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"Would you; could you; on a boat?" Wait-time and travel-time activities during river ferry journeys and their relationship to overall satisfaction in Brisbane Queensland

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Abstract

This study investigates travel behaviour and wait-time activities as a component of passenger satisfaction with public transport in Brisbane, Australia. Australian transport planners recognise a variety of benefits to encouraging a mode shift away from automobile travel in favour of active and public transport use. Efforts to increase public transport ridership have included introducing state of the art passenger information systems, improving physical station access, and integrating system pricing, routes and scheduling for train, bus and ferry.

Previous research regarding satisfaction with public transport emphasizes technical dimensions of service quality, including the timing and reliability of service. Those factors might be especially significant for frequent (commuting) travellers who look to balance the cost and efficiency of their travel options. In contrast, infrequent (leisure) passengers may be more concerned with way finding and the sensory experience of the journey. Perhaps due to the small relative proportion of trips made by river ferry compared to bus and rail, this mode of public transport has not received as much attention in travel-behaviour research.

This case study of Brisbane's river ferry system examines ferry passengers at selected terminals during peak and off-peak travel times to find out how travel behaviours and activities correlate to satisfaction with ferry travel. Data include 416 questionnaires completed by passengers intercepted during wait times at seven CityCat terminals in Brisbane. Descriptive statistical analysis revealed associations between specific wait time activities and satisfaction levels that could inform planners seeking to increase ridership and quality of life through ferry-oriented development.

1.0 Introduction

Contemporary transport and land use arrangements in Australian cities are implicated in a long list of urban problems, including excessive land take, automobile and oil dependence, traffic congestion, road crash trauma, air pollution, land degradation, social inequities in access to services and global warming (Banister 2005). In addition to the negative impact of these externalities on the quality of life for residents, they can also have a negative impact on tourism. Tourism studies have found that quality in public transport services influences visitors' experience, overall satisfaction and repeat visitation (Thompson and Schofield 2007). The state of Queensland and its capital city, Brisbane, have suffered recent declines in holiday visitors due to severe weather events and global financial downturns. Tourism contributes approximately $19.0 billion to Queensland's economy each year and employs 5.3% of the state, and is thus an important policy priority at state and council levels (Tourism Queensland 2011).

Recent planning interventions prioritise sustainability by encouraging the use of public transport (Banister 2008). For example, Brisbane's City Plan 2000 and the new draft city plan aim to achieve significant increases in public transport ridership by integrating transport terminals with supportive contextual land uses and by providing integrated, high-quality public transport systems (Brisbane City Council 2008). Transport authorities note that public transport options must provide timing and comfort that compete with private car travel to encourage the mode switch for commuters (BCC 2008). These improvements also promise to draw more tourism, as the quality of transport infrastructure and services can make the difference between tourists' choice of destinations (Prideaux 2000).

River-based public transport is well suited to support these policy objectives. It serves a similar purpose to other forms of mass transit such as bus and rail in providing an alternative to driving and potentially decreasing the volume of road traffic. However, it stands apart from other forms of mass transit because the journey has such high potential scenic and experiential value in addition to its ability to move people between places, and thus appeals to both tourist and resident markets. River ferry transport provides an amenity to attract tourism, encourage discretionary spending and enhance land values and quality of life for existing and potential residents (Weisbrod and Lawson. 2003).

To boost tourism and support the use of sustainable transport, Brisbane's new draft city plan recommends ferry-oriented development and more comfortable and accessible terminals (Brisbane City Council 2008). Related to that policy, the city has begun to enhance the quality of river ferry infrastructure and services, including new terminals at Tenerife and Northshore Hamilton (Tourism and Transport Forum 2011). It has also attempted to improve comfort, reliability and on board security (Barabino, Deiana et al. 2012). These initiatives aim to attract increased ridership on river ferries by improving the technical efficiency and user experience of the service.

The relationship between passengers' travel experience and satisfaction with ferry service are the subject of this paper. As reflected by the phrase quoted in the title, our central question is like the one posed by the Dr. Suess character, Sam, inquiring about the main character's opportunity and propensity to realize a certain activity while on a boat journey. It presents findings from a pilot study that used a questionnaire and intercept sampling to learn about passengers' experiences and perceptions first hand. Based on a sample of 416 CityCat passengers, the study found that in addition to improving technical dimensions of ferry service such as timing and reliability, increasing passengers' involvement at the ferry terminal would be an effective strategy to develop the ferry transit market in Brisbane.

2.0 Literature Review

Transport research has found that satisfaction with public transport is primarily linked to perceptions of service quality including service frequency, timing and reliability, friendliness of staff,

and ease of use (Parasuraman, Zeithamel et al. 1985, Brady and Cronin 2001, Caro and García 2007, Chen, Zhang et al. 2009). Time and cost-related aspects of service might be especially significant for frequent (commuting) travellers who look to balance the cost and efficiency of their travel options. Poor perceptions of service quality, and the availability of alternatives to ferry travel in particular have been associated with low ridership (Ceder 2006, Adiguzel Mercangoz, Paksoy et al. 2012).

Technical aspects of service quality such as service frequency, timing and reliability have objective and subjective dimensions. For example, the objective dimension of timing would include the interface between modes at multimodal interchanges and the actual amount of time that passengers wait before boarding the next available service. A subjective dimension of timing would include passengers' perceptions of the amount of time they wait before boarding. Studies have shown that dynamic real-time information results in lower perceived wait times for passengers, and higher levels of satisfaction, suggesting a degree of importance to the subjective dimension (Dziekan and Vermeulen 2006, Mishalani, McCord et al. 2006, Dziekan and Kottenhoff 2007).

A variety of factors have been found to influence subjective perceptions of service quality and satisfaction with public transport. For example, Givoni and Rietveld (2007) found that the quality of station access has a significant impact on satisfaction of travelling by rail. Thomspon (2007) similarly argues that ease of use is more important than the influence of efficiency and safety. Some studies suggest that perceived accessibility may be multifaceted, for example including a sense of social belonging, affordability, purpose and security (Zuniga, Bevrani et al. pending). Thus, conditions as diverse as the comfort and cleanliness of a station (Eboli and Mazzulla 2007, Stradling, Carreno et al. 2007) or the choice of travel companions (Prioni and Hensher 2000, Beirão and Cabral 2007, Guiver 2007) would not only influence passengers' perceptions of quality but also their perception that the service was accessible to them personally.

Literature regarding satisfaction with public transport focuses on passenger rail and bus more so than river ferry travel, perhaps due to its relatively small mode share. However, the discourse establishes a conceptual understanding of behaviour that may be tested with other travel modes. Although that discourse examines contextual and behavioural influences on satisfaction, there has been less attention paid to the specific interface between passengers and station environments (with the exception of real-time information displays). This pilot study pays particular attention to passengers' choices of activities during wait and travel times to better understand the impact of contextual characteristics on perceptions of service quality and satisfaction with ferry travel.

3.0 Methods

3.1 Research Design

This descriptive research investigates a case study of river-ferry transport services in Brisbane, Australia including a cross-sectional survey design and an objective land-use inventory to examine behavioural and contextual influences on ferry passengers' satisfaction. The research was undertaken as part of a one-semester capstone project for seven undergraduate planning students at Queensland University of Technology in Brisbane under the supervision of a faculty mentor.

3.1.1 Setting and Case Study

Brisbane is the capital city of Queensland and the third largest city by population in Australia. In 2011 the population was just under 2.1 million people and is expected to increase to approximately 2.7 million by 2026 (www.abs.gov.au/ausstats/abs@.nsf/mf/3222.0). Located in the south-eastern corner of Queensland, Brisbane has a subtropical climate and is bisected by a deep, meandering tidal river which supports year-round river-based transport and provides both a landmark and scenic amenity to the city.

Brisbane introduced catamaran river ferries (CityCats) in 1996 to help reorient the city to its river, to encourage inner city densification, to spur changes in attitudes toward public transportation, and to promote tourism (see Sipe and Burke 2011). The ferry system provides a connection between key residential, business and academic destinations and replaces previous cross-river linkages, making it an integral part of Brisbane's transport network. It serves a variety of trip purposes, including commuting to work, shopping, school, tourism, recreation and leisure.

Patronage on CityCat services has experienced periods of growth as a result of recent development trends and improved integration with the larger public and active transport system. Sipe and Burke (2011) found that a recent transition from warehouse and industrial riverfront development to residential, commercial and retail uses has resulted in significant population growth rates along the river (31.4%) that are nearly double the rate of growth for the city as a whole (17.7%). They associate the concentration of people near the river with an increase in ferry patronage.

Passengers have the opportunity to transfer to and from bus or rail at most CityCat stops, although timetables and transfers have not always conveniently aligned. One period of growth occurred between 2004 and 2005 with the introduction of multimodal fare cards, which allow passengers to transfer between busses, trains, and ferries without financial penalty. Brisbane's public bicycle hire scheme, introduced in 2011, has further aligned the ferries as part of an integrated multimodal transport system.

The Brisbane City Council (BCC) currently operates a fleet of 19 CityCats along a network of 24 terminals stretching from the University of Queensland at St Lucia (in the southwest) to Northshore Hamilton (in the northeast) (Brisbane City Council 2013). The system includes 12 dedicated CityCat terminals, three CityHopper terminals, one dedicated cross-river ferry terminal and eight terminals that serve a combination of the three services. More than 6.25 million passengers used CityCats in 2008, equating to more than 17,000 boardings per day. Despite those formidable figures, annual CityCat ridership pales in comparison to rail with 50 approximately million trips and bus with approximately 65 million trips. Ferry revenues do not meet operating costs due to low ridership and are subsidized by the Queensland Government at a rate of approximately 1.50 (USD) per passenger (Sipe and Burke 2011).

To improve satisfaction with ferry travel and thus increase ridership, Brisbane planners have proposed to partner with private developers to shape terminals as user-oriented, active social spaces. Over the past several years, several new terminals have been added to the system including a terminal at the Regatta Hotel, Toowong; a terminal at Teneriffe, Newstead; a Norman Park Cross River terminal reactivated in 2007; and an Apollo Road CityCat terminal added and reactivated in 2008 (Brisbane City Council 2013). Proposed development includes a new terminal at Milton (approximately 3km from Brisbane CBD), which includes retail and commercial land uses. That planning strategy makes two significant assumptions: first, it assumes that opportunities for social activities in and around ferry terminals will increase existing and potential passengers' satisfaction with river-based travel; and second, it assumes that increased satisfaction will correspond to higher rates of river-based travel.

3.1.2 Site Selection

The purpose of this research was to examine ferry passengers' behavioural patterns during wait and travel times with relationship to stated levels of satisfaction as a base-line to determine the potential impact of development proposals that integrate commercial land uses with the ferry terminals. To that end, the research team selected a subset of Brisbane's ferry terminals as research sites that represented the broadest possible variety of contextual land uses and potential user groups (see table 1).

Table 1: Terminals selected as research sites

Ferry Terminal	Purpose
University of Queensland	Furthest upstream, servicing a large university campus and mixed use development
West End	Medium density, medium income residential area
North Quay	Mixed use area with high density uses, including a nearby Casino
South Bank	Most central to the entertainment and cultural precinct
New Farm Park	Near New Farm Park and medium to high income, medium density residential land uses.
Bulimba	Medium density, medium income residential area
Brett's Wharf	Furthest downstream activity centre. Medium to high income, medium density housing and mixed use development. There are a number of motels across the road from the terminal.

Note: The furthest downstream terminal is technically *Northshore Hamilton*. However, due to its indefinite closure since the January 2013, it was not selected for this study.

3.2 Data Collection

The research team developed a short, paper-based questionnaire (see appendix 1) that included personal demographic information (e.g. age, gender, place of residence), travel details (e.g. purpose, frequency and destination), activities and behaviours while waiting and riding the ferry, and perceptions and preferences (e.g. determinants of service quality and level of satisfaction). To measure activities and behaviours, respondents were invited to select all that apply from among fourteen possible activities, including an open-ended "other" response that allowed them to specify an alternative that was not listed. Satisfaction was measured by a Likert-scaled rating from *very dissatisfied* to *very satisfied*. A final open-ended question invited respondents to recommend improvements to the ferry terminals. Participants recorded all data directly on the questionnaires and returned them before boarding.

Data collection occurred over a four-week period from April 15 – May 15, 2013 during a scheduled array of days and time periods, using intercept sampling of passengers waiting to board ferries at the seven selected terminals. The recruitment strategy aimed for a stratified sample of users, including gender and age, trip purpose, and frequency of ridership. It also aimed to reflect peak and off-peak conditions, with the expectation of fewer responses during off-peak data collection.

3.3 Data Analysis

Responses to the questionnaire were analysed using SPSS Version 21.0. After exploring frequencies of individual variables, the research team used a series of cross-tabulations to identify factors associated with perceived quality of service. Responses to the open-ended question were analysed using qualitative coding techniques (Corbin and Strauss, 2008). Codes were identified through multiple readings and constant comparative analysis, and were validated by corroboration among the research team.

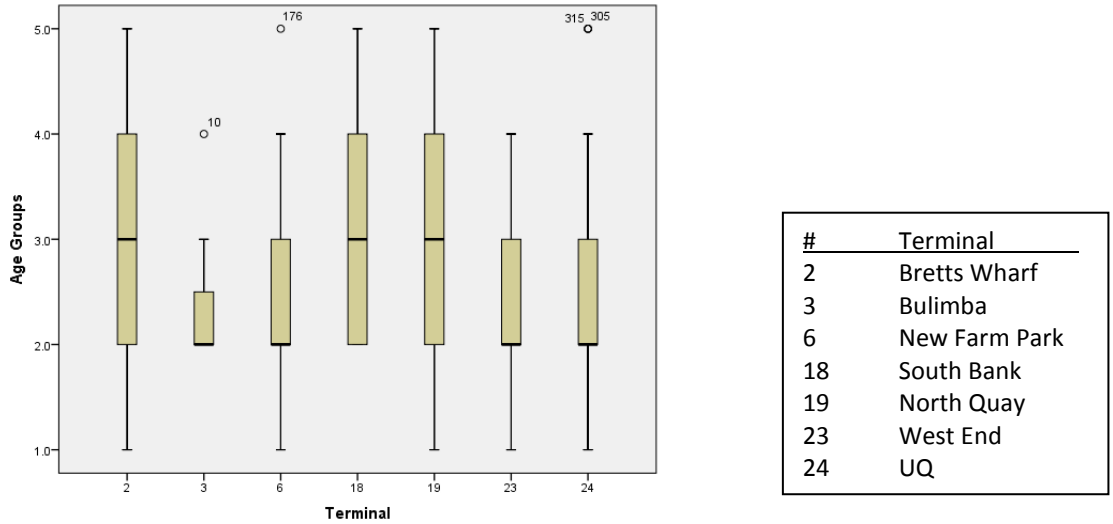
3.4 Sample Profile

Data collection resulted in 416 completed surveys out of 426 that were distributed. The proportion of responses collected at each terminal was roughly even, with higher than average proportion at New Farm Park (19.2%), and a slightly lower proportion at West End (11.5%) (See table 2). Meeting sampling objectives, the completed surveys included representative proportions of male (51.9%) and female (48.1%) respondents overall (see table 2). However, proportions of male respondents were higher than expected at Bulimba (60.9%) and New Farm Park (61.3%), and lower than expected at South Bank (46.8%), North Quay (45.6%), West End (45.8%) and UQ (44.2%). The majority of respondents overall (50.2%) and at each terminal (see table 2) were between eighteen and thirty years old, although the median at Bretts Wharf, South Bank and West End was in the 31-45 age group (see figure 1). Overall, the sample reflects the young median age (31.4 years) of central Brisbane's population (Australian Bureau of Statistics 2011).

Table 2: Sample profile by origin terminal

Origin Terminal	Total Count (% by Terminal)	Male Count (% by Terminal)	18-30 Count (% by Terminal)	Leisure Count (% by Terminal)	Alone Count (% by Terminal)	6+ Trips Count (% by Terminal)
Bretts Wharf	53 (12.7)	28 (52.8)	18 (34.0)	35 (66.0)	20 (37.7)	18 (52.0)
Bulimba	64 (15.4)	39 (60.9)	48 (75.0)	42 (65.6)	43 (68.3)	54 (84.4)
New Farm Park	80 (19.2)	49 (61.3)	35 (44.3)	38 (48.7)	19 (24.1)	42 (52.5)
South Bank	62 (14.9)	29 (46.8)	28 (45.2)	40 (64.5)	17 (27.4)	11 (17.7)
North Quay	57 (13.7)	26 (45.6)	25 (43.9)	28 (54.9)	31 (54.4)	22 (38.6)
West End	48 (11.5)	22 (45.8)	29 (60.4)	12 (26.1)	36 (75.0)	31 (64.6)
UQ	52 (12.5)	23 (44.2)	26 (50.0)	15 (28.8)	34 (68.0)	35 (68.6)
All Terminals	**416 (100.0)**	**216 (51.9)**	**50.4 (50.2)**	**210 (50.5)**	**200 (48.5)**	**211 (50.8)**

Figure 1: Median age group and quartile range by terminal



The sample was almost evenly divided in the stated purpose of their trip, with about half travelling for leisure purposes (50.5%) and just under half travelling for work or study (43.5%). Three terminals (Bretts Wharf, Bulimba and South Bank) had significantly higher than average proportions of leisure travellers, while two (West End and UQ) had significantly lower proportions of leisure travellers. Consistent with the sample's profile by age and trip purpose, just over half of respondents travelled alone (48.1%) or with colleagues (5.3%). Just less than half travelled with mates (24.5%), family (15.6%) or children (5.3%). Proportions of respondents travelling alone were significantly lower than average at South Bank (27.4%) and New Farm Park (24.1%), and significantly higher at Bulimba (68.3%), West End (75.0%) and UQ (68.0%). Ridership among the sample group was divided almost evenly with 50.8% moderate to frequent users (more than 6 trips per month) and 48.8% infrequent to very infrequent users. As would be expected, the two terminals nearest to tourist and activities (South Bank and North Quay) had the relatively low proportions of frequent travellers.

Reflecting peak and off-peak service schedules, perceived typical wait time at the origin terminal for the majority of the sample group was under 15 minutes, but a small proportion of respondents (7.5%) typically waited between 15 and 30 minutes. Although approximately one third (30.8%) of respondents perceived their typical wait time to be less than five minutes, they had sufficient time to collect, complete and return a questionnaire, which suggests either than the current wait was atypical, that perceived and actual wait times differ, or that very short waits provide sufficient time to engage in activities. Other significant proportions of respondents perceived their wait to be between six and ten minutes (39.7%) and between 11 and 15 minutes (20.2%), also providing sufficient time to engage in wait-time activities at the terminal.

4.0 Findings

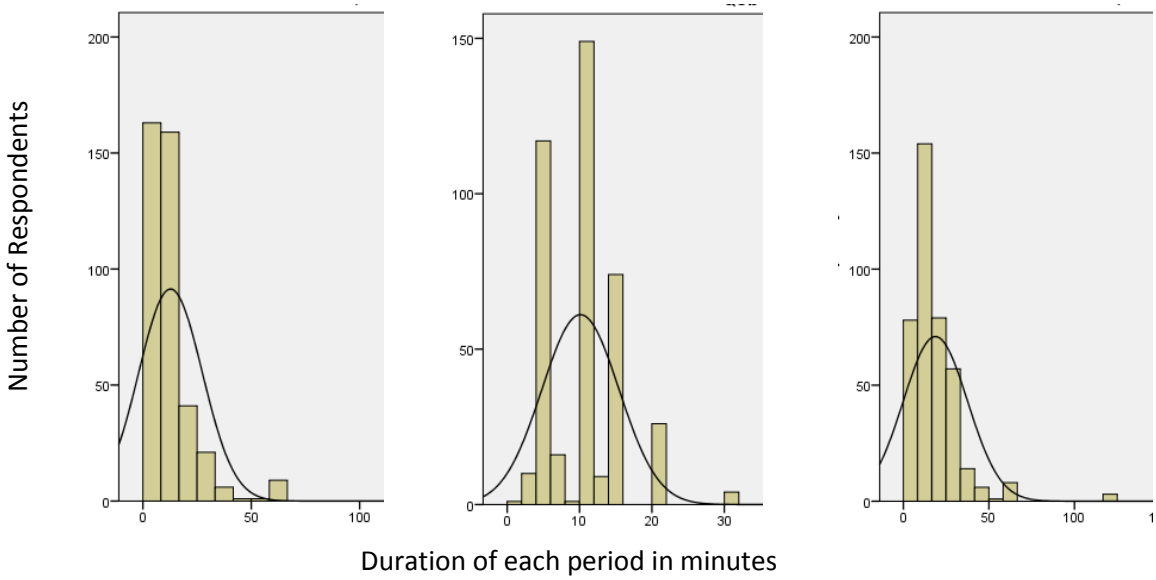
Data analysis revealed significant behavioural trends associated with passengers' perceptions of service quality and overall satisfaction with ferry travel. Findings are presented below to draw connections between perceived wait times, activities, satisfaction and prioritization of certain aspects of service.

4.1 How much time do passengers spend accessing, waiting and riding the ferry?

On average, respondents in this study claimed to spend 12.7 minutes accessing ferry terminals, another 10.1 minutes waiting at the terminals and 18.7 minutes riding the ferries (see figure 2). While each of these time periods may be sufficient to engage in additional activities, it may be assumed that opportunities for such are more limited during access time except for those passengers using another mass transit feeder mode. Thus, this study limits its examination of additional activities to wait and ferry travel periods.

It is significant to note that while the average reported access and wait times are similar in duration, the range of times is much less uniform for wait times, suggesting a degree of uncertainty that might relate to the timing and reliability of service, familiarity with timetables, or accuracy in gauging time spent in that environment. In any case, it indicates an opportunity to manipulate perceptions of wait time in order to improve satisfaction with service.

Figure 2: Stated access (left), wait (middle) and travel (right) times



4.2 What do CityCat passengers do during wait and travel times?

The study revealed that overall, passengers engage in a wide range of activities while waiting for and riding on CityCat river ferries, but individuals tend towards a smaller range of activities in both locations. Data indicated that respondents typically engaged in approximately 3.2 activities during wait time at the terminals and approximately 2.8 activities during travel time (see table 3).

Table 3: Activities during wait and travel times

		At Terminal		On Ferry		Combined Contexts	
	Activity	**Count (%)**	**% Total (n=1318)**	**Count (%)**	**% Total (n=1146)**	**Count**	**Average %**
Type A	Reading	91 (21.9)	6.9	75 (18.0)	6.5	166	20.0
	Planning/Organizing	63 (15.1)	4.8	37 (8.9)	3.2	100	12.0
	Eating/Drinking	42 (10.1)	3.2	24 (5.8)	2.1	66	7.9
	Working (not email)	25 (6.0)	1.9	19 (4.6)	1.7	44	5.3
	Playing Games (print)	11 (2.6)	0.8	8 (1.9)	0.7	19	2.3
	Writing	7 (1.7)	0.5	6 (1.4)	0.5	13	1.6
	Subtotal	**239**	**18.2**	**169**	**14.7**	**408**	
Type B	Talking (in person)	184 (44.2)	14.0	156 (37.5)	13.6	340	40.9
	Watching People	141 (33.9)	10.7	96 (23.1)	8.4	237	28.5
	Nothing	91 (21.9)	6.9	83 (20.0)	7.2	174	20.9
	Site Seeing	78 (18.8)	5.9	156 (37.5)	13.6	234	28.1
	Sleeping	12 (2.9)	0.9	20 (4.8)	1.7	32	3.8
	Grooming	8 (1.9)	0.6	7 (1.7)	0.6	15	1.8
	Subtotal	**514**	**39.1**	**518**	**45.2**	**1032**	**41.9**
Type C	Facebooking	153 (36.8)	11.6	132 (31.7)	11.5	285	34.3
	Listening to music	138 (33.2)	10.5	135 (32.5)	11.8	273	32.8
	Chatting/Texting	114 (27.4)	8.7	80 (19.2)	7.0	194	23.3
	Emailing	83 (20.0)	6.3	56 (13.5)	4.9	139	16.7
	Playing Games (Electronic)	47 (11.3)	3.6	37 (8.9)	3.2	84	10.1
	Tweeting	26 (6.3)	2.0	17 (4.1)	1.5	43	5.2
	Subtotal	**561**	**42.7**	**457**	**39.9**	**1018**	**41.3**
	Other	4 (1.0)	0.3	2 (0.5)	0.2	6	0.2
	Total Activities	**1318 (3.2)**	--	**1146 (2.8)**	--	**2464**	**100.0**

Table 6 illustrates three types of activities and the frequency of selection. Type A includes non-electronic activities that require materials for participation (e.g. book, planner, food, etc.). The pre-planning required for those activities seems to indicate knowledge regarding overall journey time as well as certain traveller characteristics (e.g. travelling alone for work or study). As a group, Type A activities were selected least frequently for passing time at the terminal and during travel, although approximately one fifth of respondents indicated a tendency to read in both contexts. Within Type A, proportions of selected activities were similar for wait and travel times.

Type B includes non-electronic activities that do not require any materials for participation. Because the activities do not require pre-planning, they are well suited to infrequent passengers for occasional recreational travel or tourism, and as pastimes during unexpected delays. As a group, Type B activities were selected most frequently for travel time, and second most frequently for wait time, although talking in person was the most frequently selected activity overall for both contexts. Within Type B, proportions of selected activities were similar for wait and travel times, with the exception of site seeing which shared the top frequency with talking in person for travel time.

Type C includes activities that require handheld electronic devices for participation (e.g. phone, iPad, etc.). The research team speculates that similar to Type B, these activities do not require pre-planning because people who use handheld electronic devices are likely to carry them wherever they go. In that sense, Type C activities might serve a similar purpose as Type B for infrequent travellers and during delays to lessen perceived waiting time. In contrast, Type C activities effectively disengage people from their social and physical surroundings, which may ultimately have a detrimental impact on overall quality of life and travel experience. As a group, Type C activities were selected most frequently for wait time, and second most frequently for travel time. Within Type C, proportions of selected activities were similar for wait and travel times, and tended to be significant with the exception of electronic games and tweeting. After talking in person (and site seeing during travel time), using Facebook was the next most frequently selected activity overall for both contexts.

4.3 Are passengers satisfied with their ferry travel experience?

The overall satisfaction rating of ferry travel was positive, with over three quarters (77.9%) of valid responses (n=409) indicating either *satisfied* or *very satisfied* (see table 4). That proportion was slightly higher (88.1%) for non-Australian respondents (n=31), although they tended toward the less extreme *satisfied* response. Men tended to give lower satisfaction ratings than women overall, although an overwhelming majority of each gender group still gave a positive rating.

Table 4: Satisfaction rating by nationality and gender

Rating	Australian Count (%)	Foreign Count (%)	Male Count (%)	Female Count (%)	Total Count (%)
Dissatisfied	33 (8.9)	1 (3.2)	28 (13.2)	6 (3.0)	34 (8.3)
Neutral	52 (14.0)	3 (9.7)	33 (15.6)	23 (11.6)	56 (13.7)
Satisfied	287 (77.2)	27 (88.1)	150 (71.1)	169 (85.4)	319 (77.9)
Valid responses	**372 (100.0)**	**31 (100.0)**	**211 (100.0)**	**198 (100.0)**	**409 (100.0)**

In 2012, Translink found overall passenger satisfaction with ferry travel to be 75%, which would suggest an increase of approximately 3% from 2012-2013. However, due to limitations in the present study's data collection window, sampling frame and questionnaire design (single Likert-scaled satisfaction rating), it is not possible to estimate error sufficiently to make a meaningful comparison with data from other studies. Rather, in combination with behavioural information from the present survey, the satisfaction findings revealed significant relationships that could inform land use planning initiatives aiming to increase ferry ridership by improving passenger experience.

Satisfaction ratings by trip purpose generally paralleled the overall sample with a few exceptions (see table 5). For example, compared with other trip purposes, a higher than average proportion of students indicated that they were dissatisfied (14.1%). Respondents who made more than six trips per month had lower than average satisfaction ratings (see table 6).

Table 5: Satisfaction rating by trip purpose

Rating	Work Count (% by purpose)	Study Count (% by purpose)	Leisure Count (% by purpose)	Other Count (% by purpose)	Total Count (%)
Dissatisfied	6 (6.4)	12 (14.1)	14 (6.9)	1 (6.7)	33 (8.3)
Neutral	14 (14.9)	8 (9.4)	30 (14.7)	3 (20.0)	55 (13.8)
Satisfied	74 (78.7)	65 (76.5)	160 (78.4)	11 (73.3)	310 (77.9)
Valid responses	94 (100.0)	85 (100.0)	204 (100.0)	15 (100.0)	398 (100.0)

Table 6: Satisfaction rating by trip frequency

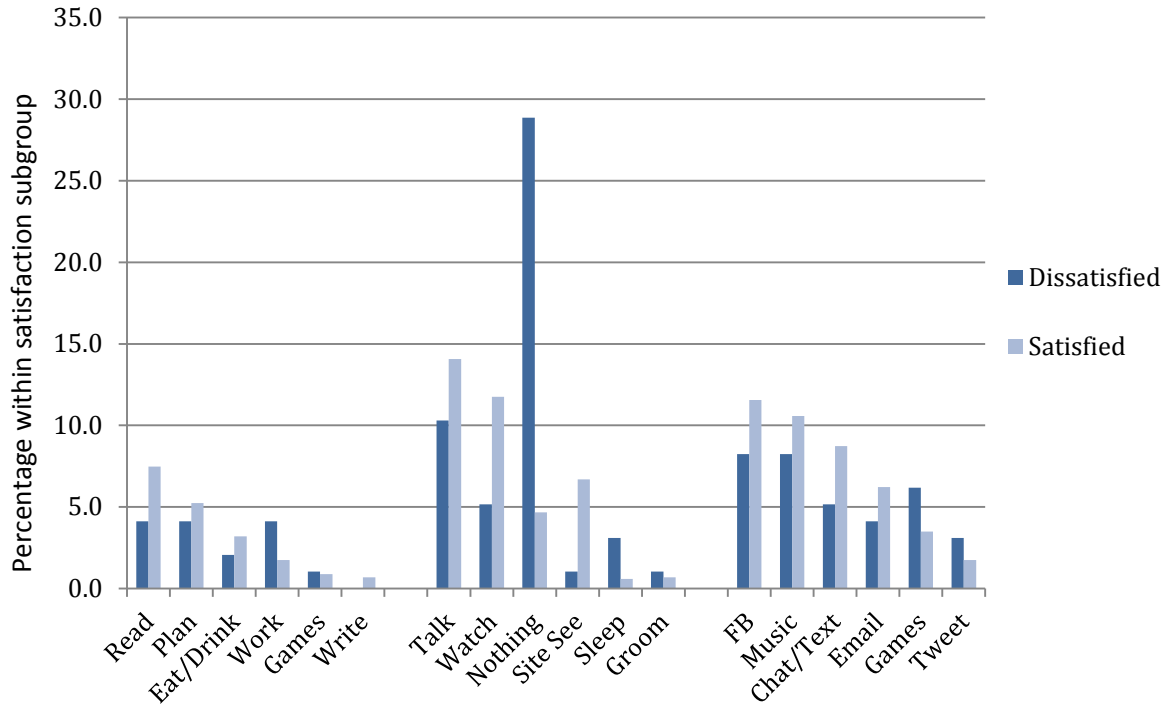
Rating	0-1 Count (% by purpose)	2-5 Count (% by purpose)	6-9 Count (% by purpose)	10+ Count (% by purpose)	Total Count (%)
Dissatisfied	6 (5.2)	6 (7.4)	7 (12.5)	15 (9.7)	34 (8.3)
Neutral	17 (14.7)	5 (6.2)	12 (21.4)	21 (13.6)	55 (13.5)
Satisfied	93 (80.2)	70 (86.4)	37 (66.0)	118 (76.6)	318 (78.1)
Valid responses	116 (100.0)	81 (100.0)	56 (100.0)	154 (100.0)	407 (100.0)

4.4 How do wait time activities relate to satisfaction?

As noted in section 4.1, satisfaction levels were generally very high regardless of nationality, gender, trip purpose or frequency. The same was true for activities during wait time at the terminals. As a result, regression analysis was inconclusive for determining factors that might contribute to satisfaction levels. However, a cross-tabulation of activities and satisfaction levels revealed several significant anomalies (see figure 3).

Figure 3 illustrates proportions of respondents by satisfaction level who selected each of the listed activities. For each of three activity types (see section 4.1), individual activities are listed in descending order of frequency. Based on overall satisfaction levels, it would be expected that each level of satisfaction would similarly descend.

Figure 3: Activities (by type A-C) and satisfaction



The most pronounced contrasts to that trend occur with dissatisfied respondents (n=34). For example, the very high value for those who selected “nothing” as a wait time activity indicates a correlation between that selection and the low satisfaction rating. It is important to note that respondents who made that selection often selected additional activities as well. That may indicate a negative perception of single-use terminals, despite the variety of activities still available to pass the time. Other activities that had disproportionately high numbers of dissatisfied respondents include working, sleeping and games. In contrast, activities with unusually low proportions of dissatisfied respondents include reading, people watching and site-seeing.

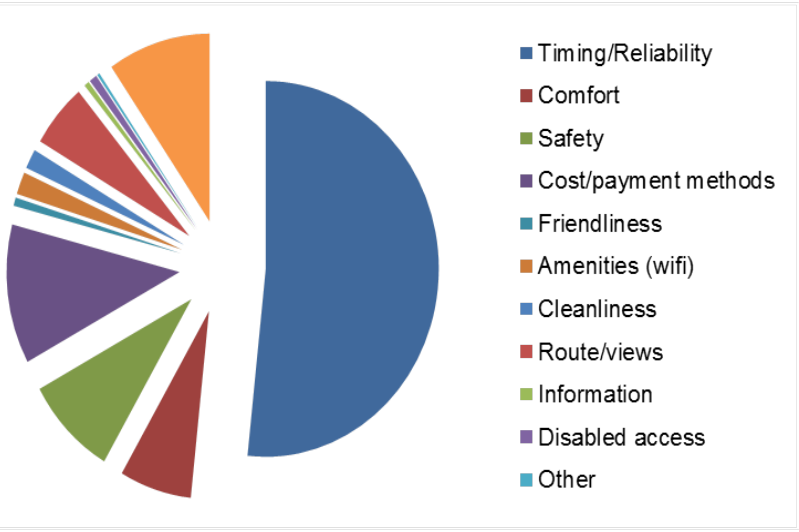
In general, the proportions of satisfied respondents (n=319) were more consistent with the overall proportions of respondents for each activity, although within Type B activities they are somewhat higher than average for talking, people watching and site seeing. The low proportion of satisfied respondents who selected “nothing” as an activity makes sense given the aforementioned trend among dissatisfied respondents.

4.5 What aspects of ferry service are most important to passengers?

Consistent with research regarding public transport more broadly, a majority (51.7%) of respondents (n=376) indicated timing and reliability to be the most significant aspects of ferry service. The second most frequently cited concern was cost (12.0%). It is important to note that in isolation, these responses do not indicate dissatisfaction with the reliability or cost of ferry service, but highlight the importance of these characteristics as components of service quality.

Figure 4: Prioritization of 11 components of service quality

Quality	Per cent
Timing/Reliability	51.7
Comfort	6.7
Safety	8.7
Cost/payment methods	12.0
Friendliness	.7
Amenities (wifi)	1.9
Cleanliness	1.7
Route/views	5.5
Information	.5
Disabled access	.7
Other	.2
Invalid or Blank	9.6
Total	100.0



Approximately one fifth of respondents (20.1%) indicated that the most significant aspects of service relate to terminals, including comfort, safety, amenities, cleanliness, information and disabled access.

4.6 How would respondents improve ferry terminals?

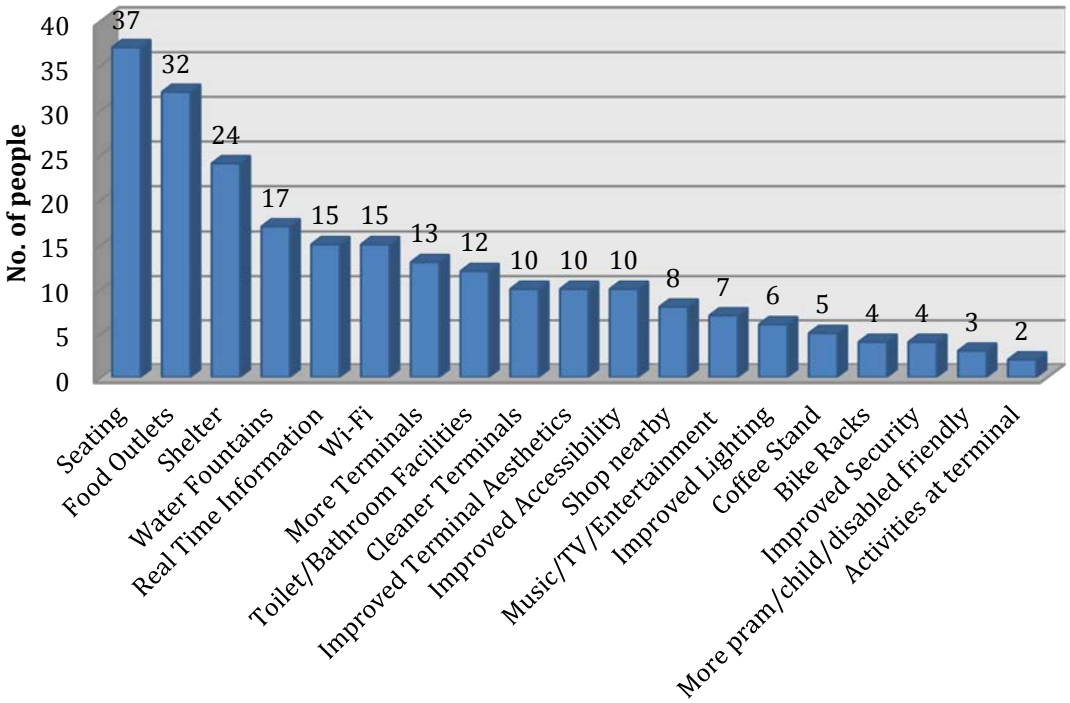
In response to the open-ended question, "How would you improve ferry terminals?" 330 respondents offered suggestions that ranged from terminal-specific improvements (e.g. cleaner terminals, shop nearby, and shelter) to service-specific improvements that have little to do with the terminals (e.g. increased frequency and more services at night). The apparent misinterpretation of the question reinforces the emphasis that passengers place on the technical aspects of service. However, a significant proportion of the responses indicated opportunities to improve perceptions of ferry travel that can occur as a part of the land development surrounding terminals (see figure 5).

For example, the second most frequently cited improvement was the introduction of food outlets. Lesser-cited suggestions of introducing shops, a coffee stand, and activities at the terminal suggest a similar purpose of increasing opportunities for Type A activities that would otherwise require pre-planning.

Other suggestions related to Type B activities – those that do not require pre-planning and that take advantage of the social and physical environment. For example, two of the three most frequently cited improvements were seating and shelter. References to cleanliness and aesthetics similarly suggest a desire to actively engage with the physical environment of the terminal.

Another subgroup of suggestions relates to Type C activities – those that typically require a hand held electronic device and that allow passengers to socially disengage. For example, respondents recommended the introduction of free WiFi service at terminals and music or entertainment. Finally, there were several suggestions relating to health and safety, including water fountains and toilets, lighting, security, and accessibility.

Figure 5: Suggestions for improving terminals



5.0 Conclusions and Discussion

The purpose of this study was to gauge whether increasing behavioural affordances at ferry terminal sites through ferry-oriented development would be likely to have a positive influence on passengers' satisfaction levels. The study built on previous research investigating influences on passenger satisfaction with public transport. Specifically, it explored relationships between travel behaviours and wait-time activities and perceptions of service quality and overall satisfaction with river-ferry travel. Data included 416 questionnaires completed by passengers who were intercepted at seven ferry terminals in Brisbane, Australia. Respondents provided demographic and travel information in addition to selecting (all that apply) from among fourteen activities that they typically engage in during their wait times at ferry terminals and during ferry travel.

Data indicated that like other forms of mass transit users, ferry passengers determine service quality primarily by the timing and reliability of the service. Satisfaction levels were noticeably lower for respondents with access times of more than 20 minutes and for respondents who expected to wait longer than 15 minutes at the terminal. The most direct ways to use this information to increase satisfaction would be to address intermodal linkages and to increase the frequency of ferry service, thus reducing headway times. In fact, respondents put forth similar suggestions in response to an open-ended question about improving ferry travel. However, it may also be possible to decrease perceived wait times or to increase the value of time spent waiting by offering a wider range of possible activities. Although respondents in this study participated in a wide range of activities, a small proportion of respondents seemed to have a negative interpretation of the single function terminals.

The study found that travel behaviours, including trip purpose and frequency of travel, had a more significant influence on perceived quality of service than some personal characteristics such as 'local' or 'tourist' status. For example, leisure travellers had higher levels of satisfaction than commuters and students. By increasing understanding of each sub-group's behaviours during wait and travel times, this research can help to guide policy efforts to make the overall journey more accessible and enjoyable, thus increasing satisfaction and return use.

While this finding suggests a possible advantage to increasing service frequency and providing real time information displays at ferry terminals, it may also be possible to influence satisfaction levels by either decreasing perceived wait times, or by increasing the perceived value of time spent waiting for service.

Based on these findings, the authors argue that while offering quality technical service is essential, increasing passengers' involvement at the ferry terminal can be employed as a strategy to develop the ferry transit market in Brisbane. By expanding affordances for activities at the terminals, planners can leverage a positive association between active engagement and satisfaction, thus supporting an increase in ridership. For Brisbane's ferry network, developing contextually unique terminals with social activities is likely to attract tourism and ridership. The new privately funded terminal in Milton provides an appropriate example of this development intervention, as it plans to include social gathering spaces as well as commercial food and drink outlets.

This pilot study revealed several limitations that will be addressed in subsequent research. First, the questionnaire did not adequately operationalize passengers' satisfaction and should be refined to include multiple measures (for example, it could also ask about the likelihood of referring others to the service and likelihood of using the service again personally). Second, the questionnaire could do more to investigate the role of contextual land uses in satisfaction with wait-time specifically. And third, it would be useful to compare results across modes of public transport and in different contexts.

6.0 Citations

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