

**USER PERCEPTIONS OF  
THE NEW ZEALAND  
STATE HIGHWAY SYSTEM**

**Transit New Zealand Research Report No. 31**

# **USER PERCEPTIONS OF THE NEW ZEALAND STATE HIGHWAY SYSTEM**

**TRAVERS MORGAN (NZ) LTD**  
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## **EXECUTIVE SUMMARY**

### **1. THE PROJECT**

This research project investigated the perceptions and views of road users about state highways in New Zealand. The project has been undertaken for Transit New Zealand by Travers Morgan (NZ) Ltd in association with McDermott Miller Ltd and Forsythe Research.

### **2. METHODOLOGY**

Market research was undertaken for the project, and involved an initial series of group discussions, followed by a household telephone survey (200 respondents) and a personal interview survey of commercial road users (113 respondents). The research investigated users' rating of the importance of 24 attributes of the state highway system and their assessment of the performance of the present system against each attribute.

The project was of a pilot nature and the results should be taken as indicative only. As a pilot, the project has been successful and its overall objective has been achieved as it has provided Transit New Zealand with its first systematic information on the views of users of the state highway system.

### **3. USER PERCEPTIONS OF THE STATE HIGHWAY SYSTEM**

#### **3.1 Importance of Attributes**

Most road users (both private and commercial) considered that the most important attributes of the state highway system were safety-related, including:

- Road markings that are clearly visible in the wet
- Road surfaces that are not slippery when wet
- Cats eyes along the centre-lines of the road
- Reflective markings along road edges
- Roadside barriers by steep drops
- Median barriers on heavily used routes

Other attributes of importance were those that helped to improve the flow of traffic, including:

- Passing lanes
- Turning lanes at junctions
- Sufficient road capacity for peak traffic



### **3.2 Performance against Attributes**

People on average rated the performance of state highways overall between "adequate" and "good" on most of the attributes investigated. Commercial road users tended to rate attributes rather more poorly than other road users.

In general, the performance of state highways on the above important safety-related attributes was rated quite highly.

Attributes which were regarded as important but for which performance was relatively poor would, on the face of it, warrant priority for attention by Transit New Zealand. These perceptions of performance relate to the state highway system overall and include:

- Sufficient road capacity for peak traffic
- Median barriers on heavily used routes
- Passing lanes
- Turning lanes at junctions
- Wide shoulders or verges

### **3.3 Performance of Specific Route Sections**

The surveys also investigated perceptions of specific route sections with which respondents were familiar. Although the sample sizes on any of these route sections were small, valuable information was obtained on perceptions of each route. It is apparent that there were considerable differences in perceptions of performance for different routes.

### **3.4 Perceptions of Changes over Time**

Around two-thirds of all respondents considered that the state highway system has been getting better over time, while only around 10% thought that it has been deteriorating. These are general perceptions only and the issue was not pursued in more detail.

### **3.5 Significance of User Perceptions**

It is to be noted that the users' views were not necessarily measuring the same things as the quantified performance indicators used in the Transit New Zealand Statement of Intent, examples of which are the number of lane kilometres exceeding a certain NAASRA road roughness, and the number of renewed bridges opened to traffic.

#### **4. FURTHER RESEARCH AND POTENTIAL APPLICATIONS**

One of Transit New Zealand's goals is to "*increase public satisfaction with New Zealand's land transport system*". From the project, Transit New Zealand now needs to consider how best to pursue progress towards and monitoring of this goal, through further market research and/or other approaches.

##### **Recommendations**

- (i) Further market research to provide more information on road user views in general, on views about specific routes, and to monitor changes in views over time should be carried out.

Whether to use research methods similar to those applied in this project, or to use methods that would allow greater exploration of perceptions should be investigated.

- (ii) Methods that integrate road user views into the programme and project development, evaluation and selection processes for state highway improvements should be developed.

Such methods would give greater emphasis on improvements which reduce the perceived stress, risks and uncertainty in driving, as compared with present project evaluation procedures which focus on time, operating cost, and accident savings.



## **ABSTRACT**

This report is of market research into the perceptions and views of road users about the state highway system in New Zealand.

The research involved group discussions, a household survey and a survey of commercial road users. It investigated users' rating of the importance of 24 attributes of the state highway system and their assessment of the performance of the existing system against each attribute. It covered perceptions both of the state highway system as a whole and of particular routes.

The report highlights those road attributes which users rate as important but for which, they consider, the present system performance is inferior. These are the attributes that warrant high priority for attention by Transit New Zealand.

Recommendations are made for further market research and for the development of methods to integrate road user views into the project development, evaluation and selection processes for improvements to the state highway system.

## **1. INTRODUCTION**

### **1.1 Overview**

This report is of a two-stage research project for Transit New Zealand to investigate the views of road users about state highways in New Zealand.

The project has been undertaken for Transit New Zealand by Travers Morgan (NZ) Ltd, transport planning consultants, working in association with McDermott Miller Ltd and Forsythe Research as market research consultants.

### **1.2 Objectives and Scope**

The overall objective of the project was:

*"to identify and evaluate the expressed concerns, needs and problems of users of the state highway road system, in order to ensure that Transit New Zealand fully understands the needs of this group of customers."*

Specific points in the Research Brief which amplified this objective and guided the scope of work required were as follows:

- *The project was to be concerned only with the state highway system and its users.*
- *The project was to cover drivers of motor vehicles, viz. motor cars, motor cycles, light and heavy transport vehicles including buses. (Vehicle passengers, pedestrians and cyclists were not to be covered specifically in this initial project.)*
- *The project was to cover individual drivers only, not road user and related groups/organisations.*
- *Attributes of the road system to be covered in the research included:*
  - *perceptions on performance of the existing state highway system, by a range of attributes (examples of attributes are: road geometry, surfacing noise, passing opportunities and signs); and*
  - *perceived priorities for system improvements.*
- *The project was to focus on attributes of the road system, and not to cover perceptions of Transit New Zealand or other roading organisations.*
- *Given the subject matter and the pilot nature of the project, it is recognised that the results would be indicative only. It was therefore not seen as essential to ensure that the survey would provide a random coverage of either state highway users or the total New Zealand population.*

### **1.3 Stages**

The project was divided into two stages:

- Stage 1 - Inception Stage: involved initial exploration of the issues, including focus group discussions with road users, and development of the best approach to detailed market research.
- Stage 2 - Main Stage: involved more extensive quantitative market research.

### **1.4 Report Structure**

- Section 1 - summarises the work undertaken by the consultants in both stages.
- Section 2 - summarises the Stage 1 appraisal of Transit New Zealand's objectives and the review of previous research in New Zealand and Australia. (Further details are contained in Appendices 1, 2 and 3.)
- Section 3 - summarises the findings from the focus group discussions held in Stage 1.
- Section 4 - presents the results of the household telephone survey (Stage 2).
- Section 5 - presents the results of the roadside intercept survey (Stage 2).
- Section 6 - provides an overview of the project findings and conclusions.

## **2. OBJECTIVES AND PREVIOUS RESEARCH**

### **2.1 Relevant Transit New Zealand Objectives**

A review of Transit New Zealand objectives relating to road user needs and the state highway operating environment was carried out, principally to ensure that any relevant objectives were taken into account in defining the scope and emphasis of the market research programme.

This review is reported in full in Appendix 1. However, the documents reviewed contained only very limited material that directly related to road user needs or to how these needs might be assessed. No specific pointers were identified that would help in directing this research project.

### **2.2 Review of Previous Research**

Previous research on road user needs and methods of assessing these needs was reviewed, and is reported in full in Appendix 2 (New Zealand research) and Appendix 3 (Australian research).

The main findings of relevance from these reviews are as follows:

- A very limited amount of research has been identified in either country which is of direct relevance to this project.
- The limited research that is available indicates that people place high priority on measures which will improve safety (bad bends, etc.) in preference to those that merely reduce travel time.
- The relevant New Zealand research (on the Arthur's Pass Road, SH73) highlighted that people's perceptions were likely to vary substantially on different lengths of route; and that general views of the state highway network as a whole would be of somewhat limited use, as they would not bring out the different perceptions of different routes.
- The previous research did not identify any survey approaches which indicated a case for changing the approach outlined in the Research Brief on the project.

### **3. FOCUS GROUP DISCUSSIONS**

#### **3.1 Overview**

Initial investigations into the views of groups of road users (called focus groups) about the state highway system were held. They were designed to elicit the range of issues and perceptions experienced by road users, particularly to assist in the design of the more detailed market research that was part of the project.

Three focus groups were held during March 1993, with:

- private drivers from an urban area (Wellington),
- private drivers from a rural area (Otaki),
- commercial drivers (truck and coach) based in Wellington.

Each session involved informal but structured group discussions to determine the range of views held, likely responses to key questions, and appropriateness of different approaches to various issues.

#### **3.2 Structure of Discussions**

After an initial briefing of participants about the objectives and scope of the research, including definition of the state highway system, discussion followed six broad steps seeking:

- General impressions of the state highway system and how it compares with inter-urban road systems in other countries.
- Identification of the attributes of the system that are most important to road users.
- The rating of these attributes in importance relative to each other.
- Perceptions of how well the system in general is performing relative to expectations with respect to each attribute.
- Perceptions of performance of the routes most familiar to participants.
- A re-appraisal of findings to check consistency both internally and against expected priorities for improvements.

The discussions are summarised in the following sections. (The focus group findings are not reported in detail, as their primary objective was to aid design of the quantitative surveys.)

### 3.3 General Impressions of the State Highway System

The initial impressions of the state highway system in general expressed by most participants were positive. People believed the road system had improved gradually over time. Examples of improvements included coloured cats eyes marking lane boundaries and the removal of bends on popular holiday routes.

A number of drivers however, both commercial and private, stated they did not believe the state highways are suitable for the heavy traffic using them now, following deregulation of the transport industry, or for the current speed limits and capabilities of modern vehicles. One issue of concern that was raised in all discussions was congestion on SH1 between Wellington and Paraparaumu.

Many of the problems with the roads were considered to be as much to do with poor driving as with physical attributes. People generally considered that New Zealand roads compared well with those overseas, making allowance for differences in terrain and urbanisation.

### 3.4 Important Attributes of the State Highways

The three groups were each asked to identify attributes of the roads that were most important to them. Each group identified most of the following attributes, although the last few on the list were, in some cases, prompted by the facilitator. Participants discussed the attributes to ensure they were all clear about the meanings.

- ***Passing Lanes.*** The need for frequent, long, passing lanes was raised by every group. These have both convenience and safety value, as they diffuse frustrations. (The private drivers commented that the road between Otaki and Wellington was particularly deficient in them.)
- ***Turning Lanes.*** Lanes for right-turning traffic or room to pull over for left-turning traffic at intersections on state highways were regarded as important, particularly for rural and commercial drivers. For the urban drivers, a related attribute was motorway on and off ramps, and these were generally considered not long enough for current speeds.
- ***Shoulders/Verges.*** These need to be wide and tidy. Well-maintained road edges were important, especially to commercial drivers. Eroded seal edging and/or too steeply cambered shoulders result in wear of the inside edges of tyres on a vehicle's left side and may lead to tyre blowouts on trucks. (Respondents considered this as ironic with the current road safety campaigns advocating driving to the left of a lane.)



- **Warning Signs.** Warning signs and road markings were recognised as important. Passing lane starting signs were praised, as were the new "stay left unless overtaking" signs on Wellington highways. Consistency of timing and location of warning signs were seen as desirable features.
- **Visibility.** This was important on the approaches to railway crossings, bridges, corners and intersections. The value of warning signs on a give-way crossing is limited if approaching traffic is obscured from traffic at the intersection.
- **Median Barriers.** These were a particular need, expressed by urban drivers, on stretches of highway where speeds are high and traffic is heavy. Four-lane roads, such as between Paekakariki and Paremata, gave particular concern because of a perceived risk of confusion between passing lanes and oncoming lanes.
- **Railway Crossings.** Barriers or lights on railway crossings were important to rural drivers as they are deficient on local roads.
- **Intersections.** There was some debate over intersections on state highways. Many drivers wanted the main routes to be completely uninterrupted, but some rural drivers stressed that secondary road traffic also had to be able to cross the highways. Where secondary traffic volumes are significant, large roundabouts were generally preferred to traffic lights, although this view was not unanimous.
- **Capacity.** The issue of congestion on highways in the Wellington region was broadened to cover road capacity in general. Several participants were critical of the toll road proposals for the Transmission Gully route, given that "the Government siphons off road user charges to pay for other things".
- **Bends.** Users were not averse to bends in the road, and in fact considered them as useful in increasing scenic interest and keeping speeds in check. However, they considered it important that the radii of bends were appropriate for the prevailing speeds in the general area, e.g. isolated sharp bends on the open road, or just before a hill (when trucks would lose their revs), were undesirable.
- **Road Surface and Seal.** The general condition of the road surface and the surface material were seen as important attributes. Most people believed the state highways were generally well maintained and sealed.
- **Distractions.** These were considered dangerous and should be avoided. An example, given by the rural group, was the market gardens south of Otaki, where a hazard is posed by some drivers slowing to read fruit and vegetable prices.
- **Information Signs.** Signs informing drivers of, for example, distances to towns were seen as useful. However, they need to be bigger and clearer than they are at present.

- **Rest Stops.** For certain road users (families or tourists) the present provision of roadside rest stops and picnic areas was praised. Other drivers simply did not use them. One participant suggested New Zealand should adopt the Australian idea of signs reminding drivers to take a break.

### **3.5 Attributes Most in Need of Improvement**

Groups considered the full list of attributes they had identified and ranked them in order of importance. Attributes which were consistently seen as most important included those related to safety. Attributes related to driving convenience or pleasure were less highly valued.

For the urban group, the strongest concern was to prevent head-on collisions, and hence they rated median barriers most highly. Next in importance for urban drivers, and of considerable importance for both rural and commercial drivers, were warning signs, road condition and surface, and turning or merging lanes. Long, frequent passing lanes and wide, tidy shoulders/verges were rated highly by all groups.

The performance of the state highway system on each of these attributes ranged between satisfactory/meeting expectations and falling well short of what was expected. The poorest opinions of current performance for important attributes of the system in general were about turning/merging lanes and passing lanes.

Participants were asked to distinguish between the performance of the route they used most and that of the system in general. Several specific problems influenced the performance of individual routes, such as the Wellington highway congestion, the Otaki market gardens, the lights at Ngauranga Gorge, and icy sections on the Desert Road.

### **3.6 Conclusions and Implications**

The focus group discussions identified the attributes of state highways which participants considered important and also provided confidence that the importance/performance approach proposed for the surveys would be successful.

The range of important road attributes was relatively consistent between focus groups and this consistency enabled a standardised list to be developed for the surveys. Variations were identified between types of road user in the perceptions of importance and performance of each attribute, and these variations were also explored later in the project.

Route-specific assessments of performance were found to be useful in prompting people's memories and in drawing out isolated problems that may influence perceptions of the wider system. In many cases people's views differed markedly in relation to different sections of a road. As people's general views are influenced very much by the road sections they use frequently, the research had to separate out views on specific road sections from views on the state highway system in general.

## 4. HOUSEHOLD TELEPHONE SURVEY

### 4.1 Overview

The results of the household telephone survey are described. The survey was undertaken using the Computer-Assisted Telephone Interview (CATI) facility at Forsyte Research's survey centre in Auckland. The survey was first piloted through interviews with 22 households in the Auckland area (21 April 1993). The pilot findings were submitted to Transit New Zealand for approval before proceeding with the main survey. Generally the pilot was very successful and only minor changes to the questionnaire were made for the main survey.

The main survey involved telephone interviews with a random sample of 200 people in urban and rural households throughout New Zealand, stratified by region according to the national population distribution. The interviews took place from 3 May to 1 June 1993.

### 4.2 Survey Sample

Surveying was continued until 200 successful interviews were obtained. 61% of households telephoned resulted in a successful interview, which is a reasonably high response rate for surveys of this type.

The maximum error at the 95% confidence level for the total sample is  $\pm 6.9\%$ . This means that results based on the entire sample (200 interviews) are 95% certain to differ by no more than  $\pm 6.9\%$  from the parameter for the New Zealand population, if the whole population were to be surveyed. This maximum error is based on the greatest divergence of responses (i.e. 50% say yes, 50% say no). Actual error is likely to be less for any results which do not show this divergence. However results based on subgroups of the overall sample may differ by more than 6.9% from the exact figures for the whole population.

Table 4.1 shows the age and sex distribution of the sample, and compares the sample with age and sex for the New Zealand population overall. It is seen that:

- The 16-19 age group is substantially under-represented in the sample, while older age groups tend to be over-represented.
- Females are significantly under-represented in the sample. In some households males appear to do most of the driving, and females either refused to respond or tried to get the male to respond instead.

Given the pilot nature of the project, these sample biases were not considered to be of concern.

Table 4.1. Age and sex distribution of respondents in Household Survey and of New Zealand (NZ) population.

<b>Category</b>	<b>% of Survey Respondents</b>	<b>% of NZ Population<sup>(1)</sup></b>
<b>Age Group</b>		
16-19 years	2	9
20-29 years	15	21
30-39 years	27	21
40-49 years	22	17
50-59 years	16	12
60+ years	20	21
<b>Total</b>	100 <sup>(2)</sup>	100 <sup>(2)</sup>
<b>Sex</b>		
Male	63	49
Female	37	51
<b>Total</b>	100	100

**Notes:** <sup>(1)</sup> Data from 1991 Census. Population figures refer to relevant age groups only (excluding age under 16).

<sup>(2)</sup> Figures do not always add to totals, because of rounding.

Respondents were asked what type of vehicle they usually drive and responses were as follows:

Private car/van/ute	89.0%
Company car	3.5%
Commercial vehicle	5.5%
Motorbike	2.0%

### 4.3 Surveyed Attributes of State Highways

As a result of the focus group discussions (Section 3.4) and the pilot telephone survey, the most important attributes of state highways to users were identified. Table 4.2 defines the 24 attributes used in the main survey. This table sets out the full definition for each attribute in the survey, together with the abbreviated title used in the relevant tables and figures.

Table 4.2. Definitions of attributes of state highways used in the surveys.

<b>Full Definition</b> (as used in survey questionnaire)	<b>Abbreviated Title</b> (as used in report tables/figures)
* Clear, well placed road signs (showing bends, passing lanes, junctions, etc.) * Information signs showing distance to towns * No distractions (detailed shop signs, etc.) by the roadside	Clear road signs Information signs No distracting signs
* Lighting all along the road * Lighting at key spots in rural areas (like bends and junctions)	Lighting along road Isolated rural lighting
* Median barriers (down the centre of the road) in areas where traffic is heavy and speeds are high * Barriers (along the side of the road) in areas where there is a steep drop beside the road	Median barriers Roadside barriers
* Roundabouts or traffic lights at intersections on state highways where secondary roads cross * Turning lanes (i.e. separate lanes for traffic to turn left or right) at junctions * Barriers or lights on railway crossings	Controlled intersections Turning lanes Controlled level crossings
* Road markings that are clearly visible in the wet * Well maintained cats eyes down the centre of the road * Reflective markings along the edge of the road	Road markings Cats eyes Reflective edge markings
* Road surface that is not slippery when wet * Road surface that gives a smooth ride	Surface not slippery Surface smooth
* Well maintained road seal * Well maintained road edges * Overall maintenance of the road and verges	Maintained seal Maintained edges Overall maintenance
* Sufficient road capacity to cope with peak traffic * Passing lanes * No bends which you have to slow down for, to drive round safely	Sufficient capacity Passing lanes No bends
* A wide road shoulder or verge * Rest stops and picnic areas at the roadside * Management of traffic when there are road works	Wide shoulder/verge Rest areas Works traffic management

#### 4.4 Importance of State Highway Attributes

Respondents were asked to rate the importance of the specified attributes of state highways overall in New Zealand. The rating scale used was:

5	=	Very Important
4	=	Important
3	=	Neither Important Nor Unimportant
2	=	Unimportant
1	=	Totally Unimportant

Table 4.3 shows the results for the importance of each attribute. The mean importance rating shows that all except one attribute have ratings between 3 (neither important nor unimportant) and 5 (very important), with the majority of attributes rating between 4 (important) and 5 (very important).

The two most important attributes, with mean ratings over 4.8, are both related to driving in the wet. Over 90% of respondents rated these attributes as "very important":

- *Road surface that is not slippery when wet*
- *Road markings that are clearly visible in the wet*

The next five most important attributes, with mean ratings between 4.7 and 4.8, with over 70% of respondents rating these five attributes as "very important", are:

- *Clear, well placed road signs*
- *Well maintained cats eyes down the centre of the road*
- *Passing lanes*
- *Reflective markings along the edge of the road*
- *Well maintained road seal*

The next six attributes have mean ratings between 4.4 and 4.6, with around 60% of respondents rating them as "very important":

- *Barriers where there is a steep drop beside the road*
- *Barriers or lights on railway crossings*
- *Turning lanes (at junctions)*
- *Sufficient road capacity to cope with peak traffic*
- *Median barriers where traffic is heavy and speeds are high*
- *Lighting at key spots in rural areas*

The remaining eleven attributes were rated as "very important" by only approximately 10% to 50% of respondents.

Notable was the relatively low importance given by respondents to:

- *Rest stops and picnic areas at the roadside*
- *No bends which you have to slow down for*
- *Lighting all along the road*

Table 4.3. Importance of state highway attributes from Household Survey.

Attribute <sup>(1)</sup>	Rank <sup>(3)</sup>	Mean Rating	% Distribution <sup>(2)</sup>				
			5	4	3	2	1
Clear road signs	3	4.78	79	20	1	-	-
Information signs	20	3.94	23	54	19	4	-
No distracting signs	23	3.29	11	30	37	20	2
Lighting along road	24	2.85	15	14	21	40	10
Isolated rural lighting	13	4.44	62	25	7	5	1
Median barriers	12	4.47	61	29	7	3	-
Roadside barriers	8	4.56	66	26	5	3	-
Controlled intersections	19	3.95	30	44	20	3	3
Turning lanes	10=	4.51	63	27	9	1	-
Controlled level crossings	9	4.54	61	34	4	1	-
Road markings	1	4.91	92	7	1	-	-
Cats eyes	4	4.78	80	18	2	-	-
Reflective edge markings	6	4.71	75	21	3	1	-
Surface not slippery	2	4.88	91	7	2	-	-
Surface smooth	18	4.18	34	52	12	2	-
Maintained seal	7	4.70	71	28	1	-	-
Maintained edges	16	4.32	46	43	10	1	-
Overall maintenance	15	4.36	44	49	7	-	-
Sufficient capacity	10=	4.51	59	36	4	1	-
Passing lanes	5	4.74	80	16	4	-	-
No bends	22	3.65	17	45	27	9	2
Wide shoulder/verge	17	4.20	36	49	14	1	-
Rest areas	21	3.82	24	45	22	8	1
Works traffic management	14	4.41	51	41	7	1	-

- Notes:** (1) Refer Table 4.2 for full definition of each attribute  
(2) Shows % of total respondents rating the attribute as:  
5 = Very important  
4 = Important  
3 = Neither important nor unimportant  
2 = Unimportant  
1 = Totally unimportant  
(3) Ranked from 1 (highest mean rating) to 24 (lowest mean rating)

#### 4.5 Overall Performance of State Highways against Attributes

Respondents were asked to rate the performance of state highways in New Zealand based on the previous attributes, using a 5-point scale:

5	=	very good
4	=	good
3	=	adequate
2	=	not so good
1	=	poor

Table 4.4 shows the results for the performance against each attribute. The mean performance rating on every attribute is between 3 (adequate) and 4 (good). While this is a reasonably satisfactory result, it also suggests scope for improvement because no attribute has a mean rating of "good" or better, and most attributes have a low proportion of "very good" ratings.

The performance of the four most important attributes is better than the mean performance for all attributes, particularly for:

- *Well maintained cats eyes down the centre of the road*  
(which received a high proportion of "very good" scores)
- *Clear, well placed road signs*

The poorest performing attribute of all, in terms of its mean rating, is:

- *Sufficient road capacity to cope with peak traffic*

23% of respondents rated performance on this attribute as "not so good" or "poor", while only 3% rated it as "very good".

Other attributes for which performance was rated well below average are:

- *Lighting at key spots in rural areas*
- *A wide road shoulder or verge*
- *Lighting all along the road*

#### 4.6 Comparisons of Performance against Importance for State Highways Overall

Figure 4.1 compares performance on each attribute against the importance of that attribute. Attributes which warrant the highest priority for attention are those towards the top left-hand corner of the figure, i.e. those which are regarded as relatively important but on which current performance is perceived as relatively weak. Lowest priority attributes for attention are those towards the bottom right-hand corner; while those towards the other two corners should be regarded as of middle priority.

As noted in Section 4.5, performance on the four attributes rated most important is generally better than the average. The attributes which appear in Figure 4.1 to warrant highest priority for attention are (in broadly descending order of priority):

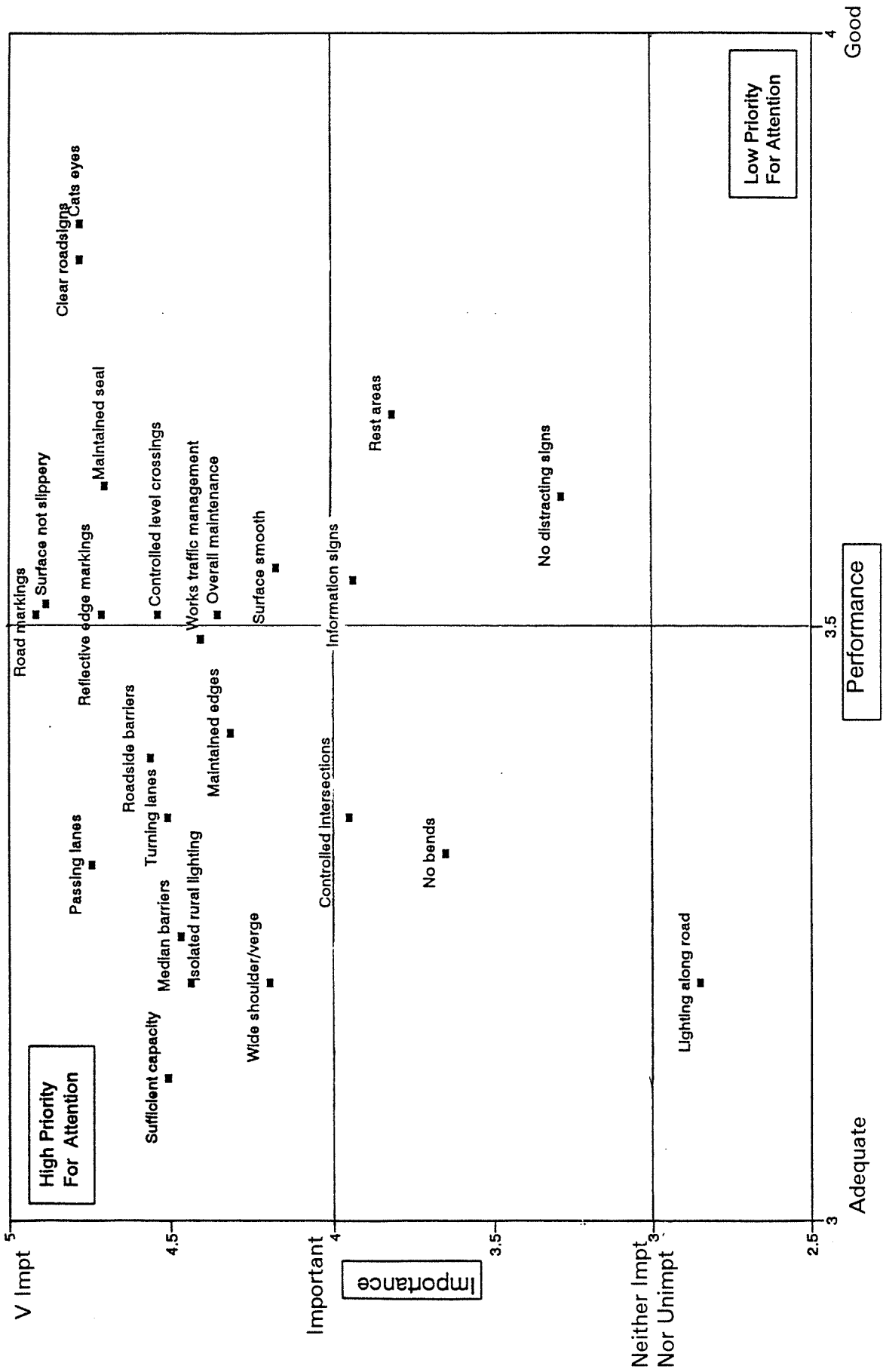


Table 4.4. Performance against state highway attributes from the Household Survey.

Attribute <sup>(1)</sup>	Rank <sup>(3)</sup>	Mean Rating	% Distribution <sup>(2)</sup>				
			5	4	3	2	1
Clear road signs	2	3.81	16	54	26	3	1
Information signs	7	3.54	14	45	28	7	6
No distracting signs	5	3.61	9	51	31	8	1
Lighting along road	21=	3.20	8	34	37	11	10
Isolated rural lighting	21=	3.20	10	37	28	15	10
Median barriers	20	3.24	9	36	33	13	9
Roadside barriers	15	3.39	10	39	37	6	7
Controlled intersections	16=	3.34	7	43	33	12	5
Turning lanes	16=	3.34	5	44	35	12	4
Controlled level crossings	9=	3.51	11	47	27	10	5
Road markings	9=	3.51	19	38	25	11	7
Cats eyes	1	3.84	30	41	16	10	3
Reflective edge markings	9=	3.51	17	41	27	8	7
Surface not slippery	8	3.52	14	39	36	7	4
Surface smooth	6	3.55	10	47	34	5	4
Maintained seal	4	3.62	13	46	33	6	2
Maintained edges	14	3.41	6	46	33	12	3
Overall maintenance	9=	3.51	9	47	34	6	4
Sufficient capacity	24	3.12	3	38	36	14	9
Passing lanes	19	3.30	9	40	31	14	6
No bends	18	3.31	4	42	39	10	5
Wide shoulder/verge	21=	3.20	5	33	42	17	3
Rest areas	3	3.68	18	46	26	7	3
Works traffic management	13	3.49	11	45	32	5	7

- Notes:** (1) Refer Table 4.2 for full definition of each attribute  
(2) Shows % of total respondents rating performance against the attribute as:  
5 = Very good  
4 = Good  
3 = Adequate  
2 = Not so good  
1 = Poor  
(3) Ranked from 1 (best performance) to 24 (worst performance)

Figure 4.1. Comparison of performance v importance of attributes, from the Household Survey.



- *Sufficient road capacity to cope with peak traffic*  
(As would be expected performance on this attribute is rated slightly lower by urban respondents than by rural respondents)
- *Lighting at key spots in rural areas*
- *Median barriers in areas where traffic is heavy and speeds are high*
- *Passing lanes*
- *A wide road shoulder or verge*
- *Turning lanes (at junctions)*

The attribute which appears to warrant relatively low priority for attention is:

- *No bends which you have to slow down for*

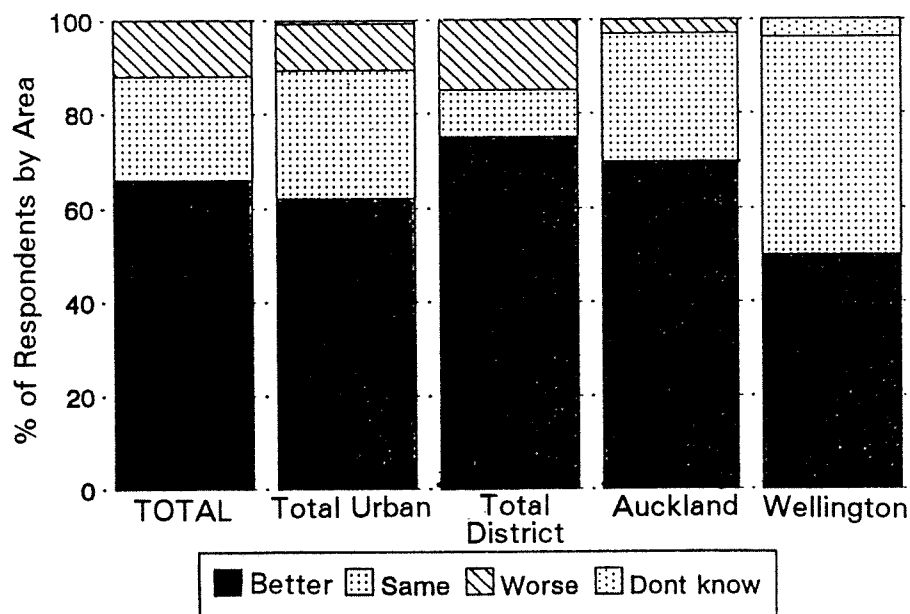
#### 4.7 Overall Impressions of the State Highway System over Time

All respondents were asked whether they thought "that overall the state highway system is getting better, getting worse, or is about the same as time goes on".

The results are shown in Figure 4.2. Overall, 66% of respondents thought the state highway system was getting better, 22% thought it was remaining about the same, and 12% thought that it was getting worse.

The rural/smaller urban centre respondents were more positive in their responses to this question than the urban dwellers, and Auckland respondents were more positive than Wellington respondents.

Figure 4.2. Performance of state highway system over time, from the Household Survey.



#### **4.8 Other Comments on State Highways**

Respondents were asked if any attributes of state highways that they felt were important had not been covered. The majority of respondents had no comment to make. Issues that were raised by respondents include:

- More lanes/separate truck lanes
- More/bigger signs
- More lighting

At the conclusion of the interview respondents were asked if they had any other comments to make about what had been discussed. The main comments about the state highway system were positive, and suggestions for improvement include:

- Sign improvements - bigger, cleaner, better situated
- Improve surface quality and maintenance
- Separate lanes for trucks/less heavy traffic on roads
- More passing lanes
- More cats eyes/improve maintenance of cats eyes

#### **4.9 Performance of Specific State Highway Routes**

As well as considering state highways in general, respondents were asked to name the section of state highway that they use most often. They were then asked to rate the performance of this section of highway on each of the listed attributes.

A full analysis of the results from this section of the questionnaire is given in Appendix 4. It is apparent from that analysis that substantial differences exist between route sections in their perceived performance on the various attributes. The results thus give useful indications (although with small sample sizes) of the attributes that most warrant attention on each route sections.

## 5. ROADSIDE INTERCEPT SURVEY

### 5.1 Overview

The results of the roadside intercept survey of the drivers of commercial vehicles are described. The survey was undertaken by Forsyte Research's team of interviewers. It used essentially the same questionnaire as for the household telephone survey, but with face-to-face interviews. It was piloted first through 13 interviews with commercial vehicle drivers at the Grey Lynn Testing Station in Auckland.

The main survey involved interviews with 113 commercial vehicle drivers. These took place at convenient locations during the working day, principally at:

- Vehicle testing stations
- Petrol stations
- Roadside cafeterias
- Ferry terminal (Wellington)

### 5.2 Survey Sample

The interviews were conducted in the following areas to ensure a reasonable geographic spread:

Auckland	15
Hamilton	20
Tauranga	21
Wellington	15
Christchurch	21
Dunedin	<u>21</u>
<b>Total</b>	<b><u>113</u></b>

The types of vehicles usually driven by those interviewed were:

Heavy Commercial	53%
Light Commercial	22%
Company Car	15%
Coach Bus	5%
Other	<u>4%</u>
<b>Total</b>	<b><u>100%</u></b>

### 5.3 Importance of State Highway Attributes

Respondents were asked to rate the importance of the specified attributes of state highways overall in New Zealand, using the same rating scale that was used for the household survey (Section 4.4). Table 5.1 shows the results for the importance of each attribute.

Table 5.1. Importance of state highway attributes for Roadside Intercept Survey for commercial drivers.

Attribute <sup>(1)</sup>	Rank <sup>(3)</sup>	Mean Rating	% Distribution <sup>(2)</sup>				
			5	4	3	2	1
Clear road signs	5	4.75	80	16	3	1	-
Information signs	21	3.65	15	49	23	13	-
No distracting signs	24	2.69	4	13	40	34	9
Lighting along road	23	3.03	13	20	32	25	10
Isolated rural lighting	10=	4.39	51	40	5	4	-
Median barriers	13=	4.36	52	35	10	2	1
Roadside barriers	13=	4.36	55	29	13	3	-
Controlled intersections	20	3.68	26	35	21	16	2
Turning lanes	8	4.60	63	34	3	-	-
Controlled level crossings	9	4.48	55	38	7	-	-
Road markings	1	4.95	96	3	-	1	-
Cats eyes	3	4.80	80	18	2	-	-
Reflective edge markings	6	4.70	80	20	-	-	-
Surface not slippery	2	4.92	95	3	1	-	1
Surface smooth	18	4.18	36	50	10	4	-
Maintained seal	7	4.65	66	33	1	-	-
Maintained edges	16	4.32	48	39	10	3	-
Overall maintenance	12	4.37	40	56	4	-	-
Sufficient capacity	10=	4.39	49	42	8	1	-
Passing lanes	4	4.79	82	14	4	-	1
No bends	19	3.78	17	55	17	11	-
Wide shoulder/verge	17	4.30	40	52	7	-	1
Rest areas	22	3.29	7	49	13	28	3
Works traffic management	13=	4.36	49	41	7	3	-

- Notes:** (1) Refer Table 4.2 for full definition of each attribute  
(2) Shows % of total respondents rating the attribute as:  
5 = Very important  
4 = Important  
3 = Neither important nor unimportant  
2 = Unimportant  
1 = Totally unimportant  
(3) Ranked from 1 (highest mean rating) to 24 (lowest mean rating)

In general, the mean importance ratings given to each attribute by commercial drivers differ very little from the ratings from the household survey (Table 4.3) so that, with a few variations, the order of importance of attributes in the two surveys is very similar. For instance the seven most important attributes in the household survey are also the most important in the commercial driver survey, with only minor changes in order.

As in the household survey, attributes of safe driving in the wet filled the top two places (road markings clearly visible in the wet; road surface that is not slippery when wet). High importance is again placed on these attributes relating to safety and those relating to free flow of traffic, such as passing lanes and turning lanes.

#### **5.4 Overall Performance of State Highways against Attributes**

As in the household survey, respondents were asked to rate the performance of state highways in New Zealand on a 5-point scale. Table 5.2 shows the results for the performance against each attribute.

The mean performance rating on every attribute is between 2.8 and 4.2 (where 3 = adequate, 4 = good). This compares with a spread between 3.1 and 3.8 for the household survey (Table 4.4). The commercial drivers generally have lower opinions on performance than the household survey respondents. For example, commercial drivers gave average ratings below 3.1 to eight attributes, whereas no attributes rated below this level in the household survey. The commercial drivers generally have a lower proportion of "very good" ratings, and a higher proportion of "adequate" and "not so good" ratings, especially for those attributes ranking lower in importance.

The one attribute with outstanding performance (mean rating 4.15) in the commercial driver survey is:

- *Well maintained cats eyes down the centre of the road*

Attributes rating below "adequate" on mean performance rating (<3.0) are:

- *Passing lanes*
- *A wide road shoulder or verge*
- *Lighting all along the road*
- *Median barriers in areas where traffic is heavy and speeds are high*

#### **5.5 Comparisons of Performance Against Importance for State Highways Overall**

Figure 5.1 compares performance on each attribute against the importance of that attribute. The results are interpreted in the same way as for Figure 4.1, and show that commercial drivers place high priority for attention on some of the same attributes that household survey participants do, such as passing lanes, median barriers, wide shoulders and verges.

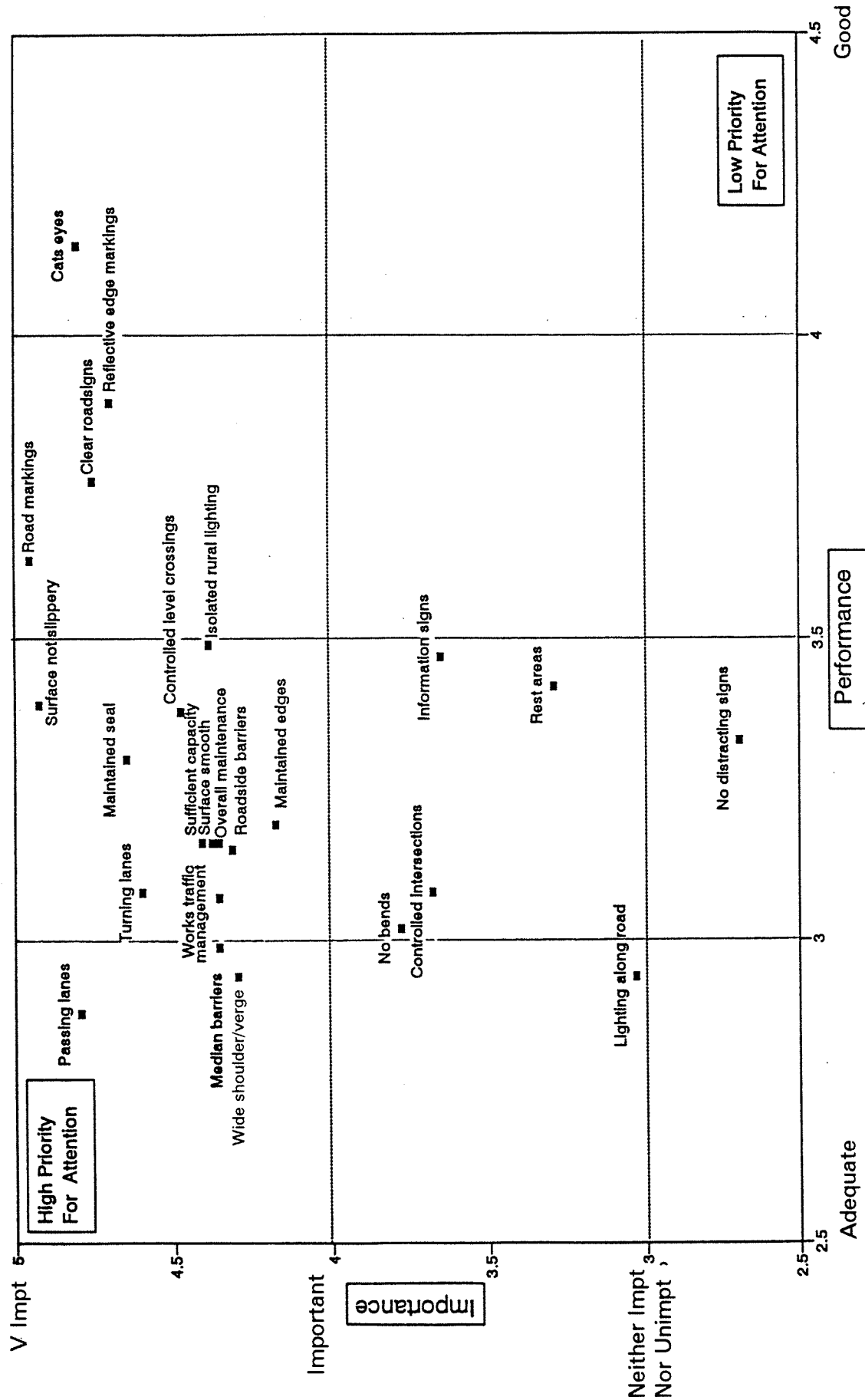
Table 5.2. Performance against state highway attributes for Roadside Intercept Survey of Commercial Drivers.

Attribute <sup>(1)</sup>	Rank <sup>(3)</sup>	Mean Rating	% Distribution <sup>(2)</sup>				
			5	4	3	2	1
Clear road signs	3	3.76	10	62	22	6	-
Information signs	6	3.47	6	46	39	6	3
No distracting signs	10	3.33	4	37	50	5	4
Lighting along road	22=	2.94	4	18	56	12	10
Isolated rural lighting	5	3.49	8	50	30	8	4
Median barriers	21	2.99	2	28	45	17	8
Roadside barriers	13=	3.16	5	37	35	15	8
Controlled intersections	17=	3.08	2	31	46	16	5
Turning lanes	17=	3.08	2	33	42	17	6
Controlled level crossings	9	3.38	4	50	32	9	5
Road markings	4	3.63	12	54	23	6	5
Cats eyes	1	4.15	39	46	10	3	2
Reflective edge markings	2	3.89	24	56	9	7	4
Surface not slippery	8	3.39	5	43	40	10	2
Surface smooth	12	3.19	4	36	42	13	5
Maintained seal	11	3.30	4	41	40	12	3
Maintained edges	16	3.15	1	37	41	17	4
Overall maintenance	13=	3.16	4	30	48	15	3
Sufficient capacity	13=	3.16	2	33	49	11	5
Passing lanes	24	2.88	32	24	38	29	6
No bends	20	3.02	3	31	43	20	5
Wide shoulder/verge	22=	2.94	2	27	41	23	7
Rest areas	7	3.42	6	43	40	7	4
Works traffic management	19	3.07	4	34	35	21	6

- Notes:** (1) Refer Table 4.2 for full definition of each attribute  
(2) Shows % of total respondents rating performance against the attribute as:  
5 = Very good  
4 = Good  
3 = Adequate  
2 = Not so good  
1 = Poor  
(3) Ranked from 1 (best performance) to 24 (worst performance)



Figure 5.1. Comparison of performance v importance of attributes from Roadside Intercept Survey for commercial drivers.



As in the household survey, the performance recorded in Table 5.2 on most of the more important attributes is better than average. Four of the six most important attributes rate highest in terms of performance:

- *Well maintained cats eyes down the centre of the road*
- *Reflective markings along the edge of the road*
- *Clear well placed road signs*
- *Road markings that are clearly visible in the wet*

At the other extreme, one of the most important attributes ranks lowest of all in performance terms:

- *Passing lanes*

Other important or moderately important attributes which rank relatively poorly in performance terms are:

- *Turning lanes (at junctions)*
- *Median barriers in areas where traffic is heavy and speeds are high*
- *A wide road shoulder or verge*

## **5.6 Overall Impressions of the State Highway System over Time**

Respondents were asked whether they thought that overall the state highway system is getting better, getting worse, or is remaining about the same as time goes on.

The majority (62%) of commercial drivers interviewed thought that the state highway system was getting better, while 30% consider it was remaining about the same, and 8% thought it was getting worse. The results are shown in Figure 5.2.

These are slightly less positive results than for all road users surveyed in the Household Survey (Figure 4.2).

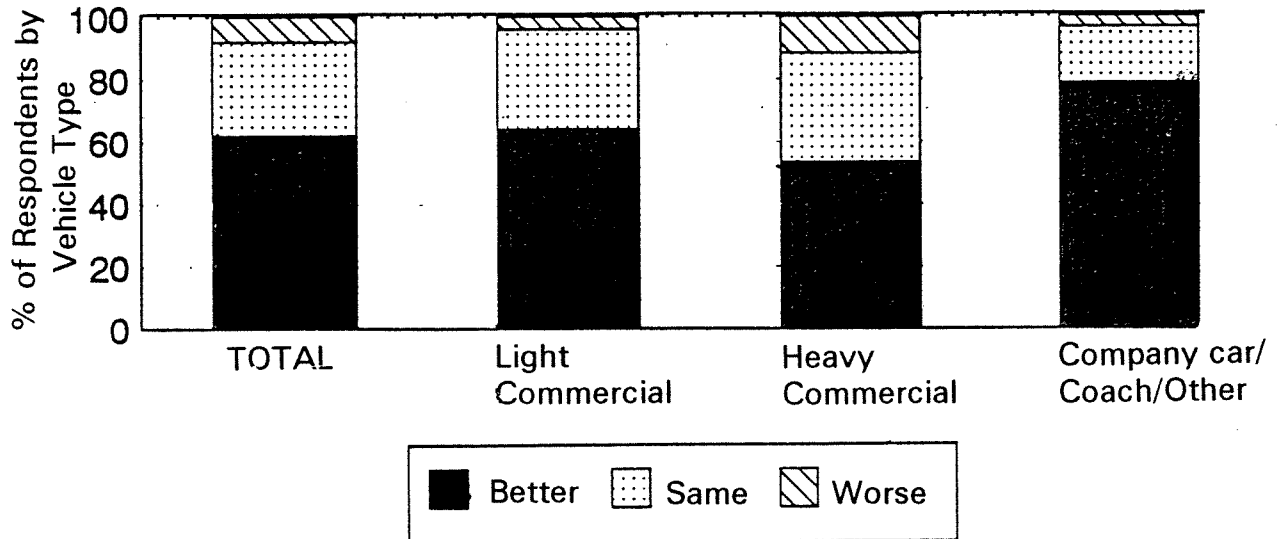
Heavy commercial vehicle drivers are the least positive group, with only just over half of these drivers believing that the system is getting better over time.

## **5.7 Other Comments on State Highways**

Other issues relating to state highways which were mentioned by commercial drivers as being important include:

- *More lighting*
- *Bigger/better signs*
- *Better road markings*
- *More rapid completion of road works*

Figure 5.2. Performance of state highway system over time for Roadside Intercept Survey for commercial drivers.



Other general comments mentioned by significant proportions of this group include:

- Improve surface maintenance, fill pot-holes (mentioned by over 20% of respondents)
- Wider verges/roads
- Improve signs
- More passing lanes/extra lanes

### 5.8 Performance of Specific State Highway Routes

As for the household telephone survey, respondents were asked to name the section of state highway that they use most often and then to rate the performance of this section on each of the listed attributes.

A full analysis of the results from this section of the questionnaire is given in Appendix 4. As in the case of the household survey, the responses show substantial differences between route sections in their perceived performance on various attributes. Surveys of this nature (with larger sample sizes) are thus likely to be useful in identifying the attributes that most warrant attention on each individual route.

## 6. CONCLUSIONS

### 6.1 Review of Objectives and Methodology

The overall objective of this project was:

*"to identify and evaluate the expressed concerns, needs and problems of users of the state highway road system ... "*

The market research approach adopted in this pilot project proved to be effective and reasonably efficient, so that this overall objective has been achieved. The project is the first of its type in New Zealand, and has provided Transit New Zealand with its first systematic information on the views of users of the state highway system.

### 6.2 Perceptions of the State Highway System

#### 6.2.1 Importance of Attributes

Most road users (both private and commercial) considered that the most important attributes of the state highway system were safety-related, including:

- *Road markings that are clearly visible in the wet*
- *Road surface that is not slippery when wet*
- *Well maintained cats eyes down the centre of the road*
- *Reflective markings along the edge of the road*
- *Barriers in areas where there is a steep drop beside the road*
- *Median barriers in areas where traffic is heavy and speeds are high*

Other attributes of importance were those that helped to improve the flow of traffic, including:

- *Passing lanes*
- *Turning lanes (at junctions)*
- *Sufficient road capacity to cope with peak traffic*

Attributes which ranked perhaps surprisingly low in importance included:

- *No bends which you have to slow down for*
- *Rest stops and picnic areas at the roadside*

#### 6.2.2 Performance against Attributes

People on average rated the performance of state highways overall between "adequate" and "good" for most of the attributes. Commercial road users tended to rate attributes rather more poorly than other road users.

In general, the performance of state highways on the above safety-related attributes was rated quite highly. Both groups of users rated state highways relatively highly on:

- *Well maintained cats eyes down the centre of the road*
- *Clear, well placed road signs*

Attributes which were regarded as important but for which performance was relatively poor would, on the face of it, warrant priority for attention by Transit New Zealand. These include:

- *Sufficient road capacity to cope with peak traffic*
- *Median barriers in areas where traffic is heavy and speeds are high*
- *Passing lanes*
- *Turning lanes (at junctions)*
- *A wide road shoulder or verge*

One notable attribute which appears to warrant relatively low priority for attention is:

- *No bends which you have to slow down for*

### **6.2.3 Performance of Specific Route Sections**

The surveys also investigated perceptions of specific route sections with which respondents were familiar. Although the sample sizes on any of these route sections were small, valuable information was obtained on perceptions of each route. It is apparent that there were considerable differences in perceptions of performance for different routes.

### **6.2.4 Perceptions of Changes over Time**

Around two-thirds of all respondents considered that the state highway system has been getting better over time, while only around 10% thought that it has been deteriorating. These are general perceptions only and the issue was not pursued in more detail.

### **6.2.5 Significance of Perceptions**

It is to be noted that the users' views were not necessarily measuring the same things as the quantified performance indicators used in the Transit New Zealand Statement of Intent, examples of which are the number of lane kilometres exceeding a certain NAASRA road roughness, and the number of renewed bridges opened to traffic.

### **6.3 Future Research and Potential Applications**

The type of market research approach adopted in this pilot project has proved to be an effective means of eliciting road user views about the state highway system. Transit New Zealand now needs to consider carefully how to extend and apply such an approach in future, particularly to pursue its goal to *"increase public satisfaction with New Zealand's land transport system"*.

#### **6.3.1 Further Market Research**

Two potential extensions of the market research approach, adopted in this project, to further investigate and monitor road user views are:

- More extensive surveys (telephone and/or personal interview) to obtain views on the performance of specific sections of state highways and on perceived priorities for improvements. Such surveys could potentially provide a valuable input into route-based upgrading programmes as well as into priorities between routes for upgrading.
- A periodic repeat (say every 2-3 years) of the surveys developed here, to track changes in perceptions and user satisfaction over time.

The survey methods used for this project may not be the most cost-effective for future research. Future methods may need to include face-to-face interviewing, using smaller sample sizes, to allow greater exploration of perceptions and attitudes. Conjoint analysis or similar techniques could be used to explore user trade-offs between improving different attributes of the state highway system, allowing for funding constraints.

#### **Recommendations:**

Further market research to provide more information on road user views in general, on views about specific routes, and to monitor changes in views over time should be carried out.

Whether to use research methods similar to those applied in this project, or to use methods that would allow greater exploration of perceptions should be investigated.

### **6.3.2 Integrating User Views into Project Evaluation**

If the Transit New Zealand goal to increase public satisfaction with the land transport system is to be achieved, user views should be incorporated into Transit New Zealand's project development, evaluation and selection processes for state highways. This will be a far from trivial matter.

The present project evaluation procedures focus on resource cost benefits from roading improvements, with time savings comprising the major benefits from many projects.

However, the user perceptions obtained from this project, of important attributes of the road system and of its present performance against these attributes, appear to give much less emphasis to time, operating cost and accident savings, but greater emphasis on improvements which reduce the perceived stress, risk and uncertainty in driving. Such improvements will not necessarily translate into economic benefits under the present project evaluation procedures.

There thus appears to be a degree of mismatch between the attributes which are valued as important under the present project evaluation procedures, and the priorities which road users give to improving various attributes.

#### **Recommendations:**

Methods that integrate road user views into the programme and project development, evaluation and selection processes for state highway improvements should be developed.

Such methods would give greater emphasis on the improvements which reduce the stress, risk, and uncertainty in driving, as compared with present project evaluation procedures which focus on time, operating cost, and accident savings.

## **APPENDICES**





**APPENDIX 1. REVIEW OF TRANSIT NEW ZEALAND  
OBJECTIVES RELEVANT TO ROAD USER NEEDS**



## **A1.1 Introduction**

This appendix covers that part of the work for Stage 1 which was to :

*"Review Transit New Zealand objectives etc. relating to road user needs and the State Highway operating environment. The task will cover the requirements of the Transit New Zealand Act and Statement of Intent."*

For this, a review was made in March 1993 of the following documents:

- Transit New Zealand Act (1989) and amendments
- Transit New Zealand Annual Report (1991/92)
- Transit New Zealand Statement of Intent (1992/93)
- Transit New Zealand Strategic Direction report (Nov 1991)

Publications since March 1993 are not reviewed.

## **A1.2 Transit New Zealand Act (1989)**

The principal objective of the Transit New Zealand Authority (S.5) is:

*"...to promote policies and allocate resources to achieve a safe and efficient land transport system that maximises national economic and social benefits."*

The functions of the Authority (S.6) include:

- "(j) To advise the Government in respect of the land transport system in New Zealand, including ... (ii) any improvement, extension, or reorganisation of the land transport system that may be desirable taking into consideration local, regional, and national communities of interest; ...*
- "(k) To assist and advise local authorities ... on any special land transport needs that arise in respect of persons who are transport disadvantaged or as a consequence of regional or local developments."*

## **A1.3 Transit New Zealand Annual Report 1991/92**

Transit New Zealand's roles quoted in its Annual Report for 1991/92 (p.3) include:

*"Helping to reduce the rate and severity of road accidents."*

*"Identifying and promoting solutions to land transport problems including the needs of the transport disadvantaged. These include those who are disabled, who do not drive, who are very young or old or who do not own a motor vehicle."*

*"Increasing public satisfaction with the land transport system."*

Under the heading "Community Consultation" (p.13) it is stated that:

*"Transit New Zealand continues to consult widely and directly on the impact of planned projects through the news media and with presentations at public forums and local council meetings. The views of road users have an important impact on developing and selecting preferred project options and their input will continue to be actively sought."*

#### **A1.4 Transit New Zealand Statement of Intent 1992/93**

The Transit New Zealand Statement of Intent is prepared annually to meet the requirements of the Transit New Zealand Act S30, and specifically to:

- Set out Transit New Zealand's objectives and performance targets for the current (1992/93) year,
- Give clear guidelines for Transit New Zealand's business direction.

The Transit New Zealand Statement of Intent 1992/93 contains very little of direct relevance to road user needs.

#### **A1.5 Transit New Zealand Strategic Direction 1991**

This report (November 1991) on Transit New Zealand's strategy for the future noted (p.4) one of the weaknesses in the current land transport system was that:

*"There is no direct client/customer linkage between road controlling authorities and road users, even though road users are charged for the use of the infrastructure. In effect, the government acts as the linkage but is not dedicated to the best interests of road users due to its wider responsibilities."*

Elsewhere (Annual Report 1991/92, p.5), it is noted that the proposals in the paper for improving the administration of land transport seek to:

*"Improve client/customer links between road controlling authorities and the road users."*

#### **A1.6 Summary**

The documents reviewed contain very limited material directly relating to road user needs, or to how these needs are to be assessed or satisfied.

The 1991/92 Annual Report does note that one of Transit New Zealand's roles is *"increasing public satisfaction with the land transport system"*, but neither the 1992/93 Statement of Intent nor any other documents reviewed state how this satisfaction is to be monitored. No specific guidance is given that helps in directing this research project.

**APPENDIX 2. REVIEW OF  
PREVIOUS NEW ZEALAND RESEARCH**



## A2.1 Introduction

This appendix covers that part of the work for Stage 1 which involved investigation and reporting on previous systematic market research in New Zealand on road user needs.

Two previous reports had been identified by Transit New Zealand which are of some relevance to this task. Relevant material from these reports is summarised below.

No other New Zealand reports have been identified that are of direct relevance to this project, although road user views have undoubtedly been expressed in a limited way in consultations on specific projects (e.g. the SH1/Transmission Gully route in the Wellington region). A review of such sources has not been attempted, as it seems unlikely it would be of more than very marginal value to this project.

## A2.2 "Arthur's Pass Roading Feasibility Study: Use and Significance of State Highway 73"

This report (January 1987) is by the Ministry of Works and Development (Christchurch) of a study undertaken in 1986 of the social significance of SH73 (Arthur's Pass Road). Road users were asked about their use of the route and the significance they placed on it.

Table A2.1 summarises the major dislikes and likes about the road obtained from the surveys. The report gives more detailed analysis in relation to dislikes/likes.

Table A2.1. SH73 Feasibility Study - main likes/dislikes of road users.

Survey Group	Main Dislikes	Main Likes
Road User - Roadside Intercept	<ul style="list-style-type: none"> <li>• Obstacles on road</li> <li>• Road alignment</li> <li>• Road width</li> </ul>	<ul style="list-style-type: none"> <li>• Scenery/vegetation</li> <li>• Road surface</li> <li>• Road alignment</li> </ul>
Road User - Postal Questionnaire	<ul style="list-style-type: none"> <li>• Dangerous alignment/visibility</li> <li>• Stock on road</li> <li>• One-way bridges</li> </ul>	<ul style="list-style-type: none"> <li>• Landscape</li> </ul>
Permanent Residents	<ul style="list-style-type: none"> <li>• One-way bridges</li> <li>• Road width</li> </ul>	<ul style="list-style-type: none"> <li>• Landscape</li> </ul>
Bach Owners	<ul style="list-style-type: none"> <li>• Dangerous alignment/visibility</li> <li>• One-way bridges</li> <li>• Grade or alignment</li> </ul>	<ul style="list-style-type: none"> <li>• Landscape</li> </ul>



For the Arthur's Pass study, two groups of surveys were undertaken:

- A survey of people using the road, involving:
  - roadside interviews
  - postal questionnaires (handed out at time of the roadside interview)
  
- Surveys of the following user groups that used the road most:
  - permanent residents (depending on the road for access)
  - bach owners
  - recreational and sporting groups
  - government departments and local authorities

### **A2.3 "Traffic in Residential Streets - The Social Response"**

This report (KRTA Ltd (Kingston Reynolds Thom Allardice Ltd) for National Roads Board, 1982) is of two pilot studies undertaken in Takapuna, in 1979-82, of residents' attitudes to the traffic in their residential street.

The studies investigated the extent, and correlation with traffic volume, of:

- Awareness of traffic, and personal feelings about traffic, in terms of:
  - heavy traffic volumes
  - high traffic noise
  - traffic considered to be dangerous
  
- Effects of traffic on various activities:
  - walking
  - cycling
  - children playing
  - children crossing the road
  - parking

The studies were concerned with the views of residents, principally in relation to conditions in residential streets. Thus, while interesting, they are of little direct relevance to the present project.

### **A2.4 Conclusions**

The Arthur's Pass study is of considerable relevance to this project, and is the only previous New Zealand study that has much relevance. The survey approach (roadside interview with follow-up postal questionnaire) is potentially applicable for Stage 2 of this project.

**APPENDIX 3. REVIEW OF  
RELEVANT AUSTRALIAN RESEARCH**



### **A3.1 Introduction**

This appendix covers that part of the work for Stage 1 which involved investigation and reporting on any readily available, previous, systematic market research in Australia on road user needs. The principal objective of the investigation was to review market research methods developed in Australia, with a view to their application in Stage 2 of this project. A secondary objective was to review the issues and priorities of road users in Australia.

Three main market research studies of road user views in Australia were identified and relevant attributes of each are summarised here. Full references of these study reports are given in Section A3.7.

### **A3.2 NATROV Study, Victoria**

This study into the case for the development of a national urban arterial road network for Melbourne involved three groups of consultations (Travers Morgan 1987):

- Questionnaire survey of major firms in the road freight industry
- Discussions with key firms in the road freight industry and with industry organisations
- Discussions with other relevant parties, including developers, manufacturing associations and Federal/State Government bodies

The questionnaire survey of major road freight companies and the discussions with key firms included questions on the perceived principal road problems in the metropolitan area and on priorities for improvement to different categories of roads. However, the work is not directly relevant to the current study.

### **A3.3 The Australian Roads Outlook Report (TAROR)**

This major study for NAASRA (1986-87) included three groups of consultations (NAASRA 1987):

- Some 2000 telephone interviews of households throughout Australia, to report on community views on identified road needs
- Survey of key commercial road user organisations on perceived road needs
- Interview survey of selected Government departments and community groups on road system performance, needs and priorities

#### **A3.3.1 Household Interviews**

The household telephone survey included questions on the following attributes:

- The importance of roads in relation to other Government services
- Ratings of the quality of different road types
- Trends in quality of different road types over last five years

- Trends in quality of specific attributes by different road types:
  - road surface
  - road width
  - signposting
  - travel time
- Priorities for different types of improvement:
  - removal of road hazards (bad bends, blind corners, etc.)(high priority)
  - more overtaking and passing lanes (medium)
  - better traffic signal co-ordination (medium)
  - better signposting (low)
  - improved lane markings (low)
  - improvements to existing roads (widening, etc.) (medium)
  - construction of new roads (low)
- Willingness to pay fuel levies to provide additional road funding
- Importance of increased road funding
- Priorities between sources of additional road funds

### **A3.3.2 Commercial Road User Organisations**

This survey was to ascertain road needs as perceived by the commercial sector, but was only of peripheral relevance to the current study.

In terms of priorities for road improvements, safety attributes were given high priority over travel times, road surfaces, comfort factors, etc.

### **A3.3.3 Government and Community Organisation Consultations**

These consultations involved interviews with Federal/State Government bodies (16) and with transport sector organisations (9). The standard questionnaire included the following attributes:

- Priorities for increased funding - improving safety seen as higher priority than improving travel times or travel comfort
- Priorities if roads budget reduced - improvements to road safety and maintenance of road surfaces regarded as of high priority

### **A3.4 NESS Study, NSW**

This study (Travers Morgan 1988a, 1988b) included a questionnaire survey of major firms in the road freight industry in the Sydney area, very similar to that used in the NATROV study (Section A3.2).

The survey found that congestion was the main problem experienced by these firms for movements in the metropolitan area, with the next most frequent problem relating to bridges (height restrictions, etc.). Other problems related to junction layouts and parking restrictions.

### **A3.5 Ride Quality Study**

This study (Potter et al. for ARRB 1991) involved an investigation of car users' perceptions of the ride quality of roads in both rural and urban areas. It derived relationships between road roughness (counts/kilometre) and user acceptability of the road surface. Full study details are not to hand.

### **A3.6 Conclusions**

Most of the Australian studies cited have focused on commercial vehicle movements, with little investigation of specific attributes of major highway routes.

The most relevant survey was the TAROR household telephone interviews (Section A3.3), which covered priorities for different types of improvements.

No case for changes to our survey approach originally proposed for this project has been identified from review of the Australian studies.

### **A3.7 References**

National Association of Australian State Road Authorities (NAASRA) 1987. The Australian Roads Outlook Report. Working Papers Volume 1 - Community Views, November 1987.

Potter, Hannay, Cairney and Makarov 1991. An investigation of car users' perceptions of the ride quality of roads. ARRB Road Infrastructure Research Program Working Document.

Travers Morgan Pty Ltd 1987. National Road Strategy for Victoria (NATROV) Study: Background paper - study consultations. Report to RCA Vic, May 1987 (Ref M1054E).

Travers Morgan Pty Ltd 1988a. National Roads Economic Strategy Study NSW (NESS): Results of freight industry survey in Sydney. Working Paper to NSW Department of Main Roads, January 1988 (Ref 1299).

Travers Morgan Pty Ltd 1988b. Road Freight Strategy NSW: Analysis of survey data from major freight operators. December 1988 (Ref 1534).



**APPENDIX 4. PERFORMANCE OF  
SPECIFIC STATE HIGHWAY ROUTES**





#### **A4.1 Introduction**

As well as giving their views on state highways in general, respondents to both the household telephone survey and the roadside intercept survey were asked to name sections of state highway that they used most often. They were then asked to rate the performance of this section of highway on each of the specified attributes.

The questionnaire was structured so that respondents rated first state highways in general and then the section of state highway they use most frequently, on an attribute by attribute basis. Thus the results are likely to indicate how the respondents consider the section of state highway that they use most often compares to state highways in general.

This appendix reports the results for each of the sections of highway investigated, first for the household survey (see Section 4.2) and then for the roadside intercept survey (see Section 4.3).

The following appraisal focuses on the differences between the mean performance ratings for each route section and the mean ratings for state highways in general for the same attribute, as rated by that group of respondents who used the route section described.

The route sections have been defined where possible to result in sub-sample sizes of at least ten respondents for any particular route. To achieve this it was necessary to have fairly broad definitions for routes, so that SH1: Auckland to Hamilton (for example) covers respondents who make that journey or *parts of it* most frequently.

The sub-sample sizes for each route section were generally small, because of the geographic spread of the respondents and the limited overall survey size. Sub-samples of this size can only be reported on in a broad sense and have limited statistical validity when compared to the population as a whole. Caution is therefore needed in drawing firm conclusions from this appraisal. The appraisal does, however, give a good indication of the variations between routes and of what this type of data can show if it were based on larger samples.

#### **A4.2 Results - Household Survey**

From the household survey responses, Figure A4.1 shows the differences in perceived performance on each attribute between the particular state highway sections that respondents used most often and state highways in general (for the same respondents). The following comments are about these results. (The commentary uses the abbreviated title for each attribute - refer Table 4.2 for full definitions.)

#### **A4.2.1 Comparison of Overall Ratings for Routes Most Used and for State Highways in General**

This comparison is based on the whole sample of 200 respondents and therefore has stronger statistical validity than the analysis of the specific routes which follows.

The results show that a number of attributes are commonly rated lower for specific routes than for state highways in general. The poorest performing attribute is:

- *Passing Lanes*

This attribute has a high level of importance and is obviously felt to be below par by many respondents on the route they most use.

Other attributes which rate appreciably lower than for state highways in general are:

- *Turning lanes*
- *Sufficient capacity*

These two attributes rate fairly poorly for state highways in general.

These results suggest that dissatisfaction with the section of road most used is contributing significantly to dissatisfaction with state highways in general.

#### **A4.2.2 Route 1: SH1 - Auckland Urban (Albany to Bombay Hills)**

The attributes rated as performing below the standard of state highways in general include:

- *Sufficient capacity*
- *Works traffic management*
- *Rest areas*
- *Passing lanes*

These appear to be typical criticisms of an urban road system with high traffic volumes.

Attributes rating significantly better than for state highways in general include:

- *Median barriers*
- *Turning lanes*
- *Maintained seal*
- *Surface smooth*

#### **A4.2.3 Route 2: SH1 - Auckland (Rural) to Hamilton**

This section of road is rated well in comparison with state highways in general on most attributes and is not substantially below average on any attributes. Relatively high ratings are obtained for:

- *Controlled level crossings*
- *Rest areas*
- *Overall maintenance*
- *Wide shoulder/verge*

#### **A4.2.4 Route 3: SH1 - Auckland (Rural) to Whangarei**

This route rates below average on a number of attributes and is not considered to be significantly superior to state highways in general on any attributes. The main attributes with negative comparative ratings are:

- *Rest areas*
- *Passing lanes*
- *Sufficient capacity*
- *Information signs*

#### **A4.2.5 Route 4: SH1, 2 - Auckland to Tauranga**

This route performs relatively poorly on four reasonably important attributes:

- *Passing lanes*
- *Roadside barriers*
- *Sufficient capacity*
- *Wide shoulder/verge*

#### **A4.2.6 Route 5: SH1, 5 - Auckland to Napier**

This route is regarded as performing relatively poorly on almost all attributes. The general condition of the road is obviously a concern to users. Attributes for which the performance shortfall is very significant (around 1.0 points) are:

- *Maintained seal*
- *Passing lanes*
- *Surface smooth*
- *Overall maintenance*
- *Maintained edges*
- *No bends*
- *Turning lanes*

#### **A4.2.7 Route 6: Wellington Urban (Paraparaumu, Hutt Valley, Featherston)**

These routes perform reasonably relative to state highways in general. Attributes with performance substantially worse than average are:

- *Sufficient capacity*
- *Passing lanes*

#### **A4.2.8 Route 7: SH2 - Wellington to Napier**

This route rates poorly on most attributes in comparison to state highways in general. Attributes of particularly poor performance are:

- *Maintained seal*
- *Wide shoulder/verge*
- *Sufficient capacity*

- *Works traffic management*
- *Overall maintenance*
- *Rest areas*
- *Roadside barriers*

#### **A4.2.9 Route 8: SH1, 3 - Wellington to New Plymouth**

This route performs reasonably well comparatively. The only attributes with ratings significantly lower than average are:

- *Passing lanes*
- *Rest areas*

#### **A4.2.10 Route 9: SH 1 - Auckland to Wellington**

Overall, this route performs reasonably well. Attributes performing significantly below average are:

- *Rest areas*
- *Sufficient capacity*

#### **A4.2.11 Route 11: SH1 - Invercargill to Dunedin**

(Route 10: see Section A4.2.16)

This route performs relatively well on a number of attributes, but poorly on others. Attributes rated significantly below the average for state highways in general include:

- *Controlled intersections*
- *Rest areas*
- *Turning lanes*
- *Sufficient capacity*

#### **A4.2.12 Route 12: SH1 - Christchurch to Nelson/Picton**

This route is rated similar to or slightly better than state highways in general on the majority of attributes. Attributes with particularly poor performance are:

- *Wide shoulder/verge*
- *Passing lanes*

#### **A4.2.13 Route 13: SH1 - Invercargill to Dunedin**

This section of road covers both route 11 and parts of route 14. It performs significantly worse than state highways in general on a number of attributes:

- *Turning lanes*
- *Median barriers*
- *Sufficient capacity*
- *Passing lanes*

#### **A4.2.14      Route 14: SH1 - Dunedin to Christchurch**

This route performs comparatively well. The only attribute with a negative rating of any significance is:

- *Roadside barriers*

#### **A4.2.15      Route 15: SH7 - Christchurch to Westport**

This route performs poorly, with negative ratings for almost all attributes. Those of most significance include:

- *Passing lanes* (particularly poor rating)
- *No bends*
- *Surface smooth*
- *Roadside barriers*
- *Turning lanes*

#### **A4.2.16      Routes 10/16: Other Rural Routes - North Island and South Island**

The other rural routes are rated as performing better in the South Island (Route 16) than the North Island (Route 10). Attributes which are significantly worse than average for these routes in both islands are:

- *Passing lanes*
- *Wide shoulder/verge*

**Figure A4.1. Comparisons of performance ratings for specific routes, from Household Survey**

Chart shows differences between mean Performance Ratings for state highways used most often and state highways in general. (Scale is that used for performance rating of state highways overall (Section 4.5), but relates to differences between specific route and state highways overall.)

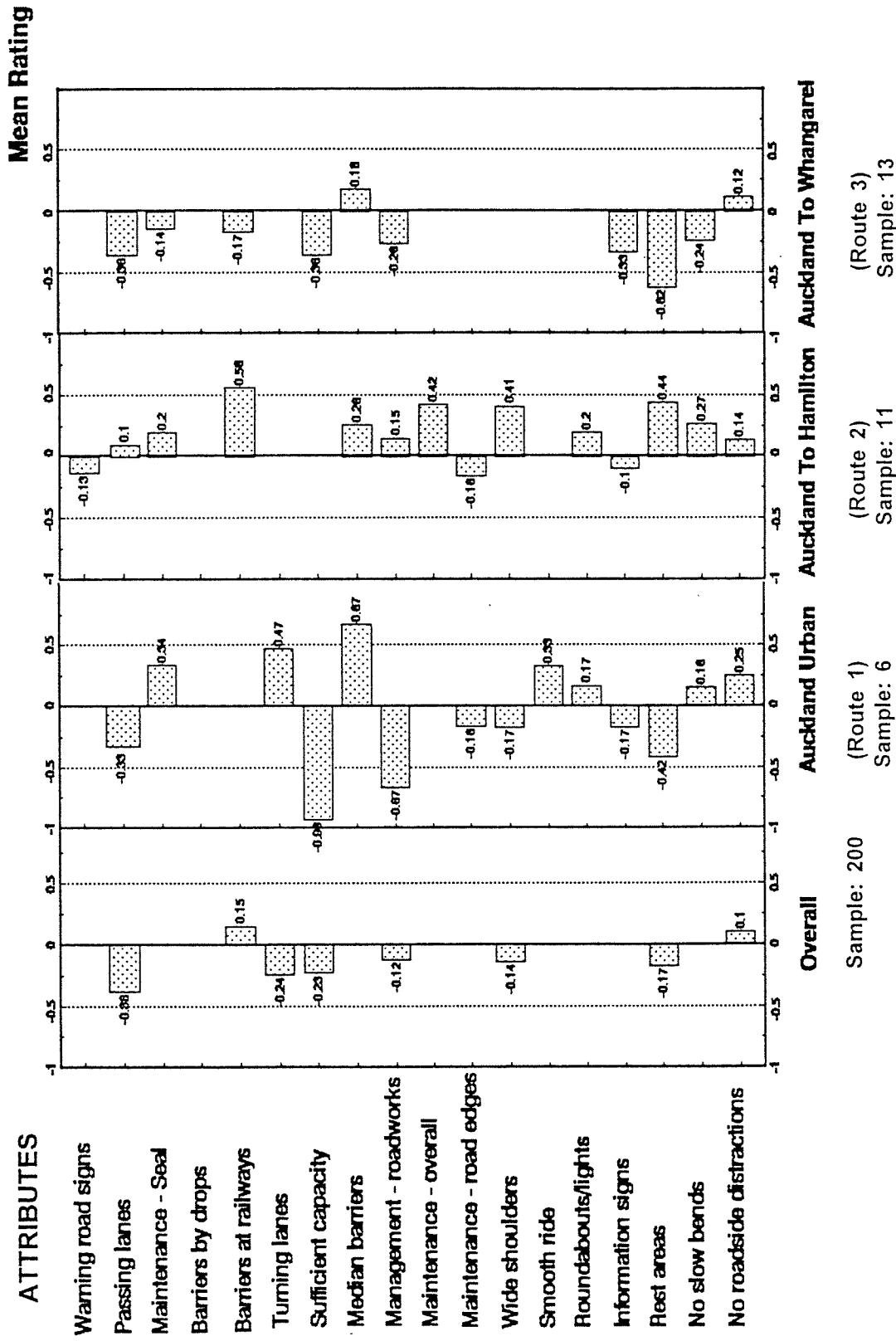
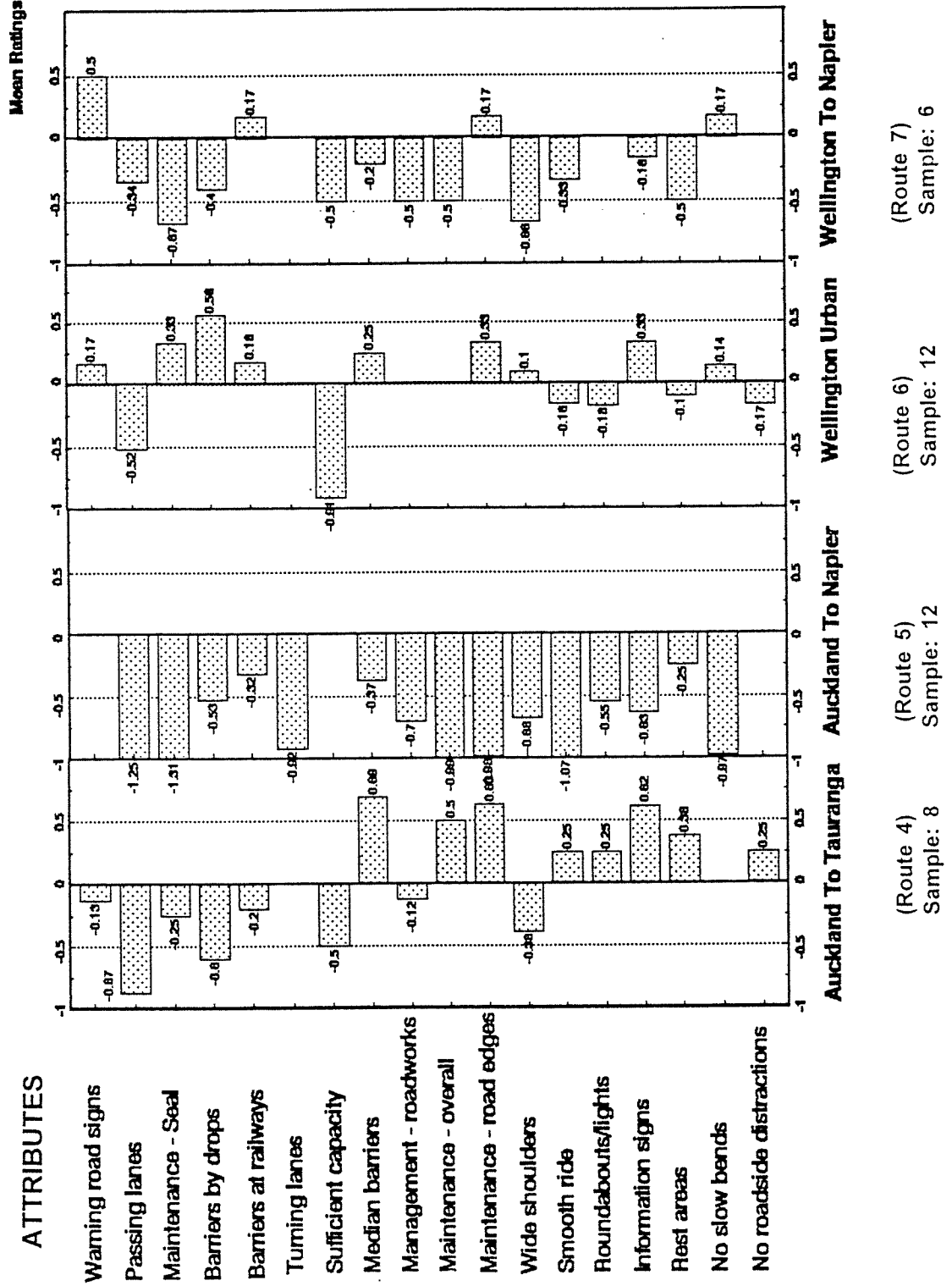


Figure A4.1. Comparisons of performance ratings for specific routes, from Household Survey (contd)



(Route 4) Sample: 8  
 (Route 5) Sample: 12  
 (Route 6) Sample: 12  
 (Route 7) Sample: 6



Figure A4.1. Comparisons of performance ratings for specific routes, from Household Survey (contd)

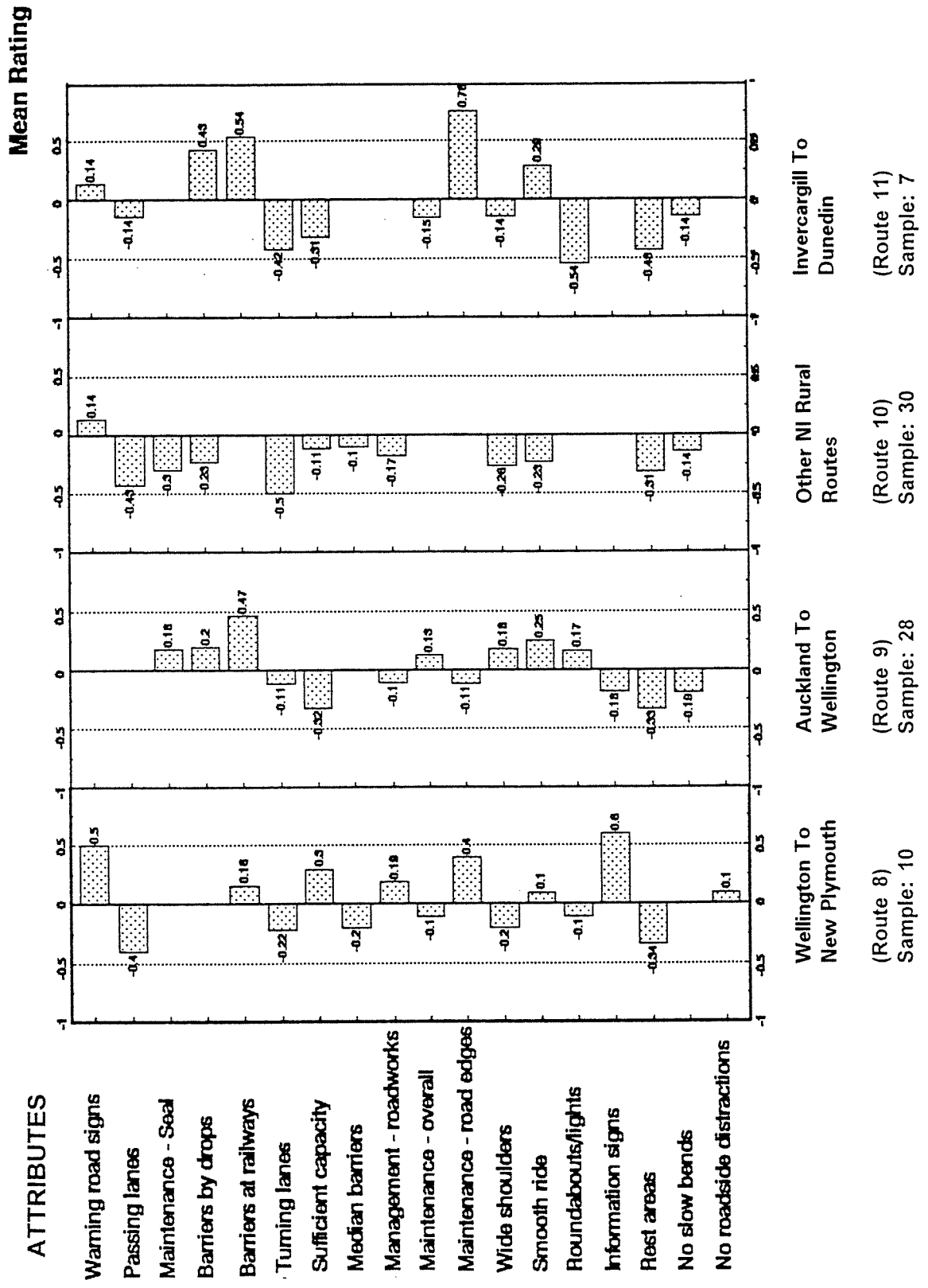


Figure A4.1. Comparisons of performance ratings for specific routes, from Household Survey (contd)

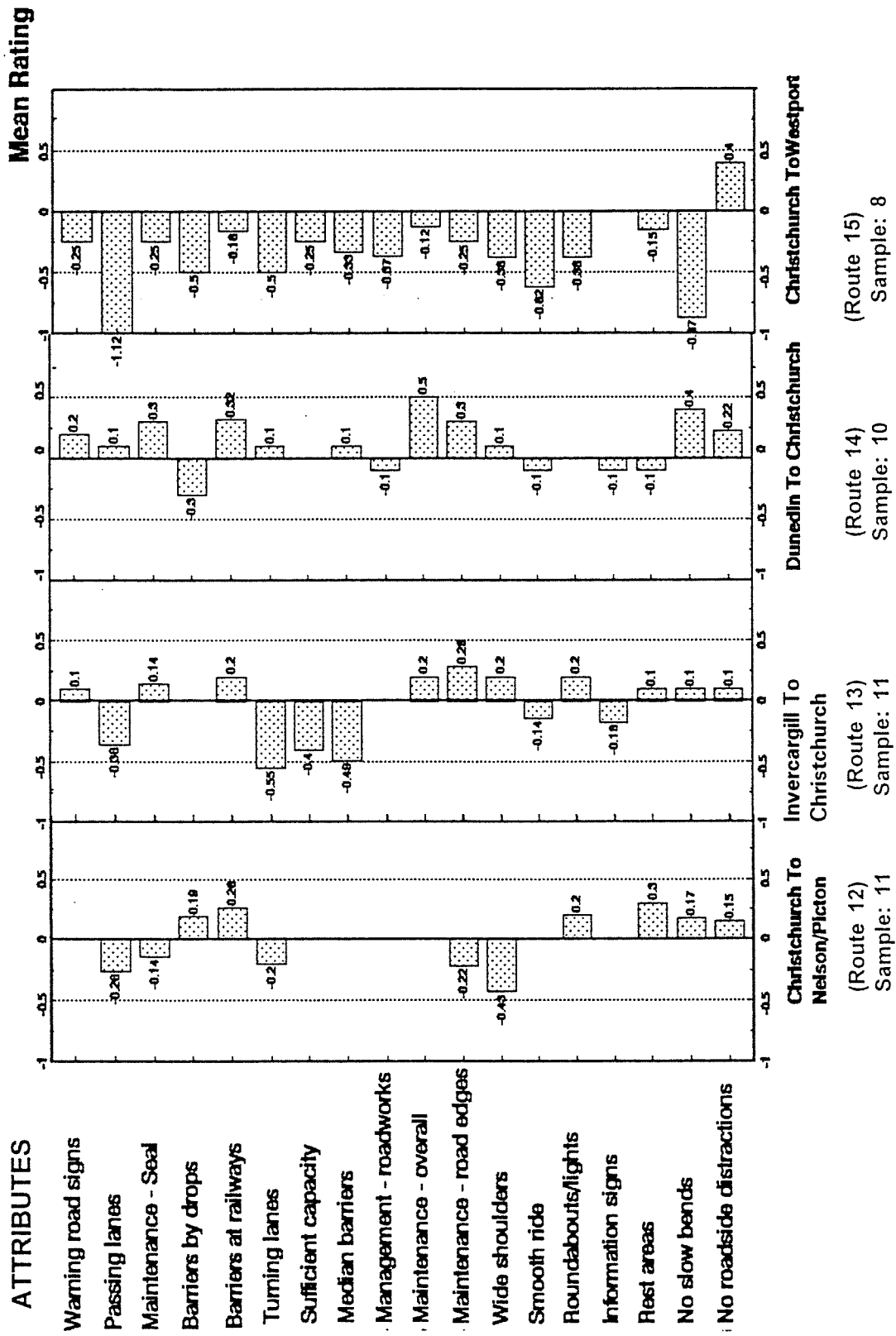
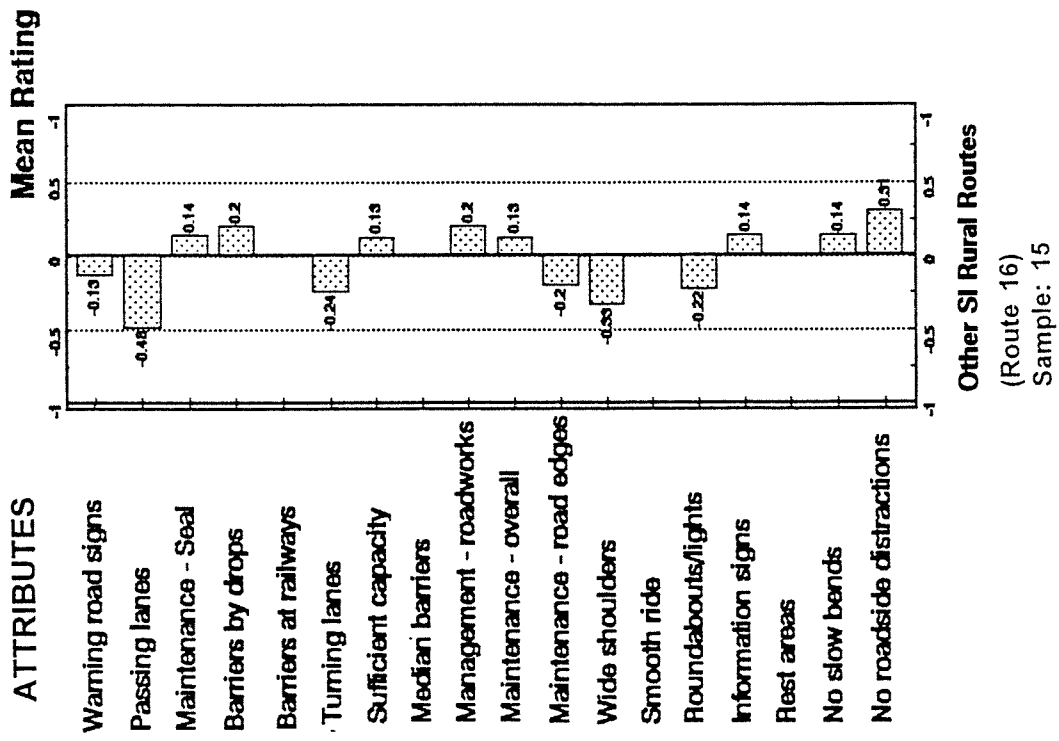


Figure A4.1. Comparisons of performance ratings for specific routes, from Household Survey (contd)



### **A4.3 Results - Roadside Intercept Survey of Commercial Drivers**

For the roadside intercept survey of commercial vehicle drivers, Figure A4.2 shows the differences in perceived performance on each attribute between the particular state highway sections that respondents used most often and state highways in general (for the same respondents). The following comments are about these results. (The route sections used differ in some cases from those in the household survey, because of the different patterns of traffic movement of the commercial vehicle respondents.)

#### **A4.3.1 Comparison of Overall Ratings for Routes Most Used and for State Highways in General**

This comparison is based on the whole sample of 113 commercial drivers and therefore has stronger statistical significance than the analysis of the individual routes which follows.

The results for the overall comparison show few significant differences in terms of performance ratings. The three attributes of specific routes which are under-performing are, in order of significance:

- *Passing lanes*
- *Sufficient capacity*
- *Controlled intersections*

The first two attributes are consistent with the results for the telephone survey and indicate that these are definite priorities from the users' point of view.

#### **A4.3.2 Route 1: SH1, 29 - Hamilton to Tauranga**

For most attributes this route is rated as being on a par with state highways in general, or better. The two attributes with relatively poor performance (although based on small sample sizes) are:

- *Median barriers*
- *Controlled intersections*

#### **A4.3.3 Route 2: SH1 - Auckland to Rotorua**

This section of road is rated comparatively highly and out-performs state highways in general on most attributes. The main attribute in which it rates relatively poorly is:

- *Passing lanes*

#### **A4.3.4 Route 3: SH1 - Auckland to Wellington**

This route performs somewhat better than state highways in general. The main attribute on which it performs relatively poorly is:

- *Sufficient capacity*

#### **A4.3.5      Route 4: SH1, 2 - Auckland to Tauranga**

This route is rated below par on 11 of the 18 attributes considered, though the differences are generally not great (and the sample is small).

#### **A4.3.6      Route 5: SH2 - Wellington to Napier**

Similarly, this route rates below average for the majority of attributes considered (refer also S4.2.8). Attributes with poorest relative performance are:

- *Turning lanes*
- *Passing lanes*

#### **A4.3.7      Route 6: SH1 - Invercargill to Christchurch**

This route generally rates quite well (refer also S4.2.11, 4.2.14). The main attributes with relatively poor performance are:

- *Median barriers*
- *Controlled intersections*
- *Sufficient capacity*

#### **A4.3.8      Route 7: SH1 - Christchurch to Nelson**

This route performs relatively poorly on almost all attributes (refer also S4.2.12). Attributes of particularly poor performance are:

- *Surface smooth*
- *Passing lanes*
- *Overall maintenance*
- *Works traffic management*
- *Maintained seal*
- *Sufficient capacity*
- *Median barriers*

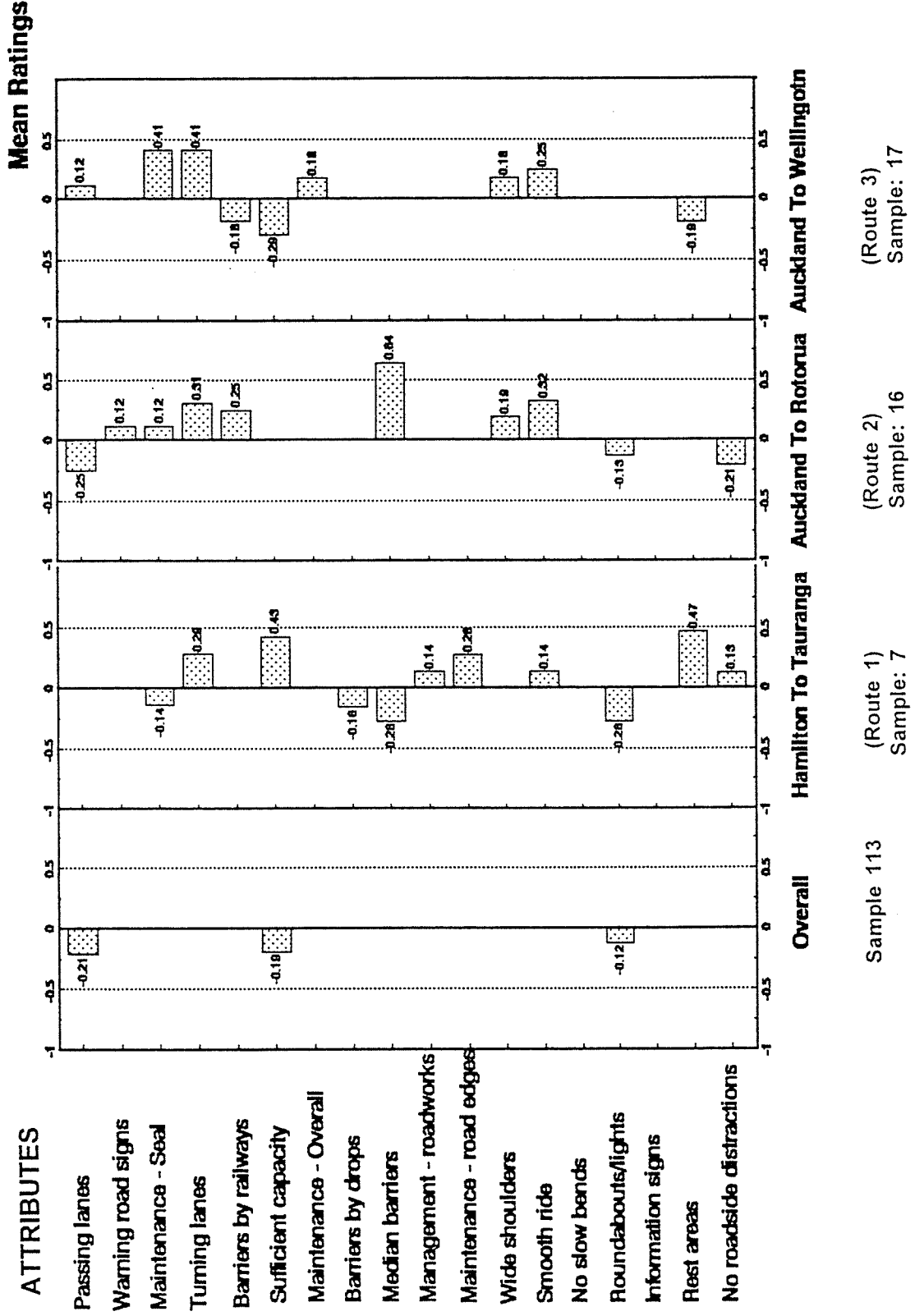
The condition of the road and flow of traffic along it are the main concerns.

#### **A4.3.9      Routes 8/9: Other Rural Routes - North Island and South Island**

The results for the South Island (Route 9) are generally better than those for the North Island (Route 8). In particular "other North Island" routes perform very poorly in relation to "passing lanes" and also "sufficient capacity".

**Figure A4.2. Comparisons of performance ratings for specific routes, from Roadside Intercept Survey of commercial drivers.**

Chart shows differences between mean Performance Ratings for state highways used most often and state highways in general, for commercial drivers. (Scale is that used for performance rating of state highways overall (Section 5.4), but relates to differences between specific route and state highways overall.)



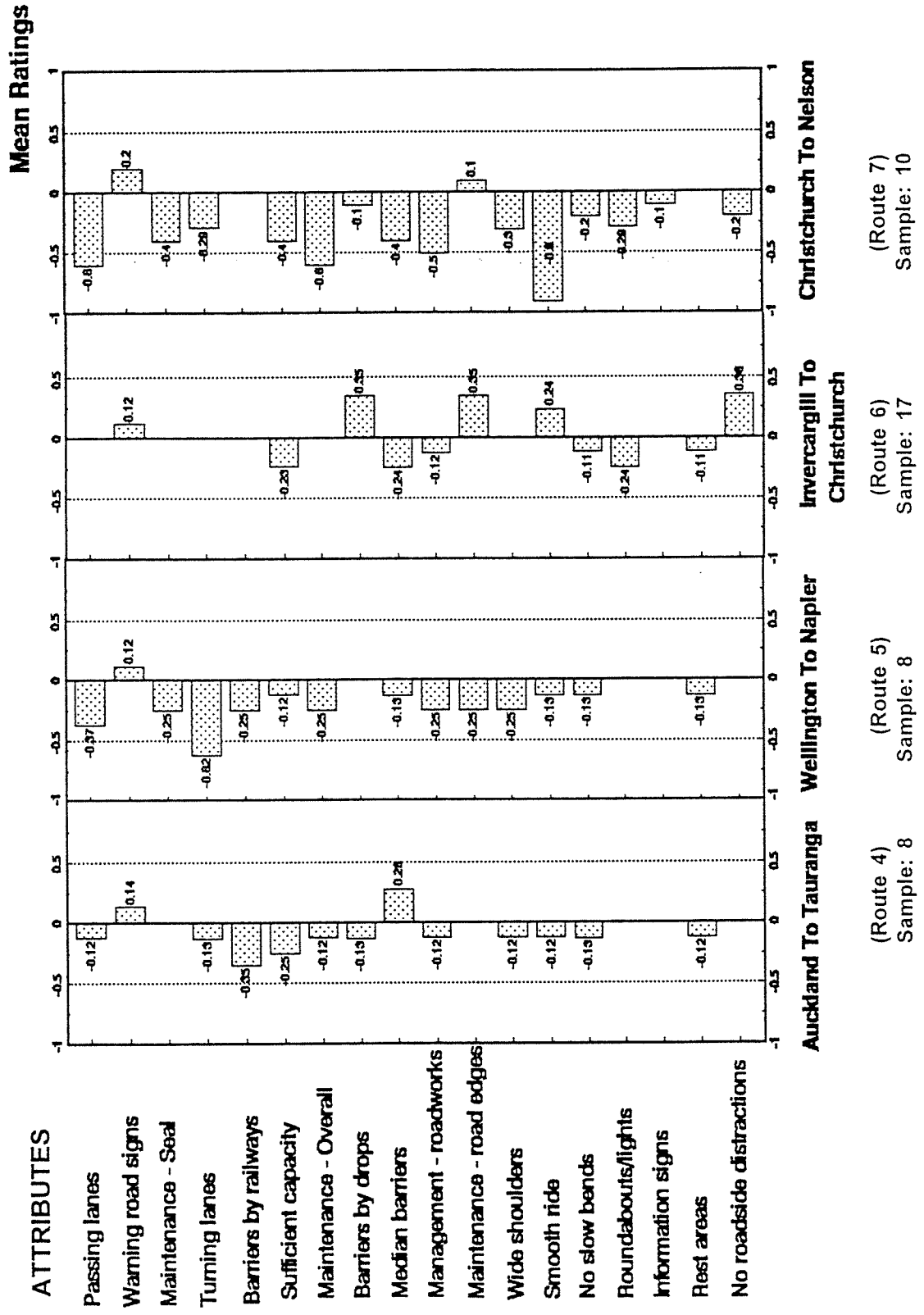
Sample 113

(Route 1)  
Sample: 7

(Route 2)  
Sample: 16

(Route 3)  
Sample: 17

Figure A4.2. Comparisons of performance ratings for specific routes, from Roadside Intercept Survey of commercial drivers (contd)



**Figure A4.2. Comparisons of performance ratings for specific routes, from Roadside Intercept Survey of commercial drivers (contd)**

