Understanding Market Segments Captured through Data Collection Using a Transit Passenger Information Website

Lorelei Schmitt[1], Sally Harris[2],

[1] Department of Civil Engineering, Monash University, VIC 3800, Australia

[2] Marketing and Product Development, Public Transport Victoria, VIC 3800, Australia

Email for correspondence: lorelei.schmitt@monash.edu

Abstract

The rapid development of technology has brought with it increased use of apps and other internet-based tools to assist travellers in planning their journeys, particularly public transport journeys. Such tools also offer transit operators a potential means of gaining a better understanding of their customer needs. While published research acknowledges the importance of these tools for travellers, little research has examined their efficacy as a conduit to conduct research. In the present study, data was collected through a poll which was presented alongside the results of a journey planner search on a Transit Passenger Information Website (TPIWS) in Melbourne. Those who responded to the poll were then invited to provide their email addresses to fill in a survey following their travel. A total of 3,537 polls were submitted and 658 follow up surveys completed. In this paper, the sample population is compared to the wider Melbourne public transit user population to provide perspective as to which market segments respond to research through a TPIWS interface. A description of the benefits and challenges associated with the research method is also offered. While the experimental method of data collection yielded a reasonable number of responses and achieved the aims of the research, some lessons were learnt that may guide future use of TPIWS to conduct research.

Keywords: travel planning websites, TPIWS, research methods, market segments, Advanced Traveller Information Systems (ATIS)

1. Introduction

Rapid advances in technology have yielded improved information tools for travellers which are often referred to collectively in Advanced Traveller Information Systems (ATIS). Such tools include improved transit planning websites, applications, variable message services and other tools to assist planning and undertaking travel. While ATIS are generally regarded to be important, with a number of studies exploring the likely users of and implications of development of ATIS, less research is published about using ATIS as a mechanism for conducting research.

This paper explores the efficacy of using one ATIS, a Transit Passenger Information Website (TPIWS) in Melbourne to undertake research. The study involved offering a poll in the journey planner section of the TPIWS which was partnered with a follow up survey. The paper seeks to provide lessons learnt on the technological viability and challenges associated with this engagement mechanism as well as analysis of which market segments were captured through this research design. First a review of literature is provided in the 'Research Context' section. This is followed by a description of the 'Method' used, including

a discussion of obstacles encountered in undertaking the study. The Results section identifies which demographic groups were captured, comparing this with the wider transit user population in Melbourne. The Discussion section provides a number of inferences on the use of travel planning websites as a means of data collection, including identification of the associated advantages and disadvantages of using a TPIWS for capturing different market segments. Finally some specific suggestions relating to the use of trip planning websites as a mechanism for data collection are offered.

2. Review of Literature

As a broad term, ATIS refers to information tools that could assist travellers across a number of travel modes including cars and public transport. Much of the research concerning ATIS, refers to ATIS across modes; however, some studies are specific to one mode. For example, research by Toledo and Beinhaker (2006) is specific to automotive ATIS, while Tam and Lam (2005) focus on public transport ATIS. Few of the studies focusing on ATIS are specific to TPIWS. As such, this review of literature begins by providing an overview of the market penetration of ATIS which is followed by an overview of which market segments use ATIS. TPIWS are then examined generally which is followed by a review of what little research has been undertaken using TPIWS followed by a short description of Melbourne's TPIWS to provide the context for the Method section. Finally, at the end of the literature review, a short review of guidance about undertaking research online is provided.

2.1 Market Penetration of ATIS

ATIS use has increased rapidly with advances in technology and the growing penetration of internet use. Peirce and Lappin (2003) noted that when they undertook their research of Seattle households in 2000, only 8% of households surveyed had high-speed internet connections at home. The researchers found growth in usage and awareness of Advanced Traveller Information Systems (ATIS) websites since 1997 with some of the major public-sector traffic and transit websites having awareness levels of just over 25 percent. However they found that frequent use of the sites was still limited to a small group of dedicated users, but they predicted it would continue to grow with rises in "broadband" internet access (Peirce and Lappin 2003). Heavy users of information, defined as those who use travel information sources at least five times a week, were more likely to be regular commuters, have a tertiary education, be salaried employees, and be workplace internet users and mobile phone users (Peirce and Lappin 2003). Given that 10 years have passed since this study, it seems likely that market penetration of ATIS has grown substantially since.

2.2. Who Accesses ATIS

Zhou et al (2004) argues that targeted marketing campaigns that recognise distinct market segments instead of homogenous groups may be advantageous. Previous studies have shown that use of ATIS differs between socio-demographic groups and trip types. A number of authors provide comprehensive overviews of these studies in terms of which specific studies have found various associations (refer: Tam and Lam 2005; Chorus et al. 2006; Chorus et al. 2006; Polydoropoulou and Tsirimpa 2010). Socio-demographic characteristics that have generally been shown to be associated with higher rates of information acquisition include:
- Male
- Highly educated
- High income
- Professional
- Frequent internet users

- Mobile phone owners
- Countries and regions

Trip characteristics that are associated with higher rates of ATIS use include

- Business trips
- Commute trips
- Time-sensitive trips
- Expected congestion of travel time
- Peak hour trips

Farag and Lyons (2012, p.90) explain that "respondents who find it difficult to consult public transport information online often do not have internet access at home, are relatively older, and less educated". It is worth noting that there have been some, though not extensive, inconsistencies in findings (refer Tam and Lam 2005 for more information). For example, Farag and Lyons (2012) found females access transit information more often than males prior to undertaking travel. As noted by Tam and Lam (2005) inconsistent findings have been found related to age in terms of information-seeking. Besides socio-demographic and trip type correlations, attitudes and perceptions have been identified as important to undertaking travel (e.g. Farag and Lyons 2012) and Chorus et al (2006) describes how a cost and benefit evaluation process predicts access of ATIS.

Interestingly, Khattak et al. (2008) found that higher numbers of information sources accessed were significantly associated with an increased likelihood of adjusting travel (changing route, time, or mode, or cancel trip and in particular, the Internet was associated with the greatest tendency to change travel decisions, followed by radio and television (Khattak et al. 2008).

2.3 Transit Passenger Information Websites (TPIWS)

As internet usage grows, web-based resources are becoming increasingly used for information retrieval. Public transit authorities often provide and maintain information for potential public transit travellers though TPIWS. Much of the research concerning TPWIS' (though other names for such websites are sometimes used) is about the design of such websites (e.g. Currie and Gook 2009) or is bundled with studies about ATIS generally in terms of the likely users of ATIS and/or the potential impacts of ATIS on mode choice (e.g. Chorus et al. 2006; Zito et al. 2009).

Worldwide, one of the most common tools provided on TPIWS is the journey planner (Currie and Gook 2009). Also referred to as 'transit trip planners', the tools can be utilised to identify transit services available on the basis on their origin, desired destination, time of travel and other characteristics (for example, least number of transfers). This type tool was the interface in which the present research was conducted. Research by Trépanier, Chapleau et al (2005) indicated that in their study area (Laval, Canada), more than 70% of the visitors to the TPIWS had used the journey planner tool before. In their study, which is now eight years old, the authors noted that use of TPIWS-based journey planners is growing "faster than the growth of internet usage itself" (Trépanier et al. 2005, p.100). Moreover, Currie and Gook (2009, p.148) argue that "TPIWS systems will increasingly act as the public interface of transit agencies worldwide". Thus, it would seem likely that an even greater percentage of TPIWS users would use journey planners now, making the present study, which discusses how a very popular TPIWS interface in Melbourne was used for research, potentially quite important.

2.4 Undertaking Research Using TPIWS

No published research was found specifically about using journey planners, or TPIWS more generally, as an interface to conduct market research via online surveys. However, Trépanier, Chapleau et al (2005) analysed data that is collected as part of operating a journey planner tool (a/k/a "trip planner"). They studied the potential to use the journey planner log files to inform transport planning. The log files capture the information about what journeys are being researched by different users. From their work the authors argue that, "log files can be useful for identifying new locations to be accessed by a transit system, for better understanding user behaviours, and for guiding updates of the geographic information system (GIS) and the trip planner itself" (Trépanier et al. 2005, p.79). Their research does provide some pertinent lessons. In terms of journey planner behaviour, the authors found that the Internet user usually performs more than one calculation during a visit and that the trip planner is used to access destinations that are more difficult to reach by public transit. They also note that not all transit users have internet access, use journey planners on a regular basis, and that trips planned are not always actually undertaken. The journey planner tool is particularly advantageous for complex transit networks that often require several transfers or when areas are not well serviced by PT. In terms of market segments, the researchers found that the journey planner was most often used by regular commuters and workers.

Thus, no research was found about using TPIWS to conduct market research via online surveys. However this does not necessarily mean that TPIWS have not been used in such a way. By chance, when one of the present study's researchers was travelling in Boston she observed that the Massachusetts Bay Transport Authority (MBTA) had a survey on their TPIWS. Their survey was about the use of real time subway departure LED screens that they were trialling at select subway departure platforms. Thus it seems transit agencies may be occasionally using such interfaces to interact with the public but little, if anything, has actually been published about the practice.

Given that no research could be identified about using TPIWS for data collection, a review of literature was also undertaken about best practices for online research more generally. Much of this review has been excluded from this paper in the interest of brevity. However, a short summary of this is provided in the next section.

2.2.1 Conducting Online Research

Research is increasingly being conducted through the internet, particularly in the form of web-based surveys due to a number of perceived advantages over traditional, paper-based surveys and other methods. Some of the generally recognised benefits of web-based surveys are that completed questionnaires can be returned more quickly and at a lower cost than by other means (Couper et al. 2001; Umbach 2004). Online surveys are also more dynamic than paper surveys and can be randomly ordered, catered to different subgroups, or include features such as skip questions (Umbach 2004).

As internet usage has continued to grow over the last 20 years, the issue of web-based non-response bias is continually diminishing as the wider population is increasingly represented on the internet. Some statistics suggest that approximately 78% of Australians now use the internet with a high annual rate of new subscribers (14.8%) and rapid turnover from slower download technology to faster download avenues (e.g. mobile and fixed wireless) (Australian Bureau of Statistics 2011; Miniwatts Marketing Group 2011).

Polls and online surveys can be beneficial to respondents by offering an avenue to express opinions quickly and easily (U.S. House of Representatives 2011). Likewise polls can

benefit the organisations offering them by providing public input in a low-cost way that requires little administration, particularly in comparison with processing individual written letters. 'Poll-specific' advice is to consider showing graphical representations of the results for respondents (Klaas 2003; U.S. House of Representatives 2011).

The present paper documents research using a TPIWS to conduct a poll and follow up survey. Communicating the lessons learned through this study's data collection may inform the way in which transit agencies, or government agencies more widely undertake online surveys on their public information websites. Before describing the research method in more detail however, an overview of Melbourne's TPIWS is provided.

2.2.1 Melbourne's TPIWS

Melbourne's TPIWS which is managed by Public Transport Victoria (PTV) is a very popular information dissemination website. The website offers timetables and route maps for transit services across the state of Victoria, a journey-planning tool and a variety of other transit-related information. There were more than 500,000 unique visitors each month to the journey planner section of the website during October and November 2012 (Nielsen NetRatings 2013). During the study period, October and November 2012, the PTV website had approximately 4.8 million visits (Nielsen NetRatings 2013) including 2.2 million visits to the journey planner section of the website and 3.7 million journey plans (Nielsen NetRatings 2013; PTV Journey Planner 2013).

In a review of best practices for TPIWS design, Cook & Currie (2009) scored Melbourne's TPIWS the best-designed TPIWS out of four websites evaluated, though it is worth noting that website has since been upgraded and re-designed.

2.2 Research Aims

The journey planner poll and follow-up survey had two major aims which were to investigate unfamiliar public transport travel and to evaluate the efficacy of using a TPIWS as an interface to undertake research. The former objective is the subject of another conference paper (refer Schmitt et al. 2013 for more information). The present paper addresses the latter research objective.

3. Method

3.1 Participants and Procedure

Prior to the research being undertaken, ethical approval to undertake the research was obtained from Monash University's Human Research Ethical Committee.

The poll was available on the journey planner section of the website that PTV administers over a period of six weeks during October and November 2012 but the email survey was open until January 2013 due to some trips not being completed until this time. The journey planner is used by inputting an origin, destination and desired time and date of travel. Data was collected by presenting a poll to a random sample[1] of Journey Planner users when their

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[1] During the study period, for every fourth Journey Planner search undertaken was offered the poll, but if completed, a JavaScript cookie was sent to the associated computer so that the person would not be offered the poll again.

search results were provided. If a person opted to fill in the poll and pressed the 'submit' button, their answers to the questions along with the Journey Planner itinerary searched were saved and a new browser window would then appear for the user[2]. The new browser window included a thank-you to the individual for submitting the poll and an invitation to provide their email address to complete a post-travel follow-up survey in exchange for the chance to win a prize of a $200 voucher to use at local Australian businesses, or one of two second prizes of $50 vouchers.[3] The initial poll could be filled in by anyone but in order to fill in the follow-up survey one had to be 18 years of age or older. Those that provided their email addresses were sent an email with a link to the follow-up survey one day after the itinerary for which they searched, and one reminder email. An overview of this research process, from the participant's perspective, is depicted in Figure 1.
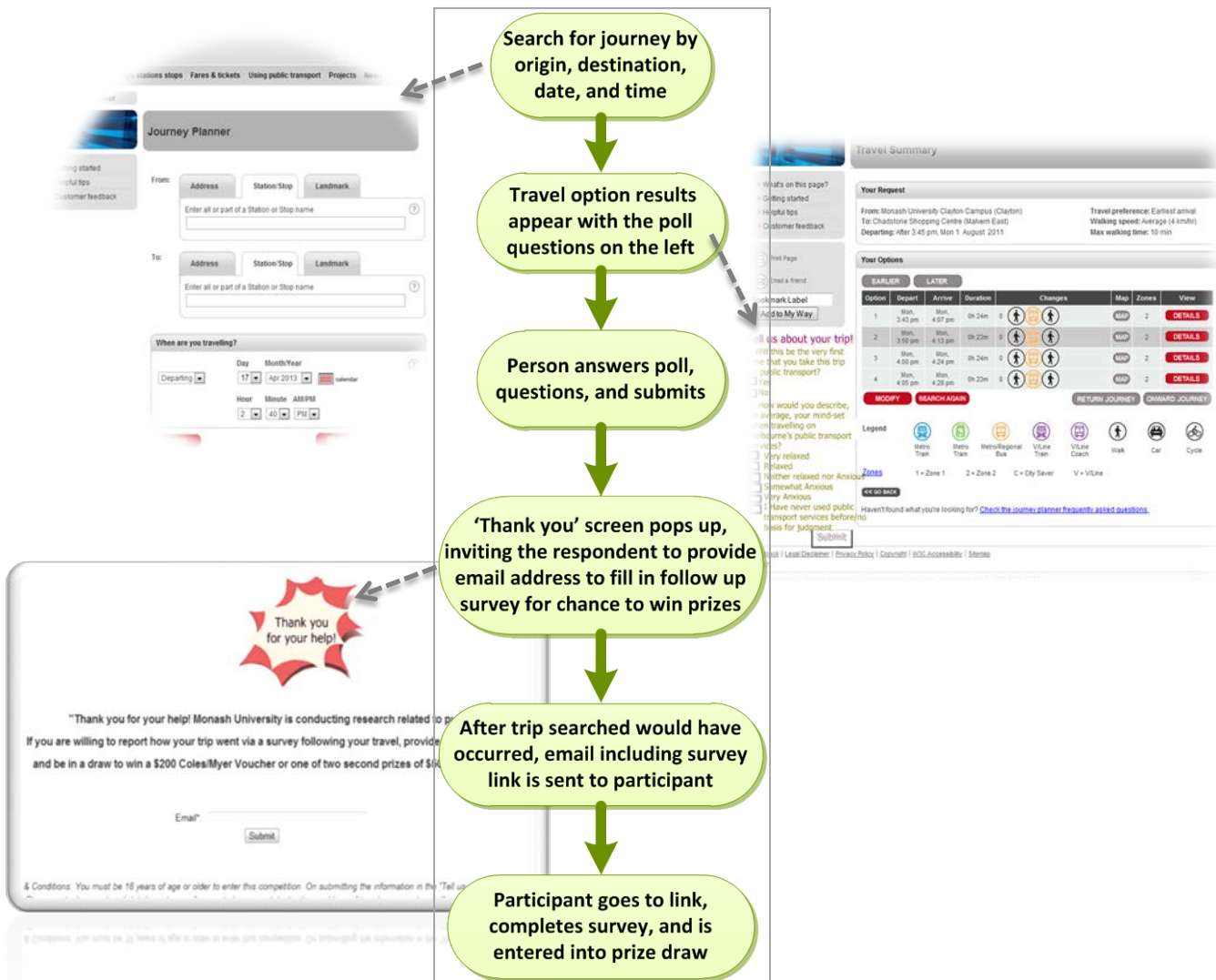

Figure 1: Research process from the perspective of a participant

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[2] It is surmised that in many instances this window may have been blocked by 'pop-up blockers'. Hence for the new browser to appear for many participants, they would have had to notice the blocked pop-up and manually instruct their browser to allow the new window. This issue was revealed during the research method testing phase and was unable to be changed due to the security settings required on the website.

[3] 'Terms and conditions' which were designed to comply with relevant statutes such as the Gambling Regulation Act 2003 and the Gambling Regulation Regulations 2005.

3.1. Poll and Follow up Survey Questions

The poll, which was embedded on the page showing journey planner search results, asked participants if it would be their first time taking the journey by public transport and about how their expectations of using Melbourne's public transport have been met through their experiences.

The follow-up survey was prefaced by an explanatory statement and included questions about demographics, usual travel habits, respondents' recent trip experience, and whether the person would use public transport for that journey again. Some of the questions had multiple-choice options and allowed for only one answer while other questions were multiple-choice but allowed multiple responses. Trip experience questions were asked with a 5-point likert-style rating scale.

4. Results

In this section, the sample population from the journey planner poll and follow-up survey is described, beginning with the overall response rate, then through comparisons of the sample population to Melbourne's wider public transport user population, and in the final section, by presenting other characteristics of the sample population.

4.1. Response Rate

The initial poll attracted 3,537 responses which included:
- 2,377 (67%) respondents answered the poll but did not provide an email address to complete the follow up survey (though it is noted that a number of the respondents may not have noticed that there was a pop-up being blocked)
- 486 respondents completed the poll, provided their email address but never completed the follow-up survey
- 658 respondents, who completed the poll, were over the age of 18 and completed the survey at least to the third question asking about typical personal modeshare (the cut-off point for inclusion in data analysis).

4.2. Comparison with Melbourne's public transport population

For the purposes of this paper, Melbourne's public transport population, who the sample population will be compared against in the first stage of analysis, is based on an annual origin-destination survey undertaking by PTV. Each year this survey targets a different public transport mode. The mode surveyed in 2012 was trains and is the dataset used for the present analysis. This data has been weighted by PTV to be representative of the wider Public transport user population. Origin-destination data is collected on weekdays, Monday-Thursday.

4.2.1 Age and Gender

The demographic characteristics of the journey planner sample were compared against that of Melbourne's population of public transport users. Chi-square tests confirmed that there was a significantly greater proportion of females to males represented in the Journey Planner sample x^2 (2) = 8.41, p< .05. Statistical tests were not undertaken for the age groupings due to slight differences in how ages were grouped in the journey planner survey versus the origin-destination survey; however it is clear from Table 1 that the samples were quite differently represented in terms of age with 61% of the Journey Planner respondents being 30 years old or younger.

Table 1: Sample Characteristics (Socio-demographic)

Respondent Characteristics	Journey Planner Population (n=658)	PT Population (n=26,303)
Gender*	Proportion of Sample (%)	Proportion of Sample (%)
Male	46%	48%
Female	53%	49%
No response	1%	3%
Age[4]		
<30	61%	~49%
31-60	36%	~45%
61+	3%	~6%

Note: Journey planner characteristics that were significantly different from the public transport population represented by * for p<.05 and ** for p<.01

4.2.2 Trip Characteristics

Chi-square tests confirmed that the journeys captured through the Journey Planner survey included a significantly higher proportion of journeys related to leisure/errands/shopping/fitness-related (24%), personal business/healthcare (10%) and to visit friends and relatives (12%) than the general public transit population, x^2 (6) = 433.89, p < .01. However, it should be noted that this may be partly attributable to the fact that origin-destination data is only collected on weekdays, Monday – Thursday. It may also be that the website is used to plan unfamiliar rather than familiar journeys which are taken more regularly.

Table 2: Trip Characteristics: Journey Purpose**

	Journey Planner Population (n=658)	PT Population (n=26,303)
Journey Purpose[5]**	Proportion of Sample (%)	Proportion of Sample (%)
Education	19%	20%
Employment	35%	59%
Leisure/Errands/Shopping/Fitness-Related	24%	8%
On holiday/Visiting Melbourne	1%	1%
Personal business/Healthcare (for self or other)	10%	6%
Visiting Friends and Relatives	12%	6%

Note: Journey planner characteristics that were significantly different from the public transport population represented by * for p<.05 and ** for p<.01

4.3. Other Journey Planner Sample Characteristics

Many of the questions asked on the origin-destination survey and the Journey Planner survey differed so that no other characteristics can be reasonably compared between the

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[4] Age groupings were different between samples so numbers are approximate and statistical tests were not undertaken

[5] Trip purposes were worded slightly differently between the origin-destination survey and Journey Planner survey.

two datasets. However, to provide further context on the sample population captured through the Journey Planner survey, this section provides an overview of the other characteristics of the Journey Planner sample, but without a comparison population.

4.3.1 Respondent Characteristics

Table 3 shows a number of respondent characteristics in terms of employment, marital status, and household type. Most of the respondents were work full-time (43%) and almost a third study full-time (29%)In terms of marital status, the largest proportion of respondents identified as being single (59%), followed by 'married/defacto' (38%). Perhaps reflecting the young demographic captured, a large proportion of the sample either lived at home with parents (25%) or with friends or flatmates (24%). The sample had a diverse range of incomes with the largest group (27%) identifying as having a personal income of $1- $399 per week ($1 - $20,799 per year).

Table 3: Respondent Characteristics (Socio-demographic)

Respondent Characteristic	Proportion (%)[6] (n=658)
Employment	
Working Full Time	43%
Studying Full Time	29%
Working Part Time	17%
Unemployed / Seeking Work	6%
Retired	3%
Studying Part Time	2%
Marital Status	
Single	59%
Married / defacto	38%
Separated	2%
Divorced	2%
Household type	
Living at home with parents	25%
Living with friends or flatmates	24%
Couple (with no children living at home)	19%
Couple with children at home	14%
Single person household (including single, divorced and widowed)	12%
Other	5%
Single parent family with children living at home	1%
Income	

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[6] Percentages reflect percentage of respondents that provided an answer to each question. Due to rounding percentages will not always sum to 100%.

$1- $399 per week ($1 - $20,799 per year)	27%
$1,000 - $1,399 per week ($52,000 - $72,799 per year)	15%
$400 - $699 per week ($20,800 - $36,399 per year)	12%
$700 - $999 per week ($36,400 - $51,999 per year)	12%
$1,400 - $1,999 per week ($72,800 - $103,999 per year)	10%
Nil or negative income	5%
$2,000 or more per week($104,000 or more per year)	5%

The typical mode-use of participants was explored through the question, "in an average week, what percentage, approximately, of your travel (in terms of distance) do you complete by each of the following modes?" In order to interpret the modal split of the sample population, these numbers were grouped so that someone using a mode for 40% or more of their travel in a week was deemed as 'committed to that mode'. The results from this grouping are provided in Table 4 and indicated that the greatest proportion of respondents were 'committed' public transport users (66%), followed by 'committed' car drivers (21%).

Table 4: Respondent Characteristics (Modal Split of Sample Population)

Mode	Percentage of sample 'committed' to each mode (%) (n=658)
Public Transport	66%
Car	21%
Walk	7%
Bicycle	5%
Taxi	1%
Motorbike	0%

4.3.2 Other Trip Characteristics

The time of trips was captured when the survey participants did their initial search through the journey planner. These journey times have been grouped into 'peak' and 'off-peak' trips and a summary of the proportion of trips occurring during peak and off-peak times is provided in Table 5.[7] The results indicate that the journey planner research captured a large number of off-peak trips (58%).

Participants were also asked to identify which public transport modes they used in their travel. Because public transport journeys often involve the use of multiple services,

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[7] There are two caveats associated with this data. Firstly it is possible that people searched for a certain time but did not end up travelling at that actual time, particularly for cases in which someone was more interested in figuring out which route to take (e.g. which services to transfer onto) rather than the timings at which the services run. Secondly, the peak and off-peak grouping has been somewhat simplistic in that it has not taken into account locations; so someone's trip which occurred in the counter-peak direction but during peak time would still be categorized as a peak trip.

participants were able to select more than one mode. For this reason the percentages shown in Table 5, which provides an overview of modes used, will not add up to 100%, but rather reflect the percentage of participants indicating use of each mode. The results indicate that a large proportion of the public transport travel was train travel (74% of journeys involved use of a train).

Table 5: Other Trip Characteristics (Time of Day and PT Modes Used)

Characteristic	Proportion (%)[8] (n=658)
Time of Day	
Off-peak	58%
Peak (Monday –Friday either 7:30am - 9:30am or 3:30pm – 6:30pm)	42%
PT Modes Used for Travel researched using JP	
Metro Train	74%
Tram	25%
Bus/Smartbus	21%
Regional bus	1%
Other (included car, walking & Skybus)`	1%
Nightrider bus	0%
Regional train (V/Line)	0%
Regional coach (V/Line)	0%

5. Discussion

The use of ATIS has been growing rapidly alongside advances in technology and increasing penetration of the internet. The literature review suggested that ATIS tend to be used more frequently by high-earning, internet-dependent, and highly educated market segments and especially for travel related to commuting, business, which may be particularly time-sensitive. It was also revealed that there does not seem to be any published studies documenting use of TPIWS for undertaking research.

Overall, the Journey Planner was a successful method for collecting data, yielding a large number of poll responses (n=3,537) and a substantial number of completed follow up surveys (n=658), representing an 18.6% response rate. The market segments captured through the research did not completely align with those that tended to be associated with high use of ATIS as reviewed in section 2.2. In particular, travel related to employment seemed to be under-represented. However, as revealed in the review of literature, there were some inconsistencies associated with ATIS market segmentation in past studies. In particular, the correlation between age and use of ATIS was inconsistent. The present study had high-responsiveness by a young demographic which is consistent with research by Polydoropoulou and Tsirimpa (2010, p.739) in which they explain "Traveler's [sic] age significantly influence systems choice, since as it increases, the probability of choosing traffic information web sites and wireless devices is decreasing. These systems require familiarity with current technology." Thus the responsiveness of the younger demographic may have reflected the high internet usage associated with younger populations who have grown up in the internet age. The high response rate by a younger demographic may have also been associated with the enticements, which in this case were not large and only obtainable via a

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[8] Percentages reflect percentage of respondents that provided an answer to each question. Due to rounding percentages will not always sum to 100%.

raffle. Perhaps the low value was only attractive to younger people who, in many cases, tend to have less financial stability than older market segments.

Despite the success of the journey planner poll and follow-up survey, there were also some limitations to the findings and aspects that could be improved. A number of questions related to personal and trip characteristics were not asked in the same way in the Journey Planner research as they were in the overall public transport population survey undertaken annually in Melbourne, (the origin-destination survey) so it was difficult, and in some instances, impossible, to compare some sample characteristics. It would be beneficial for future surveys on TPIWS to have socio-demographic and other questions that are consistent with other surveys so that the sample populations can be compared.

Another point worth mentioning is that the origin-destination survey was only undertaken on weekdays, and for 2012, on trains. In comparing the journey planner population and the origin-destination population, it is worth considering that there could be some differences in socio-demographic trends between the population of train users and the more modally-diverse Journey Planner respondents.

As identified by Umbach (2004) there are a number of bias associated with online sampling including coverage sampling, sampling error, measurement error, and non-response bias. Despite the increasing access of internet among the wider population, it is likely that some of these biases may have occurred. In particular it seems likely that the latter two types of error would have resulted due to a challenge associated with use of the "pop up" browser (where participants were invited to provide their email address to complete the follow up survey. This method was selected as the preferred mechanism to engage with participants following poll submission in order to minimise adverse effects on journey planner users (by retaining their search results in a very apparent way) and meet other objectives of the study, specific to journeys planned. However, due to the prevalence of unwanted "pop ups" most anti-virus/spam software prevents these from showing. This likely reduced response rate as users would have had to manually disable pop-up blockers. This may have impacted the demographic of the sample collected. Noticing and disabling a blocked pop-up is a somewhat advanced internet response that may have been more commonly undertaken by younger TPIWS users, who grew up with the internet. Indeed a number of resources confirm the disadvantages of pop-ups in undertaking online research. The United States' House of Representatives Chief Administrative Officer's (2011) document, "Suggested Web Site Best Practices" advises that political offices should consider the inclusion of polls or surveys on their websites, but that pop-up windows should not be used unless there is substantial reason to have them (such as to look up information to fill out forms such as postal codes or calendars). Likewise, Demographix Ltd (2011) also cautions against pop-up surveys because they are often blocked.

Future research using the journey planner section of a TPIWS may therefore benefit from a different mechanism of engagement. For example, pressing the 'submit' button could have just changed the existing browser to the new screen but with two buttons displayed such as:
- "Return to results now"
- "Submit email address, then return to results"

Alternatively, for other research objectives, recruitment advertisements could be placed on the homepage of the TPIWS. This could, perhaps avoid the 'pop-up' issue altogether and may yield more responses, particularly from those that use TPIWS websites but not the trip planner portions in their visits.

An interesting area of future research would be to undertake another survey using a different interface than a pop-up and see if socio-demographic characteristics of the sample population are different.

Understanding Market Segments Captured through Data Collection using a Transit Passenger Information Website

Research using a TPIWS has the potential to benefit transit authorities in a number of ways. For example, it may provide a low-cost opportunity to undertake consultation or gain feedback about potential projects and priorities. Using a TPIWS survey would also be a great research tool to gain feedback about information tools themselves. Khattak et al (2008) discusses how creating survey to explore the impact of travel information tools may benefit behavioural analyses. Similarly, in their review of the design of TPIWS, Cook and Currie (2009, p.148) describe how a "particularly fruitful task would be to research user views and opinions relative to the weightings applied in the score card. In this way, assessment could be better related to the opinions of those who use TPIWS systems". Offering a survey through a journey planner seems an optimal means of achieving such objectives.

6. Conclusion

Overall, using Melbourne's TPIWS as an interface to conduct an online poll and follow-up survey was successful and it is recommended that other transit agencies consider their TPIWS as more than just a mechanism to distribute information, but also as a means to collect information, engaging with their users. However, in doing so, agencies will need to consider the sample population likely to emerge: those that use TPIWS, frequent public transport users, and possibly a younger demographic. Moreover, transit agencies could benefit by reviewing this study and consider how best to integrate the design of their survey into the website to ensure maximum response rates.

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