



**Planning ferry services:  
using research to understand the market and evaluate service initiatives**

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**Abstract**

Ferries are closely identified with the distinctive character of Sydney. Sydney Ferries, a business unit of the State Transit Authority of NSW, carries over 13 million passengers a year on ferry services in Sydney Harbour and Parramatta River to over 40 wharves. But while patronage has increased by approximately 90% over the last twenty years, Sydney Ferries still incurs substantial financial losses.

To understand better the current and potential market for Sydney Ferries and determine what initiatives could most efficiently increase patronage, a major business development study was undertaken for Sydney Ferries in 2000-2001 by consultants Booz Allen and Hamilton. A key element of the study was primary research to provide base data and analytical insights into demand for ferry services as limited data is available to assist the planning process. The extensive data collection including qualitative research, origin-destination surveys of 16,000 passengers, and stated preference surveys to value service quality attributes. The data was used to develop a demand model to evaluate a range of service development options including new services and service extensions, rationalisation of existing services, and improvements to wharf and vessel quality.

The paper includes sections on the characteristics of ferry travel, valuation of service quality aspects, the modelling approach and assessment of a range of service development options. Of over 20 potential service developments which were evaluated, few offered potential to improve financial performance, highlighting the difficulties of providing commercial ferry services. Further development and implementation of options has been constrained by the operational and policy environment.

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## **Introduction**

Ferries have been closely identified with the distinctive character of Sydney since commuter-style ferry services began operating on Sydney Harbour in the mid 1800s. Today, Sydney Ferries, a business unit of the State Transit Authority of NSW, carries over 13 million passengers a year on ferry services in Sydney Harbour and Parramatta River to over 40 wharves. While patronage has increased by approximately 90% over the last twenty years, patronage is relatively stable and Sydney Ferries still incurs substantial financial losses.

To understand better the current and potential market for Sydney Ferries and determine what initiatives could most efficiently increase patronage, a major business development study was undertaken for Sydney Ferries in 2000-2001 by consultants Booz Allen Hamilton. A key element of the study was primary research to provide base data and analytical insights into demand for Sydney Ferries services as limited data is available to assist the planning process. The extensive data collection included qualitative research, origin-destination surveys of 16,000 passengers, and stated preference surveys to assist the development of mode choice models and value service quality attributes. The data was used to develop a demand model to evaluate a range of service development options including new services and service extensions, rationalisation of existing services, and improvements to wharf and vessel quality.

The paper includes sections on Sydney Ferries and ferry travel, the structure of the research, and results from the research including characteristics of ferry travel and valuation of service quality. It then describes the modelling approach and concludes with an assessment of a range of service development options.

## **About Sydney Ferries**

With a fleet of 32 vessels of seven types, Sydney Ferries provides 1.3 million vessel kms per year. The 2,000 ferry services per week operate to over 40 wharves on Sydney Harbour including Manly, Inner Harbour and Parramatta River services (see Figure A1 in the Appendix for a network map). Circular Quay in the CBD is the hub of services. Trends in annual patronage are shown in Table 1. Strong demand for ferries during the Olympics contributed to annual patronage of 14.9 million in 2000/2001. On one day during the Olympics, Sydney Ferries broke the record for patronage set on Federation Day 1901, carrying 96,000 passengers.

The cost of providing ferry services is high compared to bus services. In 2000/2001, the average cost per ferry passenger was \$4.97, compared to a cost of \$1.93 per bus passenger. Farebox cost recovery is also low for ferry services. In 2000/2001, farebox revenue for Sydney Ferries was less than \$42 million while total costs were \$74 million (State Transit 2001).

**Table 1 Patronage on Sydney Ferries**

Year	Patronage ('000)	Annual change
1997/98	13,068	0.4%
1998/99	13,080	0.1%
1999/00	13,258	1.4%
2000/01	14,912	12.5%
2001/02	13,732	-7.9%

Source State Transit Annual Reports.

#### Data sources on ferry travel

There is limited internal data on ferry travel due to the ticketing system and limited external data due to the small size of the market. The ticket system is not a closed system and tickets are not wharf-specific: Circular Quay and Manly are the only wharves with ticket barriers. Thus there is good data on travel between Circular Quay and Manly but not for other wharves.

The primary external data sources are the Journey to Work (JTW) dataset from the 1996 Census by the Australian Bureau of Statistics and the Transport Data Centre's Household Travel Survey. JTW data indicates that 0.6% of all trips to work in the Sydney Statistical Subdivision (8,419 trips) include a ferry trip. Manly LGA has the highest proportion of work trips using ferry at 11.4% (Table 2).

**Table 2 Ferry use for the Journey to Work**

Origin (Local govt areas)	Number of ferry trips	Ferry mode share	Proportion of total
Manly	1,728	11.4%	20.5%
Mosman	1,066	9.4%	12.7%
Hunters Hill	249	5.9%	3.0%
North Sydney	1,564	5.5%	18.6%
Leichhardt	858	3.2%	10.2%
Drummoyne	341	2.6%	4.0%
All other areas	2,613	0.2%	31.0%
Total: Sydney SD	8,419	0.6%	100.0%

Source 1996 Census, ABS.

The Household Travel Survey (HTS) is a sample of travel for all purposes by selected households. While the HTS data produces an approximation of daily ferry patronage, insufficient ferry trips are included in the sample to allow disaggregation of the data. In addition, the HTS is a household-based survey and excludes travel by tourists and non-Sydney residents. Thus external data sources do not provide a comprehensive understanding of the Sydney Ferries market, particularly the non-work market, due to limited sample size.

## Structure of the research

The research involved data collection, model development and evaluation. The four phases of primary data collection were qualitative research; origin-destination survey of ferry users and passenger counts; stated preference surveys of mode choice; and valuation of wharf and vessel service quality.

### 1. Qualitative research

Six focus groups were held in May 2000 with Sydney Ferries' users including Inner Harbour frequent users, Manly frequent users, tourists and infrequent users. The groups explored factors affecting mode choice and attitudes towards ferry wharf and vessel features and service levels. Following discussion on these topics, participants completed a questionnaire to capture individual responses to the topics raised during the groups.

### 2. Origin-destination survey of ferry users

Due to the nature of data available from internal and external sources, it was necessary to undertake an on-board survey of ferry users and passenger counts to understand ferry travel patterns. Surveys were completed in May 2000 on both weekday and weekend services, with the aim of counting passengers on every service at every wharf. Passengers boarding and alighting were recorded at each wharf for all services on the survey days. Passengers were handed a double-sided A4 size survey as they boarded the vessel and counts were made of passengers boarding and alighting at each wharf. The survey included questions about the ferry trip including trip purpose, frequency of use, trip origin and destination (street and suburb), access mode to the wharf, ticket type, and party size, and questions about the ferry user such as primary place of residence, occupation, age and sex.

A total of 16,163 completed surveys were collected from the 63,957 passenger boardings counted on the surveyed services, representing a response rate of 25%. The results are presented in the following section.

### 3. Mode choice Stated Preference surveys

A series of mode choice Stated Preference (SP) models were designed to quantify the response of both the ferry and alternative (bus and car) travel markets to changes in the key parameters that impact on mode choice decisions. Attributes included both price and non-price factors such as access and egress time, travel time and public transport service characteristics such as the need to interchange, service frequency and reliability.

The surveys focused on ferry users, plus current bus and car users. Rail is not a viable alternative in most of the ferry market. One experiment presented current

public transport users with a choice between two public transport trip options (PT vs PT) while the other experiment design provided current car users and ferry users with a choice between a public transport trip and a car trip (PT vs Car). The public transport trips included bus trips, ferry trips and bus+ferry trips.

Two pilots of the PT vs PT experiment, with over 70 interviews, were required to refine the experimental designs and show cards. Three pilots of the PT vs Car experiments were required because both current public transport and current car users displayed a strong preference for their existing mode and the design had to be fine-tuned to ensure that respondents exhibited some “trading” behaviour between their existing mode and the alternative. Considerable difficulty was also encountered in recruiting current car users for the survey. Interviewers were seeking people willing to complete the SP experiment who were currently driving to work, living in an area in which ferry was a viable alternative form of transport and willing to use ferry to travel to work. The number of respondents for the SP experiments is shown in Table 3.

**Table 3 Responses to mode choice SP experiments**

Mode choice experiments	Peak	Off-peak	Total
PT vs PT:			
Current ferry users	189	158	347
Current bus users	125	82	207
PT vs Car*:			
Current ferry users	176	140	315

\*Current car users were also surveyed, but not included in the model.

#### 4. Valuation of service quality

Valuation of service quality surveys of current ferry users were also undertaken to establish the relative importance of ferry wharf and vessel attributes and to estimate customer “willingness to pay” for wharf and vessel service quality enhancements. The wharf and vessel improvements were based on a review of the focus group outcomes. The list of improvements is in Table A1 in the Appendix. A “bag of points” approach was used in which respondents were asked to assign 10 points to the five wharf improvements that would most improve their ferry travel from a given list, and then 10 points to the five vessel improvements that would most improve their travel from a given list. In the final stage, respondents assigned 10 points between their chosen packages of wharf improvements, vessel improvements and perfect reliability.

Because a value for reliability had already been established in the mode choice SP experiments, the value of the wharf and vessel improvement packages could then be estimated. The valuation of improved ferry reliability provided a bridge between the mode choice and service quality experiments. The approach ensure that the sum of valuations for all individual wharf and vessel features was precisely equal to the maximum willingness to pay for wharf and vessel improvements, addressing the problem of packaging in valuation studies.

A total of 320 peak and off-peak ferry users from five routes, including a mix of wharf and vessel types, completed the surveys. Again, the implementation of the survey indicated the problem of market size. On one route, interviewers found a significant proportion of potential respondents had been approached previously to complete the mode choice experiment.

### Characteristics of ferry travel

Key results from the survey of ferry users on the characteristics of ferry trips and ferry users are highlighted. Almost half of all travel on Sydney Ferries (45%) occurs between Manly and Circular Quay. Taronga Zoo accounts for 8% of the market, while three other wharves account for 10% of the market: Mosman (4%), Balmain East (3%) and Neutral Bay (3%). All other wharves account for the remaining 37% of travel.

Trip purpose varied significantly by both route and day of week (Table 4).

**Table 4 Trip purpose by route**

Route	Weekday Commuter	Weekend Non-commuter	Total* Commuter	Total* Non-commuter
Manly	53%	89%	41%	59%
Manly - JetCat	84%	78%	65%	35%
Taronga Zoo	40%	87%	30%	70%
Darling Harbour	45%	91%	32%	68%
Mosman	62%	78%	54%	46%
Neutral Bay	61%	84%	51%	49%
Watsons Bay	60%	98%	47%	53%
Woolwich	74%	93%	62%	38%
Parramatta	49%	98%	36%	64%
Average	58%	88%	45%	55%

\*Based on expanded survey results for a weekday, weekend day and full week.

On an average weekday, 58% of trips were for commuter purposes (defined as work and education trips). The Manly JetCat route had the highest proportion of commuters on a weekday, at 84%, due to its high speed, premium fare service. The Woolwich route also had a higher proportion of commuter use, with three-quarters of weekday users (74%) being commuters. The Taronga Zoo route had the lowest proportion of commuters on a weekday, at only 40%. The Darling Harbour and Parramatta services also had high non-commuter use on weekdays.

On a weekend day, 88% of trips were non-commuter based, defined as trip purposes such as recreation/social, shopping/personal business and “just enjoying a ferry ride”. The weekend market is characterised by a series of peaks between the late morning and mid-afternoon, not dissimilar to the weekday non-commuter market.

Walk was the most common mode used to access ferry services, with half of ferry users (47%) walking to the wharf. One in five ferry users caught a bus to the wharf. Access mode varied by trip purpose, as shown in Table 5.

**Table 5 Access mode by trip purpose**

Access mode	Commuter	Non-commuter	Total*
Walk	60%	37%	47%
Bus	16%	24%	20%
Train	9%	17%	13%
Car	12%	13%	13%
Ferry	1%	8%	5%
Other	2%	2%	2%
Total	100%	100%	100%

\*Weighted average by trip purpose. Based on expanded survey results for a full week.

Ticket type was strongly related to trip purpose (Table 6), with most commuters using FerryTen or TravelPass (multi-mode) tickets (80%). Non-commuters were more likely to use single fares (returns are not available), or the Pensioner Excursion Ticket (\$1.10 for all-day travel on government bus, ferry and rail services in Sydney).

**Table 6 Ticket type by trip purpose**

Ticket type	Commuter	Non-commuter	Total*
TravelPass (multi-modal)	42%	14%	27%
FerryTen	38%	8%	22%
Single	12%	38%	26%
Pensioner Excursion Ticket	3%	27%	16%
Other	5%	12%	9%
Total	100%	100%	100%

\*Based on expanded survey results for a full week.

Frequency of ferry travel was also closely related to trip purpose (Table 7), with most commuters using ferry more than once a week compared to 28% of non-commuters.

**Table 7 Frequency of travel by trip purpose**

Frequency	Commuter	Non-commuter	Total*
Weekly (or more often)	92%	28%	57%
2-3 times per month	4%	18%	12%
More than once a year	2%	22%	13%
Once a year or less	1%	17%	10%
First time	1%	15%	8%
Total	100%	100%	100%

\*Based on expanded survey results for a full week.

Three-quarters (75%) of ferry users were Sydney residents, with 5% from the rest of NSW, 8% from interstate and 13% from overseas. Travel by interstate and international tourists was particularly significant for Parramatta, Taronga Zoo, Darling Harbour and Watsons Bay routes. For instance on the Taronga Zoo route, 38% were non-Sydney residents, including almost a quarter (23% of the total) from overseas, while on the Parramatta route, 35% were non-Sydney residents.

Information from the surveys was a key input into the modelling process, discussed below. However the survey data, including data not reported here such as origin street and suburb and destination street and suburb, has also been useful in providing data for other planning purposes, particularly as the sample size provides reasonable data on most wharves. Planning uses include:

- Profile of ferry users at specific wharves
- Distance decay effect for bus access to Manly wharf from the northern beaches
- Destination within the CBD of passengers arriving at Darling Harbour wharf.

### **Mode choice**

The mode choice SP experiments provided interesting insights into the travel preferences of ferry users. Validation tests showed that the models produced were statistically strong and the parameters were broadly consistent with the available literature and understanding of the Sydney Ferries market.

Indicative results from the PT vs PT mode choice experiments are shown in Table 8. The table shows the value of a one unit change in service characteristics such as walk time to wharf and reliability (late running) in terms of the equivalent in-vehicle travel. For instance, one minute of walk time to the ferry wharf was valued as being equivalent to less than one minute of in-vehicle travel time for peak ferry users. In contrast, a one minute increase in late running was valued as equivalent to almost 2 minutes of ferry travel time for a ferry user in the peak. A peak ferry user would prefer a 9 minute longer ferry trip rather than an interchange on a trip (such as bus to ferry).

**Table 8**      **Valuations of service characteristics in in-vehicle time:  
(from PT vs PT mode choice experiments)**

Indicative results	Peak	Off-peak
<i>Value of time (\$/hr)</i>		
Ferry users	\$13.50	\$11.00
Bus users	\$6.00	\$6.80
<i>Service characteristics</i>		
Reliability (1 min increase in late running)		
Ferry users	1.7 in-veh mins	2.2 in-veh mins
Bus users	7.8 in-veh mins	6.2 in-veh mins
Interchange (each interchange)		
Ferry users	9.1 in-veh mins	19.0 in-veh mins
Bus users	3.1 in-veh mins	6.5 in-veh mins
Headway* (1 min increase in headway)		
Ferry users	0.2 in-veh mins	0.3 in-veh mins
Bus users	0.6 in-veh mins	0.3 in-veh mins
Access time (1 min increase in walk time)		
Ferry users	0.8 in-veh mins	1.0 in-veh mins
Bus users	1.3 in-veh mins	1.1 in-veh mins

Note: in-veh mins = travel time on ferry for ferry users, and travel time in bus for bus users.  
\*Headway refers to gap between services. A frequency of two trips per hour is equal to a headway of 30 minutes.

Key insights into travel choices derived from the PT vs PT mode choice experiments included:

- Ferry users had a strong preference for ferry over bus as a form of transport, particularly in the off-peak. For peak users, this preference is the equivalent of 17 minutes of in-vehicle time, while for off-peak users the difference is much higher at 31 minutes.
- Value of time for peak and off-peak ferry users was higher than typical for public transport users. This is not unexpected as the ferry market includes harbour foreshore areas dominated by relatively high income earners.
- Access time by walk mode was valued on par with in-vehicle time by both ferry and bus users.
- Valuation of frequency of service varied with the frequency of the existing service. Ferry services are generally less frequent than bus services. The relatively low frequency ferry services had lower valuations than peak bus services which are more frequent.
- Valuation of reliability was characterised by a relatively low valuation for ferry users and a relatively high but variable valuation for bus users. The differential between modes may reflect the differing waiting conditions associated with the two modes.
- The perceived cost of interchange was significantly higher for ferry users compared to bus users.

Due to difficulties in surveying current car users for the PT vs Car experiment, estimates of the likely sensitivity of current car users to changes in ferry service quality were developed by modelling those ferry users who said their next best alternative would be car as driver. Insights from the PT vs Car experiments included:

- Ferry customers have a strong bias in favour of car.
- The value of time for peak ferry users was consistent with the value for ferry users in the PT vs PT experiment, but the value of time for off-peak ferry users was significantly higher than what would be expected. A possible explanation is that respondents may have discounted the parking costs for shorter off-peak trips.
- The relatively low valuation for walk time may reflect the relatively short walk options offered in the experiments.
- Peak ferry users and the car drive market were more sensitive to changes in frequency than the off-peak market.
- The relatively high valuation given to reliability may reflect respondents' bias against the reliability of ferry services relative to car, and their subsequent discounting of the ferry reliability options in the experiments.
- The interchange penalty associated with the car drive market was very high and suggests that many respondents simply ruled out a trip that involved an interchange and preferred to travel by car in these situations.
- The value of car time results suggest that off-peak travellers consider a minute in a car to be significantly better than a minute in a ferry whereas peak travellers would prefer to be in a ferry, possibly reflecting the impact of road congestion.

### **Valuation of wharf and vessel improvements**

Due to the approach used to value wharf and vessel service quality described earlier, the results are related to respondents' value of time and the valuation placed on an improvement in service reliability.

#### **Wharf improvements**

Overall, the valuations of the wharf improvements were relatively low, suggesting that ferry users are happy with their wharves. Valuations for the total improvement package ranged from around 20 cents per trip for three wharves, 31 cents per trip for Manly wharf and over 50 cents per trip for Rydalmere wharf (but a very small sample). The three wharves with the lowest valuation placed on the improvement package (Neutral Bay, Cremorne Point and Mosman) had previously been identified in a wharf infrastructure report as being in relatively good condition and relatively well-appointed. Valuations were obtained for both peak and off-peak users, but did not vary markedly.

As well as the total package, valuations were also obtained for specific improvements. The most highly valued improvements varied across wharves. At Manly wharf, the top three wharf improvements identified in both the peak and

off-peak periods, each valued at more than 5 cents per trip, were a repainted and refurbished wharf appearance, provision of well-maintained toilets and more seating in the waiting area.

The other wharves differ significantly from Manly wharf in the facilities provided. Across the 18 other wharves surveyed, the provision of the help point and emergency phone attracted the highest valuation, at 5 cents per trip. Since the survey, help points have been installed at all wharves. Valuations for all other improvements ranged from 1 cent to 3 cents per trip.

### Vessel improvements

The valuations for the vessel improvement packages were similar in magnitude to the wharf improvement packages. Valuations varied between 18 cents per trip for the Lady class ferry to 38 cents per trip for the RiverCat and Manly ferries. Valuations were higher in the peak than off-peak. Key areas for improvement with the Manly ferry were reductions in delays while boarding and alighting (6 cents per trip), cleaner toilets (6 cents per trip) and a kiosk that is always open (4 cents per trip).

For the First Fleet class of ferries, both peak and off-peak users identified an on-board ticket machine and cabin air quality as the most valuable areas for improvement. The provision of on-board ticket vending machines attracted the highest valuation at 7 cents per trip from peak users. Reduction of engine fumes in the seating area was valued at 4 cents per trip by both peak and off-peak users.

### **Sydney Ferries Demand Model**

A Sydney Ferries Demand Model was developed using a variety of inputs including data from the primary data collection phase. The development of the model is shown in Figure 1. The model was calibrated for weekday travel made by Sydney residents for all trip purposes (excluding “just enjoying the ferry ride”). The in-scope market for the model accounts for 72% of all weekday trips and 52% of weekend trips.

A disaggregate zone system was developed to allow for the assessment of different access and egress characteristics at varying distances from each ferry wharf. It provided a series of small zones within a 500 m walking buffer from a ferry wharf and a series of large suburbs and regional zones were defined around each walking buffer. The zone system was based on the Transport Data Centre’s travel zones.

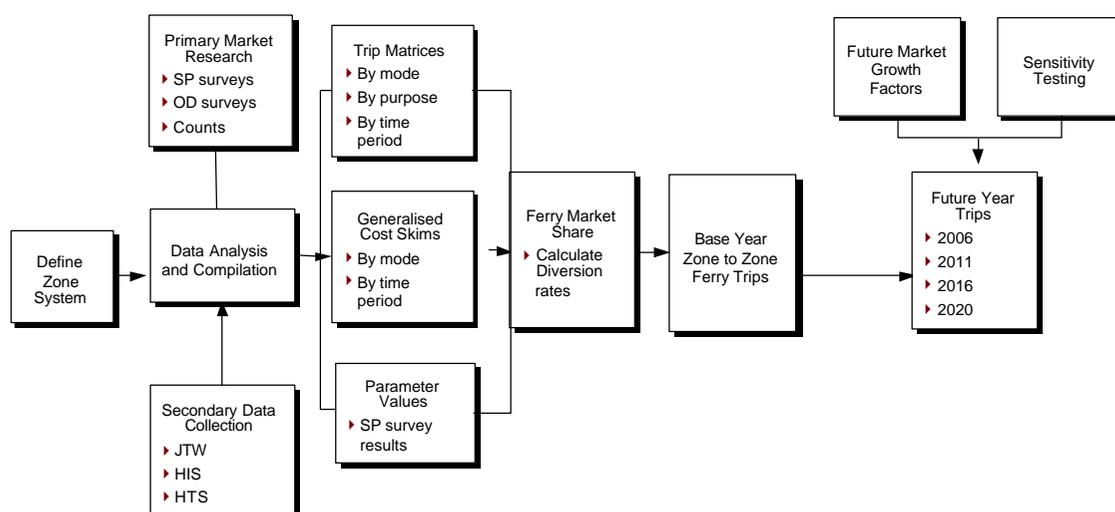
Base market trip matrices for each mode were developed by combining data from the survey of ferry users with data from the 1991 Home Interview Survey, 1998 Household Travel Survey and the 1996 Journey to Work dataset. The

ferry base trip matrix was based on the origin-destination survey, expanded up using the ferry passenger counts undertaken at the same time.

A generalised cost function was developed to estimate the cost of travel between any pair of zones. To calculate the generalised cost of travel, travel skims between each origin-destination pair for ferry, bus and car were developed including in-vehicle time, access and egress, frequency, interchange, fare or parking cost, and reliability. The skims were developed from two primary sources:

- Timetables and maps to generate the ferry skims
- Transport Data Centre's EMME2 model to generate peak period skims for bus and car. Off-peak skims were generated by applying adjustment factors to allow for off-peak travel time savings.

**Figure 1 Development of the Sydney Ferries Demand Model**



Source Booz Allen Hamilton (2001).

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The mode choice experiments provided parameter estimates for the mode choice module.

The travel matrices, SP parameters and skims were combined to develop estimates of divertable trips to/from ferry services for weekday travel. An Excel spreadsheet model was developed to model base year and future ferry demand. The model calculates the number of trips diverting to ferry from alternative modes (ie bus and car) that are the result of factors which impact favourably on the ferry's attractiveness when compared to other modes such as ferry route development, service improvements such as frequency and travel time savings. The model also calculates the number of trips diverting from ferry that are the result of factors which adversely affect the attractiveness of ferry to other modes such as service deterioration or ferry cancellations.

## **Assessment of service development options**

The Sydney Ferries Demand Model was developed in order to evaluate a range of business development opportunities. There were three types of options identified for evaluation including:

1. Entirely new services or extensions to services
2. Rationalisation of existing services
3. Specific improvements to wharf or vessel quality.

Results from the evaluation of the options are discussed first, and the response to the study discussed in the following section.

### **1. New services or extensions to services**

The 12 new services and extensions which were evaluated included weekday peak express services to Inner Harbour wharves such as Rose Bay and Watsons Bay; new all day services to Darling Harbour, Glebe and Manly–Milsons Pt–North Sydney; and extensions to existing services. Of the 12 new services examined, only one, the extension of the Circular Quay–Watsons Bay service to Manly in the off-peak, was found to have potential to generate an operating surplus. However the annual operating surplus was \$34,000, equivalent to 14,400 passenger trips per year or 40 per day. All other proposals had negative annual operating surplus, with a new all day service between Manly–Milsons Pt–North Sydney estimated to lose as much as \$2 million per year.

Another proposed service, a Circular Quay–Glebe service, had the potential to generate higher farebox revenue per vessel km than the current average for Inner Harbour services. But it would still incur an annual operating loss of over \$600,000. The analysis also considers vessel operating costs only, and does not take into account the cost of wharf infrastructure, both the capital cost of wharf provision and on-going maintenance costs. As there is no suitable wharf, a wharf would have to be constructed.

### **2. Rationalisation of existing services**

A number of service rationalisations were identified with potential to improve the financial position. Those options offering the greatest potential included terminating all existing Parramatta services at Homebush Bay, that is discontinuing services to Rydalmere and Parramatta wharves, and discontinuing services to a number of wharves on the Rydalmere route including Darling Harbour, Milsons Pt and McMahons Pt.

The financial benefits of these proposals do not simply reflect operating cost savings. The improvements in travel times and service frequency to and from the remaining wharves on the routes facilitated by these changes generate significant patronage and hence farebox revenue gains.

### **3. Specific improvements to wharf and vessel quality**

From a wide range of service quality enhancement options, three potential service quality enhancements were specified for detailed evaluation. These included:

- Installation of on-board ticket machines on all vessels other than Manly ferries, as ticket machines exist on Circular Quay and Manly wharves.
- Installation of on-wharf real-time passenger information at all wharves other than Circular Quay (which already has it).
- The refurbishment of Manly wharf (ie repainting and minor cosmetic work).

Of the service quality enhancement initiatives considered, the installation of on-board ticket vending machines on Inner Harbour and Parramatta services, was found to generate a positive return with a Net Present Value of \$1.6 million over 20 years through reduction in fare evasion. It was assumed that the rate of fare payment on trips that did not involve Circular Quay would increase significantly with the installation of on-board ticket machines.

### **Response to the study**

The response by Sydney Ferries to the evaluation of service development options has been affected by the original purpose and perspective of the study, completed in May 2001. The evaluation focused on estimation of the operating surplus generated by each option. The study did not address the acceptability of the service rationalisation options from a policy perspective such as the social impacts on those communities which would lose services. While a number of service rationalisations were identified which would improve the financial position, none of these is currently being pursued by Sydney Ferries.

It was also beyond the scope of the study to provide a definitive assessment of how each option might be accommodated from an operational perspective. Vessel suitability and reliability are significant operational issues. For instance, a Watsons Bay to Manly service requires a vessel that can serve both Watsons Bay and Manly wharves, and cross the heads of Sydney harbour. The three JetCats, which operate the high speed service between Circular and Manly, are the only suitable vessels. However, the JetCats may cause unacceptable wash and noise impacts at Watsons Bay. The SuperCat vessels which currently operate to Watsons Bay are not certified to cross Sydney Heads.

The relationship between vessel use, scheduling and berthing capacity at Circular Quay for services across the whole ferry network makes it difficult to introduce only one change on its own. The ability to implement change has been affected by vessel availability. The mixed fleet of seven vessel types operated by Sydney Ferries gives flexibility but depends on reliability. Vessel reliability has delayed the introduction of new schedules which would improve frequency of service.

Wharf ownership also affects the ability of State Transit to implement initiatives. A major constraint to further investigation of a service between Glebe and

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Circular Quay is the lack of wharf infrastructure at Glebe. Sydney Ferries does not construct wharves, and owns only nine of the wharves to which it operates. While a refurbishment of Manly wharf would be valued by passengers, State Transit does not own the wharf. The forecourt of Manly interchange has been upgraded recently by Transport NSW, and the wharf is currently undergoing redevelopment.

Help points were a feature valued by passengers on remote wharves. CCTV surveillance cameras and two-way help points have been installed on 38 wharves used by Sydney Ferries to enhance passenger and staff safety. The remote monitoring project was awarded a Significant Project Award for 2001 by US-based Lucent Technology. The 2002/03 NSW State budget included provision for on-board ticket machines, another improvement valued by passengers.

## **Conclusion**

To improve planning of ferry services, extensive primary research was required to compensate for limited existing sources on ferry travel. A variety of data sources including focus groups, origin-destination surveys, passenger counts, mode choice Stated Preference surveys, and valuation of wharf and vessel improvements were used to improve planning and development of ferry services. The Sydney Ferries Demand Model was developed as a tool to use the wide range of data sources to evaluate a range of service alternatives.

But the research, including both the methodology and the results, demonstrated the challenges in improving ferry services and increasing patronage. Several pilots were required to refine the SP experiments to encourage trade-off between mode choice attributes and it was time-consuming to identify and recruit current car users who were potential ferry users. Of over 20 potential service developments which were evaluated, few offered potential to improve financial performance, highlighting the difficulties of providing commercial ferry services. In addition, those options with potential face operational and policy constraints on further development and implementation.

The identification and analysis of service development initiatives is an on-going response to the study, with the viability of options changing as demand and supply side conditions change over time. The data and insights gained from the research, together with the Sydney Ferries Demand Model, will continue to be a valuable tool for improving planning of ferry services.

## Acknowledgments

The State Transit Steering Committee included Wendy Adam, Rhonda Daniels, Egle Garrick and Jacqui Ritchard. The Booz Allen Hamilton team included Mark Streeting, Martin Walsh, Tom Frost and Natalie Schmidt. The SP experiments were designed and analysed in conjunction with Pacific Consulting Infrastructure Economists.

## References

Booz Allen Hamilton (2001) *Sydney Ferries Business Development Study*, Final Report, May, Consultant Report for State Transit (unpublished)

State Transit (2001) *Annual Report 2000/2001*, State Transit Authority of NSW, Sydney (also [www.sta.nsw.gov.au](http://www.sta.nsw.gov.au))

## Appendix

**Table A1 Wharf and vessel improvements offered to respondents**

Wharf improvement	Ferry vessel improvement
Brighter lighting at wharf and approach ways	Onboard security cameras
Security cameras	Help point and emergency phone
Help point and emergency phone	Real time arrival time and position display
Clear wharf announcements	Clearer onboard passenger announcements
Computerised real time information display	No delays when boarding and alighting
Provision of ticket vending machine(s)	Outdoor seat always available
More car parking at wharf	Indoor seat always available
Secure bike rack	More efficient, quieter, air conditioning and heating
Large weather protected waiting area	No engine fumes enter seating area
More seating in waiting area	An always open food, beverage, newspaper kiosk
Provision of well maintained toilets	Onboard ticket vending machine
Clean, no rubbish, all graffiti regularly removed	Cleaner graffiti free seats
Repainted, refurbished wharf appearance	Cleaner well maintained toilets
	Refurbished ferry interior appearance
	Refurbished ferry exterior appearance

Source Booz Allen Hamilton (2001).

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Figure A1 Map of Sydney Ferries network

