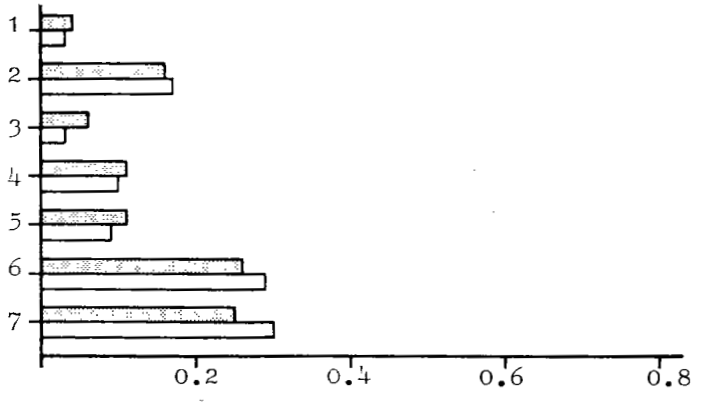
OBJECTIVE ..... EXTERIOR DESIGN

METHOD ..... Bus Design 3

DISTRIBUTION OF RESOURCES

Rating	Male	Female	Total
1	19	13	32
2	69	84	153
3	26	15	41
4	50	48	98
5	47	44	91
6	115	146	261
7	110	147	257
Unstated	1	1	2
Total	437	498	935
Mean	4.9	5.1	5.0

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Bus design 3, a futuristic design, while rated second of the three with a mean response of 5.01, displayed marked bimodality indicating the strength of feeling on the design .

OPTION H/1

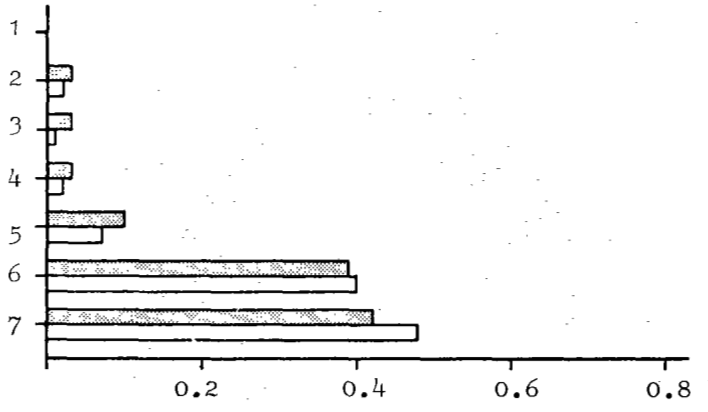
OBJECTIVE ..... SEATING ARRANGEMENT

METHOD ..... Interior Layout 1

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	1	1	2
2	15	11	26
3	12	5	17
4	14	12	26
5	43	33	76
6	168	197	365
7	183	238	421
Unstated	1	1	2
Total	437	498	935
Mean	6.0	6.2	6.1

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

This interior layout with seats all facing forward and only limited room for standees was rated highest of the seating arrangement methods with a mean rating of 6.14. Females rated this arrangement higher than males (6.2 to 6.0 respectively).

OPTION H/2

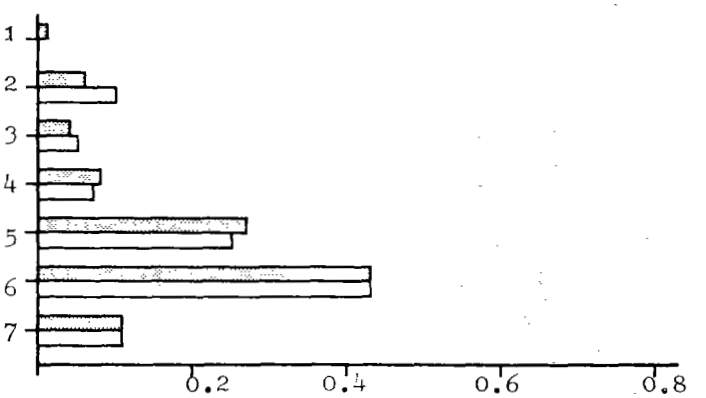
OBJECTIVE ..... SEATING ARRANGEMENT

METHOD ..... Interior Layout 2

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	4	2	6
2	28	48	76
3	19	23	42
4	34	33	67
5	116	122	238
6	188	212	400
7	47	57	104
Unstated	1	1	2
Total	437	498	935
Mean	5.3	5.2	5.2

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

This interior layout which had increased areas for standees by arranging some of the seats to face the bus centre, was rated lower than option H/1 with a mean response of 5.22. In contrast to the response to option 1, females rated this arrangement lower than males. A significant number, 8.1 percent respondents, considered the arrangement to be undesirable.

OPTION H/3

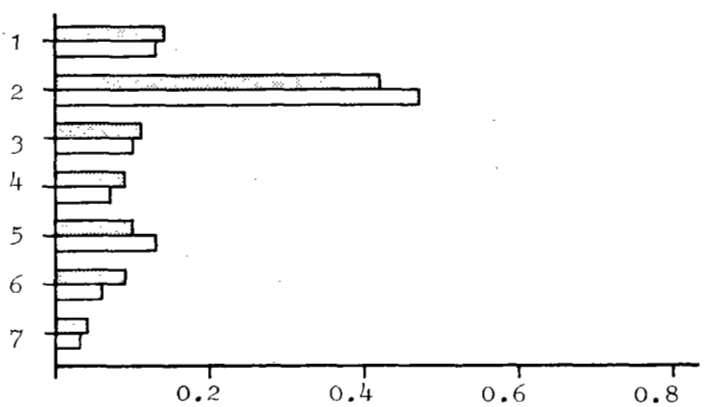
OBJECTIVE ..... SEATING ARRANGEMENT

METHOD ..... Interior Layout 3

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	62	67	129
2	184	236	420
3	50	50	100
4	39	33	72
5	45	66	111
6	38	30	68
7	18	15	33
Unstated	1	1	2
Total	437	498	935
Mean	3.0	2.9	2.9

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

As evident from the histogram this arrangement with centre facing seats allowing a large standing capacity was not favoured. The mean response of 2.93 was influenced by the 45 percent of respondents who rated the arrangement as undesirable.

OPTION I/1

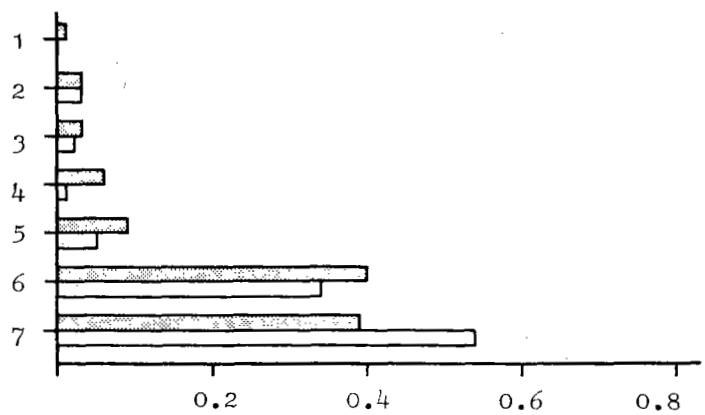
OBJECTIVE ..... SEAT DESIGN

METHOD ..... Seat Design 1

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	3	2	5
2	14	14	28
3	12	8	20
4	24	7	31
5	39	27	66
6	174	170	344
7	170	269	439
Unstated	1	1	2
Total	437	498	935
Mean	5.9	6.3	6.1

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

The seat depicted in seat design 1 appeared to be well padded and was fitted with an arm rest. It received the highest rating with a mean response of 6.12 of the three seat design options, with females overwhelmingly in favour (male rating 5.9, female rating 6.3).

OPTION I/2

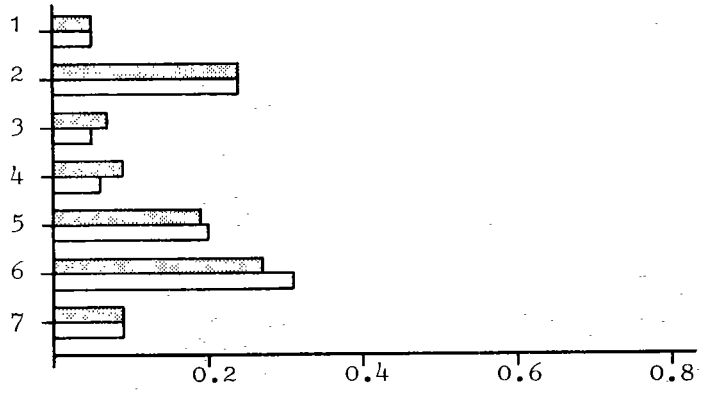
OBJECTIVE ..... SEAT DESIGN

METHOD ..... Seat Design 2

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	21	26	47
2	104	121	225
3	30	26	56
4	38	31	69
5	84	98	182
6	119	152	271
7	40	43	83
Unstated	1	1	2
Total	437	498	935
Mean	4.3	4.4	4.3

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

The seat depicted for this option was very slender and consequently gave the appearance of being hard, but was contoured. The response distribution was markedly bimodal with the 4.35 mean response indicating no clear preference and allowing no conclusion to be drawn.

OPTION I/3

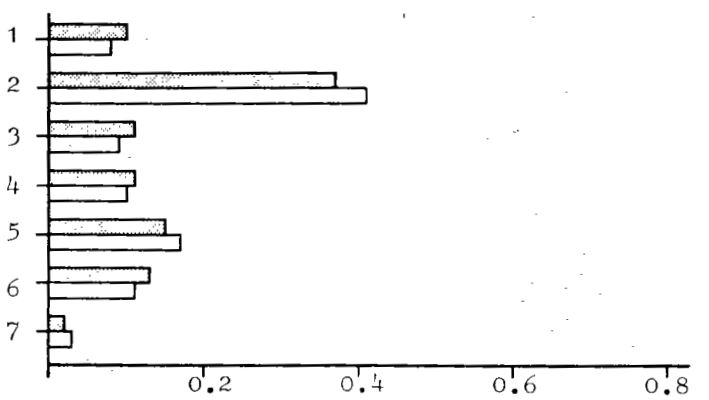
OBJECTIVE ..... SEAT DESIGN

METHOD ..... Seat Design 3

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	42	39	81
2	163	205	368
3	50	47	97
4	46	51	97
5	66	86	152
6	58	56	114
7	10	13	23
Unstated	2	1	3
Total	437	498	935
Mean	3.3	3.3	3.3

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Seat design 3, a slender uncontoured upright back design, received a mean response of 3.33 with 39.5 percent respondents considering the design as undesirable.

OPTION J/1

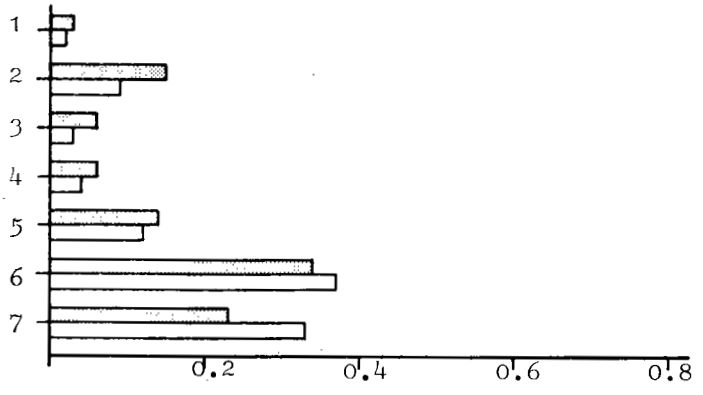
OBJECTIVE ..... SUPPORTS FOR STANDING PASSENGERS

METHOD ..... Handgrip Design 1

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	11	9	20
2	67	45	112
3	24	13	37
4	24	22	46
5	61	58	119
6	150	186	336
7	99	163	262
Unstated	1	2	3
Total	437	498	935
Mean	5.1	5.6	5.3

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

The handgrip depicted for this option was a handle attached to the top edge of the seat back adjacent to the aisle. The option was favoured overall (5.35 mean rating) with females favouring this arrangement more than males (5.6 and 5.1 ratings respectively). 18 percent respondents considered the option unfavourably.

OPTION J/2

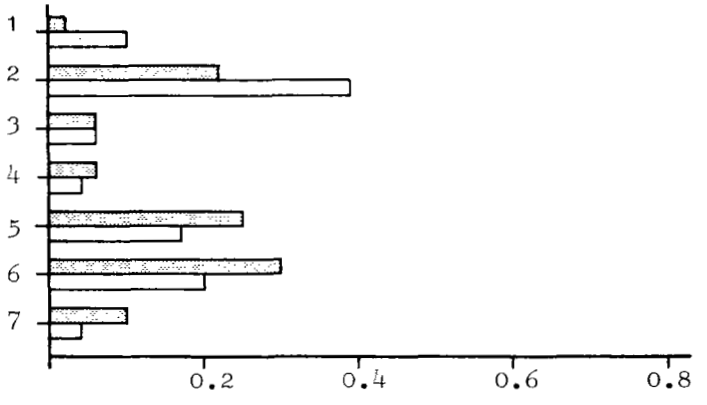
OBJECTIVE ..... SUPPORTS FOR STANDING PASSENGERS

METHOD ..... Handgrip Design 2

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	9	51	60
2	95	194	289
3	25	31	56
4	27	19	46
5	107	84	191
6	130	97	227
7	43	20	63
Unstated	1	2	3
Total	437	498	935
Mean	4.6	3.5	4.0

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

This arrangement, strap grips hanging from an overhead bar, was not favoured by the majority of respondents (4.02 mean rating). The distribution is distinctly bimodal. Females rating the arrangement below males (3.5 and 4.6 respectively) were probably influenced by height problems usually encountered with these grips.

OPTION J/3

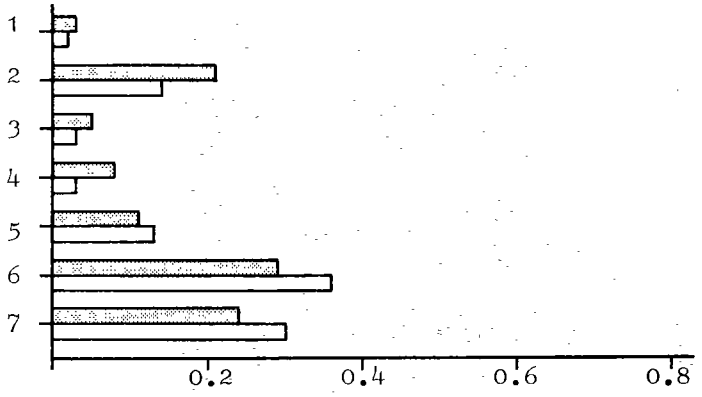
OBJECTIVE ..... SUPPORTS FOR STANDING PASSENGERS

METHOD ..... Handgrip Design 3

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	14	8	22
2	92	67	159
3	20	15	35
4	33	15	48
5	48	65	113
6	126	179	305
7	103	147	250
Unstated	1	2	3
Total	437	498	935
Mean	4.8	5.4	5.1

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

In the overall result, this arrangement of vertical bars and overhead straps, received a rating of 5.13. The distribution is however bimodal with 23 percent of respondents considering the arrangement as unfavourable. Females preferred the arrangement more than males (5.4 and 4.8 rating respectively).

OPTION K/1

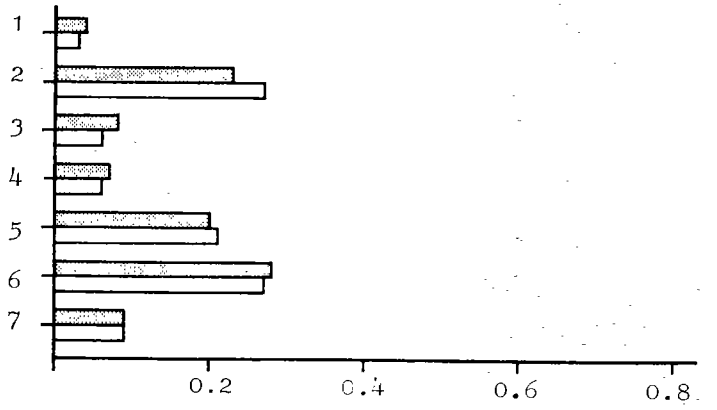
OBJECTIVE ..... SHELTER DESIGN

METHOD ..... Shelter Design 1

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	18	17	35
2	100	134	234
3	36	30	66
4	32	32	64
5	88	105	193
6	121	132	253
7	40	47	87
Unstated	2	1	3
Total	437	498	935
Mean	4.3	4.3	4.3

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

No conclusion can be drawn from the response to this option which received a mean indifferent rating of 4.34 and has a bimodal distribution. This unconclusive result may be attributable to the lack of side weather protection in the design.

OPTION K/2

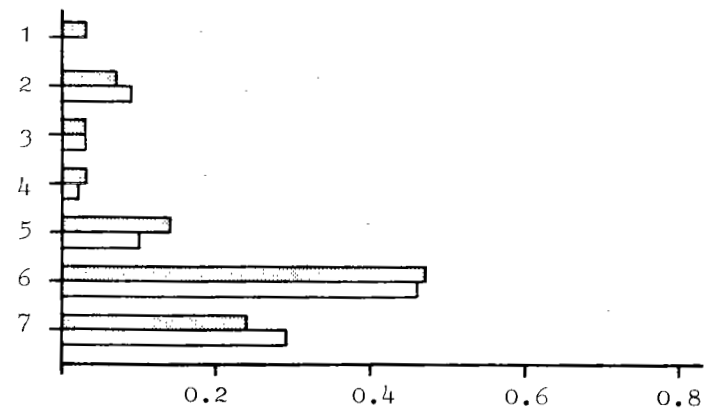
OBJECTIVE ..... SHELTER DESIGN

METHOD ..... Shelter Design 2

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	11	2	13
2	29	44	73
3	11	13	24
4	15	12	27
5	61	52	113
6	205	230	435
7	104	144	248
Unstated	1	1	2
Total	437	498	935
Mean	5.6	5.7	5.6

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Shelter 2 was preferred by respondents receiving a mean rating of 5.63. The design depicted is similar to precast concrete shelters used by the MTT which may have influenced the result to some extent.

OPTION L/1

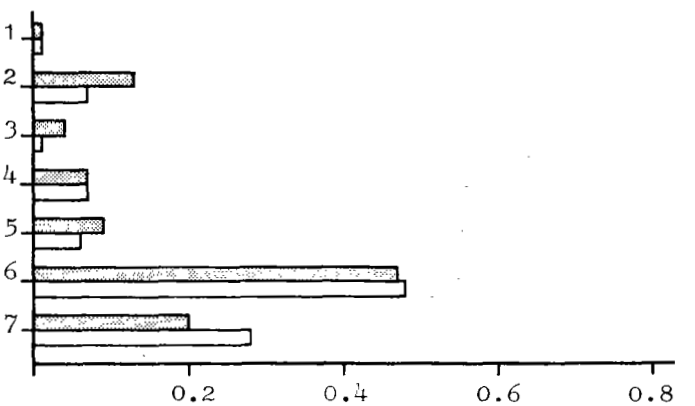
OBJECTIVE ..... REDUCE VANDALISM AND IMPROVE SECURITY

METHOD ..... Conductors on Buses

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	5	7	12
2	56	36	92
3	16	7	23
4	30	36	66
5	37	31	68
6	204	241	445
7	87	140	227
Unstated	2	0	2
Total	437	498	935
Mean	5.3	5.7	5.5

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

This option was considered to be effective (5.50 mean rating) and was particularly favoured by women (5.7 mean female rating, 5.3 male rating). The distribution was slightly bimodal with 10 percent of respondents considering, probably on cost, the option as undesirable.

OPTION L/2

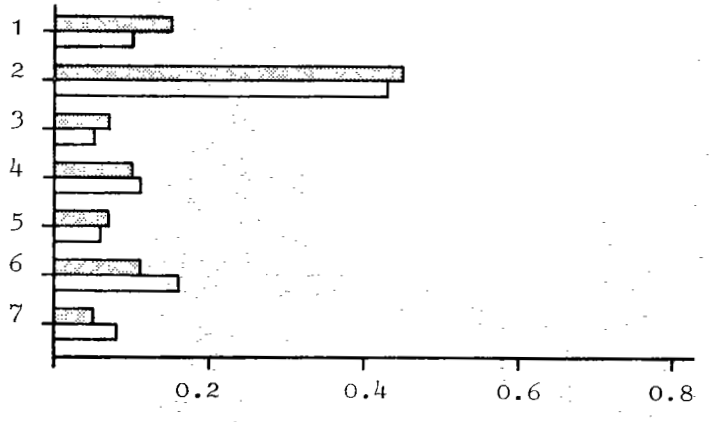
OBJECTIVE ..... REDUCE VANDALISM AND IMPROVE SECURITY

METHOD ..... Closed Circuit Television on Buses

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	65	52	117
2	197	214	411
3	29	25	54
4	43	55	98
5	29	32	61
6	50	80	130
7	22	40	62
Unstated	2	0	2
Total	437	498	935
Mean	3.0	3.4	3.2

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Closed circuit television received approximately equal response to each rating with the exception of the undesirable rating (44 percent response). Females favoured the option ahead of males (3.4 and 3.0 respectively.)

OPTION L/3

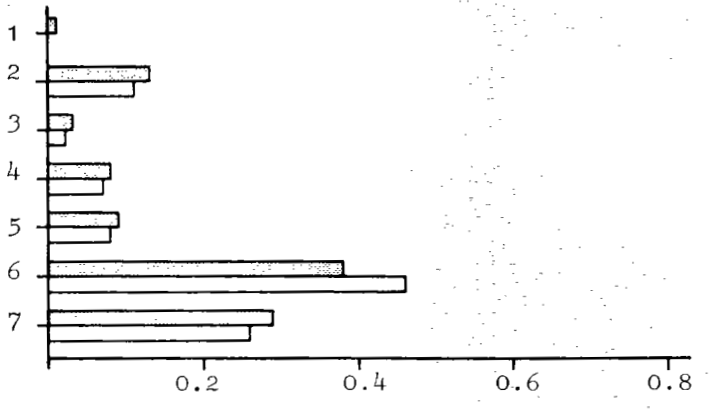
OBJECTIVE ..... REDUCE VANDALISM AND IMPROVE SECURITY

METHOD ..... Radio Communication with Base

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	3	2	5
2	56	53	109
3	11	10	21
4	36	37	73
5	38	38	76
6	166	231	397
7	125	127	252
Unstated	2	0	2
Total	437	498	935
Mean	5.4	5.5	5.5

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Overall this option received a 5.47 mean rating; the distribution is slightly bimodal, however 78 percent of respondents rated the option above slightly desirable or better.

OPTION L/4

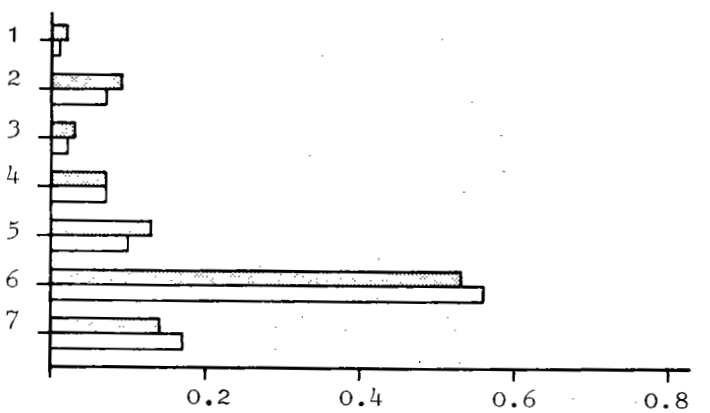
OBJECTIVE ..... REDUCE VANDALISM AND IMPROVE SECURITY

METHOD ..... Checks by Uniformed Inspectors

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	7	5	12
2	39	33	72
3	12	10	22
4	30	35	65
5	57	48	105
6	229	281	510
7	61	86	147
Unstated	2	0	2
Total	437	498	935
Mean	5.3	5.6	5.5

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

This option received a similar mean response, 5.48, to option L/3, and has a similar distribution. Approximately 54 percent of respondents rated the option. Women especially approved of this security measure.

OPTION L/5

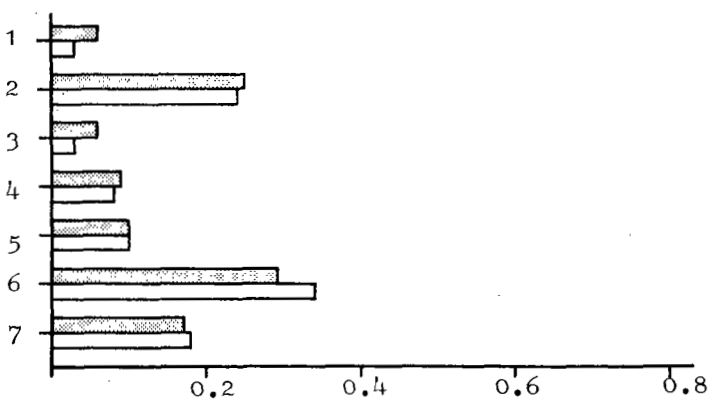
OBJECTIVE ..... REDUCE VANDALISM AND IMPROVE SECURITY

METHOD ..... Checks by Plain-Clothes Inspectors

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	24	16	40
2	110	118	228
3	25	15	40
4	37	41	78
5	42	49	91
6	125	170	295
7	72	89	161
Unstated	2	0	2
Total	437	498	935
Mean	4.4	4.7	4.6

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Respondents were undecided on the desirability of this option, as evidenced by the distribution. 31.6 percent of respondents considered the option desirable while 24.4 percent thought the option undesirable. Females, as for all the options presented for this objective, rated the option as more desirable than males.

OPTION M/1

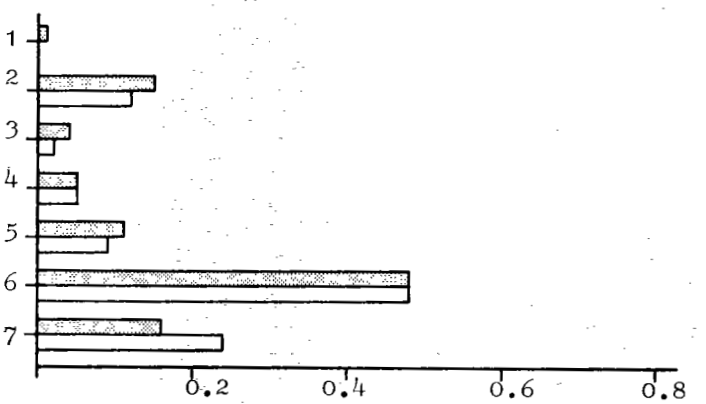
OBJECTIVE ..... PROVIDING TIMETABLE INFORMATION

METHOD ..... Timetables in Buses

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	6	1	7
2	66	59	125
3	17	10	27
4	20	24	44
5	48	47	95
6	209	238	447
7	68	119	187
Unstated	3	0	3
Total	437	498	935
Mean	5.2	5.5	5.3

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

Timetables on buses was the least preferred of the methods suggested to provide timetable information. The mean response was 5.34 with the distribution displaying a bimodal tendency. Females favoured this option ahead of males (5.5 and 5.2 mean response respectively).

OPTION M/2

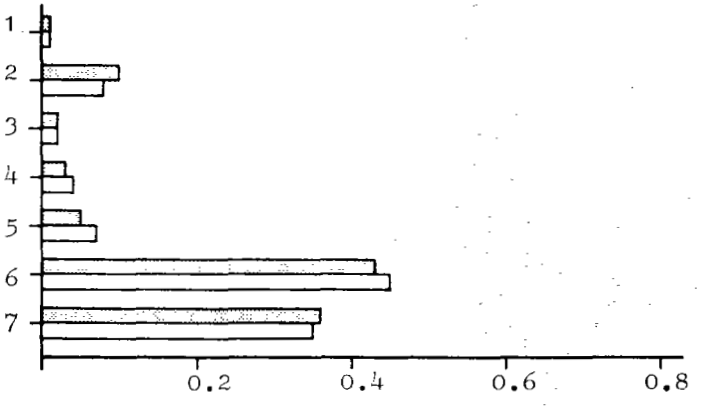
OBJECTIVE ..... PROVIDING TIMETABLE INFORMATION

METHOD ..... Timetables at Bus Stops

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	6	3	9
2	42	39	81
3	9	8	17
4	11	18	29
5	23	36	59
6	188	222	410
7	156	172	328
Unstated	2	0	2
Total	437	498	935
Mean	5.7	5.8	5.8

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

This option was rated the second most popular method of providing timetable information. Almost 79 percent of respondents rated the option above slightly desirable with a resultant mean response of 5.78. The distribution displays a small amount of bimodality.

OPTION M/3

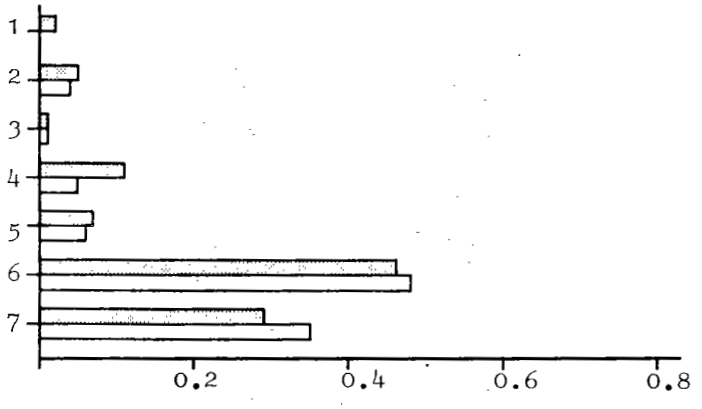
OBJECTIVE ..... PROVIDING TIMETABLE INFORMATION

METHOD ..... Easily Remembered Timetables

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	7	0	7
2	20	21	41
3	3	6	9
4	47	27	74
5	30	32	62
6	201	240	441
7	127	172	299
Unstated	2	0	2
Total	437	498	935
Mean	5.7	6.0	5.9

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

The most popular of the options, this option received a mean rating of 5.83. Females particularly favoured the method.

OPTION M/4

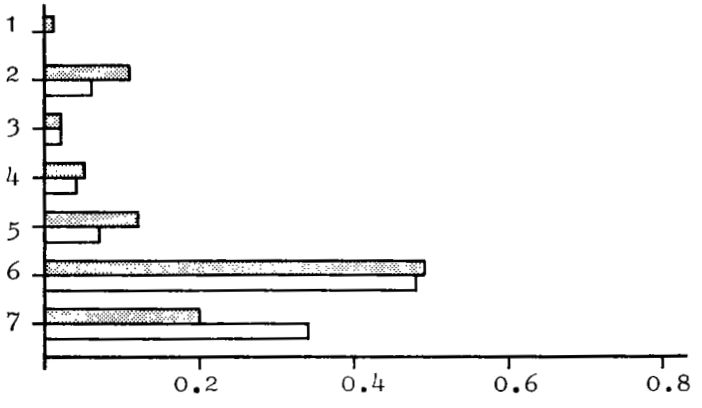
OBJECTIVE ..... PROVIDING TIMETABLE INFORMATION

METHOD ..... Timetables Supplied by Drivers

DISTRIBUTION OF RESPONSES

Rating	Male	Female	Total
1	4	1	5
2	46	28	74
3	8	8	16
4	23	19	42
5	52	37	89
6	214	238	452
7	88	167	255
Unstated	2	0	2
Total	437	498	935
Mean	5.5	5.9	5.7

HISTOGRAM OF RESULTS



COMMENTS ON RESULTS

In general, and particularly by females this option was favoured. It received a mean response of 5.69 overall; 5.5 by males and 5.9 by females. The distribution displays slight bimodality.

ANNEX CF

COLOUR SCHEME PREFERENCES

In Section 5 of the questionnaire (Questions 23, 24 and 25) respondents were asked to register their colour and shade preferences of bus exteriors, interiors and seats. Although public acceptance of colour scheme is not a significant factor in mode choice the acceptance of the other factors may be influenced by a pleasing scheme.

The existing colour scheme of the MTT fleet has an influence on the stated preference. At the time of the survey the colours used were:

- Larch Green (Dulux No. 3932940) - Exterior
- Moon White (Dulux No. 39302946) - Exterior and Interior.

A wide range of colour choices was available to the respondents, with provision for a colour choice other than those listed and registration of no preference whatever. The shade options available were:

- Light
- Medium
- Dark
- Not applicable
- Don't care.

An option of natural was only available for the exterior colour.

Colour and shade preference distributions for the exterior of buses are shown in Table CF.1 while similar distributions for interior and seating colours are shown in Table CF.2 and CF.3 respectively.

The preference for interior/exterior and interior/seat colour combinations are shown in Tables CF.4 and CF.5 respectively.

Respondents overwhelmingly favoured the MTT colour scheme of:

- Green exterior
- Cream interior
- Brown/green seats.

Yellow and Blue were the only significant alternate exterior colour preferences. Green and blue were next favoured as interior colours. Blue also was significantly preferred as an alternate seat colour. The cross referenced colour scheme distributions reinforces the favourable response to the MTT scheme.

It is difficult to estimate the influence the MTT scheme has had in preconditioning the respondents preferences. Care should be exercised when considering these results for other bus services.

TABLE CF.1 - EXTERIOR COLOUR PREFERENCES

Exterior Colour	Shade					Total
	Light	Medium	Dark	Not Applicable	Don't Care	
Natural	0	0	0	56	0	56
White	0	2	0	30	0	32
Cream	9	8	5	3	1	26
Yellow	40	85	11	0	4	140
Orange	13	23	9	0	2	47
Red	17	62	14	0	0	93
Green	20	143	122	0	4	289
Blue	20	54	33	0	0	107
Brown	2	1	5	0	0	8
Black	0	0	0	3	0	3
Other	5	20	6	7	0	38
Don't Care	10	4	0	5	75	94
Unstated	0	0	0	0	2	2
Total	136	402	205	104	88	935

TABLE CF.2 - INTERIOR COLOUR PREFERENCES

Interior Colour	Shade					Total
	Light	Medium	Dark	Not Applicable	Don't Care	
White	6	0	0	117	1	124
Cream	176	109	23	31	11	350
Yellow	30	7	3	1	2	43
Orange	4	9	2	0	0	15
Red	3	1	4	0	0	8
Green	70	12	8	0	1	91
Blue	67	16	2	0	0	85
Brown	25	7	11	0	0	43

TABLE CF.2 - INTERIOR COLOUR PREFERENCES (Cont.)

Interior Colour	Shade					Total
	Light	Medium	Dark	Not Applicable	Don't Care	
Black	0	0	0	9	0	9
Other	27	10	2	12	1	52
Don't Care	28	6	1	5	72	112
Unstated	0	0	0	0	3	3
Total	436	117	50	175	91	935

TABLE CF.3 - SEAT COLOUR PREFERENCES

Seat Colour	Shade					Total
	Light	Medium	Dark	Not Applicable	Don't Care	
White	0	1	0	10	0	11
Cream	9	9	16	4	3	41
Yellow	4	3	4	1	0	12
Orange	3	13	5	0	1	22
Red	1	23	23	0	1	48
Green	24	37	120	0	0	181
Blue	17	30	58	0	0	105
Brown	63	96	129	2	1	291
Black	0	0	1	99	1	101
Other	4	7	6	4	1	22
Don't Care	5	9	18	5	62	99
Unstated	0	0	0	0	2	2
Total	130	228	380	125	72	935

TABLE CF.4 - EXTERIOR/INTERIOR COMBINATION PREFERENCES

Exterior Colour	Interior												Total
	White	Cream	Yellow	Orange	Red	Green	Blue	Brown	Black	Other	Don't Care	Unstated	
Natural	9	16	3	1	1	12	5	3	1	1	4	0	56
White	1	7	1	2	1	3	12	0	2	1	2	0	32
Cream	3	10	1	2	0	4	3	1	0	0	2	0	26
Yellow	27	44	3	3	1	18	13	6	2	11	12	0	140
Orange	6	17	3	2	1	8	1	3	0	2	4	0	47
Red	17	38	1	1	3	9	3	6	2	7	6	0	93
Green	41	139	22	1	0	24	15	15	2	14	16	0	289
Blue	16	41	4	0	1	3	27	5	0	5	4	1	107
Brown	1	6	0	0	0	0	0	1	0	0	0	0	8
Black	0	0	2	0	0	0	0	1	0	0	0	0	3
Other	3	13	0	1	0	5	1	1	0	9	5	0	38
Don't Care	0	19	3	2	0	5	5	1	0	2	57	0	94
Unstated	0	0	0	0	0	0	0	0	0	0	0	2	2
Total	124	350	43	15	8	91	85	43	9	52	112	3	935

TABLE CF.5 - INTERIOR/SEAT COMBINATION PREFERENCES

Interior	Seat												Total
	White	Cream	Yellow	Orange	Red	Green	Blue	Brown	Black	Other	Don't Care	Unstated	
White	1	8	1	4	8	24	24	34	13	1	6	0	124
Cream	4	11	3	10	19	82	27	135	38	7	14	0	350
Yellow	1	2	2	1	0	14	2	12	8	0	1	0	43
Orange	0	2	1	1	1	0	2	5	1	0	2	0	15
Red	1	1	1	0	0	0	0	2	3	0	0	0	8
Green	1	5	1	2	2	34	4	26	8	3	5	0	91
Blue	2	5	2	3	10	7	27	15	9	2	3	0	85
Brown	0	4	0	0	1	2	2	29	2	1	2	0	43
Black	1	0	0	0	2	1	0	0	5	0	0	0	9
Other	0	1	1	1	2	7	8	15	8	7	2	0	52
Don't Care	0	2	0	0	4	10	8	18	6	1	64	0	112
Unstated	0	0	0	0	0	0	1	0	0	0	0	2	3
Total	11	41	12	22	48	181	105	291	101	22	99	2	935

ANNEX CG

HOUSEHOLD SURVEY DATA FILE FORMAT

This annex contains details of the coding and storage of edited survey records on magnetic tape. The information is organised into two files:

- Dwelling and personal data
- Personal schedule results

Notes referred to in the record listing are explained in the section following the listing.

DWELLING CONTROL FILE

The general characteristics of this data file are:

BTE tape reference	DEVS 16 (Minitape)
Data set name (DSN)	PERTH. SURVEY. HHOLD. DWELLING. MASTER
File number (label).	3
Recording density.	1600 bpi
Logical record length.	160 bytes
Physical block size.	16000 bytes
Number of records.	548
Approximate length	1.5 metres
General format	alphanumeric

Format

The record format for the dwelling control data file is scheduled below:

Field	Bytes	Contents of Field	Notes(1)
Household Information			
1	01- 03	BTE dwelling number	1
2	04	BTE completion code	2
3	05- 07	Flat or unit number	3
4	08- 11	Street Number	3
5	12- 31	Street name	5
6	32- 51	Suburb name	6
7	52- 55	Postcode	
8	56- 58	BTE suburb code	7
9	59- 61	Address LGA	8
10	62- 63	Address LGA Part	9
11	64- 65	Address CD	10
12	66- 67	Number of persons in household	11
13	68- 69	Number of persons in scope	12
14	70- 71	Number of personal schedules obtained	13
15	72- 75	Final interview date	14
16	76- 77	Interviewer code	15
Personal Particulars: First family member			
17	78	Relation to head	16
18	79	Sex	17
19	80- 81	Age group	18
20	82	Marital status	19
21	83	Schedule obtained?	20
22-26	84- 89	2nd household member	21
27-31	90- 95	3rd household member	21
32-36	96-101	4th household member	21
37-41	102-107	5th household member	21
42-46	108-113	6th household member	21
47-51	114-119	7th household member	21
52-56	120-125	8th household member	21
57-61	126-131	9th household member	21
62-66	132-137	10th household member	21
67-71	138-143	11th household member	21
72-76	144-149	12th household member	21

(1) Details of notes on following pages.

Note

1. Each sampled dwelling was arbitrarily assigned a number.
2. The BTE completion code denoted the response results for the household and was coded as follows:

Code	Result
1	All personal schedules obtained
2	Some personal schedules obtained
3	No personal schedules obtained
4	Household vacant
5	Household out of scope.

Dwellings were defined as out of scope if they contained more than one permanent family group. The presence of boarders, visitors and members of group co-operatives did not invalidate a dwelling.

3. The flat or unit number was right justified in the field and contains alphanumeric characters (blanks if not appropriate).
4. The street number was right justified and contains numeric characters only.
5. The street name was left justified in the field. The types of street, i.e. road, crescent etc., were abbreviated using the normal conventions.
6. The suburb name is left justified.
7. An arbitrary code based on the alphabetical listing of suburbs in the Perth Statistical Division. The suburb/code listing is presented in Annex BH.
8. This was the Australian Bureau of Statistics (ABS) local government area identifier.
9. LGA Part was the ABS identifier for the local government part.
10. Address CD was the ABS identifier for the Collector District from which the dwelling was sampled.
11. Persons present in the household on the night before the original approach and who were fifteen and older were in scope. A contact was made with at least one member of a household and if the number of inhabitants was not determined 99 was recorded.

12. If contact was made and the exact number of the inhabitants who were in scope was not determined, 99 was recorded.
13. If no schedules were obtained and the number of inhabitants and the number in scope was not determined, 99 was recorded. For the case where the previous two items of information were known and yet no schedules were obtained, 00 was recorded.
14. The final interview date was the date on which the last completed schedule was obtained from the dwelling. Only the day and month was recorded e.g. the 10 September as coded 1009. If contact was made with one of the household members and no schedules were obtained 9999 was recorded.
15. A confidential number was supplied by the ABS to identify the schedules completed by each interviewer.
16. The head was defined in the normal sense of household leader. The relations are coded:

    1. Head
    2. Spouse
    3. Son/Daughter
    4. Brother/Sister
    5. Parent/Inlaw
    6. Visitor
    7. Other

17. The sex of the household member is coded as:

Code	Sex
1	Male
2	Female

18. Age groups were recorded using the following codes:

Code	Age Group
01	00-04 years
02	05-09 years
03	10-14 years
04	15-19 years
05	20-29 years
06	30-39 years
07	40-49 years
08	50-59 years

09	60-69 years
10	70 and over

19. Only three categories were used in the survey, and were recorded using the following codes:

Code	Marital Status
1	Now married
2	Never married
3	Other

20. The answer to this question was recorded using the following codes:

Code	Answer
1	Yes
2	No

21. The personal particulars obtained from the first household member (field 17 through 21) were obtained and recorded for all others who were present on the night before the initial contact. Where information was not obtained, 9 was recorded for a single byte, and 99 was recorded for a 2 byte field as appropriate.

PERSONAL SCHEDULE FILE

The general characteristics of this data file are as follows:

BTE tape reference	DEVS 16 (Minitape)
Data set name (DSN).	PERTH. SURVEY. HHOLD. PERSCED. MASTER
File number (label).	4
Recording density.	1600 bpi
Logical record length.	160 bytes
Physical block size.	16000 bytes
Number of records.	935
Approximate length	2.4 metres
General format	All numeric

Format

The format of each record in the file is shown in the following list.

Field	Bytes	Content of Field	Notes(1)
01	01-03	BTE dwelling number	1
02	04-05	Card record indentifier	2
03	06-07	Person number	3
04	08	Relation to head	4
05	09	Sex	5
06	10-11	Age	6
07	12	Marital status	7
08	13	Current motorists license	8
09		Transport modes used to travel	9
09	14-17	To: work	
10	18-21	school, university, etc	
11	22-25	shopping	
12	26-29	social or recreation	
13	30-33	other activities	
14	34-35	number of bus trips made each week	
		Bus design and travel ranking	10
		- first question	
15	36-37	Cleanliness	
16	38-39	Quiet and smooth ride	
17	40-41	Time reduction	
18	42-43	Entry and exit	
19	44-45	Seat availability	
20	46-47	Fare reduction	
21	48-49	Light etc. control	
22	50-51	Exterior style	
23	52-53	Interior style	
24	54-55	Travel comfort	
25	56-57	Pollution control	
26	58-59	Colour scheme	
		Bus design and travel ranking	
		- second question	11
27	60-61	Seat availability	
28	62-63	Frequent services	
29	64-65	Distance to stops	

(1) Details of Notes on following pages.

Field	Bytes	Content of Field	Notes
30	66-67	Reliable service	
31	68-69	Safety	
32	70-71	Fare reduction	
33	72-73	Shelters	
34	74-75	Express buses	
35	76-77	Reduce vandalism, etc	
36	78-79	Timetables	
		Methods of achieving bus cleanliness rating question	12
37	80	Rubbish collection between trips	
38	81	Frequent outside cleaning	
39	82	Colours which do not show dirt	
40	83	Use of stain proof materials	
41	84	Regular outside painting	
42	85	Regular inside painting	
43	86	Provision of rubbish containers on buses	
44	87	Frequent cleaning of seats and interior panels	
		Assessment of methods to obtain quiet and smooth ride-rating questions	12
45	88	Windows which cannot be opened	
46	89	Quiet engine and gearbox	
47	90	Regular attention to rattles and squeaks	
48	91	Softly padded seats	
49	92	Firmly padded seats	
50	93	Non-slip seat material	
51	94	Smooth starting and stopping	
52	95	Good suspension and springing	
53	96	Sound-proof walls and floors	
		Assessment of ways to reduce travel time	12
54	97	Frequent bus services	
55	98	Close route spacing	

Field	Bytes	Content of Field	Notes
56	99	Reliable service (buses on time)	
57	100	Express bus services	
		Desirability of features to improve ease of entry and exit from buses	12
58	101	Low steps	
59	102	Wide doors	
60	103	Easily operated doors	
61	104	Quick method of paying fare	
		Assessment of ways to provide more seats for passengers	
62	105	More seats and less standing room	
63	106	More buses during peak hours	
		Effectiveness of methods to control the light, temperature and ventilation in buses	
64	107	Fans	
65	108	Heating in winter	
66	109	Insulation against heat and cold	
67	110	Opening windows	
68	111	Air conditioning	
69	112	Roof ventilators	
70	113	Large windows	
71	114	Pull-down blinds	
72	115	Good artifical lighting	
73	116	Transparent roof panels	
74	117	Tinted window glass	
		Assessment of exterior design of buses	12
75	118	Bus design 1	
76	119	Bus design 2	
77	120	Bus design 3	
		Assessment of seating layouts	12
78	121	Interior layout 1	
79	122	Interior Layout 2	
80	123	Interior Layout 3	

Field	Bytes	Content of Field	Notes
		Assessment of bus seat types	12
81	124	Seat design 1	
82	125	Seat design 2	
83	126	Seat design 3	
		Assessment of Handgrip types	12
84	127	Handgrip design 1	
85	128	Handgrip design 2	
86	129	Handgrip design 3	
		Assessment of bus shelter designs	12
87	130	Shelter design 1	
88	131	Shelter design 2	
		Assessment of methods to reduce vandalism and improve passenger security	12
89	132	Conductors on bus	
90	133	Closed circuit television on buses	
91	134	Radio communication with base	
92	135	Checks by uniformed inspectors	
93	136	Checks by plain-clothes inspectors	
		Assessment of ways to provide timetable information	12
94	137	Timetables in buses	
95	138	Timetables at bus stops	
96	139	Easily remembered timetable	
97	140	Timetables supplied by drivers	
		Colour preference for the outside of buses	13
98	141-142	Colour	
99	143	Shade	
		Colour preference for the inside of buses	13
100	144-145	Colour	
101	146	Shade	
		Colour preference for bus seats	13
102	147-148	Colour	
103	149	Shade	
104	150	Main activity during most of the week	14
105	151-152	Gross income last week	15

Code	Rating
6	desirable
7	highly desirable

13. The respondents were asked to choose from a comprehensive list of colours with provision for a colour preference not included. i.e. the registration of an indifference to any particular colour scheme. The colours were coded as follows with the selection of "natural" only available for exterior colour schemes.

Code	Colour
01	natural
02	white
03	cream
04	yellow
05	orange
06	red
07	green
08	blue
09	brown
10	black
11	other (to be specified)
12	don't care

14. The seven activity categories were coded as:

Code	Activity
1	full-time employment
2	part-time employment
3	looking for work
4	student
5	pensioner or retired
6	housewife
7	other

15. The weekly and corresponding annaul gross income of the respondents were coded:

Code	Weekly Income ($)	Annual Income ($)
01	0- 19	0- 1,039
02	20- 39	1,040- 2,079
03	40- 59	2,080- 3,019

Code	Weekly Income ($)	Annual Income ($)
04	60- 79	3,120- 4,159
05	80- 99	4,160- 5,199
06	100-119	5,200- 6,239
07	120-139	6,240- 7,279
08	140-159	7,280- 8,319
09	160-179	8,320- 9,359
10	180-199	9,360-10,399
11	200-219	10,400-11,439
12	220-239	11,440-12,479
13	240-259	12,480-13,519
14	760 or over	13,200 or over

ANNEX CH

BTE SUBURB CODE DIRECTORY

Listed in alphabetical order are the Perth suburbs and their sequential code. Also listed for each suburb are the:

- Local Government Area reference number
- Map reference from Perth UBD street directory
- Post Code
- Northerly distance (km) from GPO
- Easterly distance (km) from GPO
- Range on direct line distance (km) from GPO
- Bearing from true north

The approximate suburb centroid was used as the reference point to calculate distances and bearings.

NO.	SUBURB NAME	LGA	MAP REF'CE	POST CODE	NORTH	EAST	RANGE	ANGLE
001	ALFRED COVE	014	M08-26	6154	- 7.9	- 3.8	8.8	205.7
002	APPLECROSS	014	H03-27	6153	- 5.7	- 2.0	6.0	199.3
003	ARDROSS	014	L03-27	6153	- 6.3	- 1.9	6.6	196.8
004	ARMADALE	001	D03-55	6112	-19.6	12.9	23.5	146.6
005	ASHFIELD	002	J05-13	6054	4.3	7.0	8.2	58.4
006	ATTADALE	014	M05-26	6156	- 6.8	- 5.0	8.4	216.3
007	BALCATTA	021	M08-02	6021	7.9	- 3.7	8.7	334.9
008	BALGA	021	J03-03	6061	8.9	- 1.6	9.0	349.8
009	BANJUP	007	M04-44	6164	-17.4	1.6	17.5	174.7
010	BASSENDEAN	002	G07-13	6054	5.9	7.2	9.3	50.7
011	BATEMAN	014	E05-35	6153	- 9.6	- 1.4	9.7	188.3
012	BAYSWATER	003	J07-12	6053	4.6	5.3	7.0	49.0
013	BEACONSFIELD	010	J07-33	6162	-10.6	- 8.4	13.5	218.4
014	BECKENHAM	011	L09-29	6107	- 7.1	8.5	11.1	129.9
015	BEDFORD	003	G05-12	6052	4.6	2.7	5.3	30.4
016	BEDFORDALE	001	N09-55	6112	-22.3	16.0	27.4	144.3
017	BEECHBORO	026	K06-05	6063	8.9	6.3	10.9	35.3
018	BELLEVUE	026	C04-15	6056	5.5	13.9	14.9	68.4
019	BELMONT	004	C03-21	6104	0.9	3.1	3.2	73.8
020	BENTLEY	005	G08-28	6102	- 4.7	4.1	6.2	138.9
021	BIBRA LAKE	007	C08-42	6163	-15.0	- 2.6	15.2	189.8
022	BICKLEY	012	G09-32	6076	- 5.5	19.7	20.5	105.6
023	BICKLEY RES'VOIR	012	M08-31	6109	- 4.3	14.4	15.0	106.6
024	BICTON	014	L02-25	6157	- 6.6	- 6.4	9.2	224.1
025	BOORAGOON	014	B02-35	6154	- 8.2	- 1.7	8.4	191.7
026	BOYA	017	K02-16	6056	4.0	17.0	17.5	76.8
027	BRENTWOOD	014	C06-35	6153	- 8.8	- 0.7	8.8	184.5
028	BULLCREEK	014	R08-35	6153	- 9.4	0.7	9.4	175.7
029	BURNS BEACH	027	L05-67	6065	22.4	-17.6	28.5	321.8
030	BYFORD	001	L02-54	6201	-28.8	12.9	31.6	155.9
031	CALEDONIA	013	G08-56	6167	-26.2	- 4.3	26.6	189.3
032	CALISTA	013	G08-56	6167	-28.6	- 5.2	29.1	190.3
033	CANNING VALE	011	H03-37	6107	-11.3	5.9	12.7	152.4

NO.	SUBURB NAME	LGA	MAP REF'CE	POST CODE	NORTH	EAST	RANGE	ANGLE
034	CANNINGTON	005	J05-29	6107	- 5.6	6.1	8.3	132.6
035	CARLISLE	020	L09-20	6101	- 2.0	5.3	5.7	110.7
036	CARMEL	012	K07-32	6076	- 6.5	19.3	20.4	108.6
037	CAVERSHAM	026	L04-06	6055	8.0	10.4	13.1	52.4
038	CHIDLOW	017	N07-61	6556	8.0	33.6	34.5	76.6
039	CHURCHLANDS	021	K03-10	6018	4.3	- 5.7	7.1	307.0
040	CITY BEACH	020	M05-09	6015	2.6	- 8.6	9.0	286.8
041	CLAREMONT	006	N02-18	6010	- 2.7	- 6.5	7.0	247.4
042	CLOVERDALE	004	J06-21	6105	- 0.8	7.3	7.3	96.3
043	COMO	024	D07-27	6152	- 3.9	0.4	3.9	174.1
044	COOGEE	007	J07-41	6164	-15.4	- 8.0	17.4	207.4
045	COOLBELLUP	007	N06-34	6163	-12.6	- 3.3	13.0	194.7
046	COOLBINIA	021	H06-11	6050	4.6	- 0.3	4.6	356.3
047	COOLOONGUP	022	L03-58	6168	-34.6	- 8.0	35.5	193.0
048	COTTESLOE	008	B04-25	6011	- 3.7	- 8.8	9.5	247.2
049	CRAIGIE	027	C08-64	6025	16.0	- 7.3	17.6	335.5
050	CRAWLEY	025	L08-18	6009	- 2.1	- 3.3	3.9	237.5
051	DAGLISH	025	E06-18	6008	0.3	- 4.6	4.6	273.7
052	DALKEITH	018	E04-26	6009	- 4.0	- 5.2	6.6	232.4
053	DARLINGTON	017	K06-16	6075	3.6	19.3	19.6	79.4
054	DIANELLA	021	C10-11	6062	6.2	1.5	6.4	13.6
055	DOUBLEVIEW	021	C09-09	6018	5.8	- 7.1	9.2	309.2
056	DUNCRAIG	027	A02-02	6023	12.7	- 6.3	14.2	333.6
057	EAST CANNINGTON	005	G09-29	6107	- 5.4	8.7	10.2	121.8
058	EAST FREMANTLE	009	C06-33	6158	- 7.9	- 7.0	10.6	221.5
059	EAST PERTH	020	G09-62	6000	- 0.4	1.5	1.6	104.9
060	EAST ROCKINGHAM	022	C04-58	6168	-30.4	- 8.4	31.5	195.4
061	EAST VICTORIA PK	020	B06-28	6101	- 3.0	3.4	4.5	131.4
062	EDEN HILL	002	A05-13	6054	6.5	7.6	10.0	49.5
063	ELLIS	014	K10-34	6163	-11.3	- 2.7	11.6	193.4
064	EMBLETON	003	E08-12	6062	5.7	3.8	6.9	33.7
065	FERNDALE	005	M02-29	6155	- 7.3	5.6	9.2	142.5
066	FLOREAT PARK	020	N03-10	6014	2.0	- 5.9	6.2	288.7
067	FORRESTDALE	001	E06-53	6112	-19.1	6.3	20.1	161.7

NO.	SUBURB NAME	LGA	MAP REF'CE	POST CODE	NORTH	EAST	RANGE	ANGLE
068	FORRESTFIELD	012	K03-23	6058	- 2.2	11.3	11.5	101.0
069	FREMANTLE	010	G05-63	6160	- 9.5	- 9.4	13.4	224.7
070	GIRRAWHEEN	027	B02-03	6064	11.2	- 1.4	11.3	352.9
071	GLEN FORREST	017	N02-50	6071	5.5	21.3	22.0	75.5
072	GLENDALOUGH	021	J09-10	6016	3.8	- 3.2	5.0	319.9
073	GOOSEBERRY HILL	012	D08-23	6076	- 0.7	16.7	16.7	92.4
074	GOSNELLS	011	M08-38	6110	-11.6	12.6	17.1	132.6
075	GRAYLANDS	018	K01-18	6010	- 1.2	- 6.4	6.5	259.4
076	GREENMOUNT	017	E09-15	6056	5.6	16.8	17.7	71.6
077	GREENWOOD	027	L04-65	6024	13.0	- 4.9	13.9	339.3
078	GUILDFORD	026	C02-14	6055	6.0	10.6	12.2	60.5
079	GWELUP	021	K03-02	6021	8.5	- 5.5	10.1	327.1
080	HAMERSLEY	021	F05-02	6022	10.4	- 5.5	11.8	332.1
081	HAMILTON HILL	007	N08-33	6163	-12.2	- 7.1	14.1	210.2
082	HAZELMERE	026	G09-14	6055	4.3	12.7	13.4	71.3
083	HELENA VALLEY	026	L08-15	6056	3.5	16.1	16 5	77.7
084	HENDERSON	007	H08-49	6164	-20.1	- 7.0	21.3	199.2
085	HERDSMAN	021	K05-10	6016	3.8	- 4.5	5.9	310.2
086	HERNE HILL	026	B04-07	6056	11.9	13.6	18.1	48.8
087	HIGHGATE	020	C09-62	6000	1.4	0.7	1.6	26.6
088	HILLARY	027	G04-64	6025	14.4	- 9.4	17.2	326.9
089	HILLMAN	022	G05-58	6168	-32.5	- 8.4	33.6	194.5
090	HILTON	010	K02-34	6163	-11.3	- 6.9	13.2	211.4
091	HOPE VALLEY	013	C09-56	6165	-24.5	- 4.3	24.9	190.0
092	HOVEA	017	C02-59	6553	6.3	21.7	22.6	73.8
093	INGLEWOOD	021	K03-12	6052	3.3	2.1	3.9	32.5
094	INNALOO	021	C03-10	6018	6.2	- 5.6	8.4	317.9
095	JANDAKOT	007	J06-43	6164	-16.3	- 1.3	16.4	184.6
096	JOLIMONT	025	C07-18	6014	0.9	- 4.4	4.5	281.6
097	JOONDANNA	021	G03-11	6060	4.5	- 1.5	4.7	341.6
098	KALAMUNDA	012	L03-24	6076	- 1.7	16.7	16.8	95.8
099	KALLAROO	027	D03-64	6025	15.8	- 8.6	18.0	331.4
100	KARDINYA	014	M09-34	6163	-10.4	- 4.5	11.3	203.4

NO.	SUBURB NAME	LGA	MAP REF'CE	POST CODE	NORTH	EAST	RANGE	ANGLE
101	KAROBORUP	027	F06-67	6065	34.2	-15.6	37.6	335.5
102	KARRAKATTA	018	J04-18	6010	- 1.1	- 5.0	5.1	257.6
103	KARRINYUP	021	L09-01	6018	7.4	- 6.2	9.7	320.0
104	KELMSCOTT	001	J03-47	6111	-16.0	13.6	21.0	139.6
105	KENSINGTON	024	003-20	6151	- 2.6	1.8	3.2	145.3
106	KENWICK	011	N04-30	6107	- 7.4	10.2	12.6	126.0
107	KEWDALE	004	L04-21	6105	- 1.4	6.7	6.8	101.8
108	KOONDOOLA	027	B08-03	6064	11.1	- 0.2	11.1	359.0
109	KOONGAMIA	017	F08-15	6056	5.1	15.8	16.6	72.1
110	KWINANA	013	J03-56	6166	-27.9	- 7.9	29.0	195.8
111	LANGFORD	011	N06-29	6155	- 8.5	7.0	11.0	140.5
112	LEDA	013	C09.58	6167	-31.2	- 5.5	31.7	190.0
113	LEEDERVILLE	020	M02-11	6007	2.2	- 1.3	2.6	329.4
114	LEEMING	014	K06-35	6153	-11.1	0.8	11.1	175.9
115	LESMURDIE	012	F08-31	6076	- 5.3	15.1	16.0	109.3
116	LOCKRIDGE	026	M07-05	6054	7.9	7.8	11.1	44.6
117	LYNWOOD	005	B02-37	6155	- 9.2	5.3	10.6	150.1
118	MADDINGTON	011	C06-38	6109	- 9.4	12.1	15.3	127.8
119	MAHOGANY CREEK	017	K07-59	6072	5.5	24.5	25.1	77.3
120	MAIDA VALE	012	E03-23	6057	1.6	13.3	13.4	83.1
121	MALAGA	026	H08-04	6062	9.7	3.8	10.4	21.4
122	MANIANA	005	E08-29	6107	- 5.4	8.7	10.2	121.8
123	MANNING	024	J09-27	6152	- 5.9	0.7	5.9	173.2
124	MARMION	024	M05-64	6020	12.6	- 8.5	15.2	326.0
125	MAYLANDS	021	N05-12	6051	3.1	3.8	4.9	50.8
126	MEDINA	013	L08-56	6167	-27.5	- 5.4	28.0	191.1
127	MELVILLE	014	C04-34	6156	- 8.6	- 5.5	10.2	212.6
128	MENORA	021	K08-11	6050	3.6	0.2	3.6	3.2
129	MIDDLE SWAN	026	G04-07	6056	8.6	16.0	18.2	61.7
130	MIDLAND	026	B07-14	6056	6.6	11.2	13.0	59.5
131	MIDVALE	026	Q04-15	6056	7.1	14.2	15.9	63.4
132	MORLEY	003	B06-12	6062	6.8	3.5	7.6	27.2

NO.	SUBURB NAME	LGA	MAP REF'CE	POST CODE	NORTH	EAST	RANGE	ANGLE
133	MOSMAN PARK	016	H06-25	6012	- 5.5	- 8.2	9.9	236.1
134	MOUNT HAWTHORN	020	K03-11	6016	3.5	- 1.5	3.8	336.8
135	MOUNT HELENA	017	D04-61	6555	10.0	35.9	37.3	74.4
136	MOUNT LAWLEY	021	N09-11	6050	2.6	1.6	3.1	31.6
137	MOUNT PLEASANT	014	L05-27	6153	- 6.7	- 0.8	6.7	186.8
138	MULLALOO	027	B03-64	6061	17.3	-12.5	21.3	324.2
139	MUNDARING	017	L02-60	6073	6.6	26.3	27.1	75.9
140	MUNSTER	007	M09-41	6164	-16.6	- 7.0	18.0	202.9
141	MYAREE	014	B07-34	6154	- 8.7	- 3.9	9.5	204.1
142	NATIONAL PARK	017	M09-08	6071	8.3	20.2	21.8	67.7
143	NAVAL BASE	013	C05-56	6165	-23.8	- 6.4	24.6	195.0
144	NEDLANDS	018	N06-18	6009	- 2.9	- 3.9	4.9	233.4
145	NEERABUP	027	J07-67	6065	28.2	-12.9	31.0	335.4
146	NEWBURN	004	F03-22	6104	0.1	9.8	9.8	89.4
147	NOLLAMARA	021	N04-03	6061	7.4	- 1.7	7.6	347.1
148	NORTHBEACH	021	H08-01	6020	9.4	- 8.6	12.7	317.5
149	NORTH FREMANTLE	010	N02-25	6159	- 7.5	- 9.4	12.0	231.4
150	NORTH PERTH	020	M06-11	6006	2.6	- 0.5	2.6	349.1
151	O'CONNOR	010	G02-34	6103	- 9.7	- 5.8	11.3	210.9
152	ORANGE GROVE	011	N02-31	6109	- 8.3	13.0	15.4	122.6
153	ORELIA	013	B05-57	6167	-28.4	- 3.2	28.6	186.4
154	OSBORNE PARK	021	E07-10	6017	6.3	- 3.0	7.0	334.5
155	PADBURY	027	F07-64	6025	14.5	- 8.3	16.7	330.2
156	PALM BEACH	022	F06-57	6168	-32.3	-12.1	34.5	200.5
157	PALMYRA	014	C02-34	6157	- 8.6	- 6.7	10.9	217.9
158	PARKERVILLE	017	E05-59	6553	7.3	22.3	23.5	71.9
159	PARM LIA	013	E06-57	6167	-29.1	- 2.8	29.2	185.5
160	PEPPERMINT GROVE	019	C07-25	6011	- 4.0	- 8.2	9.1	244.0
161	PERON	022	G04-57	6168	-32.0	-13.7	34.8	203.2
162	PERTH	020	F05-62	6000	0.0	0.0	0.0	0.0
163	PIESSE BROOK	012	L07-24	6076	- 2.7	18.8	19.0	98.2
164	PYRTON	026	B09-13	6055	6.6	9.6	11.6	55.5
165	QUEENS PARK	005	F06-29	6107	- 4.6	7.7	9.0	120.9

NO.	SUBURB NAME	LGA	MAP REF'CE	POST CODE	NORTH	EAST	RANGE	ANGLE
166	QUINNS ROCK	027	J04-67	6065	27.5	-17.6	32.6	327.4
167	REDCLIFFE	004	B06-21	6104	2.2	7.7	8.0	74.0
168	RED HILL	026	D03-08	6556	10.7	18.1	21.0	59.4
169	RIVERTON	005	N06-28	6155	- 7.9	2.9	8.4	159.8
170	RIVERDALE	020	H09-20	6103	- 0.5	4.7	4.7	96.1
171	ROCKINGHAM	022	H09-57	6168	-32.6	-10.4	34.2	197.7
172	ROLEYSTONE	001	H06-48	6111	-16.1	17.3	23.6	132.9
173	ROSSMOYNE	005	A09-35	6155	- 8.8	0.9	8.8	174.2
174	ROTTNEST ISLAND	007	M06-51	6161	- 7.4	-30.0	30.9	256.1
175	ST. JAMES	020	E08-28	6102	- 4.7	3.8	6.0	141.0
176	SAFETY BAY	022	M08-57	6169	-35.0	-11.3	36.8	197.9
177	SAWYERS VALLEY	017	H09-60	6074	6.2	29.0	29.7	77.9
178	SCARBOROUGH	021	D06-09	6019	5.7	- 8.3	10.1	304.5
179	SEAFORTH	011	002-39	6110	-12.8	13.5	18.6	133.5
180	SHELLEY	005	M04-28	6155	- 7.0	2.9	7.6	157.5
181	SHENTON PARK	018	G05-18	6008	- 0.5	- 3.6	3.6	262.1
182	SHOALWATER	022	J03-57	6169	-34.3	-13.1	36.7	200.9
183	SOUTHERN RIVER	011	E07-45	6110	-14.8	9.0	17.3	148.7
184	SOUTH FREMANTLE	010	K03-33	6162	-11.8	- 9.1	14.9	217.6
185	SOUTH GUILDFORD	026	J02-14	6055	4.2	9.6	10.5	66.4
186	SOUTH PERTH	024	N07-19	6151	- 1.9	- 0.2	1.9	186.0
187	SPEARWOOD	007	E02-42	6163	-14.0	- 6.8	15.6	205.9
188	STONEVILLE	017	B03-60	6554	7.4	26.2	27.2	74.2
189	SUBIACO	025	E09-18	6008	1.1	- 2.3	2.5	295.6
190	SUCCESS	007	E05-51	6164	-19.7	- 1.6	19.8	184.6
191	SWAN VIEW	026	N03-08	6056	6.9	17.7	19.0	68.7
192	SWANBOURNE	006	K07-17	6010	- 2.7	- 8.4	8.8	252.2
193	THORNLIE	011	F08-37	6108	- 9.0	8.4	12.3	137.0
194	TRIGG	021	M05-01	6020	8.6	- 8.5	12.1	315.3
195	TUART HILL	021	D02-11	6060	5.8	- 1.4	6.0	346.4
196	VICTORIA PARK	020	L05-20	6100	- 1.3	3.8	4.0	108.9
197	VIVEASH	026	L08-06	6056	7.5	12.9	14.9	59.8
198	WAIKIKI	022	H07-58	6169	-37.0	- 9.3	38.2	194.1
199	WALLISTON	012	D03-32	6076	- 4.5	17.2	17.8	104.7

NO.	SUBURB NAME	LGA	MAP REF'CE	POST CODE	NORTH	EAST	RANGE	ANGLE
200	WANNEROO	027	H04-66	6065	19.8	- 4.6	20.3	346.9
201	WARNBRO	022	H05-58	6169	-38.4	- 9.1	39.5	193.3
202	WARWICK	027	B05-02	6024	11.3	- 4.2	12.1	339.6
203	WATERMAN	021	E05-01	6020	11.1	- 8.6	14.0	322.2
204	WATTLE GROVE	012	G07-30	6107	- 5.2	11.7	12.8	114.0
205	WATTLEUP	007	K06-50	6165	-21.7	- 3.2	21.9	188.4
206	WELSHPOOL	005	B02-29	6106	- 3.5	6.6	7.5	117.9
207	WEMBLEY	020	N07-10	6014	2.6	- 3.4	4.3	307.4
208	WEMBLEY DOWNS	021	H08-09	6019	4.2	- 7.7	8.8	298.6
209	WEST PERTH	020	D03-19	6005	0.7	- 1.4	1.6	296.6
210	WEST SWAN	026	E05-06	6055	10.9	10.2	14.9	43.1
211	WEXCOMBE	026	G07-07	6056	9.4	16.3	18.8	60.0
212	WHITE GUM VALLEY	010	G07-33	6162	- 9.8	- 8.0	12.7	219.2
213	WILLAGEE	014	E05-34	6165	- 9.3	- 4.4	10.3	205.3
214	WILLETTON	005	E04-36	6155	- 9.4	2.1	9.6	167.4
215	WILSON	005	K09-28	6107	- 5.8	4.5	7.3	142.2
216	WOODLANDS	021	G03-10	6018	5.2	- 6.1	8.0	310.4
217	WUNGONG	001	009-54	6112	-12.2	13.2	18.0	132.7
218	YANCHEP	027	C04-67	6065	43.0	-18.0	46.6	337.3
219	YANCHEP BEACH	027	C02-67	6065	44.5	-23.7	50.4	332.0
220	YIRRIGAN	021	J08-03	6061	8.7	0.4	8.7	2.6
221	YOKINE	021	D06-11	6060	5.6	0.5	5.6	5.1