



New travel time and reliability values for domestic freight movements

This research project investigated how willing shippers of freight were to pay for improvements in freight journeys within New Zealand, including;

- expected journey times
- reliability of journey times
- frequency of freight services
- reductions in the loss or damage of freight in transit.

The main output of the project was a set of travel time and reliability values for road and rail freight movements in New Zealand.

These values are to be included in the NZ Transport Agency's Economic Evaluation Manual (EEM), to be used for the economic appraisal of transport projects that may impact on freight.

RESULTS FILL GAP IN EVALUATION PROCEDURES

The research was conducted by Ian Wallis Associates Ltd and Murray King & Francis Small Consultancy Ltd, and was commissioned by the Transport Agency to fill a gap in the EEM procedures.

At present, all transport initiatives in New Zealand that require government funding must have their expected impacts assessed using the procedures in the EEM. This includes a social cost-benefit analysis, which covers the initiative's expected costs (capital and operating) and the anticipated benefits to transport system users (persons and freight).

However, while the evaluation procedures cover all the different categories of benefits for person travel (e.g. expected travel time, reliability of travel time, service frequency for public transport users, the equivalent benefits are not covered for freight shippers. This project was commissioned to fill this knowledge gap.

The main body of the research was conducted through a comprehensive survey of the New Zealand domestic freight market. The survey covered 59 respondents (freight shippers, receivers and a small number of

transporters) who together represent around one-third of the domestic freight sent within New Zealand (measured in tonne per km). Only transport within New Zealand was covered, including the domestic legs of import and export movements, and primarily movements by road and rail

For each respondent, the survey gathered information about their current freight movements, divided into:

- five commodity groups
- three distance bands (local, inter-regional, inter-island).

Detailed information was obtained for the four largest commodity segments (ie commodity group by distance band) for each respondent. In total, this provided information about 143 commodity segments from the 59 respondents.

The researchers also conducted an international literature review of the willingness-to-pay of freight shippers and appraised previous research into the willingness-to-pay of freight shippers in New Zealand.

RESPONSES SHOW LIMITED WILLINGNESS TO PAY

The main part of the survey consisted of questions about how willing freight shippers were to pay for reductions in expected travel times and improvements in the reliability of travel times.

Most respondents said they were not willing to pay any significant additional amount for either improved journey time or reliability - in other words, they were largely satisfied with their current journey time and reliability performance.

The following table summarises the willingness-to-pay-results for travel time and reliability. The most time-sensitive commodity group (Group 1: general manufacturing and retail) has been separated out from the other groups, because of the big difference in its expressed willingness to pay for improvements.

Summary of willingness-to-pay for travel time and reliability improvements^a

	COMMODITY GROUP 1	COMMODITY GROUPS 2 - 5	TOTAL COMMODITY GROUPS 1 - 5
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A: TRAVEL TIME

Response statistics:

% tonnes with non-zero WTP ^b values	54%	8%	29%
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WTP values (\$/tonne/hr):

Non-zero segment responses (weighted)	\$10.98	\$3.40	\$5.45
All segment responses (weighted)	\$1.13	\$0.26	\$0.45

B: RELIABILITY

Response statistics:

% tonnes WTP values	31.5%	2.6%	8.9%
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WTP values (\$/tonne/hr SD):^c

Non-zero segment responses (weighted)	\$28.44	\$27.96	\$28.33
All segment responses (weighted)	\$8.95	\$0.57	\$2.52

Notes to table:

a. All prices in NZ\$ 2017.

b. WTP = willingness-to-pay

c. SD = standard deviation (of travel time distribution).

The results show that:

- only a few of the commodity segments have non-zero values (ie only a few respondents in particular commodity areas were willing to pay for improvements)
- over all segments, the average willingness-to-pay for:
 - travel time improvements is \$0.45 per tonne per hour (\$1.13 for group 1, \$0.26 for the other groups combined)
 - reliability improvements is \$2.52 per tonne per hour reduction in standard deviation (\$8.95 for group 1, \$0.57 for the other groups).

Similar questions for service frequency and loss or damage to goods in transit were included in the survey, but in both cases either a zero or minimal willingness-to-pay values were given.

For service frequency, this was because most shippers could already specify their own service timings, so there was no benefit to be gained from increased frequencies. For loss and damage, it was because current levels of damage were minimal, and shippers had little interest in paying more to reduce these levels further.

FORMULATING NEW EEM VALUES

The survey results were used to calculate new EEM values for shipper journey time and reliability. The results were converted into values per truck, for each of the truck categories used in the EEM.

The following table shows the recommended values for an average heavy truck.

Recommended new EEM values for freight travel time and reliability changes

	VALUES FOR 'AVERAGE' HEAVY TRUCK (NZ\$2017)	
	TRAVEL TIME VALUES (PER TRUCK PER HOUR)	RELIABILITY VALUES (PER TRUCK PER HOUR SD)
Recommended new values:		
** Group 1	21.87	173.25
** Group 2-5	4.24	9.32
** All groups average	8.12	45.46
Current values (to be replaced):	3.18	-

Notes to table:

- Values are given in NZ\$2017 (current EEM base values in 2002 prices)
- Values shown relate to a 40:60 mix of heavy commercial vehicles with 44 tonne gross capacity (HCV2) and 50 tonne gross capacity (50 Max vehicles).

Further details for other vehicle categories can be found in the full research report.



RR 665 – Valuing freight transport time and reliability, Waka Kotahi NZ Transport Agency research report. Available at www.nzta.govt.nz/resources/research/reports/665