FINAL REPORT

CityRail Fare Elasticities

Independent Pricing and Regulatory Tribunal

Sydney

May 2008

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Executive Summary

Background

Specific estimates of ticket type fare elasticities for CityRail services were last prepared more than a decade ago for the Independent Pricing and Regulatory Tribunal (IPART). Given that such estimates are essential to the accurate modelling of patronage and revenue impacts associated with fare level changes, it was considered timely to complete an update of this earlier study. Accordingly, in July 2007, Booz and Company was appointed by the Tribunal to develop a suite of ticket-type elasticity estimates for the CityRail business and incorporate these estimates into the model developed by RailCorp to estimate the market impacts (i.e. patronage and farebox revenue) associated with fare level changes.

Previous empirical research suggests that observed variations in estimated public transport fare elasticities can potentially be attributed to a number of factors including:

- Trip characteristics
- Passenger characteristics
- Service and city characteristics
- Magnitude and direction of fare change
- Initial fare level
- Timescale over which the demand response is considered.

It is important to emphasise that the objective of this project was solely to develop robust estimates of ticket type elasticities that could be employed directly in modelling the estimated impact of fare level changes. While such estimates could potentially be further segmented (e.g. by trip purpose), such estimates are not directly relevant in a fares modelling context. For example, it is not possible to segment the Single ticket market into commuters and non-commuters and adopt differential pricing for these two groups of Single ticket users.

Approach

The development of ticket type fare elasticity estimates for the CityRail business was based on two primary steps.

Firstly, a significant secondary research program (i.e. literature review) was completed as a means of developing insights with respect to the variation in estimated fare elasticities according to trip and passenger characteristics, ticket type and time frame. Particular emphasis was placed on Australian studies generally and Sydney-specific studies in particular.

Secondly, primary market research (i.e. stated preference experiments) was completed with CityRail customers to understand the relative importance of fare compared to other core service attributes including rail in-vehicle time and rail service frequency. This research was conducted using samples of CityRail customers by ticket type, such that variations in responses by ticket type could be identified. Drawing on the parameter values drawn from the stated preference experiments and trip characteristics, together with information regarding 'next best' alternative ticket type or mode, fare elasticity estimates by ticket type were developed.

Elasticity Estimates

Estimated conditional and own-price fare elasticities by CityRail ticket type are presented in Table A.

The reported conditional fare elasticities are relevant to a situation where all CityRail fare levels are simultaneously increased by the same proportion. Under these circumstances, there are no 'within mode' transfers between ticket types as relative prices remain unchanged. Accordingly, these estimates reflect transfers to/from competing private and public modes and suppressed/generated journeys depending on the direction of the fare change.

The reported own-price elasticities are relevant to a situation where there is a change in individual CityRail fare levels and all other fare levels remain constant. As such, these estimates include the components identified above and make a further allowance for transfers to/from alternative CityRail ticket types.

The fare elasticities reported in Table A should be interpreted as short to medium-run values. Somewhat higher values would need to be applied in the long-run to allow for responses such as changes in employment location, place of residence and car availability. Furthermore, it is not recommended that these fare elasticities be applied to fare level changes greater than (say) 10 per cent.

Table A: Estimated CityRail Conditional and Own-Price Fare Elasticities by Ticket Type

Ticket Type	Elasticity	
	Conditional	Own-Price
Single (Return)	-0.48	-0.56
Off-Peak Return	-0.23	-0.30
RailPass/FlexiPass	-0.28	-0.47
TravelPass	-0.12	-0.39
Total	-0.29	**Not Applicable**

Source: Booz and Company estimates.

1 Introduction

1.1 Scope of Work

In July 2007, Booz and Company was appointed by the Independent Pricing and Regulatory Tribunal (IPART) to develop a suite of ticket-type elasticity estimates for the CityRail business including cross-ticket elasticities. The specific deliverables of the project were defined as follows:

- Prepare a summary and analysis of the existing body of research of fare elasticities for the Sydney public transport market
- Develop estimates of ticket type elasticities for CityRail's regulated passenger tickets on the metropolitan, suburban and regional networks for relevant market segments (including allowance for cross-ticket effects)
- Incorporate the fare elasticity estimates into the model developed by RailCorp to estimate the market impacts (i.e. patronage and farebox revenue) associated with fare level changes.

During the project inception phase it was agreed that the scope of the primary market research would be restricted to the metropolitan area. This reflected a view that the primary drivers of any variation in ticket type elasticities could be captured via a sample of CityRail customers travelling in the metropolitan area (i.e. trip purpose, time-of-day, availability of alternative modes of transport).

1.2 Conceptual Framework

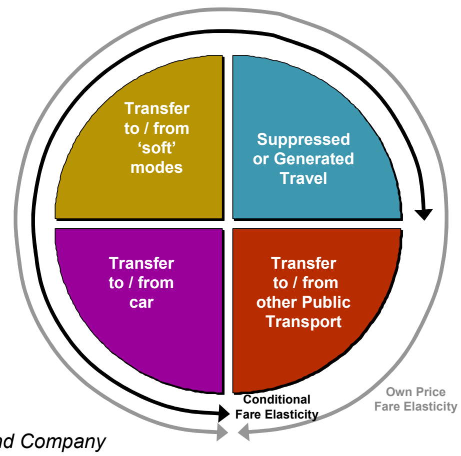
A conventional public transport own-price elasticity for CityRail services incorporates the following components:

- Transfers to/from motorised private transport (i.e. car and motor cycle)
- Transfers to/from 'soft' transport (i.e. walk and cycle)
- Transfers to/from competing public transport modes (i.e. bus and ferry)
- Generated or suppressed trips.

An additional concept (i.e. the so-called 'conditional' elasticity) is sometimes defined that includes each of these components other than the cross-mode components associated with transfers to competing public transport modes. This is intended to capture the situation where all public transport fares are simultaneously increased by the same proportion. Under these circumstances there are no transfers between competing public transport modes, as relative prices remain unchanged.

These two elasticity concepts for the CityRail business (i.e. conditional and own-price) are illustrated in Figure 1.

Figure 1: Conditional and Own-Price Elasticities, CityRail Business



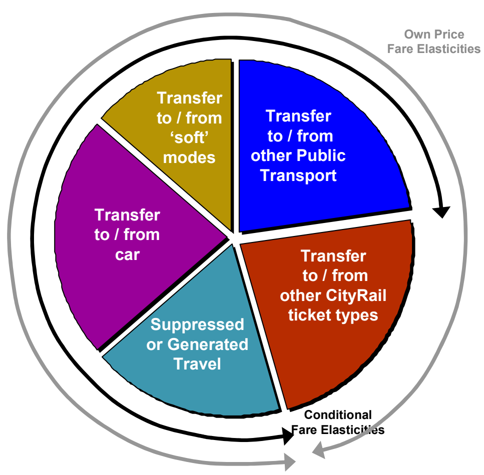
Source: Prepared by Booz and Company

From a CityRail ticket type perspective, the own-price elasticity includes an additional component (i.e. 'within mode' transfers to/from alternative ticket types). We can also define a conditional ticket type elasticity where all 'within mode' fare levels are simultaneously increased by the same proportion. Under these circumstances there are no 'within mode' transfers between ticket types as relative prices remain unchanged.

These two elasticity concepts for CityRail ticket types (i.e. conditional and own-price) are illustrated in Figure 2.

A comparison of the respective components of the conditional and own-price elasticities presented in Figures 1 and 2 shows that a weighted average conditional elasticity estimate by ticket type is comparable to the conventional own-price elasticity estimate defined at a business level (i.e. in this case CityRail).

Figure 2: Conditional and Own-Price Elasticities, CityRail Ticket Types



Source: Prepared by Booz and Company.

Developing estimates of CityRail own-price and conditional elasticities by ticket type (i.e. Figure 2) was the required output of this project. These estimates were then used in the development of an enhanced CityRail Fares Model.

1.3 Report Structure

The balance of this report is structured as follows:

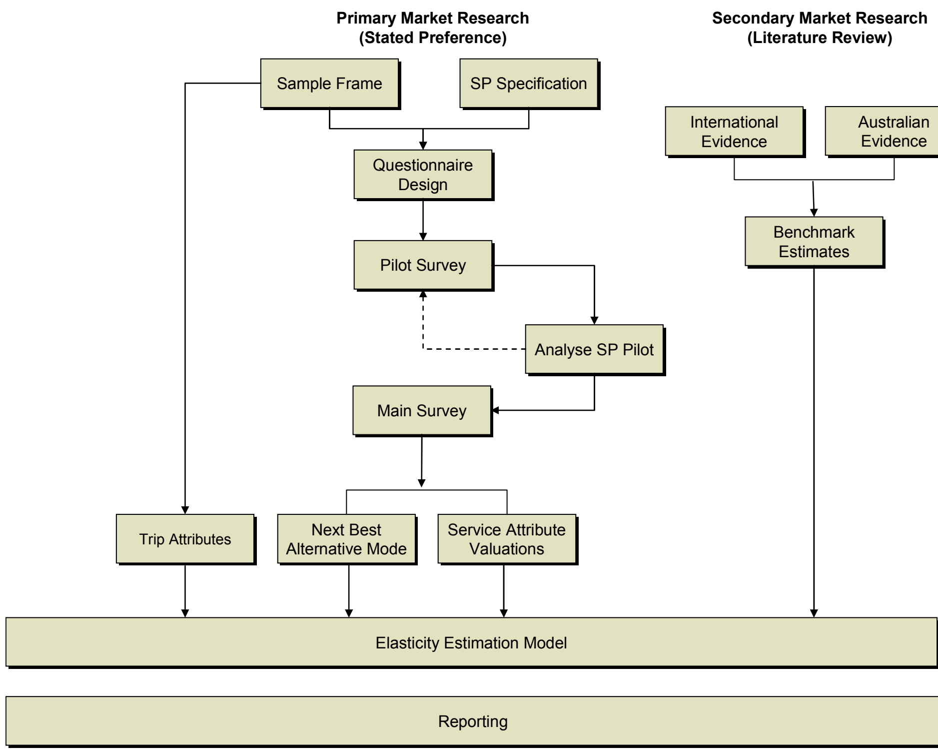
- Section 2 provides a discussion of the approach used to estimate fare elasticities for the CityRail business
- Section 3 summarises the findings of our review of the international and Australian fares elasticity literature
- Section 4 presents details of the development of the primary market research (i.e. stated preference experiments) and the results of the research
- Section 5 details our estimates of CityRail fare elasticities by ticket type
- Section 6 describes the process of incorporating our elasticity estimates into the CityRail Fares Model developed by RailCorp.
- Section 7 provides a discussion of the results and our conclusions.

2 Approach

2.1 Overview

Figure 3 illustrates the approach adopted to the estimation of CityRail ticket type elasticities.

Figure 3: Approach to CityRail Ticket Type Elasticities



Source: Prepared by Booz and Company.

In essence, the approach comprised the following elements:

- Firstly, a significant secondary research program (i.e. literature review) was completed as a means of developing insights with respect to the variation of fare elasticities according to trip and passenger characteristics, ticket type and time frame (i.e. short, medium and long-run)
- Secondly, primary market research (i.e. stated preference experiments) was completed with CityRail customers to understand the relative importance of fare vis-à-vis other core service attributes, including in-vehicle time and service frequency for individual samples of CityRail customers by ticket type
- Thirdly, information on current travel characteristics (i.e. fare, in-vehicle time, service frequency) was collated for a range of origin-destination pairs
- Fourthly, the attribute weights developed via the stated preference research for each ticket type were brought together with trip characteristics and estimates of 'generalised cost' developed for each origin-destination pair. By varying fare levels, it was possible to estimate fare elasticities for each origin-destination

pair, which were aggregated to produce overall estimates of own-price fare elasticities by ticket type

- Fifthly, drawing on these estimated own-price elasticities, estimates of conditional fare elasticities by ticket type were developed with reference to the estimated full breakdown of the own-price elasticity derived from the primary market research (i.e. own-price estimates by ticket type were pro rated to allow for the impact of cross-ticket transfers)
- Finally, estimates of both own-price and conditional elasticities were re-scaled to agree with ‘anchor’ values derived from secondary market research.

In terms of this latter point, we note that the development of ‘anchor’ values leveraged the latest fare elasticity estimates for the CityRail business prepared by RailCorp, broader international evidence and a ‘before and after’ analysis of outcomes associated with the 2006 review of CityRail fares.

3 Secondary Market Research

3.1 Introduction

There are a number of reasons why estimated public transport fare elasticities will vary and why it is appropriate to adopt different elasticities depending on a range of market demand, supply and other factors, including:

- Trip characteristics
- Passenger characteristics
- Service and city characteristics
- Magnitude and direction of fare change
- Initial fare level
- Timescale over which the demand response is considered.
- Each of these factors are considered in further detail below.

3.1.1 Trip Characteristics

Trip characteristics such as ticket type, trip length and trip time (i.e. peak/off-peak) need to be considered in determining fare elasticities. For trip length, high fares may be tolerated if they are perceived to be of good value, per unit of distance. The fare elasticity for a ticket type will be higher where there is competition from other tickets or with tickets from a competing operator. Variations in fare elasticity can also be expected by ticket type, although this is in large part due to other inherent factors such as trip purpose, service quality, fare level, distance, etc.

3.1.2 Passenger Characteristics

People with higher disposable incomes are expected to be less sensitive to fare increases, which may lead to regional differences in fare elasticities. Trip purpose also needs to be considered. Leisure travellers and trips made for other discretionary purposes, such as shopping, are expected to be more sensitive to fare changes relative to non-discretionary trips, such as commuting to the place of work or education.

3.1.3 Service and City Characteristics

Service quality differentiation is often used as a means of justifying higher prices. Rail travellers may be less responsive to fare increases where the perceived quality is high (e.g. shorter journey time, higher frequency, no requirements for interchange). City size and modal competition as well as other characteristics will also have an effect on the magnitude of fare elasticities. Where rail faces stronger competition from other modes, we would expect the fare elasticity to be higher than it would be if there were fewer substitutes.

3.1.4 Magnitude and Direction of Fare Change

Travellers may be expected to be more sensitive to fare changes where the absolute fare is higher, all other things being equal. It is unlikely that fares can be continually increased without an increase in the fare elasticity. There may be a difference in elasticities when fares are increased compared to when fares are decreased.

It is also important to consider the relationship between fare elasticities and fare levels. For example, for modelling purposes, London Underground assumes that fare elasticities are directly proportional to real fare levels (i.e. a fares 'power' of 1).

3.1.5 Time Scale

The time scale to which the elasticities relate has been categorised into short-run, where effects occur typically within 6 to 12 months of change, and medium to long-run, where effects are over a longer period of time.

3.1.6 Summary

Table 1 summarises expected fare elasticity relativities for different public transport customer and trip characteristics other things being equal.

Table 1: Expected Fare Elasticity Relativities

Customer Characteristic		Fare Sensitivity	Comment
Age	Youth	Highest	Higher levels of discretionary trips
	Adult	Moderate	Higher levels of car availability
	Senior	Lower	Higher proportion of captive users
Trip Purpose	Work	Lower	Trips are non-discretionary
	Shopping/Recreation	Higher	Trips are more discretionary
Income	Low	Higher	Lower values of time
	High	Lower	Higher values of time
Car Access	Yes	Higher	Availability of close substitute for most trips
	No	Lower	Limited options particularly for longer trips
Trip Characteristics		**Price Sensitivity**	**Comment**
Trip Length	Short	Higher	Greater range of viable options including 'soft' transport
	Medium to Long	Lower	Reduced range of close substitutes
Trip Time	Peak	Lower	Non-discretionary trips and higher values of time
	Off-Peak	Higher	Discretionary trips and lower values of time
Time Scale		**Price Sensitivity**	**Comment**
Time Scale	Short-run	Lower	Responses limited
	Long-run	Higher	Additional responses possible relating to car availability, work and home location etc

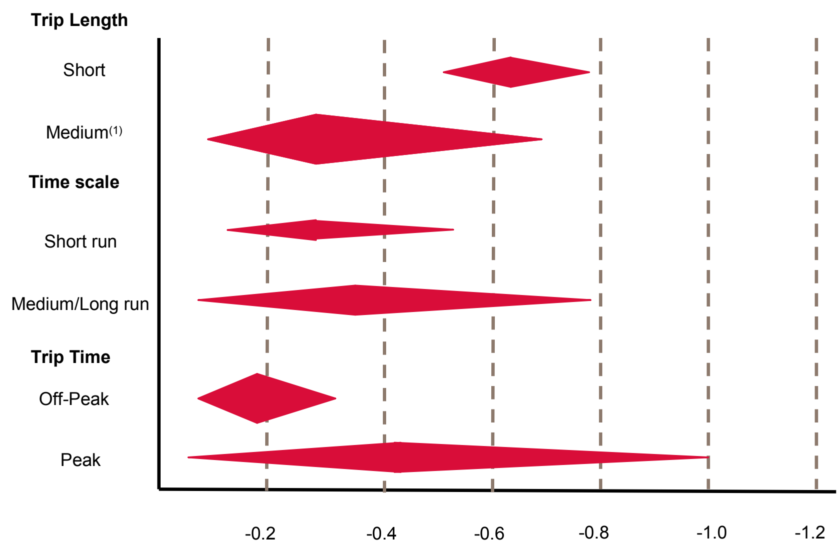
Source: Prepared by Booz and Company.

3.2 Available Empirical Evidence

3.2.1 *International*

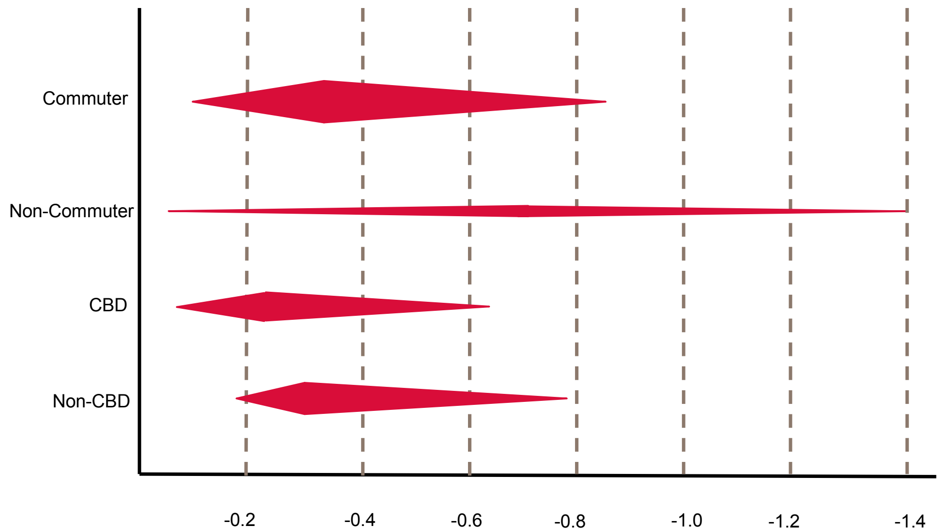
Figures 4 and 5 show the range and distribution of fare elasticities presented in the international literature based on selected trip characteristics and other factors affecting the responsiveness of demand to fare changes. The figures include both rail only and whole transit system studies to illustrate general fare elasticity values. The diamonds in the figures below illustrate the range, with the head of the diamond representing the median value of the fare elasticity estimates and the size representing the sample size. For example, there are eight short-run elasticity estimates selected from the international literature, ranging from -0.15 to -0.49, with a median value of -0.28. There are 15 medium to long-run estimates ranging from -0.08 to –0.78 with a median elasticity value of -0.36. For a more complete discussion of previous international estimates see Attachment A.

Figure 4: Distribution of Estimated Rail Fare Elasticities by Trip Length, Time Scale and Trip Time



(1) Medium distance includes suburban rail as well as general transit system elasticities but excludes intercity rail travel
Note: Ranges are based on a sample of international empirical studies and literature reviews.
Source: Booz and Company analysis.

Figure 5: Distribution of Estimated Rail Fare Elasticities
Trip Purpose and Trip Orientation



Note: Ranges are based on a sample of international empirical studies and literature reviews.
Source: Booz and Company analysis.

3.2.2 *Australian Evidence*

Trip Purpose and Time-of-Day

Off-peak fare elasticities were found to be around 1.5 to 2 times estimated peak fare elasticities. Values from Australian studies generally ranged from -0.1 to -0.3 in the peak and -0.1 to -0.7 in the off-peak (see Attachment A). These ranges are comparable to those recommended by the Victorian Department of Infrastructure (2005) for own-price rail elasticities of -0.1 to -0.15 for peak travel and -0.3 to -1.0 for off-peak travel. For the Sydney market specifically, Taplin et al (1999) estimated a value of -0.19 for commuter trips.

Conditional and Own Mode

Booz Allen Hamilton (2002) derived an own-price elasticity of -0.38 and a conditional price elasticity of -0.27 for suburban rail travel in Brisbane. By way of comparison, Amin (2001) reports an own-price elasticity of -0.68 and an associated conditional price elasticity of -0.26 for London Underground services.

Ticket Type

Booz and Company was commissioned to develop ticket-type elasticity estimates for the CityRail business based, in part, on updating the previous work done by Hensher and Raimond (1996) for IPART. As part of the Institute for Transport Studies (ITS), Hensher and Raimond conducted a study to determine how Sydney residents would respond to changes in public transport fares.

However, it is extremely important to recognise that the fare elasticity estimates developed by Hensher and Raimond are not directly comparable with our estimates. In particular, the estimates developed by Hensher and Raimond are so-called 'direct' or market share elasticities. As such, these estimates measure the proportional change in market share rather than the proportional change in demand (i.e. journeys) associated with a fare change.

The approach that Hensher and Raimond utilised in their study combined Revealed Preference (RP) and Stated Preference (SP) data. In their survey design, they included questions about the last trip travellers had made to determine their current behaviours, or revealed preference. In the stated preference section of the survey, travellers were asked how they would respond to various changes in public transport fares, including what mode of transport and which fare they would use in each scenario. Responses to the stated preference section of the survey were then used to determine how sensitive people were to fare changes (i.e. to derive a suite of fare elasticity estimates).

Table 2 summarises the direct (i.e. market share) elasticity estimates developed by Hensher and Raimond. For example, the estimated elasticity of -0.08 for trips made by Commuters on a Single ticket implies that (for example) a 10% increase in the price of a Single ticket will result in a 0.8% reduction in the proportion of daily commuter trips made on a Single ticket.

Table 2: Estimated CityRail Direct Fare Elasticities by Ticket Type and Trip Purpose

Ticket type	Commuters	Non-Commuters
Single	-0.08	-0.09
Off-Peak	-0.12	-0.04
Weekly	-0.25	-0.69
TravelPass	-0.53	-1.10

Source: Hensher and Raimond (1996).

We note that the elasticity estimates presented in Table 2 can be combined with market share weights by ticket type to generate an overall price elasticity estimate of -0.295.

3.2.3 *CityRail Estimates*

After consulting with RailCorp's Economic and Financial Analysis Unit (EFAU), details were obtained of the fare elasticity values used by RailCorp in their project evaluations (RailCorp 2007, unpublished).

Time-of-Day

Table 3 summarises RailCorp's fare elasticity estimates for CityRail by time-of-day and in aggregate between 1993 and 2007. Table 3 shows that there has been relatively little variation in the estimated own-price elasticity over time, with estimates ranging between -0.37 and -0.45. Significantly, in recent years (i.e. 2001 to 2007), the estimated own-price fare elasticity has only ranged between -0.37 and -0.38. The estimated peak period own-price fare elasticity has also been very stable since 2001, ranging between -0.34 and -0.35. The estimated own-price off-peak fare elasticity actually fell in 2007 to -0.42, compared to -0.47 between 2001 and 2006.

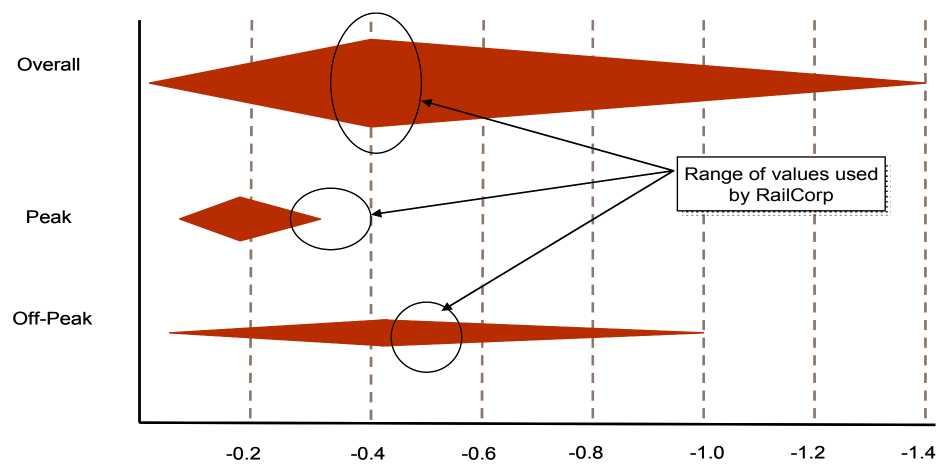
Table 3: Summary of CityRail Elasticities Used by RailCorp

Year	Peak	Off-Peak	Overall
1993	-0.36	-0.50	-0.41
1995	-0.40	-0.55	-0.45
1997	-0.40	-0.55	-0.45
2001	-0.34	-0.47	-0.37
2003	-0.34	-0.47	-0.37
2006	-0.34	-0.47	-0.37
2007	-0.35	-0.42	-0.38

Source: RailCorp (personal communication).

Figure 6 shows the elasticity values used by RailCorp fall within the range of values from international empirical studies.

Figure 6: Estimated RailCorp Fare Elasticities for CityRail Services Relative to International Evidence



Note: Ranges are based on a sample of international empirical studies and literature reviews.
Source: Prepared by Booz and Company.

Table 4 presents RailCorp estimates of own-price fare elasticities for the CityRail business by both trip length and time-of-day. These estimates are consistent with the international evidence in that fare elasticities fall over 'medium' distances relative to 'short' distances.

For peak trips, RailCorp suggests that the lower fare elasticities for medium trips reflect '… less substitutability and the fare/travel time relationships'. We assume that the latter point is a reflection of the lesser importance of the fare paid from a full generalised cost perspective compared to shorter trips. Over longer distances, the estimated fare elasticity increases somewhat. Although no explanation is offered by RailCorp, it may well reflect the fact that the absolute level of fares over longer distances becomes a barrier to travel in its own right (i.e. the so-called ‘income effect’).

Table 4: Estimated CityRail Fare Elasticities by Trip Length and Time-of-Day

Trip Length	Peak	Off-Peak
Short[a]	-0.38	-0.40
Medium[b]	-0.26	-0.33
Long[c]	-0.40	-0.66

a.Up to 25 minutes on-board time.
b.25 to 59 minutes on-board time.
c.Greater than 59 minutes on-board time.
Source: RailCorp (2007, unpublished).

The same trend in elasticity values is evident for the off-peak market (i.e. elasticities first decline and then increase over longer distances). RailCorp notes that the higher elasticity for long trips reflects the ‘… greater proportion of discretionary trips’.

We note that the estimates for ‘medium’ trips are consistent with an ‘all day’ average of -0.29. This figure is relevant to the primary market research and the derivation of ticket type elasticities discussed in subsequent sections of this report.

4 Primary Market Research

4.1 Introduction

To derive specific CityRail ticket type estimates, a program of stated preference research was designed and executed by Booz and Company. This research is discussed in detail in this section.

4.2 Stated Preference Approach

Stated preference refers to a variety of techniques that use the results of direct interviews to model the behaviour of individuals. The techniques use controlled experimental designs to construct a series of alternative situations. Individuals are then asked how they would respond to these situations as if they were faced in reality.

Stated preference techniques are based on the economic concept of 'utility', where utility is the benefit derived from spending resources on goods or services. Individuals are assumed to make choices that maximise their utility or minimise their disutility. Utility from consuming a particular good is not thought to be derived from consuming the good itself, but through acquiring the characteristics that the good possesses. For example, in deciding to use a train for a journey, it is the fare level, journey time, wait time, etc, that are influential in making the choice, not the fact that it is a train per se. Different modes of transport offer different 'parcels' of characteristics to the traveller. It is the way that a person trades-off between these different characteristics that determines which mode is actually used.

In stated preference experiments, individuals are presented with a number of hypothetical choices, constructed from various trip characteristics or 'attributes'. The respondent is asked to choose between a number of hypothetical scenarios. By varying the descriptions of the attributes in a controlled manner, we can measure the impact of each change on the responses given and hence derive a measure of the relative importance of each attribute.

In stated preference experiments, the researcher has control over the characteristics or 'attributes' presented in the hypothetical travel situations. This enables a wide range of scenarios to be investigated, which may not easily be measured when observations of actual behaviour are used. Information is obtained from respondents regarding their expected behaviour in a range of hypothetical situations with the following characteristics:

- The situations reflect different combinations of factors or 'attributes' that are relevant to choice making
- The situations are constructed to ensure that the impact of each factor can be quantitatively measured
- The hypothetical situations must be clearly understood by the respondent
- The individuals surveyed are representative of the population of interest

- The responses of individuals are analysed to provide quantitative measures of the relative importance of each factor
- The results can provide forecasts of behaviour under numerous 'what-if' scenarios
- The results can be used to place monetary values on various attributes of the experiment.

4.3 Experiment Design and Sample Frame

The stated preference experiments were designed to measure respondent's attitudes to variations in key attributes of their trip such as fare, in-vehicle time and mode. These attitudes have been found to vary between individuals on the basis of a variety of factors, most critically an individual's current mode and trip purpose.

Respondents were presented with a pair-wise SP design incorporating 12 separate 'trade-offs'. This was based on an orthogonal fractional factorial design which initially involved 16 pair-wise 'trade-offs', but was reduced to eliminate illogical choice pairs (i.e. ones where all factors on one side were 'worse' than the alternative and it would be illogical to choose in any situation).

The design (full template shown in Attachment C) incorporated three primary service attributes – fare, in-vehicle time and service frequency. Fare was presented at four levels and the other two attributes at three levels, where 'levels' relate to differences between choice A and choice B in the pair-wise design.

It is important to emphasise that the purpose of the primary market research was to establish fare elasticity *relativities* by ticket type that could then be re-scaled to aggregate fare elasticity estimates prepared by RailCorp (see Section 3 above). As such, our interviews were conducted at a range of stations consistent with 'typical' onboard trip times (i.e. 20 to 40 minutes).

4.4 Pilot Survey

The pilot survey was conducted on 9 and 10 October 2007 at Lidcombe Station between 0700 and 0930 (N=101). The majority of these interviews were conducted in the peak (N=84), with the balance (i.e. N=17) being conducted in the off-peak.

Overall the analysis indicated that the experimental designs worked reasonably well with all the estimated coefficients having the correct sign. There was, however, a bias towards respondents choosing trips with a shorter travel time and the service frequency coefficient was very weak from a statistical significance perspective. Accordingly, the survey was modified to strengthen the impact of service frequency on respondent choices and introduce more fare trading options.

4.5 Main Fieldwork

This section describes the sampling methods used to administer the main survey to CityRail customers, followed by a sequential analysis of responses to the survey. The survey form itself can be found in Attachment B.

4.5.1 *Survey Administration*

Sample quotas were set by ticket type and, in some cases, by time-of-day (i.e. peak versus off-peak where the AM Peak was defined as 0630 to 0900). In particular, the following quotas were established:

- Aggregate Single and (full fare) Return ticket quota of 100 completed interviews (i.e. 50 peak interviews and 50 off-peak interviews)
- Off-Peak Return quota of 100 completed interviews (i.e. by definition these will all be after 9:00am)
- DayTripper quota of 100 completed interviews
- Aggregate RailPass (Weekly) and FlexiPass quota of 100 completed interviews
- TravelPass quota of 100 completed interviews.

A quota of 80 completed surveys was established for each of the six stations where interviews were conducted (see Table 4). The stations were selected on the basis of having similar CBD journey times and service frequencies. We also note that all interviewees were completing CityRail trips associated with journey times of between 20 and 40 minutes (i.e. which falls within the 'average' or 'medium' trip length trip duration across the CityRail metropolitan network).

Given the quotas indicated above, the survey approach did not utilise random sampling. As such, the respondents may not be representative of the entire population and their responses may not be readily generalised across the population.

The survey was implemented from Tuesday 23 to Friday 26 October 2007 between 0630 and 1300.

A total of 584 interviews were completed. A similar number of interviews were conducted at all six stations (see Table 5), and all stations met the quota of 80 interviews.

Table 5: Distribution of Quotas and Completed Interviews by CityRail Origin Station

Origin Station	Quota	Completed Interviews	Difference
Bankstown	80	96	+ 16
Chatswood	80	100	+ 20
Epping	80	95	+ 15
Hurstville	80	98	+ 18
Lidcombe	80	96	+ 16
Parramatta	80	99	+ 19
Total	**480**	**584**	**+ 104**

Source: Prepared by Booz and Company.

4.5.2 *Question Analysis*[1]

Question 1: How long will you be on the train?

The average journey time for respondents was approximately 29 minutes and varied little by origin station (see Table 6). This outcome reflects the survey design (i.e. no customer was interviewed where their *rail* journey time was less than 20 minutes or greater than 40 minutes). This constraint was imposed so that the sample would reflect the typical network journey time.

Table 6: Distribution of Average Journey Times by Origin Station *(N = 584)*

Origin Station	Average Journey Time (minutes)
Bankstown	35.9
Chatswood	24.9
Epping	27.4
Hurstville	28.3
Lidcombe	27.7
Parramatta	32.0
Total	**29.4**

Source: Prepared by Booz and Company.

Question 2: What ticket type are you travelling on today?

Approximately one-third of the respondents were travelling on a RailPass (Weekly) or FlexiPass. This represents the largest segment of travellers, with Single and Return tickets the second largest segment as seen in Figure 6. The quotas of 100 interviews for each ticket type were almost all met, with the major exception of the DayTripper where only 29 interviews were completed. This reflected the difficulty experienced by interviewers in intercepting customers travelling on the DayTripper product.

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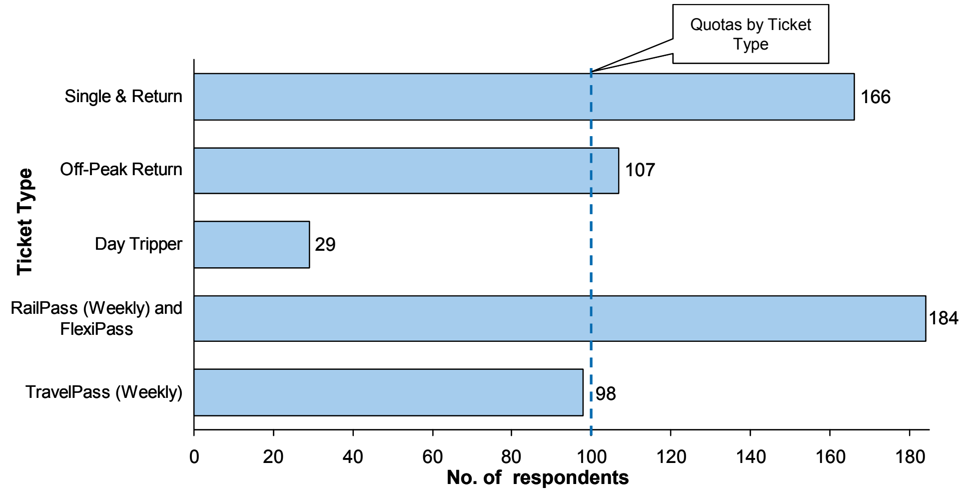
[1] The number of respondents for each question is listed with the chart or table illustrating the responses.

Figure 7: Distribution of Ticket Types Compared to Quotas *(N = 584)*

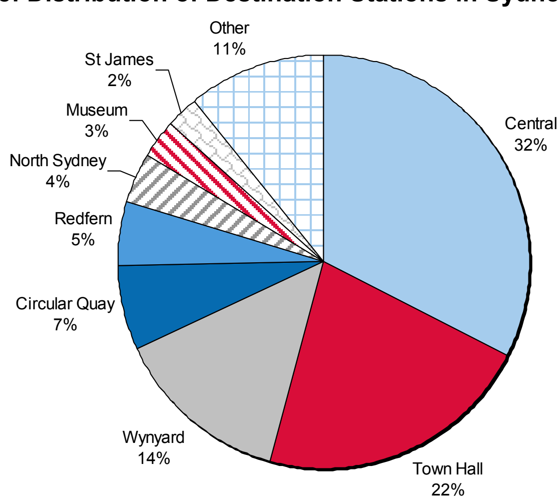


Source: Prepared by Booz and Company.

Question 3: Where will you get off the train on your trip today?

The most common destination for respondents was Sydney's CBD, based on the location of their destination station. Central, Circular Quay, Town Hall, Wynyard, St. James and Museum Stations are all defined as being in the CBD and combined to make up approximately 80 per cent of the destinations as seen in Figure 8.

Figure 8: Distribution of Destination Stations in Sydney *(N=584)*



Source: Prepared by Booz and Company.

Question 4: What time is the train due to leave this platform?

Respondents were interviewed to meet the quota of at least 50 peak and 50 off-peak interviews for Single and Return tickets. This quota was met with 82 off-peak interviews and 84 peak interviews completed. As expected, a large majority (i.e. 92 per cent) of Off-Peak Return ticket holders were travelling during off-peak times. At the aggregate level, peak and off-peak journeys were evenly divided as seen in Table 7.

Table 7: Distribution of Travel Times by Ticket Type *(N = 584)*

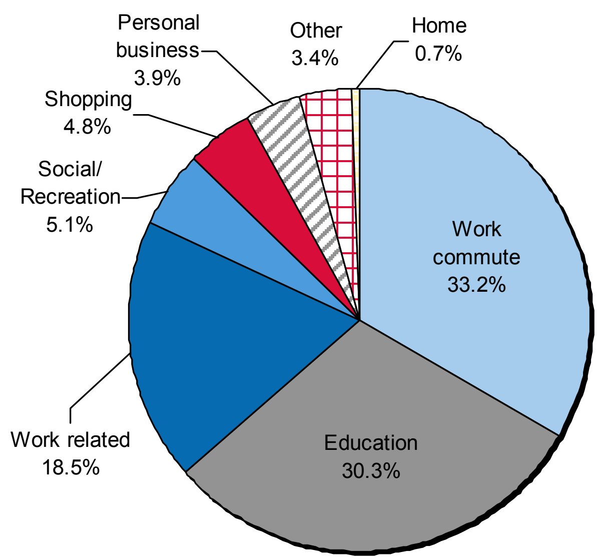
Ticket Type / Period of Travel	Single	Return	Off-Peak Return	RailPass (weekly)	Travel Pass (weekly)	Day Tripper	FlexiPass (28-366 days)	Total
Off-Peak	40	42	98	41	40	19	12	292
Peak	27	57	9	103	58	10	28	292
Total	67	99	107	144	98	29	40	584

Source: Prepared by Booz and Company.

Question 5: What is the purpose of this journey?

Almost two-thirds of respondents were commuting on CityRail (i.e. to their place of work or education), while 18 per cent were using the trains for work-related trips. This left a minority of users (i.e. around 18 per cent) travelling on CityRail for personal reasons as seen in Figure 9.

Figure 9: Distribution of Journey Purposes *(N = 584)*



Source: Prepared by Booz and Company.

Combining information from questions 2 and 5 indicates that commuters (i.e. defined as those travelling to their place of work or education) are far more likely to invest in longer-term tickets, such as the TravelPass and FlexiPass, than non-commuters. Conversely, non-commuters are far more likely to invest in a short-term ticket like the DayTripper (see Table 8 for the distribution of commuters and non-commuters within ticket categories).

Table 8: Distribution of Journey Purpose By Ticket Type *(N = 584)*

Ticket Type	Commuter	Non-Commuter	Total
Single	41.8%	58.2%	100.0%
Return	58.6%	41.4%	100.0%
Off-Peak Return	63.6%	36.4%	100.0%
RailPass (weekly)	69.4%	30.6%	100.0%
TravelPass (weekly)	79.6%	20.4%	100.0%
DayTripper	20.7%	79.3%	100.0%
FlexiPass (28 to 366 days)	82.5%	17.5%	100.0%
Total	**63.5%**	**36.5%**	100.0%

Source: Prepared by Booz and Company.

Question 6: Are you eligible for a concession ticket on suburban trains?

The majority of respondents were not eligible for CityRail concession tickets, with approximately 74 per cent negative responses indicating that they were not eligible for a concession (*N=583*). Generally, people under the age of 16, students under the age of 18 and seniors are eligible for concession rates.

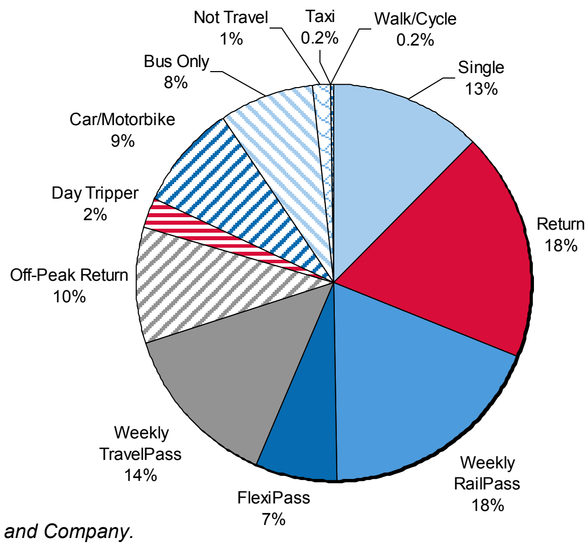
Question 7: If your current ticket type was no longer available, which ticket type or mode would you choose to complete the rail portion of your journey?

In determining the 'next best' ticket type, the following responses were excluded from analysis:

- Choosing the same ticket type on which they were currently travelling
- Choosing a (full fare) Return ticket while currently travelling on a Single ticket or vice-versa
- Choosing a FlexiPass while currently travelling on a RailPass or vice-versa.

Eliminating responses falling into the category above left 425 responses for analysis. A majority of respondents would continue to use CityRail by switching to a different ticket type if their current ticket type was no longer available (see Figure 9). Approximately 18 per cent said they would switch away from using CityRail to either buses, personal vehicles, taxis, or walking and cycling. A little more than 1 per cent indicated they would not travel if their ticket was not available.

Figure 10: 'Next Best' Rail Ticket or Mode Choice if Current Ticket is Unavailable *(N = 425)*



Source: Prepared by Booz and Company.

The distribution of 'next best' choices can also be assessed with reference to current ticket type as shown in Table 9. This reveals that current FlexiPass holders are most likely to switch to another longer-term ticket such as the TravelPass, whereas current Day Tripper ticket holders would switch to a range of products depending on their specific travel patterns. Respondents currently holding Single tickets are also just as likely to switch to an Off-Peak Return as they are to a personal car or motor cycle.

Table 9: 'Next Best' Rail Ticket or Mode Choice by Current Ticket Type *(N = 425)*

This group represents switching to other CityRail products

Ticket Type \ Alternative Ticket Type	Single	Return	Rail Pass	Flexi Pass	Travel Pass	Off-Peak Return	Day Tripper	Car or motor -bike	Bus[(a)]	Not travel	Walk or cycle	Taxi	Total
Single	-	0.0%	22.2%	3.7%	0.0%	25.9%	3.7%	25.9%	18.5%	0.0%	0.0%	0.0%	100%
Return	0.0%	-	38.9%	3.7%	3.7%	29.6%	0.0%	7.4%	11.1%	5.6%	0.0%	0.0%	100%
RailPass (weekly)	5.0%	38.6%	-	0.0%	37.6%	6.9%	0.0%	2.0%	8.9%	0.0%	0.0%	1.0%	100%
FlexiPass (28-366 days)	13.3%	6.7%	0.0%	-	66.7%	0.0%	0.0%	0.0%	13.3%	0.0%	0.0%	0.0%	100%
TravelPass (weekly)	4.1%	22.7%	35.1%	21.6%	-	6.2%	3.1%	3.1%	4.1%	0.0%	0.0%	0.0%	100%
Off-Peak Return	35.9%	13.6%	16.5%	0.0%	2.9%	-	5.8%	16.5%	5.8%	1.9%	1.0%	0.0%	100%
DayTripper	17.9%	10.7%	3.6%	14.3%	17.9%	17.9%	-	14.3%	3.6%	0.0%	0.0%	0.0%	100%

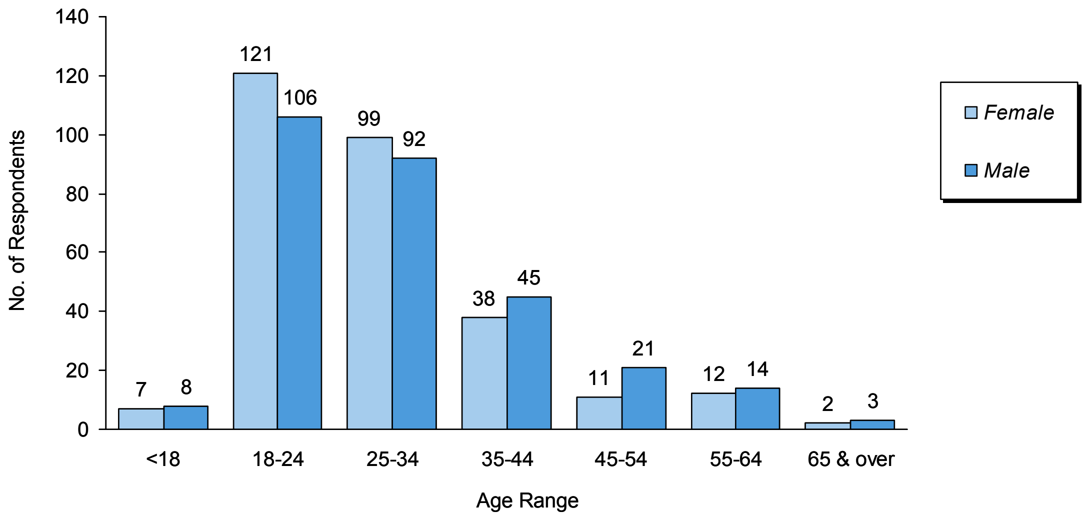
(a) Switching to 'Bus' indicates using a bus only product.

Source: Prepared by Booz and Company.

Question 8 & 11: What year were you born? (That is, what is your age?) and What is your gender?

Almost three-quarters of the respondents polled were between 18 and 34 years of age. In this age category a slight majority of respondents identified as female. However, across the entire sample approximately half the respondents identified as male and half female. The minority of respondents were either above 65 or below 18 years of age, seen below in Figure 11. This is consistent with the minority of respondents who are eligible for concession tickets from question 6.

Figure 11: Age and Gender Distribution of Respondents *(N = 579)*

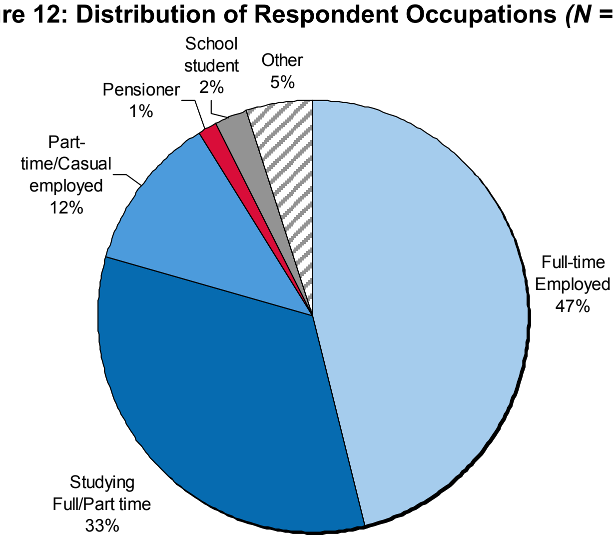


Source: Prepared by Booz and Company.

Question 9: What is your occupation?

Within the categories offered in the question, most respondents indicated they were either working full-time or studying full or part-time, with almost half of the respondents employed full-time. Pensioners and school students combined to make up a minority of 3 per cent of the respondents (see Figure 12).

Figure 12: Distribution of Respondent Occupations *(N = 583)*

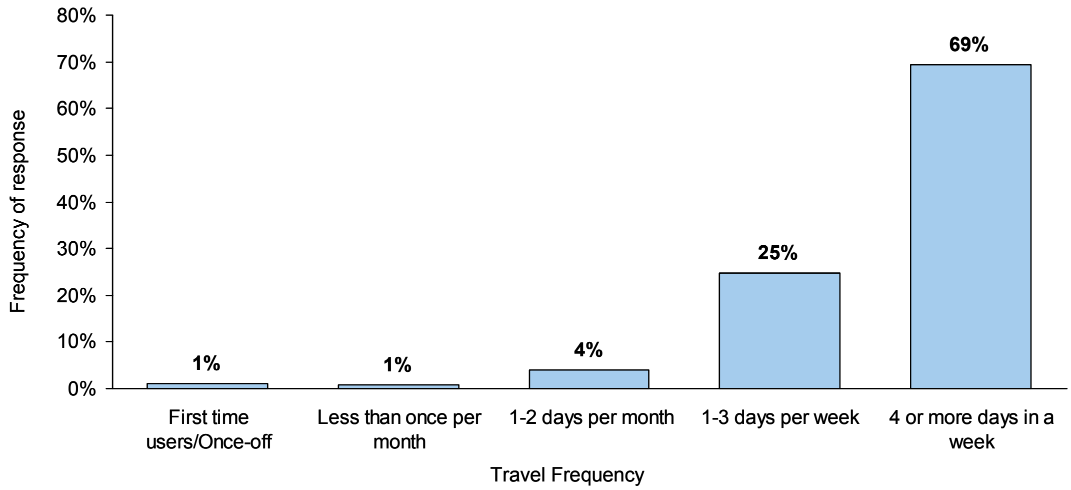


Source: Prepared by Booz and Company.

Question 10: How often do you use CityRail services?

The majority of respondents utilise CityRail four or more days a week, which indicates that most travellers consistently use the rail service. Combining this category with those who use CityRail one to three days a week reveals that 94 per cent of respondents use the rail service on a weekly basis. A small minority are infrequent users, as seen in Figure 13.

Figure 13: Distribution of Travel Frequencies Across Respondents *(N = 584)*



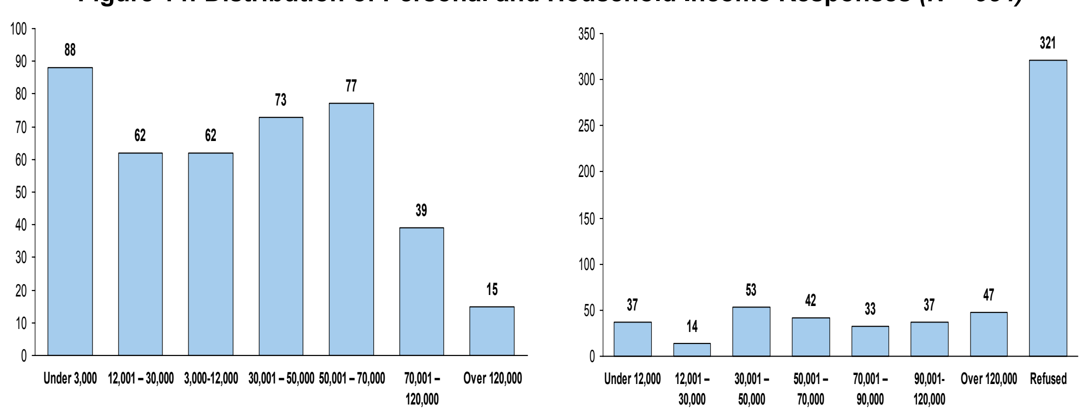
Source: Prepared by Booz and Company.

Questions 12 & 13: What is your personal income and household income?

While the largest group of respondents indicated a personal income below $3,000 a year, the distribution of respondents across all incomes was fairly even. The only categories that stand out from the distribution are those with personal incomes above $70,000 a year. These income categories have considerably fewer respondents compared to the other categories, illustrated below in Figure 14.

The responses for household incomes were also distributed fairly evenly across all categories. However, two-thirds of respondents refused to answer this question which may indicate a lack of knowledge on the topic.

Figure 14: Distribution of Personal and Household Income Responses *(N = 584)*



Source: Prepared by Booz and Company.

5 Elasticity Estimation

5.1 Approach

The process used to estimate the own-price fare elasticities by ticket type involved the following major steps:

i. Analysis of the survey data derived from the stated preference experiment (i.e. using the LIMDEP program to derive utility values[2] for the primary service attributes under consideration by various segments) and ‘alternative ticket or mode’ responses in the event that the current ticket type was unavailable (refer Table 8)

ii. Analysis of data for major stations across the CityRail network (including the six stations at which interviews were undertaken – refer Table 4) including passenger data (i.e. peak and off-peak volumes), fares by ticket type, service frequencies, distance and travel times to / from the city to enable the development of a generalised cost matrix

iii. Application of an elasticity estimation model utilising the approach outlined in Section 2.2 including re-scaling elasticity estimates to generate journey weighted averages consistent with ‘anchor’ values.

The development of the ‘anchor’ values leveraged the latest fare elasticity estimates prepared by RailCorp, broader international evidence and a ‘before and after’ analysis of outcomes associated with the 2006 review of CityRail fares.

As presented in Section 4, the average journey time for survey respondents was 29 minutes and was subject to little variation by origin station (see Table 5). Reference was therefore made to a weighted average of the RailCorp ‘medium’ distance peak and off-peak own-price elasticities (i.e. trips between 25 and 59 onboard minutes) for the CityRail business. This is consistent with an ‘all day’ estimate of -0.29 as reported in Section 3.2.3. From a ticket type perspective, this was adopted as the appropriate ‘anchor’ value for the development of conditional ticket type elasticities.

While the international evidence (specifically London Transport research) provides evidence of the relativity between conditional and own-price elasticities for the London Underground business, it does not address the magnitude of London Underground cross-ticket effects (i.e. the component that defines the difference between conditional and own-price elasticities at a *ticket type* level).

As a means of developing some insight into the relationship between conditional and own-price elasticities at a ticket type level, reference was made to the 2006 determination of CityRail fares – specifically the Off-Peak Return on the basis that fare levels for this product were increased significantly both in absolute terms (i.e. between 13 and 31 per cent subject to journey length) and also relative to other ticket types. As such, the observed change in demand is more consistent with an ‘own-price’ rather than a ‘conditional’ fare change.

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[2] Also referred to as ‘parameter values’ or coefficients

Our analysis of CityRail patronage data for the major adult ticket types (i.e. Single/Return, Off-Peak Return, RailPass, FlexiPass and DayTripper), shows that the share of adult journeys completed on the Off-Peak Return product fell from 20.1 per cent in 2005/06 to 18.4 per cent in 2006/07. This was consistent with total Off-Peak Return journeys falling from 34.0 million in 2005/06 to 31.7 million in 2006/07, consistent with a reduction of 2.3 million or about 6.8 per cent. When compared with an average Off-Peak Return price increase of approximately 20 per cent, this implies a fare elasticity of -0.34. In recognition of the magnitude of the fare level changes, the value adopted for our analysis was moderated somewhat. That is, an own-price elasticity of -0.30 was adopted for the Off-Peak Return ticket product. This estimate was used to 'anchor' the full suite of own-price ticket-type elasticity estimates.

A further input to the development of the own-price elasticities at a ticket type level was the response to Question 7 of our survey (see Section 4.5.2). These responses provide an insight into the full breakdown of the own-price elasticity (i.e. transfers to other CityRail ticket types, transfers to other modes and decisions to not travel).

5.2 Results

Own-price elasticity of demand estimates for specific ticket types were prepared for four ticket type categories (see Table 10). The FlexiPass and RailPass ticket types were combined in the analysis because they both represent multi-trip rail only products. In addition, there were not enough observations (n=29) to estimate an elasticity for DayTripper tickets.

Estimated conditional fare elasticities range from -0.12 (TravelPass) to -0.48 (Single). This implies that a simultaneous 10% change in the price of all ticket products will result in a 1.2% reduction in journeys made on the TravelPass product and a 4.8% reduction in journeys made on Singles and Returns.

Table 10: Estimated Conditional and Own-Price Fare Elasticities

Ticket Type	Conditional	Own-Price
Single / Return	-0.48	-0.56
Off-Peak Return	-0.23	-0.30
TravelPass	-0.12	-0.39
RailPass/FlexiPass	-0.28	-0.47
Total	-0.29	Not Applicable

Source: Booz and Company estimates.

The estimated ticket type own-price elasticities range from -0.30 (Off-Peak Return) to -0.56 (Single and Return). By way of example, this implies that a 10% increase in the price of Off-Peak Returns alone will result in a 3.0% reduction in the number of journeys made on this ticket type. Similarly, a 10% increase in the price of Singles and Returns will result in an estimated 5.6% reduction in the number of journeys made on these tickets.

6 CityRail Fares Model Development

RailCorp provided a copy of their current Fares Model used to predict the patronage and revenue impact of fare changes for the 2006/07 financial year. The model used conventional own-price fare elasticities which varied for each distance band/travel zone, and for peak/off-peak travel as presented in Table 11.

Table 11: Original CityRail Fare Elasticities

Distance / Zone	Peak Elasticity	Off-Peak Elasticity
< 20 km	-0.26	-0.34
20 – 45 km	-0.37	-0.72
> 45 km	-0.18	-0.39
Red, Green TravelPass	-0.26	*N/A*
Yellow, Pink TravelPass	-0.37	*N/A*
Purple TravelPass	-0.18	*N/A*
DayTripper	-0.18	*N/A*

Source: RailCorp.

Whilst the inclusion of off-peak elasticities provided some variation in elasticities for different ticket types (i.e. peak versus off-peak tickets), the same peak elasticities were applied to all other distance based tickets. Accordingly, the model did not capture the variation in fare elasticities for travel using single/return tickets and longer term periodicals or make any allowance for transfers between ticket types (i.e. under circumstances where there is a relative change in fare levels between ticket types).

To address these issues, the CityRail Fares Model was updated to reflect the elasticity estimates developed in this study. Accordingly, the model now uses the conditional and own-price elasticities from the perspective of CityRail ticket types, rather than the original model's perspective of the CityRail business.

In this case, the conditional elasticities were used to measure the loss (or generation) of journeys to (or from) competing modes of transport and suppressed/generated travel. The additional estimated shift in journeys for each ticket product to other products within CityRail were calculated using the difference between the total own-price elasticity and the conditional fare elasticity, applied to the change in fare for each product relative to all other products.

7 Discussion and Conclusions

The aim of this project was to generate a suite of fare elasticity estimates by ticket type elasticity estimates that could be used to model the patronage and revenue impacts associated with CityRail fare level changes.

The conventional own-price elasticity estimates reported in the literature are not suitable for this purpose, as they fail to include transfers with alternative ticket types as a legitimate customer response when relative ticket prices change. As such, while the use of own-price elasticities can effectively capture ‘leakage’ effects (i.e. transfers to competing modes and trip suppression associated with a fare increase), they fail to capture revenue changes associated with transfers to alternative ticket types.

The most recent study for the CityRail business that sought to develop ticket type elasticity estimates that included ticket type transfers was conducted more than a decade ago (i.e. Hensher and Raimond 1996). However, it is important to note that the full suite of ticket type elasticities developed in this report are not directly comparable with the Hensher and Raimond estimates. While the Hensher and Raimond ticket type estimates measure the proportional change in market share associated with a fare change, our ticket type estimates reflect the proportional change in demand associated with a fare change.

It is also significant to note that the suite of ticket type elasticities reported in this document were ‘anchored’ around the RailCorp ‘all day’ fare elasticity estimate for ‘medium’ trip lengths (i.e. between 29 and 59 minutes on-board). We note that the RailCorp estimates for ‘short’ (i.e. up to 25 minutes on-board) and ‘long’ trips (i.e. over 59 minutes on-board) are somewhat higher. If specific ticket type elasticities were required for either ‘short’ or ‘long’ trips specifically, we would recommend that our ticket type estimates be pro-rated to agree with the relevant ‘all day’ elasticity estimate.

Attachment A - Secondary Market Research

Previous International Rail Fare Studies

Oum et al (1990) note that generalising cross price elasticities is very difficult because they are highly sensitive to market-specific scenarios and do not stand up to comparison. For this reason, only previous studies on own-price elasticities are considered in reviewing international literature.

While there are countless sources for previous fare elasticity estimates, there are few meta-analysis papers that have compiled fairly comprehensive lists of elasticity estimates. These meta-analysis studies are the basis for the international literature review because they summarise the best existing studies of the time. The individual fare elasticity values reported in these studies were input into Figures 3 and 4. The key results of the international reviews, including United Kingdom (UK) and United States (US) specific studies, are discussed below.

Goodwin (1992) reviewed price elasticities for transport, in part, to determine the effect of increasing real fuel prices on demand for transport. The result of the review was that direct transport prices have a larger impact on demand than fuel prices, and long-run elasticities are higher than the short-run. Goodwin found an average long-run rail fare elasticity of -0.61 to -1.38.

Oum et al (1990) reviewed 70 original empirical studies from all over the world, mostly published in the 1980s in academic journals. The review focused on studies in major economic journals and generally avoided technical or government reports. As expected (refer Section 3.1.6, Table 1), the market demand elasticity for leisure travel on intercity rail (-1.40) was greater than the elasticity for business travel (-0.70). The elasticities reported for mixed purpose travel ranged from -0.11 to -1.54. The discretionary nature and higher value of time for off-peak trips was also reflected in a substantially higher elasticity for off peak trips (-1.00) than peak trips (-0.15) on intercity rail. The range of values for all day travel on intercity rail ranged from -0.12 to -1.80.

Both intercity rail travel and whole transit systems were included in the elasticity estimates reported by Oum et al. The whole transit system numbers included a range of -0.05 to -0.86 for rapid transit. The time of day values for peak (-0.0 to -0.29) and off peak trips (-0.32 to -1.00) across a transit system agree with the trends seen in rail travel.

In a further review, Oum et al (1992, p. 151) reported additional demand elasticities from discrete choice models. These ranged from -0.08 to -0.75 for urban rail fares. In this study, Oum et al also note that elasticities for rail are significantly affected by competing modes, therefore cross elasticities tend to be important in assessing the demand for rail travel.

In an effort to illuminate the benefits and costs of peak pricing for transport, Gillen (1994) reviewed the existing international literature on transit fare elasticities by different classes of user. While these are not rail specific, the estimated elasticities from previous studies reinforce the expected trends in fare elasticities listed in Section 3.1.6 Table 1. For example, the fare elasticities for 'work trips' ranged from -0.1 to -0.19 while the elasticities for 'shopping trips' ranged from -0.32 to -

0.49. Youth had the highest fare elasticity (-0.32), with working age adults having a moderate elasticity (-0.22), and those over 64 years old having the lowest elasticity (-0.14). In addition, the higher income class of user had a higher elasticity of -0.28 than the lower income users at -0.19, which most likely reflects the higher value of time and greater flexibility of high income users. Finally, the system-wide values reported by Gillen also reflect the higher value of time and lower discretion related to peak travel (-0.04 to -0.32) as compared to off peak travel (-0.11 to -0.84).

In 2004, the Transport Research Laboratory (TRL) compiled the results of both individual and previous meta-analysis studies to estimate fare elasticities for the UK and internationally (Balcombe 2004). The review found that elasticities vary significantly based on the time period of the study (short, medium, or long-term) and the specific circumstances in which each mode is operating. Table A.1 illustrates the mean values and ranges of fare elasticities found in the TRL review. The combined international and UK studies follow the same peak and off-peak trends already discussed.

Table A.1 Rail Fare Elasticities from TRL Report

Description	Mean Elasticity	Range from	Range to
Metro			
UK – short run	-0.30	-0.15	-0.55
Outside the UK – short run	-0.29	-0.13	-0.86
UK – short run – Peak	-0.26	-0.15	-0.35
UK – short run – Off peak	-0.42	-0.23	-0.63
UK – long run	-0.65	-0.61	-0.69
Suburban Rail			
UK – short run	-0.58	-0.10	-1.02
Outside the UK – short run	-0.37	-0.09	-0.78
UK – short run – Peak	-0.34	-0.27	-0.50
UK – short run – Off peak	-0.79	-0.58	-1.50
SE England – short run	-0.61	-0.10	-0.95
Outside SE England – short run	-0.55	-0.15	-1.02
Overall Rail*			
UK – short run	-0.46	-0.1	-1.02
Outside the UK – short run	-0.33	-0.09	-0.86
UK – long run	-0.65	-0.61	-0.69

**Note: Overall Rail combines estimates from metro, suburban and intercity rail service studies.*
Source: Balcombe 2004, p. 70.

The TRL considered 55 rail related studies in determining the overall fare elasticities for rail travel.[3] The mean fare elasticity for the UK over the short-run is

[3] This combines both metro, suburban and intercity rail studies.

-0.46, with non-UK studies having a -0.33 short-run elasticity. Rail fare elasticities in the UK are consistent with the expectations for short-run versus long-run elasticities, with a higher long-run elasticity (-0.65 compared to -0.46).

The TRL review also includes elasticities specific to the US. Hsing (1994, p. 308) included the price elasticity of demand for US rail services over time in a study of deregulating rail services. The fare elasticities steadily increased over time starting at -0.066 in 1961 to -1.057 in 1990. This likely reflects the increase in car ownership and incomes over time.

Previous Australian Rail Fare Studies

Table A.2 includes the previous studies on fare elasticities specific to Australia that were used for comparison in this study. The estimates from previous studies range from -0.043 to -1.103. Evidence from the Steer Davies Gleave study in Sydney reinforces the logic that short trips have more alternative options available and therefore a higher fare elasticity (from -0.29 to -0.78) than medium and long trips (from -0.08 to -0.36). This study and the Booz Allen Hamilton study in Brisbane both indicate that peak trips have a lower elasticity than off-peak trips. While the Hensher and Raimond study meets the expectation that commuters will generally have a lower sensitivity to fares (ranging from -0.08 to -0.529) than non-commuters (ranging from -0.043 to -1.103).

Table A.2 Rail Fare Elasticities for Australia

Description	Elasticity	Reference	Year	Location
Australia				
Rail demand and fare	-0.35	Luk & Hepburn	1993	Australia
Sydney				
Rail, Sydney commuting from outer suburban areas	-0.48	Hensher & Bullock	1979	Sydney
Short CBD Peak	-0.29	Steer Davies Gleave	1993	Sydney
Short CBD Off-Peak	-0.62	Steer Davies Gleave	1993	Sydney
Short Non CBD Peak	-0.78	Steer Davies Gleave	1993	Sydney
Short Non CBD Off-Peak	-0.66	Steer Davies Gleave	1993	Sydney
Medium CBD Peak	-0.19	Steer Davies Gleave	1993	Sydney
Medium CBD Off-Peak	-0.25	Steer Davies Gleave	1993	Sydney
Medium Non CBD Peak	-0.28	Steer Davies Gleave	1993	Sydney
Medium Non CBD Off-Peak	-0.36	Steer Davies Gleave	1993	Sydney
Long CBD Peak	-0.08	Steer Davies Gleave	1993	Sydney
Long CBD Off-Peak	-0.12	Steer Davies Gleave	1993	Sydney
Long Non CBD Peak	-0.18	Steer Davies Gleave	1993	Sydney
Long Non CBD Off-Peak	-0.21	Steer Davies Gleave	1993	Sydney
Train Single Commuter	-0.08	Hensher & Raimond	1996	Sydney
Train Single Non-Commuter	-0.093	Hensher & Raimond	1996	Sydney

Description	Elasticity	Reference	Year	Location
Train Off-peak Commuter	-0.123	Hensher & Raimond	1996	Sydney
Train Off-Peak Non-Commuter	-0.043	Hensher & Raimond	1996	Sydney
Train Weekly Commuter	-0.25	Hensher & Raimond	1996	Sydney
Train Weekly Non-Commuter	-0.691	Hensher & Raimond	1996	Sydney
Train TravelPass Commuter	-0.529	Hensher & Raimond	1996	Sydney
Train TravelPass Non-Commuter	-1.103	Hensher & Raimond	1996	Sydney
Train Commuter (general)	-0.186	Taplin et al	1999	Sydney
Train Single	-0.218	Taplin et al	1999	Sydney
Train Weekly	-0.093	Taplin et al	1999	Sydney
Train Travelpass	-0.196	Taplin et al	1999	Sydney
Brisbane				
Own Mode Elasticity Peak	-0.28	Booz Allen Hamilton	2002	Brisbane
Own Mode Elasticity Off-Peak	-0.53	Booz Allen Hamilton	2002	Brisbane
Own Mode Elasticity All day	-0.38	Booz Allen Hamilton	2002	Brisbane

Source: Compiled by Booz and Company

Attachment B - Stated Preference Survey

IPART Fares Survey

Interviewer:	Date:	Time:
Location (Station name):		

"Hello, I'm undertaking some market research for the Independent Pricing & Regulatory Tribunal. Would you be prepared to answer some questions about the trip you are about to make? The questions will take between five and ten minutes. "

1. **How long will you be on the train? ____________________ minutes**
   (if less than 20 minutes or greater than 40 minutes terminate interview and thank them for their time)

2. **What ticket type are you travelling on today?**

Rail Ticket Type	
1. Single	
2. Return	
3. Off-Peak Return	
4. Day Tripper	
5. RailPass (Weekly)	
6. TravelPass (Weekly)	
7. Flexipass (28 to 366 days)	
8. Staff pass (terminate interview - thank them for their time)	
9. Pensioner Excursion Ticket (terminate interview - thank them for their time)	
10. Other – (terminate interview – thank them for their time)	

3. **Where will you get off the train on your trip today?**

1.	Central	5.	Town Hall
2.	Wynyard	6.	Museum
3.	Circular Quay	7.	Kings Cross
4.	St James	8.	Other station (please specify)

4. **What time is the train due to leave this platform?**

1.	Peak (6.30am – 9.00am)	
2.	Off peak (all other times)	

5. **What is the purpose of this journey, is it for …? (*circle one number only)***

1.	Work commute	5.	HOME
2.	Work related	6.	Personal business
3.	Education	7.	Social/Recreation
4.	Shopping	8.	Other

(if answer is "Home" circle "Home" and ask "purpose" as per the above items and circle "purpose" also)

6. **Are you eligible for a concession ticket on suburban trains?** 1. Yes 2. No

"I would now like you to choose between these two train services, A and B. In making your choice please assume you are travelling for the same purpose and on the same ticket type as you are today". Refer to Notes:

- **Point to Rail Service A**
- **Explain the various attributes of Rail Service A**
- **Point to Rail Service B**
- **Explain the various attributes of Rail Service B**

Compare the *attributes* of each service for the respondent
"**Please assume that everything else would be the <u>same</u> for the two journeys"**

'Which service would you use?' *Circle A or B below then move on to next card. Do all 12.*

Stated Preference Questions – ("within rail choice" i.e. Rail A v Rail B)

Card Number	Response	
1.	A	B
2.	A	B
3.	A	B
4.	A	B
5.	A	B
6.	A	B

Card Number	Response	
7.	A	B
8.	A	B
9.	A	B
10.	A	B
11.	A	B
12.	A	B

7. **If your current ticket type was no longer available, which ticket type or mode would you choose to complete the <u>rail</u> portion of your journey?**

Rail Ticket Type	
1. Single	
2. Return	
3. Off-Peak Return	
4. Day Tripper	
5. RailPass (Weekly)	
6. TravelPass (Weekly)	
7. Flexipass (28 to 366 days)	
Other Mode	
8. Bus (on a bus only product)	
9. Ferry (on a ferry only product)	
10. Walk or cycle	
11. Car or motorbike	
12. Not Travel	

To determine how representative our sample is, could you tell me:

8. **What year were you born?** ________________

(Interviewer: if not recorded either mark N/R or make an estimate (e.g. 1. <18 2. 18-24 3. 25-34 4. 35-44 5. 45-54 6. 55-64 7. 65 and Over)

9.

Your occupation:

1. Full-time Employed
2. Part-time/Casual employed
3. Studying Full/Part time
4. Pensioner
5. School student
6. Other

10. How often do you use CityRail services?

Frequency of Travel	
4 or more days in a week	
1 – 3 days per week	
1-2 days per month	
Less than once per month	
First time users/Once-off	

11. Gender 1. Male 2. Female

12. Personal Income

Personal Income – annual $	
Under 3,000	
3,000-12,000	
12,001 – 30,000	
30,001 – 50,000	
50,001 – 70,000	
70,001 – 120,000	
Over 120,000	
Refused	

13. Household Income

Household Income – annual $	
Under 12,000	
12,001 – 30,000	
30,001 – 50,000	
50,001 – 70,000	
70,001 – 90,000	
90,001-120,000	
Over 120,000	
Refused	

For checking purposes, could you give me your first name and day time telephone number so my supervisor can confirm I did this interview?

Name... Tel #...

Thank You

Attachment C - Stated Preference Design Template

Stated Preference Survey template

Q.2	SP No.	Stated Preference A: Frequency (mins)	Stated Preference A: MIVT (mins)	Stated Preference A: Ticket Price $ AUD	Stated Preference B: Frequency (mins)	Stated Preference B: MIVT (mins)	Stated Preference B: Ticket Price $ AUD	Fractional Factorial survey design: Freq	Fractional Factorial survey design: MIVT	Fractional Factorial survey design: Fare
Flexipass (28 to 366 days)										
RailPass (Weekly)	1	6	30	2	6	25	2.5	0	-1	1
	2	8	15	3	15	20	2	1	1	-1
	3	4	40	2.5	10	30	4	1	-1	1
	4	4	30	2	10	25	3	1	-1	1
	5	10	30	3	4	40	2	-1	1	-1
	6	15	30	2.5	8	25	5	-1	-1	1
	7	10	10	5	4	25	2.5	-1	1	-1
	8	6	30	5	6	40	2.5	0	1	-1
	9	6	10	3	6	25	2	0	1	-1
	10	10	15	2.5	4	20	2	-1	1	-1
	11	6	20	2.5	6	15	4	0	-1	1
	12	15	25	2.5	8	10	4	-1	-1	1
TravelPass (Weekly)	1	6	30	2.5	6	25	3	0	-1	1
	2	8	15	3.5	15	20	2.5	1	1	-1
	3	4	40	3	10	30	4.5	1	-1	1
	4	4	30	2.5	10	25	3.5	1	-1	1
	5	10	30	3.5	4	40	2.5	-1	1	-1
	6	15	30	3	8	25	5.5	-1	-1	1
	7	10	10	5.5	4	25	3	-1	1	-1
	8	6	30	5.5	6	40	3	0	1	-1
	9	6	10	3.5	6	25	2.5	0	1	-1
	10	10	15	3	4	20	2.5	-1	1	-1
	11	6	20	3	6	15	4.5	0	-1	1
	12	15	25	3	8	10	4.5	-1	-1	1
Day Tripper	1	6	30	2	6	25	2.5	0	-1	1
	2	8	15	3	15	20	2	1	1	-1
	3	4	40	2.5	10	30	4	1	-1	1
	4	4	30	2	10	25	3.5	1	-1	1
	5	10	30	3	4	40	2	-1	1	-1
	6	15	30	2.5	8	25	5	-1	-1	1
	7	10	10	5	4	25	2.5	-1	1	-1
	8	6	30	5	6	40	2.5	0	1	-1
	9	6	10	3	6	25	2	0	1	-1
	10	10	15	2.5	4	20	2	-1	1	-1
	11	6	20	2.5	6	15	4	0	-1	1
	12	15	25	2.5	8	10	4	-1	-1	1
Off-Peak Return	1	6	30	2	6	25	2.5	0	-1	1
	2	8	15	3	15	20	2	1	1	-1
	3	4	40	2.5	10	30	4	1	-1	1
	4	4	30	2	10	25	3.5	1	-1	1
	5	10	30	3	4	40	2	-1	1	-1
	6	15	30	2.5	8	25	5	-1	-1	1
	7	10	10	5	4	25	2.5	-1	1	-1
	8	6	30	5	6	40	2.5	0	1	-1
	9	6	10	3	6	25	2	0	1	-1
	10	10	15	2.5	4	20	2	-1	1	-1
	11	6	20	2.5	6	15	4	0	-1	1
	12	15	25	3.5	8	10	5	-1	-1	1
Return	1	6	30	2	6	25	2.5	0	-1	1
	2	8	15	3	15	20	2	1	1	-1
	3	4	40	2.5	10	30	4	1	-1	1
	4	4	30	2	10	25	3	1	-1	1
	5	10	30	3	4	40	2	-1	1	-1
	6	15	30	2.5	8	25	5	-1	-1	1
	7	10	10	5	4	25	2.5	-1	1	-1
	8	6	30	5	6	40	2.5	0	1	-1
	9	6	10	3	6	25	2	0	1	-1
	10	10	15	2.5	4	20	2	-1	1	-1

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