



# Putting values on road safety, travel time and reliability

Can you put a price on your commute?  
What's the dollar value of road safety and reliable travel time?

In this 2021 study, researchers asked over 7,000 respondents throughout New Zealand to choose between different journey options, such as choosing a preferred route. The options include variable factors (attributes) such as reliability of travel time and the cost of a trip. They also asked respondents to choose between different government programmes to improve road safety, with options having differences in costs and in reductions in fatalities and injuries.

The researchers then analysed respondent preferences to suggest revised dollar values for various travel factors. These values can be used for social cost-benefit and other analyses of transport projects, including updating the Waka Kotahi Monetised Benefits and Costs Manual.

## Choice experiment research and pilot study tests

The 'route choice' approach had been tested in a pilot study to investigate how many attributes could be included in a single survey. This is an approach used in many international studies used to derive values of travel attributes, including safety.

However, survey testing suggested respondents either couldn't interpret the risk to them for a single trip or believed their risk was low because of their good driving or type of vehicle. An alternative and better approach was for respondents to choose between nationwide safety investment programmes rather than journeys with different risk levels that might affect them individually.

The final version of the survey used two approaches: a 'route choice' approach and an 'investment choice' approach.

The 'route choice' approach included:

- value of travel time using private and public transport
- value of reliability in travel time
- road congestion
- crowding on public transport.

Here's an example of a route choice question:

QC1 Which of these two routes would you prefer to take as a [driver/passenger]?  
This is a trip you are making as a [insert trip type]

	Route one	Route two
Average travel time	45 minutes	30 minutes
Heavy traffic	0 minutes <small>Of your travel time is spent in heavy traffic</small>	10 minutes <small>Of your travel time is spent in heavy traffic</small>
Cost	\$3	\$5

The 'investment choice' approach included risk reduction for:

- fatalities
- serious injuries
- minor injuries.

The final survey was undertaken throughout New Zealand between February and October 2021 through face-to-face interviews.

Here's an example of an investment choice question:

QS1 Which of the following would you prefer?

	Current (no changes made)	Investment option one	Investment option two
Deaths (per year)	250	200	250
Serious injuries (per year)	1750	1000	1500
Minor injuries (per year)	6000	5000	6000
Increase in your personal costs (per year)	\$0	\$200 more per year	\$100 more per year

## Results

The survey results are summarised below.

Separate average (mean) values are given for time and reliability for public and private transport.

For example, in the following table, the first row shows that when commuting by public transport for any length of trip, respondents would value:

- a change in travel time (where they would be certain of how much the trip would be faster or slower) at \$8.16 per hour if they were sitting or \$11.88 per hour if standing
- a change in the time between scheduled public transport departures (this is called headway) at \$8.28 per hour
- a change in the variability or reliability of travel time, measured as a change in the standard deviation of travel time, at \$14.64 per hour.

### Public transport – mean value of travel time and reliability (\$/hour)

Trip purpose	Trip length	Sitting (certain)	Standing (certain)	Headway	Reliability (standard deviation of travel time)
Commuting	All	8.16	11.88	8.28	14.64
	Short	10.02	12.18	7.86	15.18
	Long	5.64	12.96	9.96	16.32
Other	All	6.61	10.33	6.13	16.89
	Short	6.30	10.05	5.84	13.36
	Long	6.99	12.98	5.41	14.74

The next table gives us averaged results for questions about private transport. For example, the first row shows that when commuting, respondents would value:

- a change in certain travel times at \$30.90 per hour if the traffic was free-flowing and at \$57.24 per hour if they were in heavy traffic, a difference of \$26.34 per hour, which is the congestion increment
- a change in the reliability of travel time, measured as a change in the standard deviation, at \$26.52 per hour.

Safety attribute values are independent of how people travel. They are 'willingness to pay' values that apply to everyone, whether transport users or not. These are shown in the next table as minimum and maximum values of what respondents would be willing to pay (for example, as an increase in tax) for a reduction in the aggregate number of these incidents. For example, on average, respondents are willing to pay \$4.30 per annum for one annual road death fewer and \$0.225 per annum for one serious injury fewer. To estimate a total value for a reduction in these events, the individual values are multiplied either by the national adult population (maximum) or by the number of households (assuming respondents are stating their willingness to pay out of a household budget). This results in a value of a reduced fatality of \$8.1 to \$16.9 million.

### Private transport – mean value of certain travel time and reliability (\$/hour)

Trip purpose	Trip length	Free-flowing	Heavy traffic	Congestion increment	Reliability (standard deviation of travel time)
Commuting	All	30.90	57.24	26.34	26.52
	Short	38.70	73.74	35.04	24.72
	Medium	37.38	59.64	22.26	31.62
	Long	30.60	55.80	25.20	20.58
Other	All	31.97	57.07	25.10	24.96
	Short	36.32	69.78	33.46	22.05
	Medium	42.90	61.61	18.71	18.62
	Long	34.04	60.48	26.44	6.21

### Mean values of preventing fatalities and injuries

Trip length	Willingness to pay per event (\$/respondent)	Minimum aggregate national value	Maximum aggregate national value
Death	\$4.3	\$8.1 million	\$16.9 million
Serious injury	\$0.225	\$429,458	\$890,681
Minor injury	\$0.023	\$44,218	\$91,707

### Recommendations

The researchers recommend updating the Waka Kotahi Monetised Benefits and Costs Manual to include the new values, which are more robust, accurate and current.



RR 698: Monetised benefits and costs manual parameter values, Waka Kotahi NZ Transport Agency research report. Available at [www.nzta.govt.nz/resources/research/reports/698](http://www.nzta.govt.nz/resources/research/reports/698)