



WORKING PAPER
ITS-WP-00-18

Which Bus? Research on the
Use and Comprehension of
Public Transport Information

By

David Denmark
for Ageing & Disability Department

July, 2000

ISSN 1440-3501

*Established and supported under the Australian Research
Council's Key Centre Program.*

**INSTITUTE OF
TRANSPORT STUDIES**

The Australian Key Centre
in Transport Management

The University of Sydney
and Monash University

NUMBER: Working Paper ITS-WP-00-18

TITLE: Which Bus? Research on the Use and Comprehension of Public Transport Information

SUMMARY: This paper was prepared for the Disability and Ageing Department.
The research addressed the following questions:

- Where do people get the information they require to use bus services?
- Can people easily comprehend timetables?
- What aspects of timetables cause difficulties?

Includes recommendations

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DATE: July, 2000



Ageing &
Disability
Department



Timetables
Route 456 West Jamesville to Smithston
Via Jamesville Shops Mon-Fri

Route	456	456	456	456	456	456	456	456	456
Timing Point	am	am	am	am	am	am	am	am	am
7 Edward & Mary Str Jamesville West	10:35	10:50	11:05	11:20	11:35	11:50	12:05	12:20	12:35
6 George & Margaret Str Jamesville	10:42	10:50	11:02	11:29	11:42	11:59	12:12	12:29	12:42
5 Jamesville shops	10:49	11:02	11:19	11:36	11:49	12:06	12:19	12:31	12:49
4 Elizabeth & Park Str Jamesville East	10:51	11:05	11:21	11:38	11:51	12:00	12:21	12:38	12:51
3 Pamela & Rose Str Smithston Shops	10:59	11:18	11:29	11:43	11:59	12:13	12:29	12:43	12:59
2 Smithston Station	11:01	11:19	11:31	11:47	12:01	12:19	12:31	12:41	1:01
Train departs Smithston	11:06	11:22	11:36	11:52	12:06	12:22	12:36	12:52	1:06
Train arrives City	11:29	11:59	12:29	12:59	1:29	1:59	2:09		

Which Bus?

Research on the use and
comprehension of public
transport information

2000



Which Bus?

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comprehension of public transport
information**

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Timetables
Route 456 In
Vo

Route	Timing Point
7. Edward & Mary Str	Jamesville West
6. George & Margaret Str	Jamesville
5. Jamesville shops	
4. Elizabeth & Park Str	Jamesville East
3. Crumple & Rose Str	Smithton West
2. Smithton Shops	
1. Smithton Station	

Train departs Smithton
Train arrives city





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Summary

The research addressed the following questions:

- Where do people get the information they require to use bus services?
- Can people easily comprehend timetables?
- What aspects of timetables cause difficulties?

Where do people get the information they require to use bus services?

Timetables are the main information resource used by bus service passengers. However, other sources of information are also very important. The research shows that ensuring information about bus services reaches as wide an audience as possible, means providing information through a range of sources. These sources include timetables, phone information, bus stop information, and informed, helpful bus drivers.

The research identified that people use differing information sources and differing numbers of information sources depending on a range of factors. These include their familiarity with the trip undertaken, frequency of travel, age, place of residence, command of English, and the type and severity of disability they may have.

A range of information sources caters for the different needs that different people have for example in regard to their sight or familiarity with English or their skills in literacy. Also every person at different times uses the available range of information in different ways, despite their abilities remaining constant.

A range of clear and consistent sources of bus service information is crucial to facilitate the use of bus services by everyone. The research supports this conclusion. The relevant findings were:

- People consulted different information sources when using an unfamiliar service. In particular, there was a dramatic decline in the use of timetables. This occurred irrespective of age and other factors.
- In many cases passengers use two or more sources of information to find out about a service. The use of multiple information sources increased when people considered using less familiar services.
- Older people were less likely to rely on timetables; instead phoning the bus company, asking the driver and using bus stop information. The reliance on sources other than timetables increased when using




unfamiliar services. In using unfamiliar services older people checked with the bus driver much more than for services they used regularly.

- Home interviews were conducted with people who due to some personal characteristic were assumed to have difficulties using the present supply of information about bus services. The study showed that most people (76%) asked someone for information before embarking on their trip rather than depending on timetables or other non-personal information sources. Bus drivers were particularly important. The telephone was used by all of the participants with low vision.
- There were differences in the use of information sources depending on where people lived. People who live outside city suburbs (towns, villages and rural areas) were more likely to use timetables and telephone the bus company in using both the service they were on and for “other services”. The relatively less frequent bus services in country areas may account for the lower reliance on bus drivers and experience. A lower level of provision of bus stop information may account for its lower use in country areas.
- People who did not speak English at home used timetables substantially less than reported by all respondents. Consistently the most important source of information was asking other people. In using services with which they were familiar people who did not speak English at home were also reliant on their experience and on bus stop information. In using services with which they were less familiar, asking the bus driver and phoning the bus company became more important.
- Frequent users of bus services rely more on timetables for information. Less frequent users of bus services rely more heavily on phone information.

Comprehension of timetables

The importance of timetables as an information source initiated research into the quality of timetable presentation. Respondents reported a generally low comprehension of timetables. The research shows that aspects of the presentation of timetables hinder comprehension. The inconsistency of presentation across timetables poses a further barrier to intending passengers obtaining clear information.



Half of respondents reacted positively to the statement about the need to improve timetable clarity. Only 19% responded negatively.

People over the age of 75 and people who do not speak English at home were even more in favour of the need to improve timetable clarity.

Aspects of timetables that cause difficulties

The most nominated improvement to timetables was bigger print. Simpler print, clearer route numbers and names were also identified aspects for improvement.

A review of Sydney bus timetables showed a distinct lack of design consistency. There is little consensus on major design traits such as the orientation of timing points and the use of shading. Even where there was consistency of approach between operators, the trait was not always in a style that assisted comprehension. These traits include the use of codes (86% of timetables reviewed) and the lack of guide lines (75% of timetables reviewed).

Recommendations

Information sources – provision and use

That the NSW Department of Transport develop a Public Transport Information Strategy to ensure consistent, high quality information in a variety of forms useable by people with a range of skills and clear to both the frequent and infrequent user.


Telephone information

In developing and implementing its Integrated Transport Information Service (ITIS) the Department of Transport consider the needs of people who speak languages other than English and of people with disabilities.

Undertake further research to identify best practice in the delivery of telephone information systems to the public, including information services in remote locations.

Bus drivers providing information

Bus drivers have on board buses a range of local and system wide service information for distribution to passengers.



The bus industry continue recognising the important role played by drivers in distributing public transport information. That the practice be encouraged by selecting suitable drivers who are able to effectively communicate with the public and providing drivers with appropriate passenger awareness training.

Bus stop identification and information

The feasibility of audible and visual displays to identify approaching bus stops, be investigated to meet the needs of people with disabilities, older people, people who do not speak English at home and people with low literacy skills.

In developing ITIS the NSW Department of Transport recognise the need to ensure the provision at all major bus stops of adequate, consistent identification and bus service information.

Information booths

Service providers establish staffed information booths at major public transport interchanges. The option of trained volunteers be investigated.

People who speak a language other than English

That all public transport information available for distribution be in the main community languages specific to the area of operation. This is particularly important where languages not using roman numerals (e.g. Chinese) are predominant.

Older people

The Department of Transport require timetables to meet accepted disability standards for print size, which currently stand at 12 point minimum.

Difficulties using timetables

The bus industry adopt a code of practice which standardises the presentation of information in timetables and ensures that it is in an understandable form for the full range of bus users. In the longer term such a code of practice be incorporated into standards which are part of the contract conditions between the NSW Department of Transport and providers of public transport.



1. INTRODUCTION

Access to public transport is usually viewed in terms of physical barriers. There is, however, another major reason why people do not make more use of passenger services – inadequate information. When people want to go somewhere the first thing they must decide is how they are going to travel. This decision will be made on the information they have available. It follows that, for the public transport industry, the provision of relevant and up to date information is vital. However, just providing information is not enough – the information must be in a form that is readily accessible and easily understood.

The timetable is the most common source of public transport information in NSW. However, recent research from the USA suggests that fewer than one in five people can read and understand timetables. A similar lack of understanding in NSW would significantly limit the effectiveness of public transport.

This research is part of a wider Public Transport Information Project which was funded by the NSW Ageing and Disability Department as one of its Transport Demonstration Projects. The aim of the Public Transport Information Project is to improve the comprehensibility of public transport information for existing and potential users, and in particular older people and people with disabilities.

The results of the research have been used to inform the other major tasks of the project, which are:

- production of the Best Practice Manual about the presentation of public transport information, particularly for older people and people with disabilities; and
- production of the Practical Guide to Bus Service Information.

1.1. Objectives

The research addressed the following questions:

- Where do people get the information they require to use bus services?
- Can people easily comprehend timetables?
- What aspects of timetables cause difficulties?



1.2 Methods

The study involved using a range of research methods. These were:

- a random on-board passenger survey to test where people obtain bus service information and what timetable design characteristics they found problematic;
- a series of home interviews with particular passenger groups to find out what information people require, where they obtain it and to test comprehension of certain timetable characteristics;
- focus groups with particular passenger groups to find out more about how people comprehend timetable information;
- interviews with bus drivers about their role in the provision of information;
- consultations with members of ethnic communities, and;
- review of current practice in the production of timetables in the Sydney region.

1.2.1. On-board Survey

This survey was conducted with 618 passengers on-board bus services in Sydney, Port Stephens and Goulburn over a period of one month in 1998. Respondents were asked about their use of various forms of bus service information, especially timetables. The survey was based on a telephone questionnaire that had been designed for use in other Transport Demonstration projects. The survey instrument contained three types of questions: those relating to the respondents; to how people found out information; and to the characteristics of timetables.

The results of the on-board survey were also used to assist in the design of home interview questions about timetable usage.

1.2.2. Home interviews

The passenger home interviews held with public transport users, provided greater understanding of passengers information needs. The relatively small scale of the study (54 interviews) prevents comparisons between the targeted populations and the general population.

Two survey instruments were used:

- situation questions; and
- timetable questions.



Situation questions

The first questionnaire asked participants about their information needs at various stages of a bus trip and where they would find the information they require. This part of the study was based on similar research recently undertaken in the USA for the Transportation Research Board by the Texas Transportation Institute & NuStats International.

Timetable questions

Participants were provided with a timetable and given a place of departure and an arrival time at a destination. They were asked to identify the route number of the bus they required and at what time they would have to catch the bus in order to get to the destination on time. The questions and timetables were chosen so participants would have to cope with a variety of timetable characteristics such as notes or coloured text. Interviewers asked participants for their opinions of both the timetable and the accompanying route map.

The respondents were chosen for their memberships of groups assumed to have difficulties in finding and understanding the information presently provided by bus operators and also likely to be reliant on bus travel. Of the 54 people interviewed 8 were over 75 years of age, 10 had low vision, 10 had low literacy and 28 did not speak English at home. Of the 28 people chosen because they did not speak English at home, 14 spoke languages that used the Roman alphabet and 14 spoke languages where a non-Roman alphabet was used.

1.2.3. Focus groups

The focus groups clarified some issues raised in the on-bus survey, such as the preferred format for timetables. Two passenger focus groups were held in the Hunter Region of NSW at Raymond Terrace and Salamander Bay.

The focus groups involved an unstructured discussion about public transport information. All of the participants were either older people or people with disabilities. Eleven of the 16 participants were regular users of public transport.



1.2.4. Consultations with bus drivers

Information gained from the on-board passenger survey early in this project suggested that bus drivers have an important role in the provision of public transport information. This was later confirmed during home interviews of users of bus services who nominated drivers as their primary source of information. The purpose of the interviews with bus drivers was to gauge their opinions on the use of timetables and other information for passengers.

Drivers from two Western Sydney bus companies were interviewed.

1.2.5. Timetable review

This review revealed the common practices in published timetables. Under the provisions of the NSW Passenger Transport Act (1990), bus operators who hold commercial contracts with the Department of Transport are required to produce a timetable that incorporates a route map for each service.

The Department of Transport gives no guidance about the format of timetables. Consequently, there is wide variation between timetables in terms of layout, font type and size, and the use of colour. The research reviews a sample of timetables from the Sydney region and records the use of design characteristics identified in the Best Practice Manual and the Practical Guide to Bus Service Information.

The NSW Department of Transport's Transport Data Centre allowed access to its copies of all the timetables produced by Sydney's urban bus operators. The review sample includes at least one timetable from each operator in urban Sydney and some examples from larger operators on the urban fringe. More than one example was used from the largest operators such as Sydney Buses, Westbus and Busways.

Transport Planning and Management undertook the majority of research. The marketing staff of Blue Ribbon Coaches conducted some of the passenger surveys.

3. RESULTS

3.1 Where people get the information they use

3.1.1. Information sources

The on-board survey included two questions about where people obtained public transport information. The first asked where people found information about the service that they were using when they responded to the survey – termed “this service”. The second asked where people generally went to find out about other public transport services. Table 1 records the response to these questions.

Table 1: Information sources

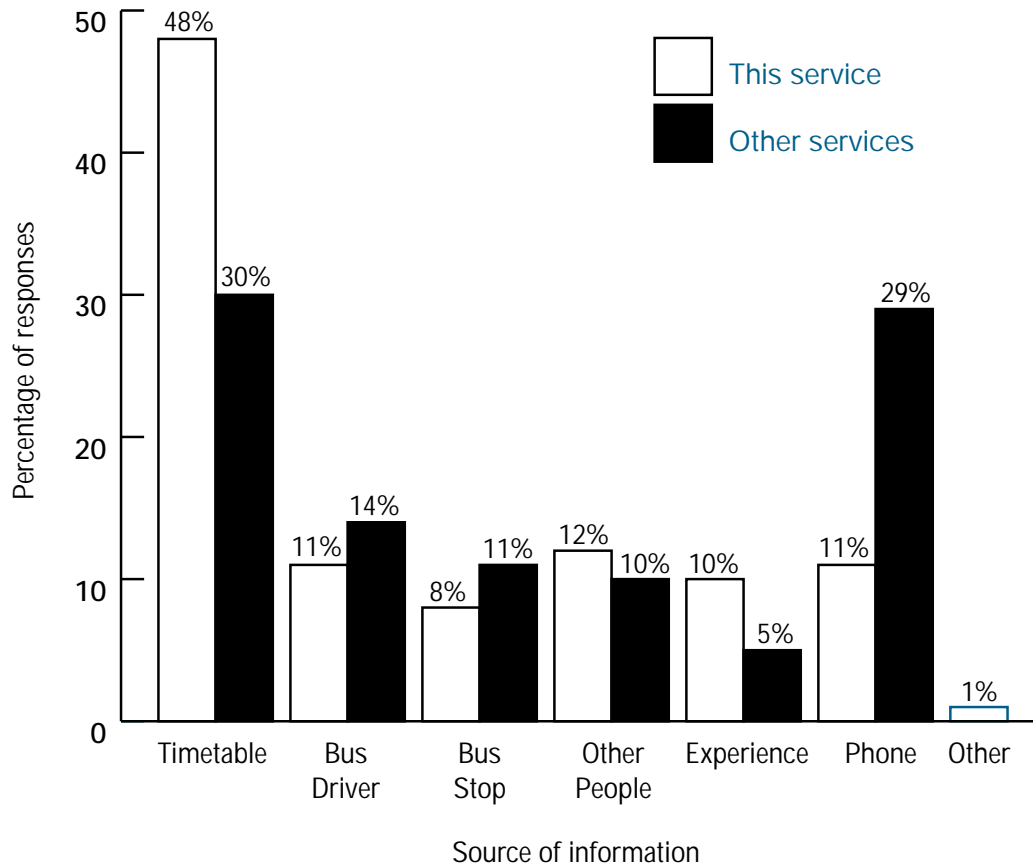
Source of information	This service		Other services	
	No.	%	No.	%
Timetable	358	48%	244	30%
Other people	88	12%	82	10%
Telephone bus company	85	11%	240	29%
Bus driver	78	11%	114	14%
Experience	71	10%	38	5%
Bus stop	60	8%	94	11%
Other	1	0%	6	1%
Total of sources consulted	741	100%	818	100%

Overall, timetables were the most common resource for information on bus services. This may reflect in part the emphasis that operators place in providing timetables as the primary information source. Nevertheless, there is no doubt about the importance of timetables. The results also clearly show the importance of other information sources.

The sources of information that respondents reported they would use in finding out about “other services” were noticeably different from the sources consulted for the service presently used. Respondents stated that they would rely less on timetables and more on direct contact with people in finding out about “other services”. The results show that the reliance on human contact to obtain information (phone, bus driver other people) increased from 34% to 53% between “this service” and “other services”. This may reflect a lower confidence in using services that are less frequently used.

Figure 1 displays the results from Table 1.

Figure 1: Information sources



3.1.2 Use of more than one source

In many cases respondents used two or more sources of information to find out about a service.

Table 2: Information source combinations used for “this service”

	Timetable	Other People	Bus Company	Bus Driver	Bus Stop
Other people	16				
Bus company	27	9			
Bus driver	31	9	14		
Bus stop	24	9	6	12	
Experience	16	5	6	6	5

The most common combinations involved the use of a timetable along with the bus driver, the bus company and the bus stop.



Table 3: Information source combinations for “other services”

	Timetable	Other People	Bus Company	Bus Driver	Bus Stop
Other people	18				
Bus company	59	16			
Bus driver	38	13	21		
Bus stop	25	12	25	22	
Experience	13	6	9	8	5

The combination of timetable/bus company stands out as the most commonly used on “other services” and was much more common than where people were seeking information on “this service”.

Overall, the use of two sources of information was much more common for finding out information about other services (300 combinations) than on “this service” (195 combinations). This suggests that when using unfamiliar services (assuming that a passenger is likely to be more familiar with services they were using on the day), people are more likely to confirm information by consulting more than one source.

3.1.3. Obtaining timetables

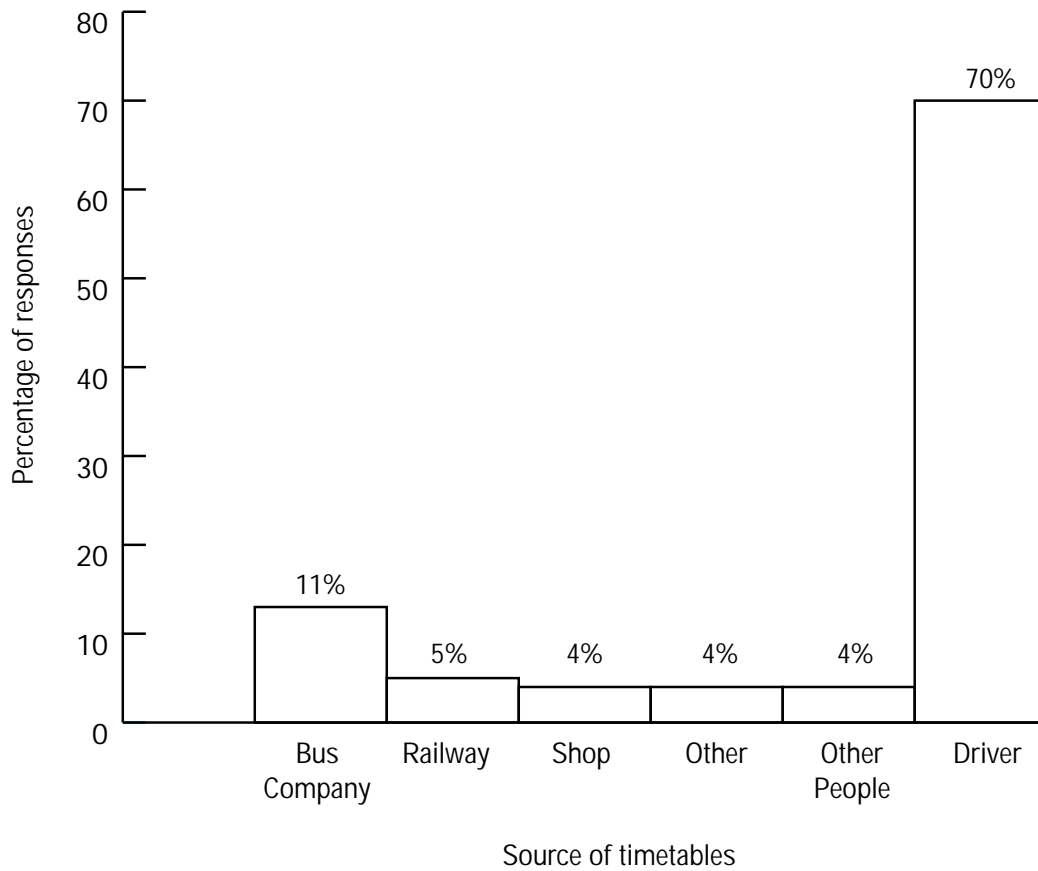
Table 4 and Figure 2 show where people who use timetables for information about bus services obtain a copy of a timetable.

Table 4: Source of timetables

Source	Number	%
Driver	362	70
Bus Company	69	13
Railway Station	26	5
Shop	19	4
Friend/neighbour/relative	19	4
Other	23	4
Total	518	100



Figure 2: Sources of timetables



By far the most common source of timetables was bus drivers. The bus company was another significant source.

Older people tend to obtain timetables from drivers more often than younger people do, although the difference is not great.

People who do not speak English at home were very dependent on drivers for obtaining timetables. 92% of people in this group obtained timetables from drivers and 8% from the bus company. This high proportion is consistent across the age groups.

Infrequent users were less likely to obtain timetables from drivers. This may reflect the frequency of contact with drivers and that timetable use is more prevalent among regular users (see section 3.1.7).



3.1.4 Use of information sources and age

There were some differences between information sources used by older people (people over 60 years of age) and other respondents. These differences were marked in regard to information sources for “other services”.

Table 5: Age of respondents and information sources used for “this service”

Age	Total Responses	Timetable		Phone		Other People		Bus Driver		Experience		Bus Stop	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
15-24	207	101	49	32	16	25	12	17	8	17	8	15	7
25-59	296	146	49	36	12	30	10	31	11	24	8	29	10
60-75	174	81	47	12	7	25	14	21	12	26	15	9	5
75+	59	26	44	12	20	7	12	7	12	3	5	4	7
Total	736	354	48	92	13	87	12	76	11	51	7	57	8
Over 60	233	107	46	24	10	32	13	28	12	29	13	13	6
Under 60	503	247	49	68	13	55	11	48	10	41	8	44	9

Figure 3: Information sources for “this service” used by older people (over 60 years of age)

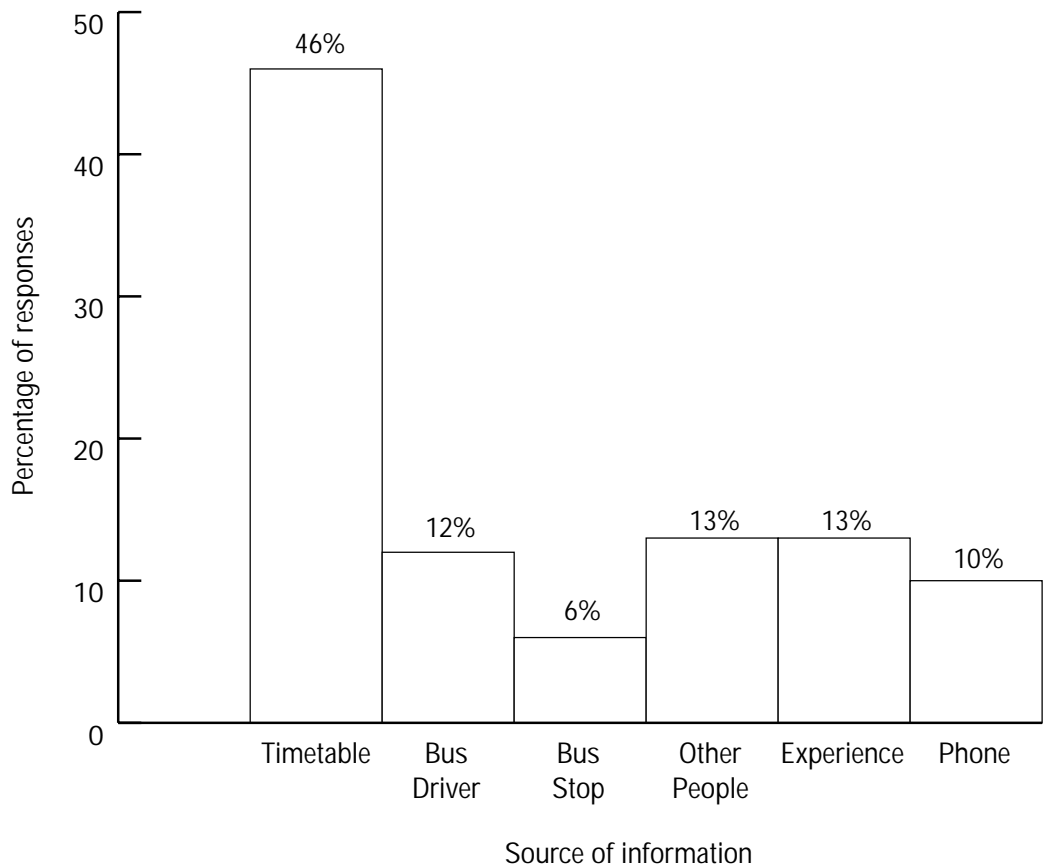
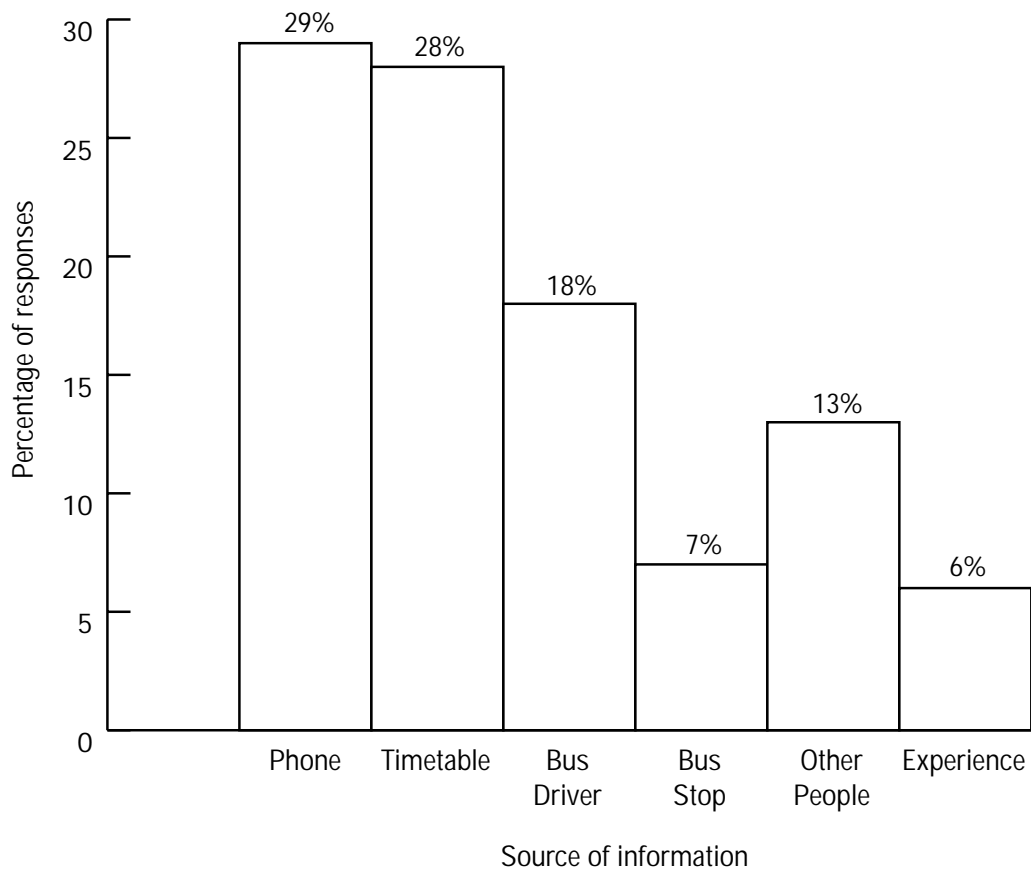





Table 6: Age of respondents and information sources used for “other services”

Age	Total Responses	Timetable		Other People		Phone		Bus Driver		Experience		Bus Stop	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
15-24	238	81	34	35	15	69	29	20	8	7	3	26	11
25-59	335	104	31	17	5	108	32	54	16	20	6	32	10
60-75	167	44	26	24	14	49	29	30	18	10	6	10	6
75+	39	14	36	2	5	10	26	8	21	1	3	4	10
Total	779	243	31	78	10	236	30	112	14	38	5	72	9
Over 60	206	58	28	26	13	59	29	38	18	11	6	14	7
Under 60	573	185	32	52	9	177	31	74	13	27	5	58	10

Figure 4: Information sources for “other services” used by older people (over 60 years of age)



Tables 5 and 6 show some variations between age groups in obtaining information. Older people were less likely to rely on timetables, phoning the bus company and bus stop information than younger people.



Older people were also less likely to use timetables to find out about “other services” than about “this service”. Overall, they were also more likely to ask the driver, particularly in obtaining information about “other services”. This indicates that older people may have more difficulty with timetables for unfamiliar services.


Despite some variations between groups, all age groups substantially changed the information sources consulted when intending to use services with which they were less familiar.

Other points to note:

- Older people gave fewer multiple answers (with an average of 1.05 answers per person) than younger people (who averaged 1.39 responses per person).
- People over 75 were more likely to ask the bus driver for information on the service they were using. This may indicate the need to check information even when undertaking routine travel. Difficulties in reading information at bus stops and on destination boards may also be an explanation.
- People under the age of 25 were significantly less likely to ask bus drivers to find out about “other services”.
- People were slightly more likely to use bus stop information to find out about other services than the one that they were actually using. This may show that the bus stop information is most useful as a check where people are less familiar with services.

The home interviews were conducted with people who due to some personal characteristic were assumed to have difficulties using the present supply of information about bus services. The study showed that most people (76%) asked someone for information before embarking on their trip rather than depending on timetables or other non-personal information sources. Almost 60% of these people asked someone directly and the rest obtained the information over the telephone. The telephone was used by all of the participants with low vision.

The bus driver was the most common person to be approached for information, particularly by people with low literacy (88%). People with low vision were also the most likely to ask other people or passengers for information (90%).



The home interviews also revealed a number of improvements to the presentation of information that would limit the difficulties people experience in using certain information sources. The improvements in regard to timetables are shown in section 3.3. Improvements suggested for other information sources were:

- Bus stops: More clearly marked bus stops would benefit both drivers and passengers. Information provided at bus stops should be made clearer and easier to read. A consistent form of presentation would support these improvements.
- Telephone information: Telephone information is often not available or may be incorrect. Developing a single telephone contact number for all transport service information would be useful.
- Familiarity of passengers with the area, drivers and with services in the area is important in understanding information. However, the interviews indicated that advertising of new services is often inadequate. Getting information across to new passengers or about new services is a challenge for operators.

Many people rely on bus drivers for public transport information, even when timetables and signage are available. Often drivers are used to confirm what passengers already know. Providing information is evidently an integral part of a bus driver's duties. The consultation with bus drivers revealed the following:

- Many people find timetables confusing. Particular problems were identified with the use of codes, different formats, and variations in routes.
- Having more information on bus destination signs has been helpful to passengers, however route variations or combined routes confuse passengers.
- Drivers find it useful to talk with each other using the two-way radio in order to assist passengers, particularly when passengers make transfers between bus services.
- Frequent shift changes reduce the ability of drivers to get to know passengers and their needs (and vice versa).



3.1.5 Use of information sources and place of residence

The on-board survey enabled the place of residence of older people to be analysed in relation to their responses about the sources of information they used. Tables 7 & 8 present these results.

Table 7: Place of residence and information sources used by older people for “this service”

Place or Residence	Total Responses	Timetable		Other People		Phone		Bus Driver		Experience		Bus Stop	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Suburb	93	37	40	14	15	6	7	10	11	9	10	17	18
Country	124	64	52	16	13	9	7	18	15	5	4	12	10
Total	217	101	47	30	14	17	8	28	13	14	7	25	12

People who do not live in the suburbs were more likely to use timetables or bus drivers to find out about the service they were using. This may reflect the less frequent service in country areas.

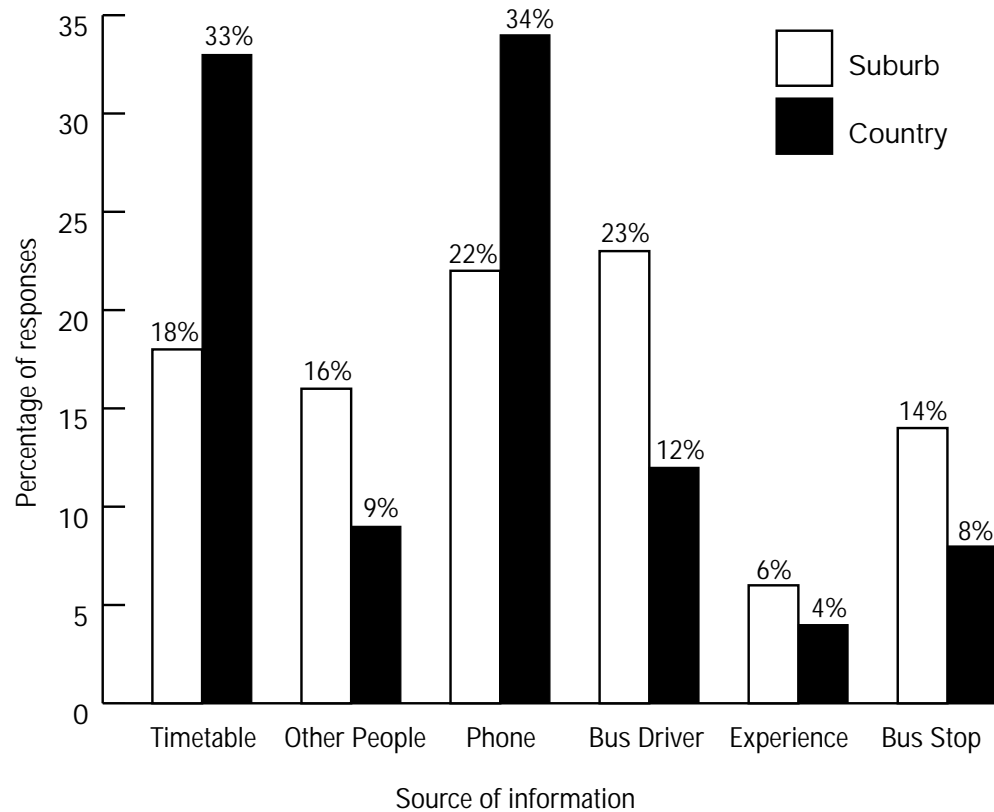
Table 8: Place of residence and information sources used by older people for “other services”

Place or Residence	Total Responses	Timetable		Other People		Phone		Bus Driver		Experience		Bus Stop	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Suburb	94	17	18	15	16	21	22	22	23	6	6	13	14
Country	113	37	33	10	9	38	34	14	12	5	4	9	8
Total	207	54	26	25	12	59	29	36	17	11	5	22	11

Respondents who do not live in the suburbs were much more likely to use the phone and consult timetables to find out about “other services”. Respondents who live in the suburbs were more likely to ask the bus driver about “other services”. This pattern is consistent with services in suburban areas being more frequent.



Figure 5: Place of residence and information sources used by older people for “other services”



Respondents from the country were also slightly more likely to use more than one source of information than people living in suburbs (1.14 sources compared to 1.07 sources).

3.1.6 Use of information sources and language spoken at home

The on-board survey enabled the information provided by respondents to be analysed with regard to the language spoken at home. These results are presented in Figures 6 and 7 and Tables 9 & 10, below.

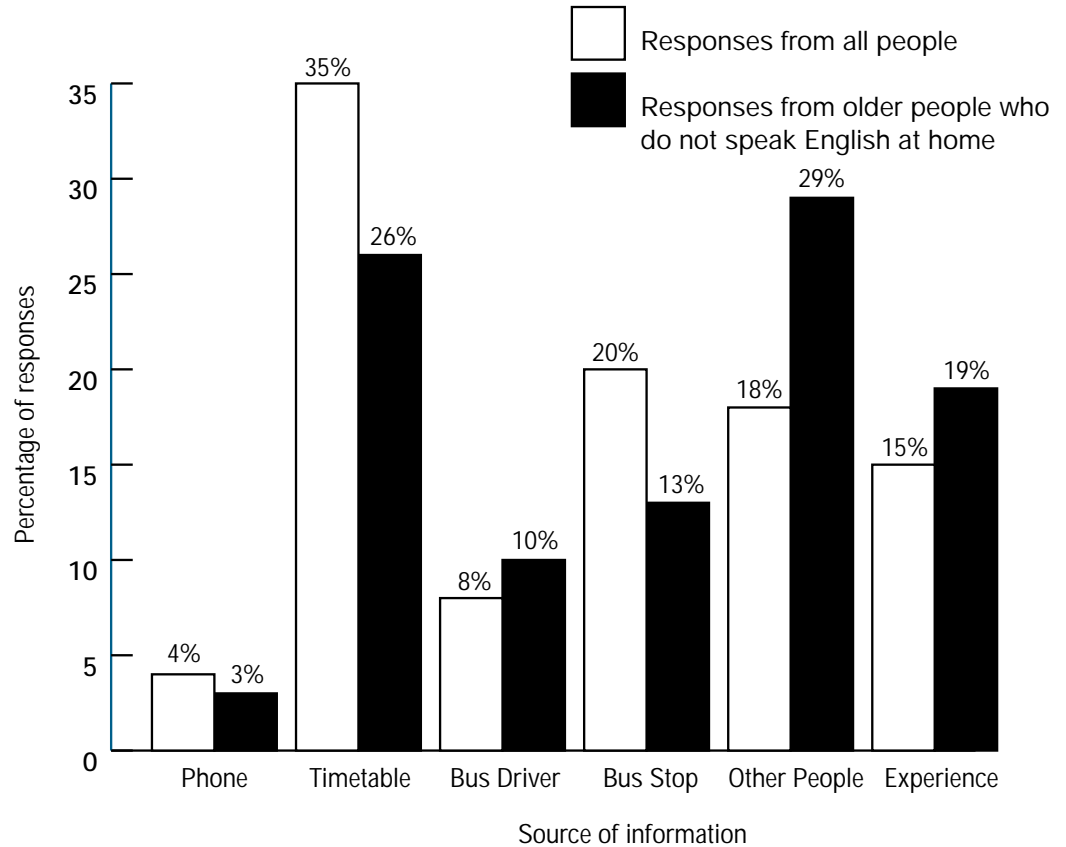
Table 9: Information sources for “this service” used by people who do not speak English at home

Age	Responses	Timetable		Other People		Phone		Bus Driver		Experience		Bus Stop	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Over 60	31	8	26	9	29	1	3	3	10	6	19	4	13
Under 60	57	23	40	7	12	2	4	4	7	7	12	14	25
Total	88	31	35	16	18	3	4	7	8	13	15	18	20
All responses	-	-	48	-	12	-	11	-	11	-	10	-	8



Among people who do not speak English at home, older people were much less likely to use timetables or bus stop information compared to younger people. Older people were much more likely to ask other people for information and to depend on their own experience.

Figure 6: Information sources for “this service” used by older people who do not speak English at home



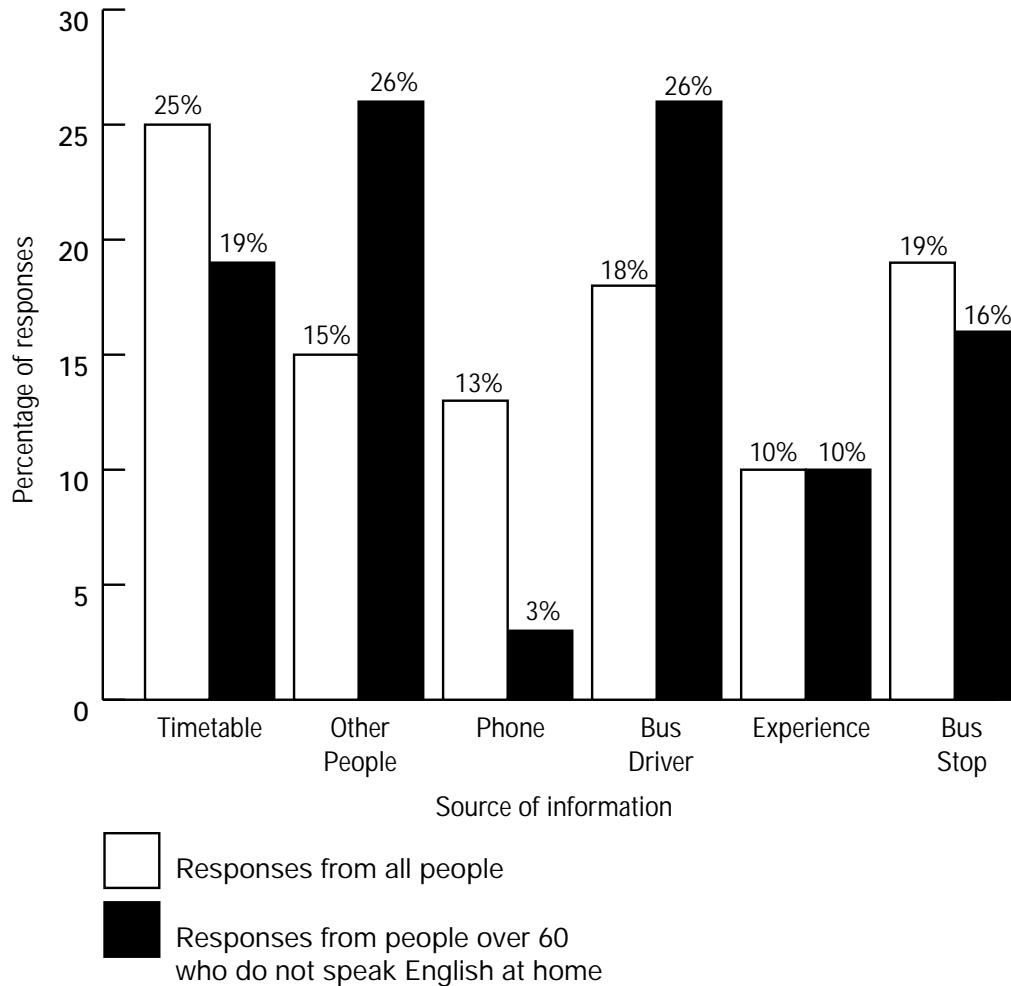
People over the age of 60 who do speak English at home relied more on bus stop information, experience and other people to find out information about the service they were using than for all respondents. Language difficulties are likely to limit the use of timetables, asking bus drivers and using the telephone.

Table 10: Information sources for “other services” used by people who do not speak English at home

Age	Responses	Timetable		Other People		Phone		Bus Driver		Experience		Bus Stop	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Over 60	31	6	19	8	26	1	3	8	26	3	10	5	16
Under 60	49	14	29	4	8	10	20	6	12	5	10	10	20
Total	80	20	25	12	15	11	13	14	18	8	10	15	19
All responses	-	-	30	-	10	-	29	-	14	-	5	-	11



Figure 7: Information sources for “other services” used by older people who do not speak English at home



With both “this service” and “other services”, timetables were still the most common information resource. However, the importance of timetables is considerably less for “other services”, where familiarity is probably much less.

Older people who did not speak English at home showed a different pattern in using information sources for “other services” compared to “this service”. However, telephoning the bus company and asking bus drivers were more important. The use of experience and timetables was much less important. This may indicate that where services are less familiar people are compelled to communicate although they may have difficulty doing so.

Comparing the responses for older people with younger people showed a consistent pattern where younger people who did not speak English at home used timetables and the telephone much more than older people. Older people particularly relied on face to face communication (other people and bus drivers) and on bus stop signs. The reliance on other people was greater than the use of timetables. Presumably the other people could either provide the information or assist with translations.

Between a quarter and a third of respondents who do not speak English at home relied on asking other people for information for both “this service” and for “other services”. This may indicate a sub-group who had consistent difficulties with English. The drop in timetable usage between “this service” (which is likely to be more familiar) and “other services”, indicates that timetables may be more difficult to understand in unfamiliar circumstances.

People who do not speak English at home and whose language does not use the Roman alphabet were much more likely to ask other passengers for information (42%) than the group who do not speak English at home and whose language does use the Roman alphabet (14%). This may indicate that the former group has more difficulty with understanding times and obtained assistance by asking people.

3.1.7 Information sources and frequency of bus service use
 Tables 11 and 12 (below) contain the results from the on-board survey about information sources and the frequency of use of bus services.

Table 11: Information sources and frequency of bus service use for “this service”

Usage	Total Responses	Timetable		Other People		Phone		Bus Driver		Experience		Bus Stop	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Every Day	347	170	49	45	13	33	10	32	9	38	11	29	8
1 x week	276	144	52	29	11	29	11	32	12	21	7	21	7
1 x month	54	21	39	4	7	8	15	9	17	6	11	6	11
< 1 x month	58	21	36	11	19	13	22	5	9	6	10	2	3
Total	735	356	48	89	12	83	11	78	11	71	10	58	8

Table 12: Information sources and frequency of bus service use for “other services”

Usage	Total Responses	Timetable		Other People		Phone		Bus Driver		Experience		Bus Stop	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Every Day	369	110	30	46	12	106	29	47	13	21	6	39	11
1 x week	304	102	34	25	8	89	29	51	17	10	3	27	9
1 x month	50	16	32	2	4	15	30	9	18	4	8	4	8
< 1 x month	64	16	25	8	13	28	44	5	8	3	5	4	6
Total	787	244	31	81	10	238	30	112	14	38	5	74	9

Respondents who are frequent users of bus services rely more on timetables for information. Less frequent users of bus services rely more heavily on phone information.

People who used the service once a week or more, predominantly used a timetable to find out about the service they were using. This dropped substantially for “other services”. Frequent users reported that they would use the timetable to find out about “other services” only slightly more often than infrequent users. Perhaps infrequent bus use and the need to catch a different service to usual create similar challenges for passengers.

Less frequent users had limited reliance on information sources such as bus stops, bus drivers, other people and experience. This was particularly so in regard to “other services”. Low service use seemed to be related to high use of the phone as a source of information. This may be because infrequent service users come across other information sources less often in the course of their travels.

Supporting this result, heavier users of services were more likely to use bus stop information to find out about “other services”.

3.1.8 Information sources and place of residence

The on-board survey enabled the information used by respondents to be analysed with regard to their place of residence. Tables 13 and 14 (below) present these results.



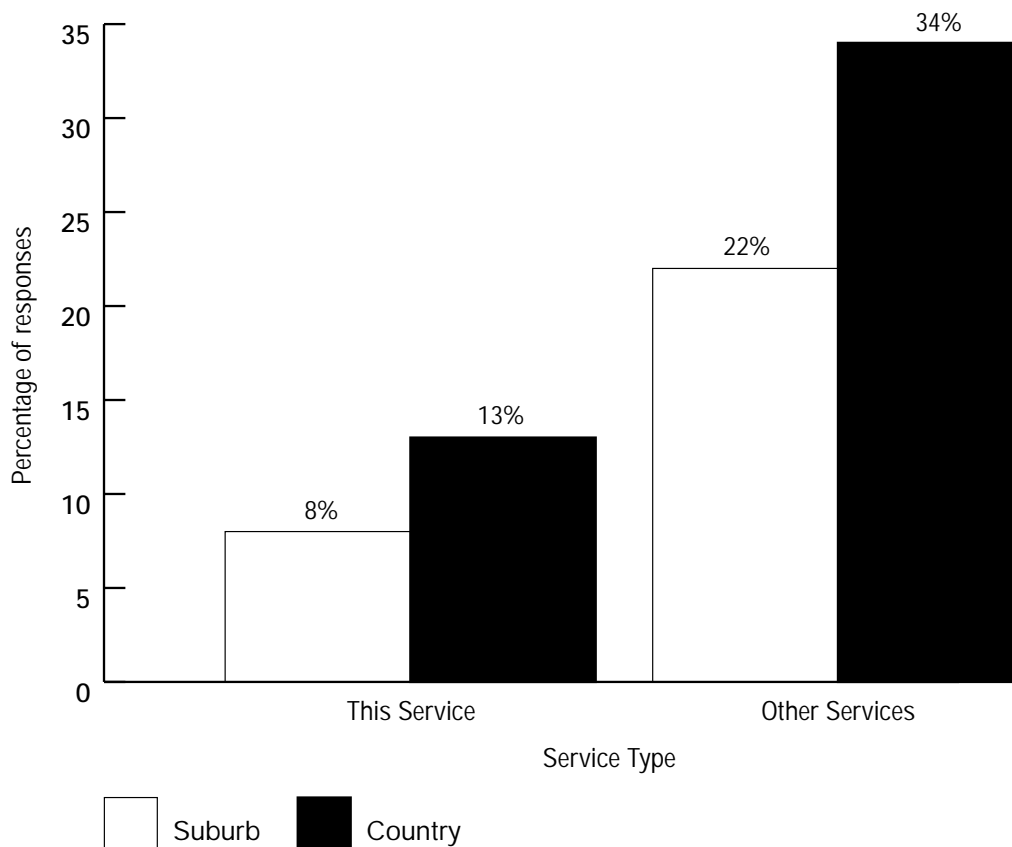
Table 13: Information sources and place of residence for “this service”

Usage	Total Responses	Timetable		Other People		Phone		Bus Driver		Experience		Bus Stop	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Suburb	256	105	41	34	13	21	8	26	10	33	13	37	14
Country	466	244	52	53	11	59	13	49	11	38	8	23	5
Total	722	349	48	87	12	80	11	75	10	71	10	60	8

Table 14: Information sources and place of residence for “other services”

Usage	Total Responses	Timetable		Other People		Phone		Bus Driver		Experience		Bus Stop	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Suburb	264	71	27	31	12	57	22	49	19	21	8	35	13
Country	531	171	32	48	9	179	34	61	11	17	3	55	10
Total	795	242	30	79	10	236	30	110	14	38	5	90	11

Figure 8: Phoning the bus company for information and place of residence



People who live outside city suburbs (towns, villages and rural areas) were more likely to use timetables and telephone the bus company in using both the service they were on and for “other services”.



The relatively less frequent bus services in country areas may account for the lower reliance on bus drivers and experience. A lower level of provision of bus stop information may account for its lower use in country areas.

Respondents who lived in the country were more likely to use more sources of information. They used 1.43 sources of information per person compared to 1.15 sources of information used per person by people who live in the suburbs. This may again reflect the relative frequency of services and the importance of ensuring that information is correct.

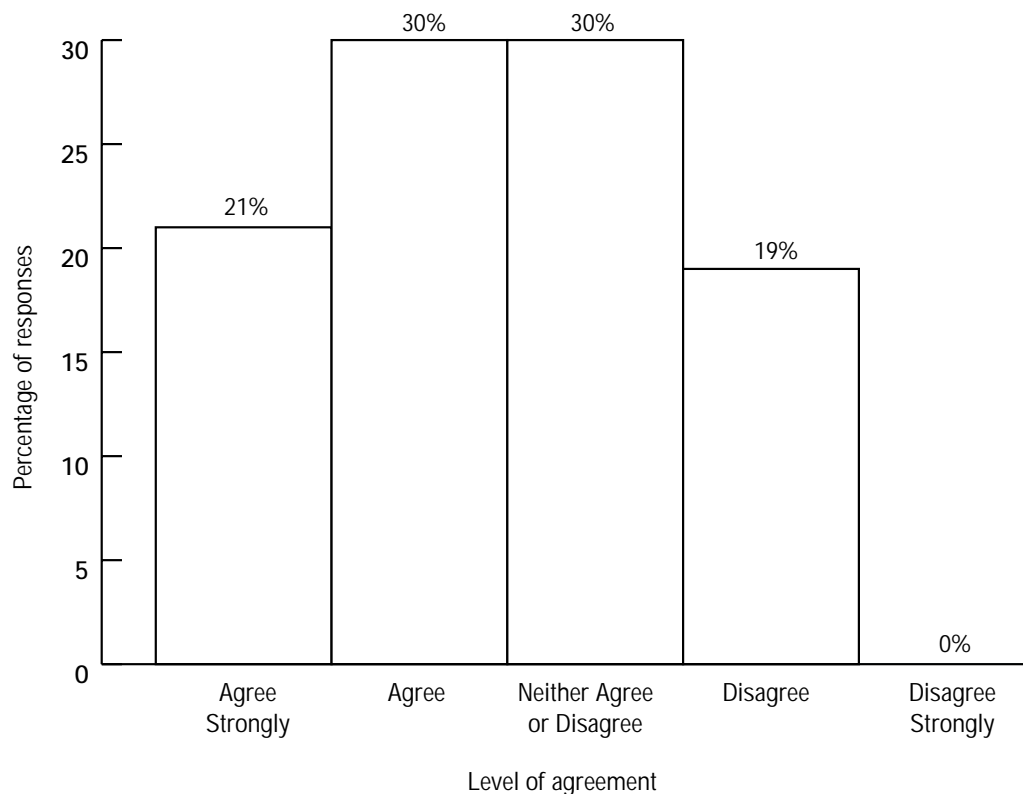
3.2 Comprehension of timetables

83% of on-board respondents used timetables. The following analysis is of the responses of these survey participants.

3.2.1 Ease of Use

Respondents who used timetables were asked whether timetables could be made 'clearer and easier to follow'.

Figure 9: Desire for clearer timetables





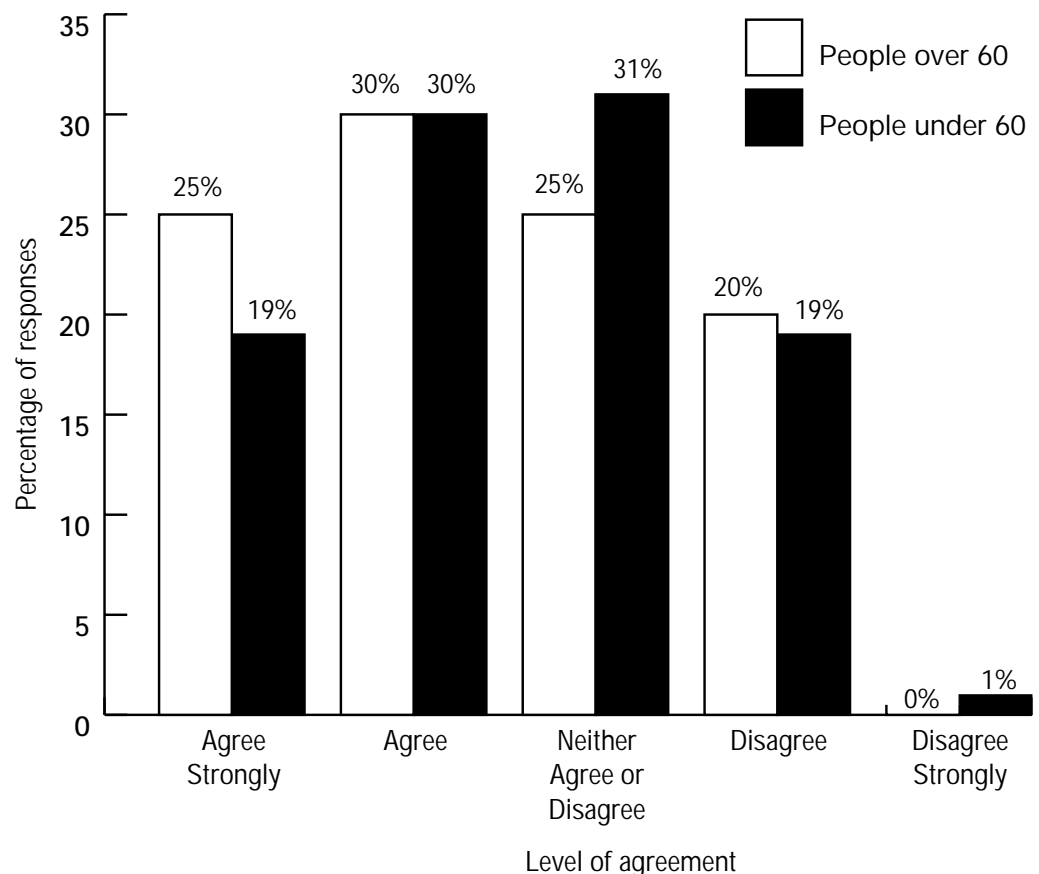
Half of respondents reacted positively to the statement about the need to improve timetable clarity. Only 19% responded negatively. The proportions were similar (54% positive and 20% negative) for people over 60 years compared to people under 60 years. However, people over 75 years were strongly in favour of improved timetable clarity (64%), although a similar proportion to that of all respondents (19%) were negative.

Table 15 records the responses to the question about timetable clarity in regard to the age of the respondent.

Table 15: Age of respondent and desire for clearer timetables

Age	Total Responses	Agree Strongly		Agree		Neutral		Disagree		Disagree Strongly	
		No.	%	No.	%	No.	%	No.	%	No.	%
15-24	145	17	12	45	31	51	35	30	21	2	1
25-59	208	49	24	62	30	59	28	37	18	1	0
60-75	107	28	26	27	25	30	28	22	21	0	0
75+	31	6	19	14	45	5	16	6	19	0	0
All	491	100	21	148	30	145	30	95	19	3	0

Figure 10: Age of respondent and desire for clearer timetables





People who do not speak English at home also responded positively to the need for improved clarity of timetables. 62% either agreed or agreed strongly with the statement. Older people who did not speak English at home were even more in favour of improvement – 73% agreed or agreed strongly with the statement compared to 7% who disagreed or disagreed strongly.

3.3 The aspects of timetables that cause people difficulties

3.3.1. Aspects causing difficulty and requiring improvement

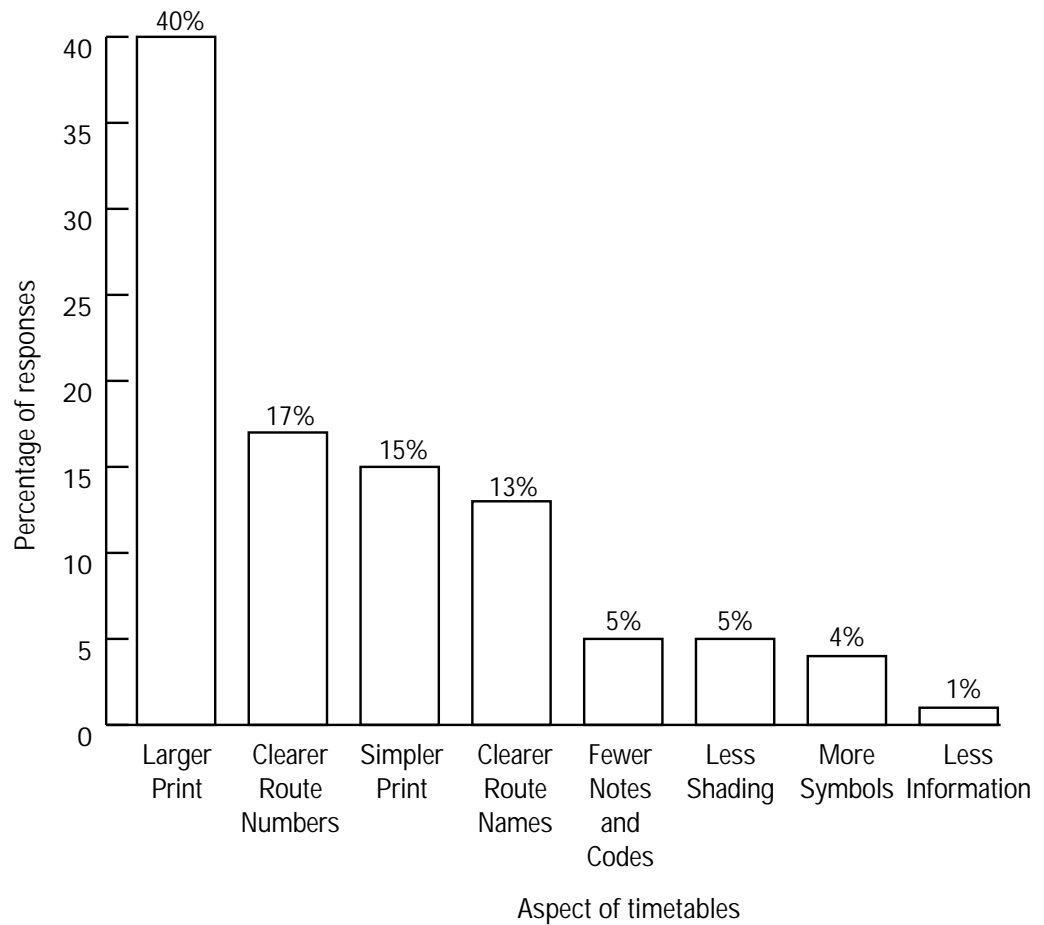
Table 16 records responses from the on-board survey about what changes to timetables would make them easier to understand.

Table 16: Requested improvements to timetables

Age	Total Responses	Bigger Print	Simpler Print	Less Shading	More Symbols	Clearer Route Numbers	Clearer Route Names	Less Information	Fewer Notes & Codes
		%	%	%	%	%	%	%	%
15-24	156	29	14	5	3	21	17	3	8
25-59	283	38	15	6	5	17	14	1	4
60-74	166	49	16	1	4	14	11	1	3
75+	34	59	12	3	1	9	6	0	9
All	645	40	15	5	4	17	13	1	5



Figure 11: Changes to make timetables easier to understand




The most nominated improvement to timetables was bigger print. This was the case across all age groups. Over half of older people nominated the need for bigger print.

Simpler print and clearer route names and numbers also received substantial support. The importance of these aspects were less among older age groups.

Reducing the number of notes and codes was nominated as an improvement by only 5% of respondents in the home interviews. However, very few participants (6%) in the home interviews were able to correctly interpret the codes used in timetables. Bus drivers also confirmed that notes and codes, present problems for passengers.

More symbols and less shading were nominated by a relatively small proportion of respondents in total and in each age group.

People who did not speak English at home responded in a similar pattern to that of all respondents. The need for bigger print was the



most favoured response among all people who did not speak English at home and for all age groups except for 15 -24 years.

Simpler print was nominated by a greater proportion of people who did not speak English at home than by all respondents. This aspect was the improvement most nominated by 15 – 24 year age group.

The home interviews showed that other timetable characteristics created difficulties. The results are summarised below:

- Where the text for the timing points was turned at a 90° angle, four times as many participants failed to get the correct answer compared to where the text ran horizontally.
- Twice as many people got the answers correct where the timetables used the term “Monday to Friday”, “Saturday” and “Sunday” instead of “Weekend” and “Weekday”.
- Very few people with low vision (10%) and people with low literacy (7%) attempted to answer questions about timetables that used coloured text.
- Although the response rates were low, many more people answered the questions correctly where no shading was used on the timetable compared to those that did use shading.
- Of those who expressed an opinion, three times as many said they had difficulty in using the route maps (76%) as those who said they managed (24%). The main concerns were the map being too small (58 comments), the print being too small (49 comments) and not enough detail (37 comments).

The focus groups identified some aspects of presentation that made timetables easier to read. These were:

- Large type.
- Paper that was not shiny or glossy – matt paper.
- Black print on white paper made information very clear. The use of shading and coloured type could affect clarity.
- Simple stylised route maps with large print or a separate key and/or with clearly marked landmarks and bus stops aided understanding.



3.3.2 Improvements required for those who have difficulties with timetables

Table 17 (below) presents results from the on-board survey. The table shows the timetable improvements nominated according to how people felt about the need to make timetables clearer and easier to follow. Some respondents agreed with more than one way that timetables could be improved.

All respondents (even those who did not agree that timetable needed to be clearer) identified bigger print as the principal aspect of timetables that needed improvement. Those who were positive that timetables needed to be clearer, agreed with more of the suggested way for improving timetables. Among these respondents simpler print, clearer route numbers and clearer route names were required improvements. The same pattern of results occurred in the responses by people over the age of 60 years and by people who did not speak English at home.

Table 17: Timetable improvements and desire for clearer timetables

Desire for clearer timetables	Total in group	Total responses	Bigger print	Simpler print	Less symbols	More symbols	Clearer route numbers	Clearer route names	Less information	Fewer notes and codes
			%	%	%	%	%	%	%	%
Agree strongly	100	200	36	21	3	3	18	16	0	4
Agree	148	175	38	13	3	5	18	15	2	5
Neither	145	118	42	10	8	2	17	12	2	7
Disagree	95	43	58	12	2	5	2	9	5	7
Disagree strongly	3	2	50	0	0	50	0	0	0	0
Total	491	538	40	15	4	4	17	14	1	5



3.3.3 Timetable format

Table 18 (below) shows the responses from the on-board survey to a question about how timetable information should be made available.

Table 18: Desired timetable format and age of respondent

Age	Total in group	One booklet with timetables for all transport services		One booklet for each transport mode		Timetables for individual services		Telephone service	
		No.	%	No.	%	No.	%	No.	%
15-24	160	75	47	41	26	32	20	12	8
25-59	266	123	46	67	25	57	21	19	7
60-74	146	44	30	48	33	44	30	10	7
75+	38	15	39	14	37	6	16	3	8
All	610	257	42	170	28	139	23	44	7

Across all age groups the format receiving the strongest support was a booklet for all services (42%). However, this option was more strongly supported by the two younger age groups than the older groups. This result may reflect the complexity and presentation standard of existing timetables. It may also indicate a need to market bus services using a number of different approaches. A different approach may be required for younger people to that for older people.

Focus group participants said that consolidated timetables should only cover the immediate local area. It is worth noting that during the home interviews there were 40 comments about difficulty in finding the correct table to read, with 28 of these (70%) related to consolidated timetables.

Participants had most difficulty with the consolidated timetable that included 14 routes. A number of people had trouble finding the correct table to read even with as few as three routes in one booklet.

The least frequent choice among all respondents was the telephone service at 7%. This might indicate that people expect to use phone information to find specific information or for checking arrangements rather than as the only or primary source of general information. In practice, people make much more use of the phone to access information (see section 3.1.1).



Among respondents who do not speak English at home, one third supported a booklet with timetables for all services and one third timetables for individual services. However a booklet for all services gained significantly more support from younger people in this group (47%) than older people (10%). The reverse was true for timetables for individual services (under 60 years – 27% and over 60 years 43%).

The same proportion of people who did not speak English at home as for all respondents supported the telephone service.

There was little variation caused by place of residence to the pattern for those of all respondents.

Table 19 (below) shows the favoured format in relation to the frequency of use of bus services.

Table 19: Desired timetable format and frequency of bus service use

Usage	Total Responses	One booklet with timetables for all transport services		One booklet for each transport mode		Timetables for individual services		Telephone Service	
		No.	%	No.	%	No.	%	No.	%
Every Day	279	116	42	77	28	63	23	23	8
1 x week	232	96	41	69	30	55	24	12	5
1 x month	50	21	42	12	24	12	24	5	10
< 1 x mth	51	23	45	13	25	9	18	6	12
Total	612	256	42	171	28	139	23	46	8

A booklet with timetables for all services was the most popular choice across all respondents. Those respondents who used the services least indicated that they would use a telephone service more often (12%), compared to respondents who used the services more regularly (7%).



3.3.4 Present timetable performance

The timetable review analysed the performance of existing timetables from bus operators in Sydney on a range of timetable characteristics.

Table 20 (below) shows the results.

Table 20: Occurrence of significant characteristics in Sydney bus timetables

Characteristic	Sub-characteristic	Percentage
Timing points	Left hand side of the page with horizontal text	54%
	Top of the page with horizontal text	8%
	Top of the page with text at an angle	38%
Use of codes	Yes	86%
	No	14%
Number of codes used	2 or less	17%
	3 or 4	31%
	5 – 10	34%
	11 – 15	8%
	15+	10%
“Weekday and Weekend”	Yes	66%
	No	34%
Use of colour	Text	72%
	Paper	18%
	Headings	15%
Contrast text/paper	High contrast	61%
	Medium contrast	34%
	Low contrast	5%
Use of shading	Yes	57%
	No	43%
Contrast text/shading	High contrast	63%
	Medium contrast	19%
	Low contrast	19%
Font type	Serif	10%
	Sans Serif	90%

Characteristic	Sub-characteristic	Percentage
Font size	6 – 7.5	11%
	8 – 9.5	60%
	10	18%
	11	6%
	12	3%
Guide lines – lines drawn every 3rd, 4th or 5th line to assist reading the correct row in a table.	No guide lines	75%
	1 – 3	8%
	4 – 6	7%
	Train times	9%
Map	Overlay	85%
	Diagrammatic	10%
	Schematic	5%
“Timetable” on cover	Yes	77%
	No	23%
Contact telephone number	Yes	86%
	No	14%
Type of paper	Matt	89%
	Glossy	11%

The review showed that practices which have a negative effect on understanding are in common use. These include:

- Use of codes – 86% of timetables with over 50% using 5 or more in one timetable.
- Use of small fonts (10 point or smaller) – 90% of timetables.
- Use of text turned at an angle of 90° to the horizontal – 38% of timetables.
- Use of terms “Weekday” and “Weekend” – 66% of timetables.
- Medium or low contrast between text and background – 38% of timetables.

This review of Sydney bus timetables showed a distinct lack of design consistency. There is little consensus on major design traits such as the orientation of timing points and the use of shading. Where there was a high degree of consistency the traits in question do not always assist comprehension. Those traits include the use of codes (86%) and the lack of guide lines (75%).



4. CONCLUSIONS AND RECOMMENDATIONS

4.1 Information sources – provision and use

4.1.1 Information in a variety of forms

Ensuring information about bus services reaches as wide an audience as possible means providing information through a range of sources.

These sources include timetables, phone information, bus stop information and informed, helpful bus drivers.

A range of information sources caters for the different needs that different people have for example in regard to their sight, or familiarity with English, or their skills in literacy. Also every person at different times uses the available range of information in different ways, despite their abilities remaining constant. A range of clear and consistent sources of bus service information is crucial to facilitate the use of bus services. The increased use of public transport is central to the NSW Government's transport strategy.

To public transport providers information provision may be seen as a cost. A more progressive way is to see information as a marketing tool and an investment in patronage growth. Even with such a positive approach, information must be provided efficiently and produce an effective outcome.

An integrated range of information sources is required to ensure coverage to all members of the community, securing the opportunity to use available services. The full range of information required goes beyond that examined in this study and includes bus signage and electronic media.

Recommendation:

That the NSW Department of Transport develop a Public Transport Information Strategy to ensure consistent, high quality information in a variety of forms useable by people with a range of skills and clear to both the frequent and infrequent user.



4.1.2 Telephone information

Direct personal contact fulfils a vital role in assisting or assuring people using bus services. This is particularly so for people who have difficulties understanding timetables. Because so much bus service information is presented in visual form, people with low vision are dependent on personal advice. People undertaking infrequent and unfamiliar bus trips are more likely to seek advice or confirmation from others. The other person may be the bus driver, a friend, relative or a fellow passenger. They may also be a telephone information operator. The importance of human contact in delivering information and providing assurance should not be underestimated. At most times all bus users will seek personal advice about the travel they are undertaking.

This result raises the importance of telephone information. The NSW Department of Transport is presently developing a comprehensive phone information system (ITIS) for public transport in the Sydney, Newcastle and Wollongong regions.

Recommendation:

In developing and implementing its Integrated Transport Information Service (ITIS) the NSW Department of Transport consider the needs of people who speak languages other than English and of people with disabilities.

Recommendation:

Undertake further research to identify best practice in the delivery of telephone information systems to the public, including information services in remote locations.

4.1.3 Bus drivers providing information

The research also highlights the key role played by bus drivers in providing information either as a primary source or as confirmation of what is already known. The vast majority of people surveyed obtained timetables from bus drivers and a significant proportion of the home interviewees said they depended on drivers for information and advice. This raises issues for bus operators in relation to the selection and training of drivers and their role in the promotion and marketing of public transport services.

Recommendation:

Bus drivers have on board buses a range of local and system wide service information for distribution to passengers.



Recommendation:

The bus industry continue recognising the important role played by drivers in distributing public transport information. That the practice be encouraged by selecting suitable drivers who are able to effectively communicate with the public and providing drivers with appropriate passenger awareness training.

4.1.4 Bus stop identification and information

There was significant support for the announcement of bus stops to assist people with orientation. This is particularly important for people with disabilities and infrequent travellers.

Recommendation:

The feasibility of audible and visual displays to identify approaching bus stops, be investigated to meet the needs of people with disabilities, older people, people who do not speak English at home and people with low literacy skills.

Recommendation:

In developing ITIS the NSW Department of Transport recognise the need to ensure the provision at all major bus stops of adequate, consistent identification and bus service information.

4.1.5 Information booths

The research showed that some people have difficulty with text-based information and that many bus users depended to a significant degree on verbal advice. Most of this advice takes the form of telephone information or advice from bus drivers or other people. This presents potential problems for people at major transport interchanges where personal advice may be limited or where seeking information from drivers could slow the boarding of services.

Recommendation:

Service providers establish staffed information booths at major public transport interchanges. The option of trained volunteers be investigated.

4.1.6 People who speak a language other than English

There were a number of significant differences between how people who do not speak English at home and the general population access public transport information.

According to the survey results people who do not speak English at home were less likely to use timetables to obtain information than the rest of the survey respondents (this was especially true of older people).



They were also less likely to use telephone information services.

People who do not speak English at home, in particular older people, depend more than the general population on information at bus stops. They were also more likely to obtain information from bus drivers and other people such as friends or relatives.

Recommendation:

That all public transport information available for distribution be in the main community languages in the area of operation, particularly where languages not using roman numerals (eg Chinese) are predominant.

4.1.7 Older people

Older people were also less likely to use timetables. Many older people had difficulty reading and understanding timetables and those surveyed gave very strong support for the use of larger print.

Recommendation:

The NSW Department of Transport require timetables to meet accepted disability standards for print size, which currently stand at 12 point minimum.

4.2 Difficulties using timetables

The research shows that certain aspects of the presentation of timetables that are in common use make timetables difficult to understand for many people. The inconsistency of presentation between timetables presents a further barrier to comprehension.

Two issues stand out as barriers to the comprehension of timetable information – print size and the use of notes and codes.

Very few Sydney timetables use a print size which would be generally accepted as large enough to be legible by many older people and people with sight problems.

Notes and codes indicate route and time variations on timetables. Very few people in the home interviews were able to successfully interpret notes or codes. Few people even attempted to do so. The usefulness of notes and codes must therefore be seriously questioned. This is a very significant issue given that their use is widespread (86% of Sydney timetables use them). Over half of Sydney timetables used more than 5 notes and codes.



Recommendation:

The bus industry adopt a code of practice which standardises the presentation of information in timetables and ensures that it is in an understandable form for the full range of bus users. In the longer term such a code of practice be incorporated into standards which are part of the contract conditions between the NSW Department of Transport and providers of public transport.

Acknowledgements

Many people who were involved in this research deserve mention for their hard work and cooperation.

Marella Pettinato of Transport Planning and Management for her field work on the passenger surveys, for manipulating the data and developing the data tables for the reports and for interminable proof reading.

Terry Lee-Williams of the Ageing and Disability Department for his unstinting guidance and advice.

George Pund of the Ageing and Disability Department for data and text editing, advice and assistance throughout the project.

Rob Lake for his work on the community consultations and surveys in western Sydney and in particular for undertaking the interviews with bus drivers.

Jill Napier and Susan Heyne for running the focus groups in Port Stephens.

The Transport Data Centre of the NSW Department of Transport for allowing us access to their collection of Sydney timetables.

The Management and staff of the following companies who were of particular assistance with surveys, interviews and other advice – Westway Bus and Coach Service, Oliveiri's Metro-Link Bus Service and Blue Ribbon Coaches.

Also the following companies who assisted us in the task of undertaking surveys on their services – Port Stephens Coaches, Westbus, Liverpool Transport, Busabout, Bustrans and Bowmans Coaches.

All those who undertook passenger surveys, home interviews and data entry.

Which Bus?

Research on the use and comprehension of Public Transport Information
ISBN 0 7313 9806 8

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Printed by Institute of Transport Studies, Sydney University