

## A13 Travel demand elasticities

### Introduction

This appendix provides a sample of travel demand elasticities gathered from international literature reviews in the course of research commissioned by Transit New Zealand.

The demand elasticity values provided are intended to provide a guide to the elasticities for use in the demand estimates.

### Price elasticity estimates for rail freight commodities

The elasticities in the table below apply to the road/rail modal choice:

Commodity	Range
Food and kindred products	-1.04 to -2.58
Lumber and wood products	-0.05 to -1.97
Paper products	-0.17 to -1.85
Machinery	-0.16 to -2.27

Elasticity depends on the level of inter-modal competition. The values in the table above are indicative only and represent the percentage change in rail volume with respect to the percentage change in rail to road price.

Transit time (generally used as a proxy for distance) appears to be a significant determinant of mode choice. The greater the distance, the less likely truck will be chosen.

In New Zealand, where inter-modal competition is likely to be significant, it is considered that freight price elasticities would more likely be at the higher end of the ranges identified above. However, it should be noted that other factors may influence a shipper's decision.

### Fares elasticity for passenger transport

The recommended elasticity for 'real' fare changes is -0.2 to -0.3 for peak periods in the short term, with a range up to -0.6 in the long term.

It is suggested that, in the absence of any local data, a standard fares elasticity of -0.25 is applied to assess the shorter term effect of fare changes on patronage and revenue in peak periods. Other factors mitigating the use of this elasticity value should be noted.

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### **Service elasticity for passenger transport**

The recommended 'standard' elasticity for service changes (generally measured by passenger transport vehicle kilometres) is 0.25 for peak periods in the short term (0.5 for off-peak periods). However this varies with initial levels of service (service frequency): it is lower for high frequency services, and vice versa. Long term values are about twice these short-term values.

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### **Passenger transport cross-modal effects**

In a study done for Transfund New Zealand in 2003, Booz Allen Hamilton suggested the following effects on public transport patronage in response to changes in car travel costs (eg through changes in fuel prices):

- Peak: c0.4 extra person public transport trips for each car trip suppressed.
- Off-Peak: c0.2 extra public passenger transport trips for each car trip suppressed.

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### **Elasticities summaries**

Summaries of fare elasticities and cross-elasticities drawn from New Zealand and international literature surveys may be obtained on request from Land Transport New Zealand.

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## A13.1 References

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1. I Wallis, Booz Allen & Hamilton, *Review of passenger transport demand elasticities*, Transfund New Zealand research report 248, 2003.
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