

Survey of Commercial Truck Drivers: Valuing Their Priorities for Improving New Zealand's State Highways

Authors: Michelle McCormick, Rochelle Bowler, Mike Dunne

Introduction

Transit New Zealand (Transit) is the Crown agency responsible for operating a safe and efficient state highway system. In 1998 Transit in association with market research company, ACNielsen, conducted its first National State Highway Satisfaction Survey. This survey of 1000 road users provided a benchmark for ongoing satisfaction surveying and for identifying areas requiring further market research and investigation.

As well as the overall state highway satisfaction levels, Transit was also interested in examining the results from a number of market segments. Results from Transit's seven geographical regions were analysed along with a breakdown of the satisfaction levels for different types of road users.

One of the more concerning results from Transit's perspective was that commercial truck drivers had a significantly lower level of satisfaction with state highways compared to other road users. Truck drivers rated overall satisfaction with state highways 8 percentage points below the national averages for all road users. In particular, truck drivers rated satisfaction with road surface and road signs significantly lower (17 and 13 percentage points respectively). This finding was of great concern to Transit as revenue from road user charges (RUC), generated mainly from trucking operations, account for around 50% of the total funding for state highways. No successful business would want its largest purchasing group of customers dissatisfied with its product.

As a result of the 1998 satisfaction survey Transit identified the need for a research project to examine in more detail the areas of the state highway system that truck drivers feel most dissatisfaction with. This project commenced in 1999 with ACNielsen appointed as Transit's market research consultant and cost about \$NZ 90,000.

Research Objectives

The specific objectives of the survey of commercial truck drivers were to:

- understand in detail what features of the state highways are causing truck drivers to be dissatisfied;
- identify the improvements that they would like to see made;
- understand truck drivers' willingness to pay for the improvements they would like made; and
- understand whether better communication by Transit could improve the satisfaction of truck drivers, independent of any improvements to the state highway system, and what type of communication is needed.

A two-stage research process was developed and employed to meet these objectives. The first stage involved exploratory qualitative research to explore in-depth the specific concerns of the truck drivers. The second stage then quantified the qualitative results using a representative sample of truck drivers from across New Zealand.

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Exploratory Qualitative Research

The qualitative research stage involved conducting four mini focus groups with commercial truck drivers in different locations around New Zealand. There were four drivers in each group and included a mix of owner-drivers (who are responsible for their own costs and revenues) and company drivers (who earn a wage working for a trucking company). The groups were structured around particular travel state highway routes. The routes chosen were considered to be diverse enough to identify all the types of problems truck drivers encountered on the state highways. The groups were structured as follows:

- Auckland – drivers who frequently travelled on State Highway 1: Wellington to Auckland.
- Tauranga – drivers who frequently travelled on State Highways 1 and 29: Tokoroa to Tauranga.
- Napier – drivers who frequently travelled on State Highway 5: Taupo to Napier.
- Christchurch – drivers who frequently travelled on State Highway 1: Dunedin to Christchurch.

The purpose of this stage of the research was to explore in detail the influences on truck driver satisfaction by exploring the drivers' main concerns and problems with the state highways they travel on. The purpose was also to identify the types of improvement they would like to see, and understand what would make them feel that they are getting value for money from the RUC they pay.

The range of problems identified by the truck drivers is listed in Table 1. Despite the different routes being travelled by the drivers, the problems identified appeared to be universally experienced across the focus groups around the state highway network. The descriptions of the problems provided by the drivers were extremely detailed and accurate when compared with Transit's technical information on the same sections of state highway. Many of the problems raised were of particular concern to drivers from a safety perspective such as rough roads causing truck trailers to cross the centreline. Drivers in the mini focus groups were also asked to give an indication of the priority of addressing each of the problems they had identified.

At this stage in the research, two broad factors began to emerge as the main contributors to truck drivers' low level of satisfaction with state highways. These factors were tangible problems with the state highways themselves, and the perceived lack of consultation and communication by Transit. The tangible problems experienced while driving were considered to be much more of a concern than the frustration felt by drivers over their lack of involvement with the management of state highways.

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Table 1 Problems with State Highways (in random order)

Quality of Repairs	<ul style="list-style-type: none"> • Speed of repairs too slow • Repairs not done properly (have to be redone often) • Individual problems fixed not the whole picture • Repairs done in low priority areas (i.e. with little traffic)
Surface	<ul style="list-style-type: none"> • Slippery surface (bitumen comes through surface making road slippery) • Lack of grip around corners • Potholes • Dips in road caused by subsidence in wet/clay areas • Lips on resealed sections which make truck difficult to control • Undulations (small rises/ falls 6cm to 50cm every 2m to 20m over a stretch of 600m to 2kms) • Dips and rises which block visibility
Passing lanes	<ul style="list-style-type: none"> • Passing lanes too short • Not enough passing lanes • Shoulders not sealed • Shoulders too narrow
Bridges	<ul style="list-style-type: none"> • Bridges too narrow • Bridges poorly positioned (i.e. on tight corners) • Lips on entry / exit to bridges • Entry / exit to bridges higher than road (steep slope when going onto/off bridge)
Corners	<ul style="list-style-type: none"> • Width of corners (trucks have to cross centre line to get around) • Corners too sharp • Flat camber on corners (causes truck to drift to side of the road) • Opposite / inconsistent camber
Stopping Opportunities	<ul style="list-style-type: none"> • Not enough rest areas
Vegetation	<ul style="list-style-type: none"> • Trees in the wrong places (i.e. where they block visibility)
Intersections	<ul style="list-style-type: none"> • Lack of turning lanes (i.e. no lanes for turning traffic to pull into)
Railway Crossings	<ul style="list-style-type: none"> • Lip on entry / exit to crossings
Signage	<ul style="list-style-type: none"> • Too close to intersections / bridges • Signs too low • Corner signs do not stand out • Not enough warning signs (e.g. one-way bridges, steep gradient, windy areas) • Directional signs do not have enough information (i.e. only next town, but not major cities)
Roundabouts	<ul style="list-style-type: none"> • Not wide enough
Road markings	<ul style="list-style-type: none"> • Not replaced quickly enough after resealing • Slippery / greasy
Miscellaneous	<ul style="list-style-type: none"> • High diesel costs (i.e. bigger chips used in road surface means higher diesel costs)

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Quantitative Survey

The problems identified in the qualitative were refined into 36 discrete problems for the quantitative phase. Each of these *problems* was assigned a *solution*, either that suggested by the drivers in the focus groups or by Transit based on the most appropriate engineering solution. Each solution was then roughly costed using the expertise of Transit's engineering staff and Network Maintenance Consultants. The problems and solutions were then illustrated with sketches to ensure respondents could grasp these quickly and without ambiguity in their task of prioritising the improvements that they wished to have made to state highways. Initially, it was proposed that photos of problems be used, but this was quickly dismissed because it may have lead to specific problems being evaluated rather than problems at a more generic level. For example, if photos had of been used, the severity of the problems depicted may have differed from drivers' own experiences and this contrast of examples may have been distracting.

The method of illustrating each problem separately with a sketch differs from the decompositional methods (e.g., conjoint analysis or choice modelling) typically used in this sort of research. Using these techniques, respondents would be shown a number of different roading scenarios (each one a complete road with many features or problems), with slight changes in the features between scenarios. Respondents would then be asked which scenarios they would prioritise to be fixed. On analysis of the different scenarios, the relative value of each of the features could be determined by decomposing these from the overall priorities. The reason this method wasn't chosen for this particular study was twofold:

- (i) The number of problems identified in the qualitative stage was too great and too diverse to include all problems in one study using decompositional techniques.
- (ii) The budget of the study was limited and this prevented the use of a split design decompositional study.

For these reasons it was decided to use a method that looked at each problem separately which also seemed to fit with the way the truck drivers thought about the issues with the state highways. Rather than describe problem areas (as car drivers tend to do) they tended to describe discrete problems with the state highways.

The questionnaire used was structured into a number of sections. The first two sections dealt with the problems and the solutions:

- Truck drivers were initially shown all 36 problems without solutions and were asked to prioritise these problems for improvements. The purpose of this was to get an evaluation of the severity of each problem without reference to the cost of fixing the problem. Truck drivers were asked to do the ranking for a stretch of state highway they were familiar with (the one they most thought needed improving). This was to provide information about specific stretches of state highway as well as an overall impression of the state highway route.
- Secondly, drivers were shown the problems with solutions and each of the solutions had a cost attached. Drivers were asked to imagine they were Transit, and that they

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had \$1,000,000 of Transit's money to allocate on fixing problems. This allocation task made it possible in the analysis to:

- (i) understand the relative priorities of fixing problems in a realistic context. That is, there is a fixed budget and only so much that can be improved within that budget; and
- (ii) examine the improvements in terms of the drivers' willingness to pay for improvements. The actual amount the truck drivers were willing to pay was applied to the \$1,000,000 and then projected beyond this current level of expenditure. This meant the results could be reported as either a dollar value for each sort of improvement or as, for example, a number of bridges to be widened.

- The third area of questioning related to the funding of the improvements to state highways. Drivers were told that there was only a limited amount of funding available for the state highways, and funding for the improvements they wanted could come from two sources:

- (i) reallocation of existing spending; and/or
- (ii) increases in RUC.

In order to measure drivers' perceptions of funding for state highway improvement, they were shown a breakdown of how Transit currently spends the funds it receives and asked how much they would reallocate and where they would take it from. Drivers were also asked if they were willing to pay any more in RUC, and if so how much. This third area of questioning was designed to allow truck drivers to review the improvements they wanted to the state highways in light of Transit's current resource allocation. And also allow the expression of the results from the earlier two questions in a willingness to pay context.

- The remaining sections of the questionnaire explored communication issues and also collected background information on the drivers

Before the main survey was undertaken, the questionnaire was piloted with two truck drivers. The drivers completed the questionnaire and then were interviewed regarding the ease of use of the survey and whether the terminology was correct and conveyed the right concepts.

The main quantitative survey consisted of 300 face-to-face interviews with commercial truck drivers lasting on average 45 minutes each. Of the 300 truck drivers interviewed, the breakdown was as follows:

Weight

225 drive heavy commercial trucks (20 tonnes and over)

75 drive medium weight commercial trucks (10 to 19 tonnes)

Driver Type

153 owner-drivers

147 company drivers

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Geographical Spread

141 interviews in the Upper North Island

88 interviews in the Lower North Island

71 interviews in the South Island

The interviews were conducted during November and December 1999 and January 2000. The sample for the interviews was sourced from the transportation categories of the Yellow Pages phone book. Every n^{th} company was selected from the directory and amongst those companies that agreed to have their drivers interviewed, every n^{th} driver was selected. To supplement the number of owner-drivers interviewed, additional owner-drivers were recruited direct from lists provided by Road Transport Forum members and by recruiters waiting at truck stops and petrol stations. Approximately 200 interviews were achieved from the Yellow Pages sample, and the remainder were from the supplementary sources.

The respondents were informed up-front in the interview that the survey was being conducted on behalf of Transit in order to understand what aspects of the state highway truck drivers would most like to see improved. They were also told that Transit would use the results of the survey as part of their process of deciding what aspects of the state highway would be improved in the future. This information added credibility to the survey and generated a good response rate. A small incentive (a gift voucher to the value of \$10) was paid to the drivers who participated in the survey as a token of appreciation for their time and effort.

Survey Results

The key survey results are discussed under the following three headings:

- Truck Drivers' Top Priorities for Improvement
- Willingness to Pay
- Communication

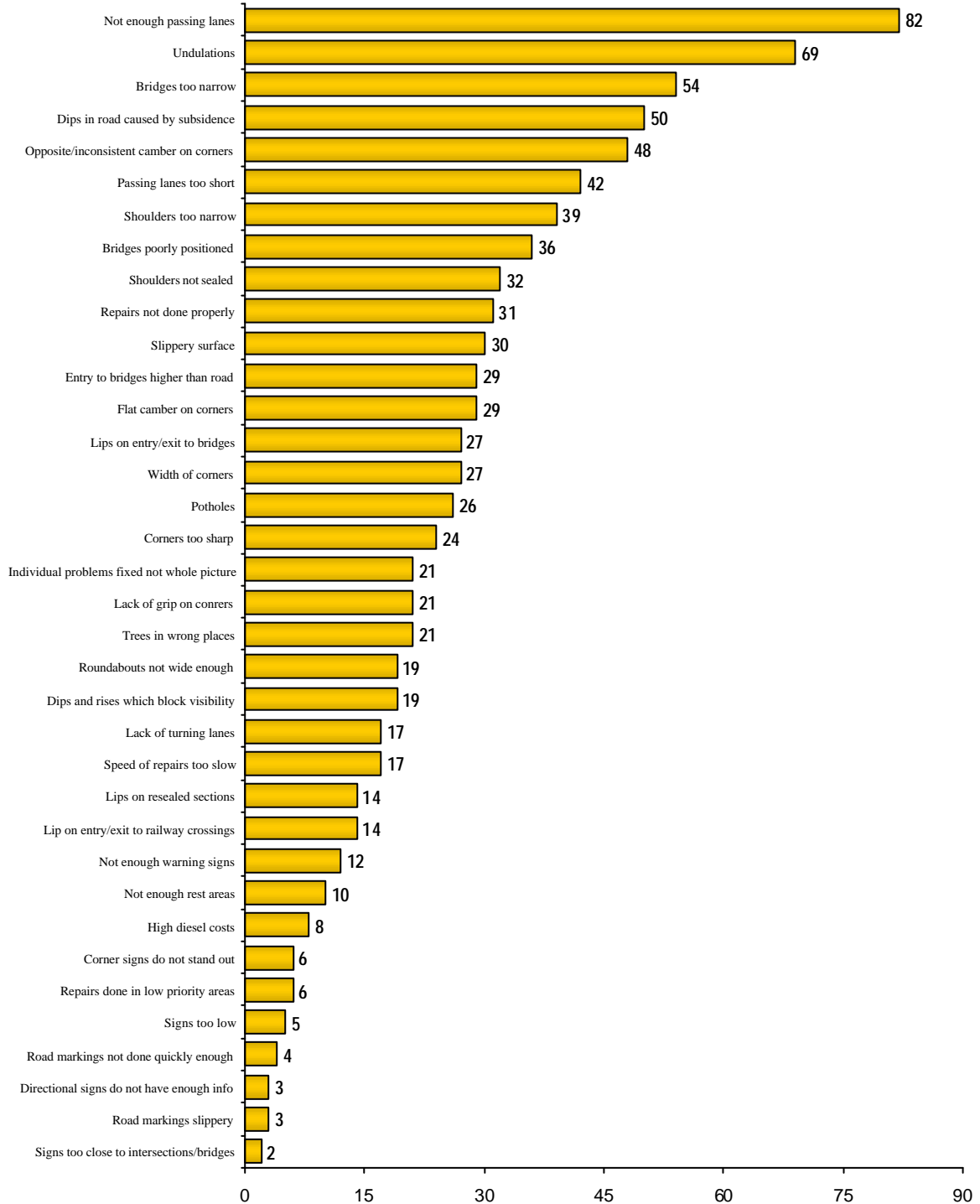
Truck Drivers' Top Priorities for Improvement

In the first part of the survey, truck drivers were asked about their experiences related to the state highways they used most often or sections they believed were a priority for improvement. When the drivers ranked the set of problems, not enough passing lanes was identified as first, second or third priority for 82% of drivers, followed by undulations (69%) (refer to Figure 1). Narrow bridges, dips in roads and camber problems on corners were the next group of priorities and range from 54% to 48% of drivers ranking them in their top three priorities.

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Figure 1 **Priorities for Improvement**
(Number of times mentioned in drivers top three priorities for improvement) **(n=300)**



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The next step was to ask drivers to prioritise the same set of problems but this time they were given information on the average costs of fixing them. The forced trade-off between high priorities with expensive solutions and lower priorities with cheaper solutions resulted in some different priority rankings to the initial prioritisation exercise. Figure 2 illustrates these different ranking priorities and includes the willingness to pay values.

The top ten priorities for improvement identified by the truck drivers when provided with information on the relative costs of solutions were:

- Not enough passing lanes
- Undulations
- Corners too sharp
- Opposite/inconsistent camber on corners
- Bridges poorly positioned
- Shoulders too narrow
- Dips and rises which block visibility
- Bridges too narrow
- Passing lanes too short
- Flat camber on corners

Willingness to Pay

One of the objectives of the survey was to understand truck drivers' willingness to pay for those improvements they wanted made to the state highways. The willingness to pay by truck drivers was defined in two ways:

- the amount of extra taxes (specifically RUC) that a truck driver was willing to contribute to the state highway system in addition to what they already pay; and
- how truck drivers would like their existing contribution to state highway funding (that is their current RUC) to be reallocated.

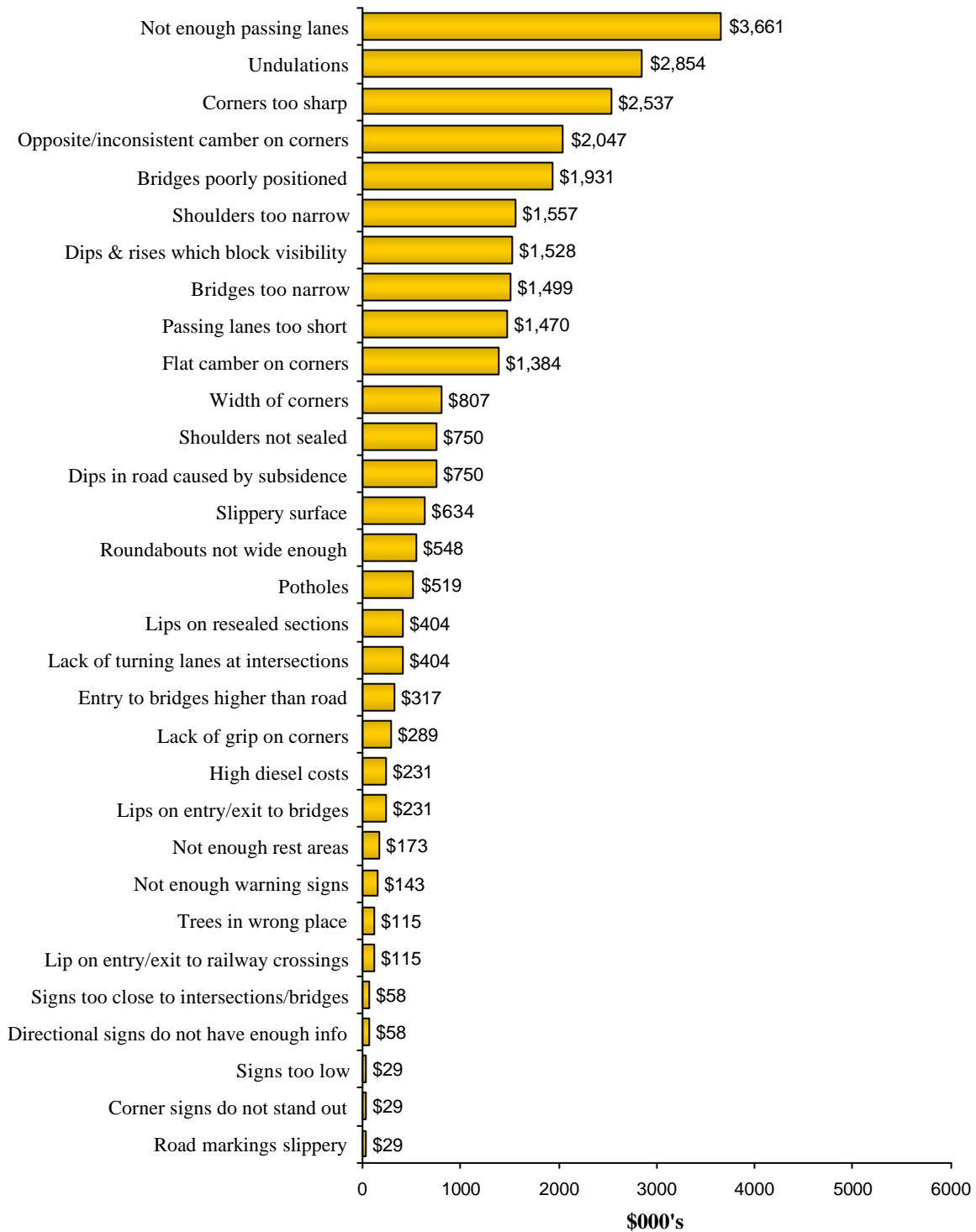
All diesel-powered vehicles over 3.5 tonnes gross laden weight are required to pay RUC. Current RUC charges are based on the vehicle tonnage and charged by the kilometre. These charges can be quite significant for large truck operators with some drivers interviewed during the course of the research indicating that they paid more than \$60,000 annually in RUC. Consequently, there is generally a strong resistance by truck drivers to paying more for their use of the road.

However, in spite of the general negative feeling towards paying more, a small proportion of owner-drivers (12%) in the survey said that they would be willing to pay more. On average, each of these drivers said that they were willing to pay \$4,386 more per year each. Figure 2 shows how truck drivers would allocate funding of improvements based on their total willingness to pay. The total willingness to pay figure is projected to the total population of truck drivers.

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Figure 2 **Priorities for Improvement Based on Cost**
 (Preferred distribution of amount willing to pay (\$27,100,000) **(n=300)**)



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72% of all truck drivers surveyed said that they would reallocate some of Transit's existing expenditure to fund the improvements that they wanted. The drivers wished to reallocate the biggest amounts of funding from those areas with the biggest current spend. For example 40% of the total reallocation was from the construction of new roads.

When the priorities of owner-drivers and company drivers were compared, the differences were not statistically significant. That is, the results were too similar for any comparison to be made between the two types of driver. Similarly, the priorities of drivers of 10 – 19 tonne trucks were not significantly different from drivers of trucks 20 tonnes and over.

Communication with Transit

Currently truck drivers have a rather distant relationship with Transit. Despite the fact that RUC funds a large proportion of the work that Transit undertakes on state highways, truck drivers actually pay RUC to another agency, the Land Transport Safety Authority. Consequently, truck drivers have little or no contact with Transit, or input into improvements on specific state highways. While the interests of truck drivers are represented to Transit through the Road Transport Forum and their various regional branches, these networks do not necessarily capture the more detailed views of the drivers using a section of highway many times per week.

Not surprisingly, the survey results also indicated that truck drivers' satisfaction with the state highways is also influenced by their communication with Transit, and the second part of the survey investigated this. In the focus group stage of the process, the drivers suggested a number of ways in which communication could be improved and these suggestions were put forward to the survey respondents to gauge their level of interest in the initiatives.

The option truck drivers were most interested in was having Transit employees travel with truck drivers so that they can experience the problems with the state highways first hand. 92% of respondents were either *very* or *quite* interested in this initiative.

Interest in 0800 Number

The truck drivers interviewed were also very interested in having a 0800 number (that is a free phone number) which they can phone to report problems with the state highways. There was also a high level of interest in having a 0800 number to phone to find out about road closures and road works.

Of those truck drivers who said they were interested in the 0800 number, almost a third of drivers said that they preferred for money to be allocated to a 0800 number above being allocated to state highway improvements.

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Transit's Response to the Survey Results

In order to give thorough attention to the survey results, Transit has elected to concentrate on the truck drivers' top 10 priorities for improvement. These top 10 fall into four broad categories:

- Passing opportunities
- Surface
- Corners
- Bridges

Transit has also identified improvements in driver communication as a potential means of improving driver satisfaction without actually physically altering the state highway product itself.

Transit considered that it could not just release the results without attracting adverse publicity unless the results could be supported with detail on the positive actions being taken or planned to address the drivers' concerns. A cross divisional team representing State Highway Management, State Highway Policy and Corporate Communications met to determine what Transit is currently doing, or could do in future to address some of the issues raised in the survey.

Communication was identified as a key area requiring urgent action. One very successful exercise undertaken to implement the survey results in the area of communication has been having the National State Highway Manager travel with two truck drivers overnight on the route between Auckland and Wellington. Other appropriate Transit staff including various regional managers and engineers undertook travel with truck drivers so that they could also experience driving from a truck driver perspective first-hand. The purpose of this exercise was to enable the truck drivers to communicate accurately their concerns relating to undulations and other concerns identified in the survey to Transit, as often these deficiencies are not obvious while driving a car.

The existing projects and new initiatives identified by Transit in response to the top 10 truck driver priorities for action are discussed below.

Passing Opportunities

In the category of passing opportunities, the main specific priorities for action identified by the truck drivers were:

- Not enough passing lanes
- Shoulders too narrow
- Passing lanes too short

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Transit has previously identified the problem of not enough passing lanes and incorporated an objective into its National State Highway Strategy of providing passing lanes every 5km on highways with over 4,000 vehicles per day. The development of a Passing Lane Implementation Plan for all Transit's high volume highways is also proposed.

One of the main impediments to providing more passing lanes is securing a Benefit Cost Ratio (BCR) for any individual passing lane project above the cut-off limit for funding. The current procedure used to evaluate passing lanes is considered to be complex and requires a large amount of work for what is often found to be an un-fundable project. Transit is working with funding agency, Transfund New Zealand, to develop a simplified procedure for evaluating passing lanes that is more widely applicable than the 'Simplified Method for Assessing Passing Lane Benefits' in the current Project Evaluation Manual. Once developed this methodology will be trialed in two Transit regions.

Surface

In the category of surface, the main specific priorities for action identified by the truck drivers were:

- Undulations
- Dips and rises which block visibility

Transit acknowledged that the shape of pavements is not always being corrected to provide a reasonably smooth ride, particularly for heavy vehicles. The condition measures used to justify pavement work currently focus on 'short wave' distortions but tend to overlook 'long wave' pavement distortions and warping between left and right wheel-paths. This especially affects trucks with longer wheelbases than cars.

In the 2000/2001 State Highway Programme, by using the survey results, Transit was able to justify an additional \$3M from Transfund specifically for additional rehabilitation and shape corrections that will be used to correct some of these undulation problems. Transit approached the Road Transport Forum to identify the worst sections of highway (in terms of roughness) in each region. These were assessed by Transit for their suitability for this special funding. Within the next year, Transit is targeting 37 kilometres of the state highway network for smoothing. Within the next three years, improvements will be made to over 200 kilometres of state highway at an estimated cost of \$21 million as a direct result of the commercial truck driver research project.

The dips and rises, which block visibility, are an issue for truck drivers because of both comfort and its impact on decreasing opportunities to pass. The passing lane initiatives previously discussed will also assist in addressing this problem.

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Corners

In the category of corners, the main specific priorities for action identified by truck drivers were:

- Corners too sharp
- Opposite/inconsistent cambers on corners
- Flat camber on corners

The initiative previously discussed to address surface problems will also assist in reducing the problem of opposite/inconsistent cambers on corners.

The elimination of low speed curves that are inconsistent with the speed environment and the avoidance of sudden changes in design speeds between successive curves are priorities in Transit's National State Highway Strategy.

The results from the truck driver survey have been communicated to Transit's regions to raise the awareness of the issues and to ensure that the problems identified by drivers are considered when Transit is undertaking individual highway strategy studies. Transit has informed Transfund of the significance of the sharpness of corners and the desire to eliminate these wherever possible.

Bridges

In the category of bridges, the main specific priorities for action identified by truck drivers were:

- Bridges poorly positioned
- Bridges too narrow

Transit and its National Bridge Consultant are currently developing a level of service for bridge width to be included in the National State Highway Bridge Asset Management Plan. The intention is to devise a threshold width for bridges, so that those bridges having widths less than this will trigger some form of investigation to be carried out. Part of the process for developing a level of service involves external consultation to test that the thresholds developed internally are acceptable with road user groups.

Both qualitative and quantitative results have provided the National Bridge Consultant with a clear indication of the specific problems truck drivers have with poorly positioned and narrow bridges and the strength of their feelings.

Further Research

As previously discussed, the current measures to justify pavement correction do not adequately reflect the road roughness experienced by truck drivers. Transit has further

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research planned to investigate how it can improve the detection of those sites where the roughness is significant enough to cause truck drivers discomfort. The immediate task is to determine a threshold for intervention. A qualitative survey of drivers as they drive over roads that vary in roughness will provide guidance for this in the interim.

In order to properly research this issue, a further proposal is to undertake a larger scale/more robust stated preference survey to identify what types of roughness are of most concern to state highway road users – for example short or long spaced undulations or roll caused by roughness varying between wheel-paths. If required, the survey could be expanded to include car occupants in addition to truck occupants, to establish differences in preferences and threshold levels between the two groups. The survey would aim to monetise the benefits associated with smoothing sections of road. Benefits could include increased comfort, decreased wear and tear on vehicles and the potential for less freight damage.

Conclusion

The Commercial Truck Drivers Survey has been an invaluable piece of original research for Transit. It has enabled the organisation to gain an in-depth understanding of the concerns and priorities of one of its most significant groups of customers. Efforts are being made to build a closer relationship with this important market segment and to improve the lines of communication so issues can be raised quickly and dealt with more effectively in the future.

This increased level of knowledge gained through the survey has also meant that Transit is now able to focus on the priority areas as identified by those who use them, and to take specific actions to implement tangible changes to the state highway system.

The results also provide independent justification for questioning current management practices and funding allocation decisions that do not deliver the types of state highway improvements that our major customers require.

The securing of an additional \$3m funding to specifically address roading surface issues is a tribute to the valuable contribution that the truck driver survey respondents have made.

Acknowledgements

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