PERFORMANCE OF MORETON BAY WATER TRANSPORT AND PRINCIPLES FOR IMPROVEMENT

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ABSTRACT: *This paper describes certain aspects of a major strategic planning study of water transport in Moreton Bay. The local water transport services which operate in the Bay are privately owned and operated and represent one of the larger groups of private water transport services in Australia. The study provided a valuable opportunity to examine the dynamics of competition, price setting and marketing in an 'unregulated' industry. As a whole, the industry was found to be competitive, efficient and responsive to the requirements of the travelling public and operating essentially without Government subsidy. It was assessed that investment in faster new craft would generate substantial additional demands and be commercially viable. Based on the results of the study, the broad principles upon which a strategy for improvement can be based are outlined.*

PERFORMANCE OF MORETON BAY WATER TRANSPORT AND PRINCIPLES FOR IMPROVEMENT

INTRODUCTION

This paper describes certain aspects of a major study of water transport in Moreton Bay which is located adjacent to the Brisbane metropolitan area. The location of the study area and the existing major ferry routes and services are shown in Figure 1. The study was commissioned by the Queensland Premier's Department in May 1986. The principal objective of the study was to identify and recommend broad strategies for the future development of the Bay Islands' transport system, including possible connections to the Gold Coast. The main technical work was concentrated on scheduled passenger, vehicular and freight services.

The local water transport services which operate in the Bay are privately owned and operated and represent one of the larger groups of private water transport services in Australia. The study provided a valuable opportunity to examine the dynamics of competition, price setting and marketing in an industry which, by comparison with land public transport, is reasonably free of regulation.

Little published data on the water transport industry in Moreton Bay existed at the outset of the study. Considerable effort was devoted therefore to obtaining data to define confidently the existing structure, conduct and performance of the industry and related matters. The information was obtained through extensive discussions and liaison with operators and relevant state and local government bodies, user surveys, field trips and the collation and analysis of other relevant technical and commercial literature.

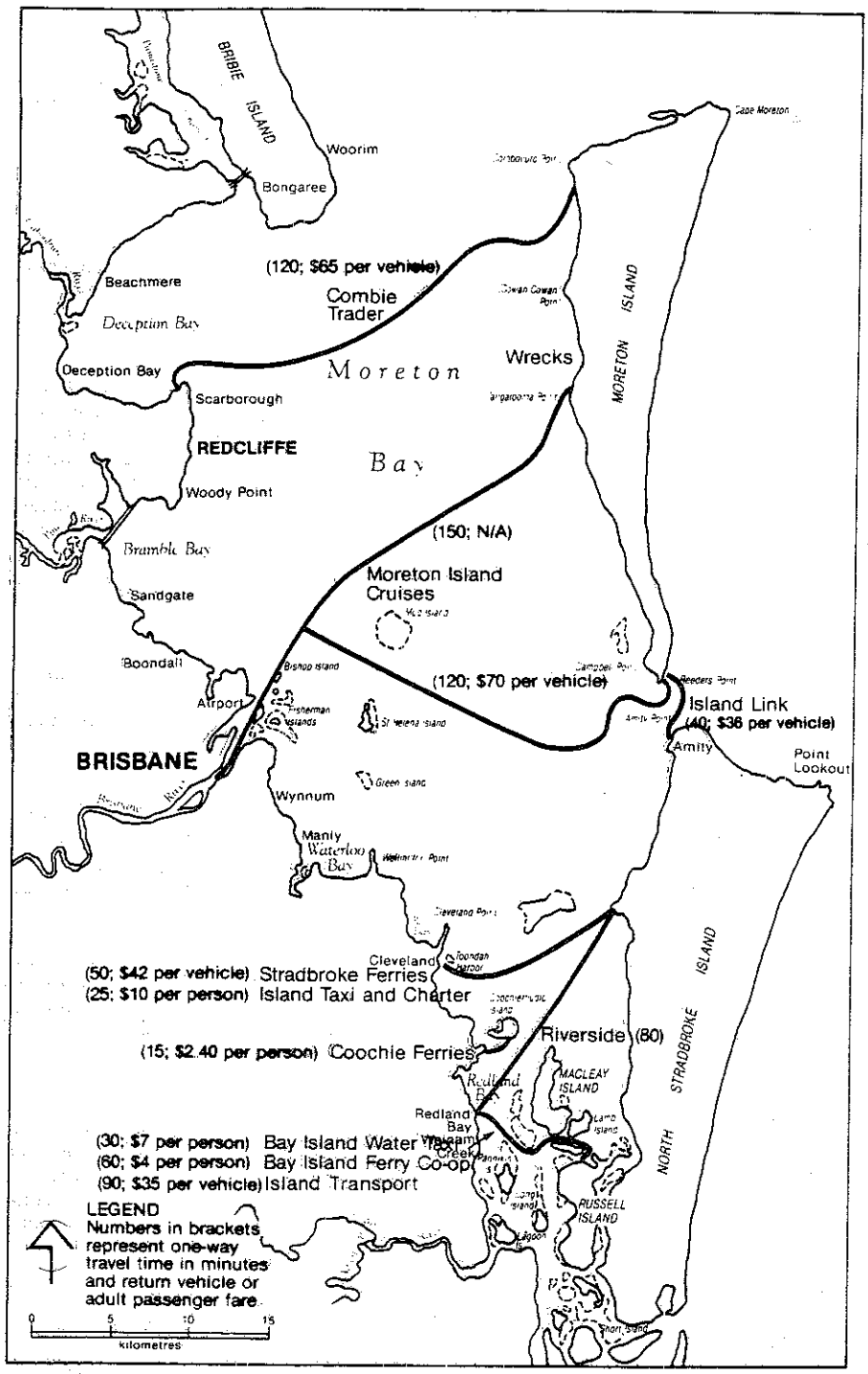
Moreton Bay consists of a diverse range of islands and waterways of considerable beauty. The more populated, but as yet relatively undeveloped islands, are North Stradbroke and Russell. The study focussed on the requirements of these islands. North Stradbroke Island is significant for its recreation potential because of its fine surf beaches, whereas Russell Island and nearby islands, for which the principal attraction is the availability of cheap land, tend to function as dormitory residential areas for the mainland.

In 1986 the population of all the Bay islands combined was estimated as 5200 persons of which North Stradbroke and Russell Islands accounted for 2500 and 260 persons respectively. By 1996, at existing growth rates, the population of the islands is estimated to more than double. Employment on the islands is very small and largely associated with a few commercial activities such as Tangalooma Resort on Moreton island and the Consolidated Rutile Limited sand mining operation on North Stradbroke island. Significant population and employment growth is taking place in the mainland areas adjacent to the Bay.

ANALYSIS OF THE EXISTING INDUSTRY

Regulatory Framework

Control is exercised over the technical qualifications of shipping personnel, standards of vessel construction and maintenance, the erection of marine facilities and the use of land around the shore line. A summary of the existing regulatory framework is shown in Table 1. By comparison with land public transport, water transport can be regarded



Existing Major Routes/Services in Study Area

FIGURE 1

as reasonably free of regulation as no licences or permits exist to give exclusive rights of operation on certain routes or areas. No operating subsidy is provided to services. Control of landing facilities, related land and access routes is fundamental to whether operation at a particular location is possible.

Supply Characteristics

The principal services to North Stradbroke and Moreton Islands are provided by landing barge type car ferries. Ferries and catamarans provide passenger services to the other islands.

Figure 1 shows the routes of major operators of scheduled services and typical travel times and fares. Services are generally operated to a published timetable. However they may be added or withdrawn depending on demand. Generally, services are added only if there is a guaranteed 'break-even' load or a reasonable expectation of achieving one. Services are normally operated as a shuttle between the mainland and an island. At peak times, where an operator has more than one vessel, two vessels may be run in parallel. All boats require a master. Other staff are provided depending on whether an engineer is required and for tasks such as ticket selling. Cancellation of services due to poor weather, mechanical breakdown or to meet survey requirements rarely occurs.

A detailed appraisal of the suitability of existing craft used for scheduled water transport services was undertaken. The general conclusion was that existing craft are generally adequate. However, the barges providing car-ferry services are slow and usually do not have sufficient passenger facilities.

During the course of the study, existing operators and other groups demonstrated considerable interest in operating new services and upgraded craft in the Bay. However, they claimed that the possibility of the construction of a bridge to North Stradbroke island and the difficulties found in obtaining a suitable landing area were two factors delaying the necessary investment.

Discussions with existing and potential operators and observations on the response of individual operators to actions of their competitors (some of which are described below), led to the conclusion that the market is contestable.

A number of operators have no shore facilities at all while others generally have minimal facilities. However, an assessment of the landings currently used by scheduled water transport services was undertaken and this indicated that all facilities generally provided an adequate level of service. Some improvements are required, however, to car parks particularly from the security point of view, complementary land public transport services and public amenities located at terminals.

Demand

Table 2 summarises estimated 1985 or potential 1986 patronage for all the major scheduled water transport services and four tourist charter services on the Bay. The latter are included to provide a complete picture. The demand figures describe total movements; that is the sum

TABLE 1. EXISTING REGULATORY FRAMEWORK IN MORETON BAY

Agency/ Relevant Legislation	Control Over								
	Qualifications of Personnel	Boat Construction	Hull Maintenance	Navigation Channels/Erection of Structures/ Facilities	Land above high water mark	Foreshore	Land below high water mark	Town Planning/ Building Requirements	Licencing of Services
Marine Board, Dept of Harbours and Marine/ Harbours Act, Marine Act	X	X	X	X					
Port of Brisbane Authority/ Harbours Act						X	X		
Local Authorities/ Local Government Act or under Lands Act					X	X		X	
Private Owners					X				
Other Government Agencies/ Lands Act					X				

TABLE 2. PASSENGER DEMAND BY COMPANY
(Actual demand 1985 or estimated demand 1986)

Services to	Company	Demand (2-way combined)	
		Vehicles/Pax	Walk-on Pax
Moreton Island	Combie Trader	7,600/19,000	3,000
	Moreton Island Cruises	9,500/58,000	-
	Island Link	3,000/12,000	-
	Tangalooma * Resort	N.A./N.A.	53,000
	Pursuit Tours *	N.A./N.A.	3,000
TOTAL		20,100/89,000	59,000
North Stradbroke Island	Stradbroke Ferries	69,400/173,500	132,300
	Peel Islander *	N.A./N.A.	10,000
	Island Taxi and Charter	N.A./N.A.	10,600
	Riverside	38,000/95,000	10,000
TOTAL		107,400/268,500	163,400
St Helena Island	Beachlander *	N.A./N.A.	10,500
TOTAL		N.A./N.A.	10,500
Coochiemudlo Island	Coochie Ferry	N.A./N.A.	180,000
TOTAL		N.A./N.A.	180,000
Russell Island Group (and Coochie Isle - 1 day per week)	Island Transport	7,000/17,500	N.S.
Russell Island Group	Bay Islands Ferry Co-op	N.A./N.A.	100,000
	Bay Islands Water Taxi	N.A./N.A.	115,000
TOTAL		7,000/17,500	215,000

Note : N.A. - Not Applicable; N.S. - Not significant; - Not available.
* Non-scheduled service, mainly tourist or charter oriented.

of the movements in each direction for vehicles and passengers in vehicles and for walk-on passengers.

The following is a summary of the features of Table 2 which are of most relevance to this paper :

To North Stradbroke Island - Stradbroke Ferries carry 65 percent of the vehicles to the island with Riverside accounting for the balance. Stradbroke Ferries carry 80 percent of the walk-on passengers to the islands with the balance mainly accounted for by Island Taxi and Charter and the Peel Islander which runs a day tour from the Gold Coast. Island Taxi and Charter which operates two small passenger catamarans, despite offering a faster service, cannot compete with the lower fares, the timetable flexibility nor the relatively smooth ride which Stradbroke Ferries can offer. Another major factor is that the small vessels employed cannot provide an all weather landing at Dunwich and so must berth at One Mile which is outside the town centre

To Russell Island Group - Island Transport provides for regular transport of cars to Coochiemudlo Island, Lamb, Macleay, Karragarra and Russell islands. The Bay Islands Ferry Co-operative provides passenger and freight ferry services while the Bay Islands Water Taxi provide the fast passenger (and emergency) services.

Surveys undertaken for the study provided information on the key characteristics of persons making trips to North Stradbroke Island and islands in the Russell group. These are described in terms of three main trip categories which were also used in the demand modelling.

North Stradbroke Island

Recreational trips generated by mainland residents (58 percent of all trips) :

- the majority of travellers had made less than two trips to the island in the year prior to being interviewed;
- four wheel drive vehicles are very important for access;
- persons generally travelled in groups consisting of one or more families;
- virtually all persons visiting the island were staying for one night or longer in low-budget accommodation (e.g. camping, staying with friends or relatives) - that is, recreational day trippers were negligible in number;
- destination expenditures were low because of the limited range of activities available on the island and the nature of the activities the visitors pursued;
- the Sunshine and Gold Coasts are the major alternative beach-related destinations for recreational travellers; at the present time the Bay islands attract only about six percent of beach related recreational trips made by metropolitan residents (excluding recreational day trips);

Other mainland residents' trips (14 percent of all trips) :

- these are mainly related to serving island development;

Trips by island residents (28 percent of all trips) :

- these are trips to the mainland for school, shopping and other activities; many of these trips are made as walk-on passengers on Stradbroke Ferries.

Russell Island and nearby islands

Recreational trips generated by mainland residents (49 percent of all trips) :

- these are mainly made around weekends when visiting holiday houses or family. These were of a more frequent nature than trips in the same category to North Stradbroke Island.

Other mainland residents' trips (10 percent of all trips) :

- these are mainly related to servicing island development.

Trips by island residents (41 percent of all trips) :

- these are mainly work, school or shopping trips. There is a higher percentage of work trips and generally more frequent trip making compared with North Stradbroke Island because of the proximity of the Russell Island group to the mainland

The above characteristics highlight the significance of recreational traffic which has a major impact on service levels and related factors

Service Levels and Load Factors

For the major scheduled services an analysis was made of the service levels provided to passengers. The results for the average weekly load factors are shown in Table 3. The key characteristics are :

service levels provided are generous. About 22 return services per day are provided between the mainland and North Stradbroke Island and islands in the Russell group; that is, about one every half hour in daylight hours. However no scheduled services are offered after dark;

average weekly load factors (based on operators' data over a year) vary between 14 and 92 percent with the majority of figures in the range 14 to 40 percent;

the load factors are low compared with land and air transport operations where load factors of 60-70 percent are normally required to provide a financially viable service. This difference is due in part to the seasonal nature of recreational travel to the islands;

where the operators do not provide more than one return service a day and the frequency of operation of a particular service is

TABLE 3. SERVICE LEVELS AND LOAD FACTORS

Island(s) Served	Company	Average return services/week operated in 1985	Average weekly load factor - percent
Moreton Island	Combie Trader	8	-
	Moreton Island Cruises	7	62
	Island Link	28	18
	Tangalooma Resort	6	43
	Total	49	N.C.
North Stradbroke Island	Stradbroke Ferries	103	26
	Island Taxi and Charter	22	-
	Riverside	34	14
	Total	159	N.C.
Coochiemudlo	Coochie Ferries	81	40
	Total	81	40
Russell Island Group	Bay Islands Taxi	91	-
	Bay Islands Ferry Co-op	31	30
	Island Transport	30	24
	Total	151	N.C.

- : Not available
N.C. : Not calculated

demand dependent then much higher load factors can be achieved; for example as the case of Moreton Island Cruises; and

where vessel size is more attuned to average loads, then higher load factors are achieved but the trade-off is that the peak demands can be accommodated only by bringing into service additional vessels.

From the above it was concluded that seasonal and daily variation in demands has a major impact on the type of operation, the choice of vessel capacity and hence operating costs and financial viability

Seasonal and Daily Variation

Figure 2 shows the monthly variation in demands for six operators. Part A of the diagram shows that those services with a significant recreational function have a large variation in traffic between months This is in contrast to those services providing a major commuter function which have a more uniform demand pattern shown in Part B of Figure 2.

The following factors have a major influence on the timing of recreational trip making :

school holidays and public holidays, the latter particularly if part of a 'long' weekend;

the timing of Easter which provides a four-day weekend and is the busiest travel period of the year, at least for Moreton and North Stradbroke Islands;

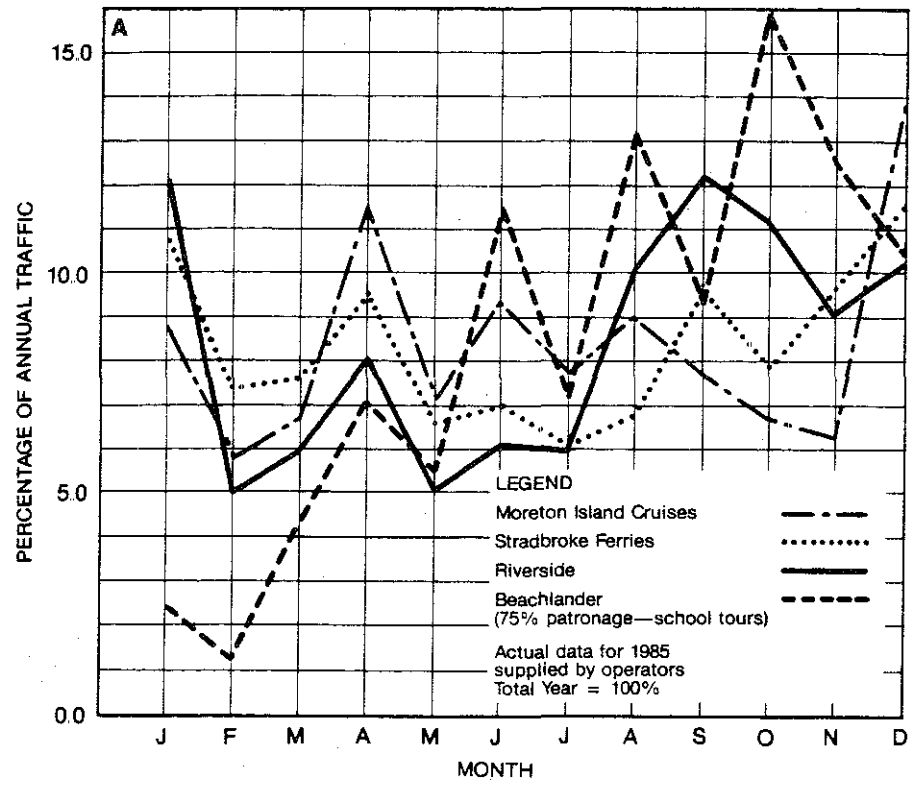
the fishing season which generally extends from June to September;

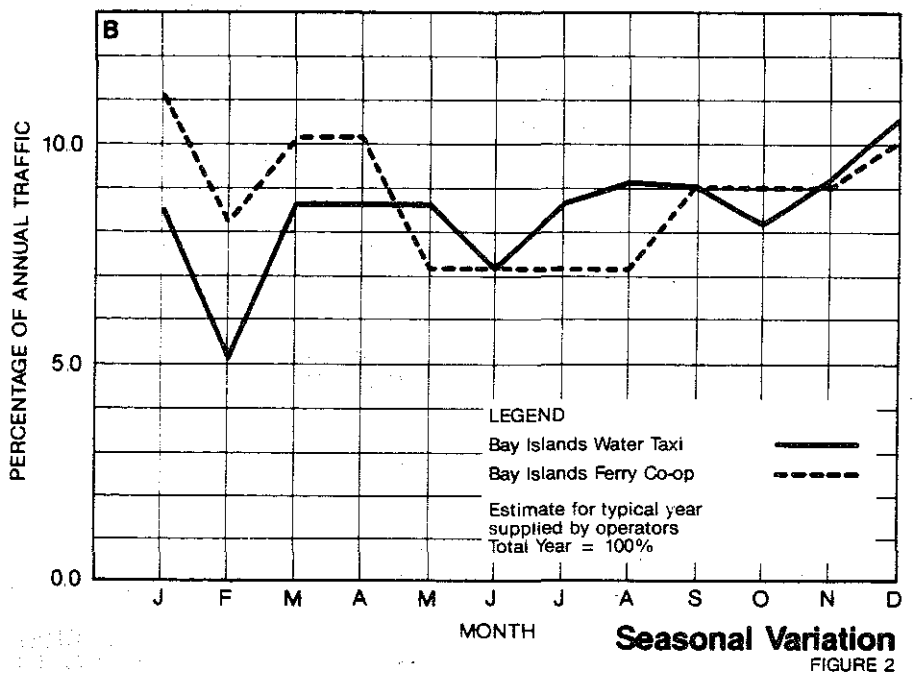
weather and physical conditions in the Bay.

Figure 3 shows estimated day to day variation for a typical week as estimated by three operators. This graph shows the dominance of travel around the weekends

Easter is the period of peak demand for travel to North Stradbroke Island. Available data shows that Stradbroke Ferries and Riverside to a lesser extent are heavily utilised before, during and after Easter. Because of this high utilisation of services at peak times Stradbroke Ferries were considering purchasing a new car ferry and/or a new fast passenger vessel

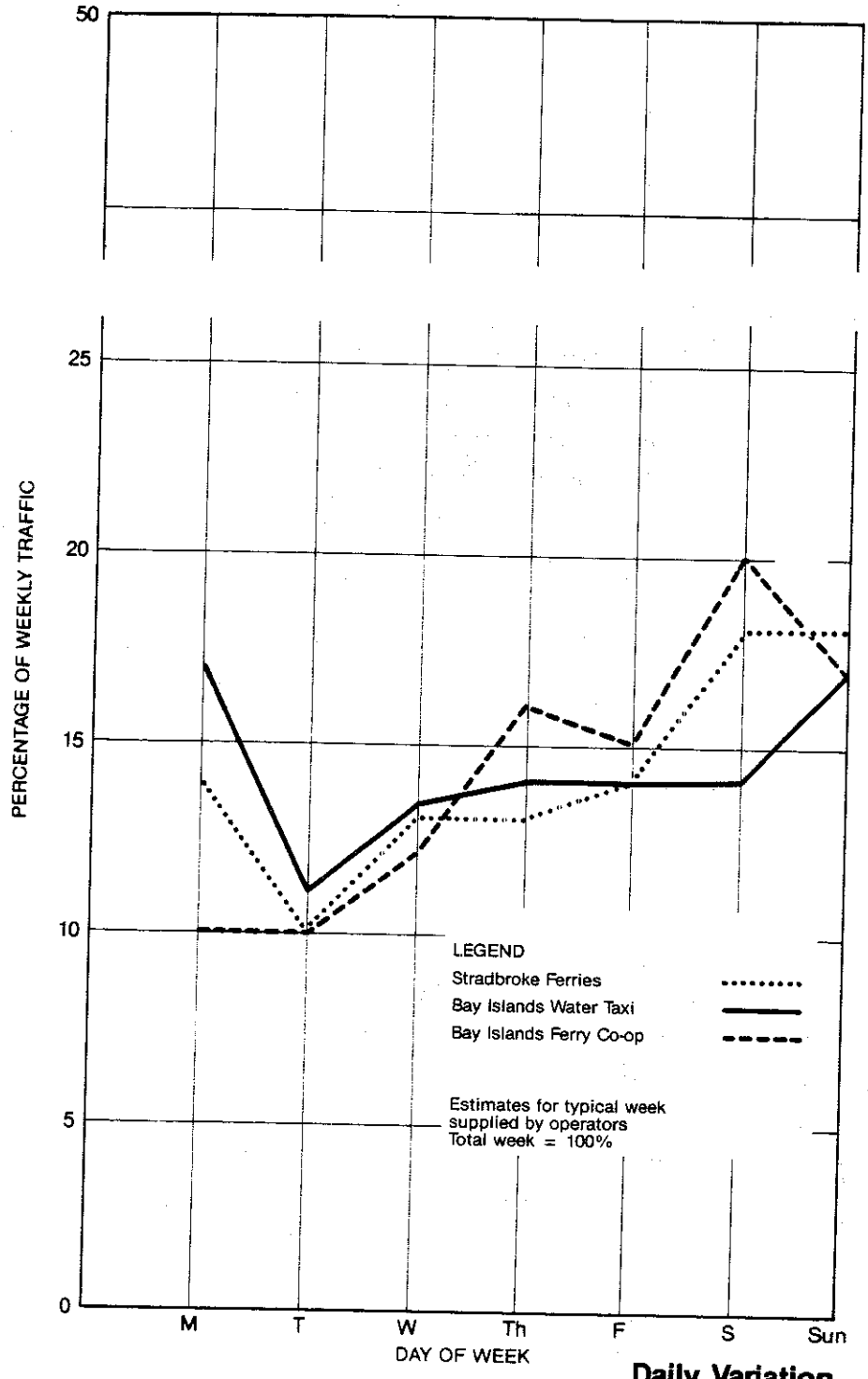
At most times of year there is adequate transport and accommodation capacity on North Stradbroke Island to meet demands There is some restraint imposed at the peak times when large volumes of people wish to travel; however, people who have travelled previously generally anticipate such problems and book in advance. There may be some unsatisfied demand at the one or two busiest times in the peak periods. Additional time slots still exist in which one or two new services could be added on peak days.





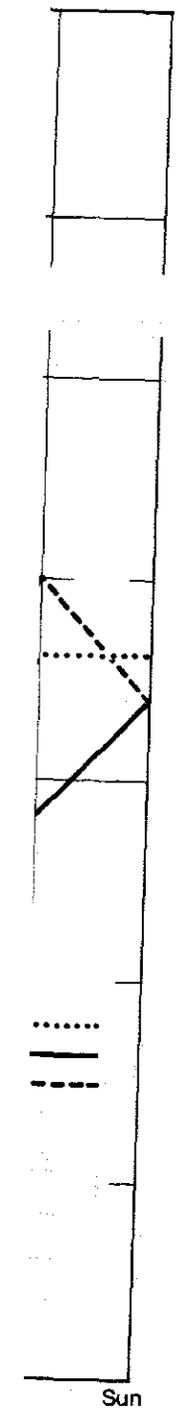
Seasonal Variation

FIGURE 2



Daily Variation

FIGURE 3



arlation
FIGURE 3

Marketing

Very little marketing of services in the Bay was carried out by the operators apart from the publication of timetables. Riverside Ferry Company had commenced a more sophisticated marketing programme which involved promoting the attributes of North Stradbroke Island via selected radio and published advertisements. Regular travellers were periodically contacted by mail and occasional 'deep' discount or free trips for regular travellers provided. Riverside also had a differential pricing policy in which non prime time trips were often available at concession rates as part of promotional programmes. (This pricing policy was additional to that adopted by both Stradbroke Ferry Company and Riverside which provided concessions for residents of the island and Redland Shire.) It was claimed that the programme was generating a significant amount of interest in trip making to the island although patronage had only marginally increased. Riverside's marketing programme appeared to be benefitting Stradbroke Ferries because Riverside's mainland terminal is less conveniently located to the centre of gravity of the metropolitan population than the Stradbroke Ferry terminal and Riverside's water crossing time is also some 50 to 60 percent longer. Never-the-less, Riverside's programme appears to have been successful since, despite its locational disadvantage, it still managed to attract 35 percent of the vehicular travel market which is the principal income earner (see Table 2). Another factor in favour of Riverside is that its vessel is well maintained and has a good standard of passenger accommodation. Surveys undertaken during the study demonstrated clearly that the travelling public perceived and valued vessel cleanliness and comfort.

Operating Costs and Profitability

Based on data supplied or estimated by eight of the operators of scheduled services, the costs of operating major existing services in the Bay were estimated. The following cost categories were adopted :

very short-run avoidable operating costs - those operating costs (crew and fuel) that would be incurred or avoided if an operator expanded or reduced his service by a small amount;

short-run (say three to six months) avoidable operating costs - this category included the very short-run avoidable costs together with those costs of maintaining operations; for example, vessel maintenance and office administration/ticketing salaries;

long-run avoidable costs - included all relevant costs including overheads such as maintenance of shore facilities.

Costs were expressed as a function of service hours. Table 4 shows that the total cost of running similar services varied little between operators or with vessel capacity. For example the per hour total operating cost for the 75 car capacity 'Riverside Venture' is only five percent higher than the cost of operating the smaller 25 car capacity ferries of Stradbroke Ferries. However, the allocation of costs between categories varies between companies and is a reflection of how services are resourced and operated; for example, use of family or union labour, existence of office accommodation, etc.

TABLE 4. EXISTING OPERATING COST STRUCTURE

(January 1986 Prices)

Operator	Total Cost per hour by Category (Percent)		Total Cost per Hour Index *
	Very Short-run Avoidable	Short-run Avoidable	
Combie Trader	43	78	2.5
Moreton Isle Cruises	30	84	4.8
Island Link	50	90	1.5
Stradbroke Ferries	49	94	3.8
Riverside	62	100	4.0
Coochie Ferries	58	79	1.0
Bay Islands Ferry Co-op	72	100	1.1
Bay Islands Water Taxi	53	93	1.2

N.S. Not Significant

* Relative to per hour cost of Coochie Ferries

Using data derived on average loads per trip the fares that need to be charged to cover total operating costs were calculated and compared with estimates of the actual average fare received The estimated operating cost recovery ratios in Table 5 show that of the eight major operators only the recently introduced Island Link service was not making a contribution to its overheads The overall conclusion was that total fare income received exceeded operating costs by only a small margin

(The analysis did not incorporate income received from other sources such as charter work walk-on passengers on the car-ferries or commercial vehicles, in particular those associated with the mining industry. However, the incomes from these other sources are believed to be small The analysis did incorporate interest payments, an allowance for a reasonable return on capital employed and tax concessions and levies)

Fares

Existing major fares are shown in Figure 1. An analysis of the movements of representative fares over the last six to seven years was made for the following operators :

Riverside Ferries Company;
Stradbroke Ferries;
Moreton Cruises;
Bay Island Taxis; and
Bay Island Ferries

This information was compared with movements in the indices published by the Australian Bureau of Statistics (All groups retail price index, Average weekly earnings index, and Average yearly retail petrol price index) and by the Motor Traders Association of Queensland (Average yearly wholesale price of diesel). These indices were selected as they reflect trends in labour costs and fuel prices - the major components of ferry operating costs. As the four indices showed similar trends they were averaged to aid interpretation of the data shown in Figure 4.

The results showed that :

Figure 4(a) - Vehicle Fares to Moreton and North Stradbroke Island

vehicle fares to North Stradbroke Island have risen faster than the combined index since mid 1982;

after 1984, Riverside have increased their fares at a faster rate than Stradbroke Ferries although generally they closely parallel each other. Since fare levels for these two companies were identical in mid 1981, this means that after 1984 Riverside have been charging higher fares than Stradbroke Ferries;

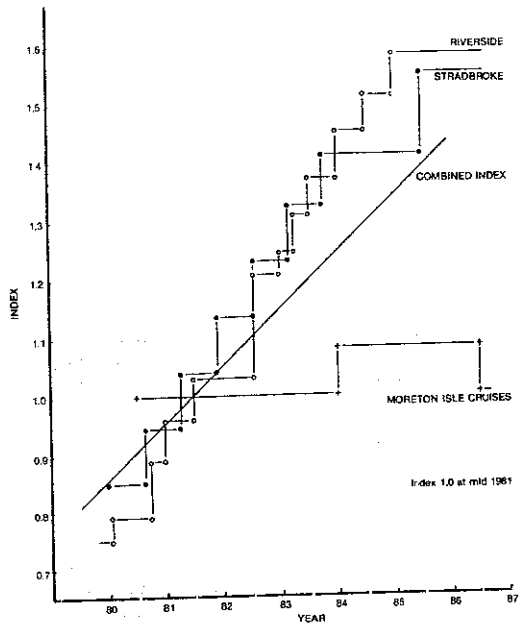
Moreton Island Cruises are charging fares at the same nominal level as they did in 1980 They actually dropped their fare recently because they were able to offer a shorter running time from Whyte Island near the mouth of the Brisbane River than from Bulimba on the Brisbane River (two hours instead of three hours) despite

Total Cost per Hour Index *
2.5
4.8
1.5
3.8
4.0
1.0
1.1
1.2

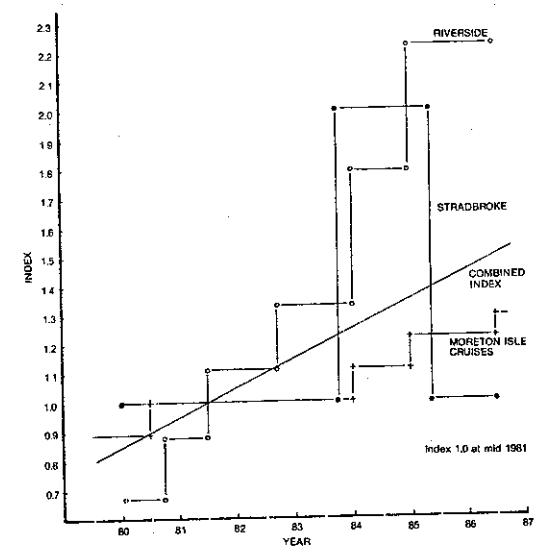
TABLE 5. OPERATING CONTRIBUTION TO OVERHEADS

Major Operator	Operating Contribution to Overheads Ratio *
Combie Trader	1.4
Moreton Island Cruises	1.5
Island Link	0.6
Stradbroke Ferries	1.0
Riverside	1.0
Coochie Ferries	2.0
Bay Islands Ferry Co-op	1.1
Bay Islands Water Taxi	1.4

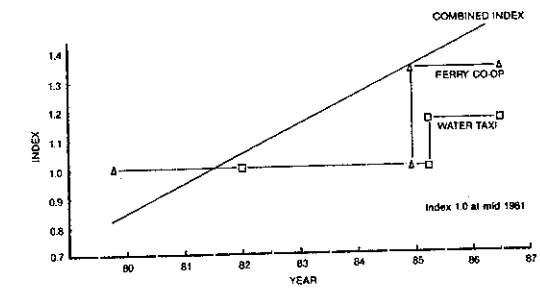
* Estimated average one-way fare received divided by estimated one-way operating costs. (A ratio greater than 1.0 indicates that there is a contribution to overheads.)



Movements in Vehicle Fares
Moreton & North Stradbroke Ferries
FIGURE 4(a)



Movements in Adult Passenger Fares
Moreton & North Stradbroke Islands
FIGURE 4(b)



Movements in Adult Passenger Fares
Russell Island Group
FIGURE 4(c)

purchasing a new vessel They are also trying to generate new patronage and are facing new competition from the Island Link;

Figure 4(b) - Passenger Fares to Moreton and North Stradbroke Island

trends vary depending on the operators. Passenger revenues are not significant to Riverside or Moreton Island Cruises. Passenger volumes on Stradbroke Ferries are significant but the fare was halved in early 1985 as a competitive response to the Island Taxi and Charter Service which provides a lightly trafficed passenger only service to One Mile at a much higher fare in smaller but faster vessels The low fare may also be an attempt to discourage entry of other operators on this route.

Figure 4(c) - Passenger Fares to Russell Island Group

the fares for both the Bay Islands Water Taxi and the Ferry Cooperative have risen more slowly than the combined index

The overall conclusion is that those operators with high operating costs relative to fares per trip (low or negative surplus) are pricing their main traffic to at least maintain this position and this price is exceeding the movement of the combined index. On the other hand, those operators who receive a reasonable net surplus per trip have been able to minimize the rate of fare increase.

Freight

The following operators of scheduled car ferry and passenger services also have a freight function :

Moreton Island Cruises - carry freight to Moreton Island to serve the requirements of residents and the Tangalooma resort;

Riverside Ferry Company and Stradbroke Ferries - both carry freight as part of their normal scheduled operations;

Island Transport - carries cars and heavy goods to Coochiemudlo Island and the Russell Island group;

Bay Islands Ferry Cooperative - carry larger 'white goods' items such as refrigerators as a part of the island residents' normal shopping requirements.

All the above companies providing scheduled services carry island residents and their shopping as part of their normal operations.

Conclusions and Discussion

This section of the paper has analysed the performance of the scheduled and charter water transport industry and supporting land transport services. The industry is not static Based on the analyses undertaken the important conclusions reached are :

Bay islands are well served in terms of frequency and choice of services during daylight services; service frequencies are adequate;

scheduled night time services do not exist Island residents appear to feel cut off from the social and cultural opportunities available on the mainland. There appears to be a need for night time services on Friday evenings and weekends;

services have evolved which meet travel requirements at fares which appear to cover operating costs by only a small margin;

in a number of cases a choice of services exists between principal origins and destinations. The services tend to have specialised to cater for different market segments;

on average, utilisation of existing scheduled water transport services is low by standards in other transport industries However, peak utilisation is extremely high. However to provide additional capacity for these peak occurrences would be uneconomic. The response by the water transport industry has been to increase service frequency in busy periods and for passengers to book in advance and/or adjust their travel behaviour to suit;

operators are responsive to passenger requirements because the communities they serve are small and they have first hand contact with their customers;

marketing of services needs to be upgraded. There may be some potential for marketing to increase demands; however it should be noted that this marketing has to compete with the marketing of alternative destinations and the effect of recent and ongoing highway improvements to the Sunshine and Gold Coasts;

if services are not viable they are discontinued or another operator with a lower cost structure attempts the service;

there is no evidence of collusion between operators;

family involvement in most of the companies has assisted in maintaining flexibility and responsiveness and in keeping costs down;

cancellation of services due to poor weather, mechanical breakdown or marine survey requirements is rare;

existing car ferries generally require a better standard of passenger accommodation;

the availability of terminal areas including land-side access, is the major constraint on entry of new operators;

the possibility of a bridge to North Stradbroke Island proceeding in the future and the lack of ready availability of terminal areas are delaying investment in craft and facilities;

land public transport access to water transport terminals is poor as are the quality of amenities and security of car parks at the terminals; and

new boat

freight transport requirements are mainly related to resource extraction and services are provided generally by means of specific contracts with transport companies

DEMAND MODELLING AND FORECASTS

Using observed relationships, demand modelling procedures were formulated to assess the likely impact on trip making by North Stradbroke and Russell Island ferry transport services (available to the general public) in response to :

- altered transport supply (service) characteristics (travel times, fares, routes, number of operators etc.);
- future anticipated population and employment growth in the Brisbane region and the spatial distribution of that growth; and
- future development scenarios for the islands, including changes in destination 'attractiveness' induced by that development.

Demand models were developed for each of the major trip categories described previously

Selected Model Parameters

While not central to this paper, some of the derived model coefficient values are worth noting:

- Value of travel time

  The following values of travel time were determined :

  - for choosing between recreational destinations, $3 per person per hour; and
  - for choosing between water transport or service options to a specific destination, $12 per person group per hour

  (The average group size was 2.95 persons.)

- Attractiveness of recreational destinations and destination expenditures

  In modelling the choice of recreational destination it was found, for equivalent perceived travel times to each of the three major alternative beach destinations, that :

  - the 'attractiveness' of the Gold Coast was the equivalent of 50 minutes of reduced travel time more attractive as a destination than the Sunshine Coast; and
  - some 160 minutes more attractive than North Stradbroke Island.

These results follow directly from the relatively undeveloped nature of North Stradbroke Island compared with the Sunshine Coast and, in turn, the Sunshine Coast compared with the Gold Coast. This is supported by the results of a study of visitor spending by Queensland Tourist and Travel Corporation (QTTC 1986), which indicates that expenditure per visitor per night on the Sunshine Coast was half that on the Gold Coast.

The demand models were used to derive forecasts for the following cases :

- fast passenger and car-ferry services from Toondah Harbour, Cleveland and Redland Bay to Dunwich for 1986 and at 1996 for a 'trend' and 'major development' scenarios prepared during the study; and

- fast passenger services from Weinam Creek, Redland Bay to Russell Island for 1986 and at 1996 for the two development scenarios

General results and implications of the forecasts are presented below :

North Stradbroke Island Services

- services with the same time and cost characteristics as today's services are likely to experience a six percent per year growth in demands over 1986 to 1996 according to the trend scenario (which is similar to recent trends);

- new craft and services which could halve the water crossing time are likely to more than double demand;

- with the 1996 major development scenario, an annual patronage growth rate of 11 percent was forecast;

- mainland generated recreational trips to North Stradbroke Island are expected to decline by 1996 from 58 percent to 41 percent of all trips as the island population increases.

Russell Group Services

- services with the same time and cost characteristics as today's services are likely to experience a 16 percent per year growth in demands over 1986 to 1996 in line with island population growth;

- with the 1996 major development scenario, an annual growth rate of 21 percent was forecast

Other Matters

- North Stradbroke Island trip making is relatively more sensitive to the time and cost attributes of services than trip making to Russell Island. For the current service characteristics the demand elasticities * are estimated as follows :

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* Elasticity is defined as the percentage change in demand in response to a one percent change in, say, time or cost.

North Stradbroke Island Trips	time -1.9 cost -1.2
Russell Group Trips	time, -0.7 cost -1.0

The greater sensitivity of North Stradbroke Island travellers (compared to Russell group trips) to time and costs reflects the larger volume of infrequent recreational trip makers for which the choice of a trip is largely optional. This contrasts with those trips by island residents which are more 'essential'

Cost elasticities of about -1.0 were expected based on prior knowledge that the operators were pricing services to maximise revenue in line with normal commercial objectives. The high response to reductions in travel time are due to recreational trips attracted from the Gold and Sunshine Coasts which, when added to the current comparatively small number of recreational trips, has a major impact. (Note that attention is confined to recreational trips of stay-duration greater than one day.)

PROPOSED SERVICES AND EVALUATION

Proposed Services

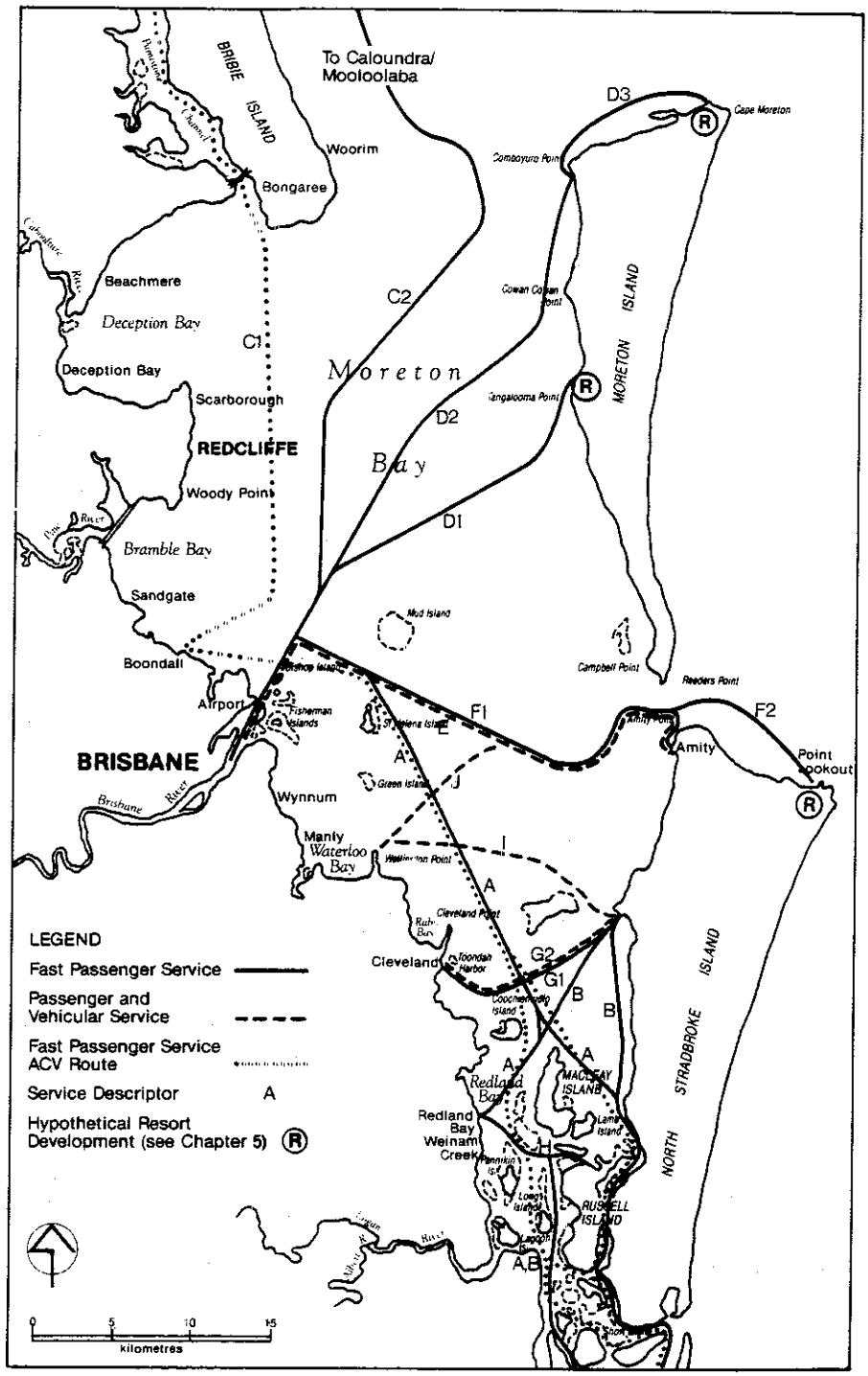
Analyses of vessel operating costs and likely passenger trip patterns confirmed that the optimum terminal locations for scheduled water transport services, where the aim is to minimise travel times and operating costs, are between locations which minimise the water crossing distance. Adoption of this principle in the case of North Stradbroke and Russell Islands allows minimisation of vessel operating costs and water crossing times and hence fares as well as passenger door to door trip times and associated vehicle operating costs. The existing locations of major terminals for North Stradbroke and Russell Island services comply with this principle. This conclusion was an important input to the work described below.

To provide the basis for specific recommendations on routes and services, a range of possible routes and related services that were suited to a regular scheduled operation were initially identified. They are shown in Figure 5 and are of two types - fast passenger and modern car ferry services with passenger accommodation. It was assumed that these would be overlayed on the existing system which would be modified to incorporate some of these proposals

A number of landing points, particularly on the mainland, were identified for each service type. These related to an existing or possible landing or terminal.

Evaluation Approach

The evaluation of the services shown in Figure 5 followed three basic steps :



Possible Services
(For Detailed Evaluation)
FIGURE 5

for each route/service a range of desirable travel time and craft characteristics were initially specified. This step allowed a shortlist of craft with the desired features to be identified;

a detailed craft and operations assessment was undertaken of shortlisted craft; and

a market assessment was undertaken which included demand estimation, financial and economic analysis (that is, social cost-benefit analysis) where relevant.

The detailed operational assessment involved consideration of :

the impacts of physical constraints such as depths, sea conditions and environmental matters on choice of craft and their likely actual operating speed;

the effects of these constraints on handling, passenger comfort and reliability of service operation.

For scheduled services it was considered that craft should be capable of providing the service at specified comfort and travel times 99 percent of the time

Services to North Stradbroke Island, the Russell group and the Gold Coast were subject to further detailed evaluation because they were the ones for which major scheduled services which would be available to the public were most likely to be developed.

The following additional evaluation procedures were applied :

a financial analysis to determine whether and when services are likely to be commercially viable; and

an economic evaluation (social cost-benefit analysis) to quantity benefits to the total community for those services found not to be commercially viable - subsidy issues may then have been important

Economic evaluation of services was not carried out as relevant services were found to be financially viable However, an economic evaluation of relocating Riverside Ferry Company from Redland Bay to Toondah Harbour was carried out.

Operational Assessment

Almost all services were found to be operationally feasible. Some services were found not to be capable of reliable operation. These were service F and part of service D which would be exposed to open sea. A summary of the results of the operational assessment for North Stradbroke Island and Russell Island group services is shown in Table 6.

Financial Assessment

For amortisation of costs of craft and terminals and determination of viability the following parameters were used :

TABLE 6. CRAFT AND FACILITIES - RESULTS OF OPERATIONAL ASSESSMENT

	Service	Appropriate Craft (capacity, 1-way travel time)	Terminal Facilities		Comment
G1.	Toondah Harbour to Dunwich (pass. only)	TRI[1] (40-60 pass; 15 mins.)	Toondah Harbour - jetty	Dunwich - jetty	. Existing jetties satisfactory . SES[2] and CAT[3] are alternative craft
G2.	Toondah Harbour to Dunwich (cars and passengers)	Barge (40 cars; 30 mins.)	Toondah Harbour - actuated shore ramp $580,000	Dunwich concrete ramp	. At Dunwich existing ramps or new ramps (as part of Dunwich terminal redevelopment) are satisfactory
H.	Weinam Creek to Russell Island via Islands	CAT (40 pass; 15 mins.) direct to Russell Island with one-stop)	Weinam Creek - pontoon	Islands - jetty	. Existing facilities are satisfactory

1 TRI = Trimaran

2 SES = Surface Effect Ship

3 CAT = Catamaran

20% real interest rate before tax;
10 year loan period;
20% salvage value on craft at the end of the loan period;
zero salvage value for terminals Terminal maintenance costs were ignored as were land costs In many existing cases, only a nominal rental for use of land is paid. In addition, shore facilities may have many users which would considerably reduce costs to the operator);
all costs in June 1986 prices.

The vessel identified as most appropriate for a service of interest was used for the purposes of the financial evaluation - its time and cost characteristics were used to estimate demands as well as operating costs

The financial assessment used 1986 demands and compared revenues in the first year of operation (taken as 1986) with amortised annual costs. A summary of the financial evaluation results using this set of parameters for those service options of interest is presented in Table 7 The analysis results are believed to be conservative since they :

do not take into account expected growth in demands;
assume a cost structure based on unionised labour;
do not take into account to any great extent other sources of income - for example, from charter work.

The analysis showed that the following services are likely to be commercially viable at present :

A fast passenger vessel (40 to 60 passenger capacity) with all weather capability that can undertake the Toondah Harbour-Dunwich route in 15 minutes, at a fare of about $4 for a one-way trip. A trimaran is considered to be the most appropriate vessel for this service. Back-up services when the craft is unavailable could be provided by using the walk-on passenger capability of the car ferries

Larger, modern and faster car ferries (40 car capacity) that can traverse the Toondah Harbour - Dunwich route in 30 minutes at existing fare levels. The shorter travel time (50 to 60 percent of existing) would substantially increase passenger demands to the islands. These craft should also have clean and comfortable passenger facilities.

For the Russell Island Group, a service including at least one catamaran (40 passenger capacity) at existing fare levels. This vessel should desirably replace one of the existing vessels plying the route. Additional craft of this type should be introduced as the population of the islands grows. It is considered desirable that the new large catamarans be used mainly to provide direct or express services between Russell Island and Weinam Creek, Redland Bay A travel time of 15 minutes is achievable by such a service

Both the fast passenger vessel and fast car-ferries would be expected to stimulate residential and tourist development of the islands. The fast passenger vessels would be particularly beneficial to island residents who commute to the mainland for work, school, shopping and social activities.

TABLE 7. FINANCIAL ANALYSIS OF SELECTED ROUTES

Type	Craft	Fleet Size	Time-table	One-way travel time	1986 Peak Hour Patronage (1-way)	Average Fare Received (1-way)	Total (2-way) 1986 Ridership '000	Total (2-way) 1986 Revenue $000	Annual Costs 1986 Capital+ Operating $'000	Annual Costs 1986 Shore Facilities $000	Annual Costs 1986 Total $'000	Profit $'000
Route (1)												
G1 Fast pass service, Toondah Harbour to Dunwich	Tri,cap = 60 pass.	1	50 min. headway	15 min.	50	$4	143 (pass)	572	515	47	562	10
G2 Fast car ferry Toondah Harbour to Dunwich	Barge,cap = 40 cars	2	45 min. headway	30 mins.	45	$17.50	135 (cars)	2,363	2,026	100	2,126	237
H Fast pass service Weinam Creek to Russell	13m CAT, cap = 40 pass.	3 (1*13m 2*8.5m as existing)	2 to 3 trips per hour	15-30 mins. to Russell Island depending on intermediate stops	48	$3.00	140 (pass)	420	395	10	405	15(2)

(1) Details of routes are shown in Figure 5
(2) Cost structure assumed similar to current small business style operation. Half of operating costs of 1 small vessell assigned to charter work.

These vessels would also permit night time, all weather operation to provide island residents with better access to mainland cultural facilities.

Conclusion

The evaluation results show that almost all services assessed are operationally feasible. Proposed services to North Stradbroke Island and islands in the Russell group were shown to be commercially viable in 1986.

IMPROVEMENT STRATEGY

The principal objective of the strategy developed by the study was to provide an efficient and effective water transport system which is consistent with existing and future demand levels. It was considered important that the strategy should ensure that the maximum opportunities for private sector involvement are retained, stimulate residential development on North Stradbroke or Russell islands and stimulate further development of the tourism potential of the Bay.

The technical analyses undertaken during the course of the study gave rise to various findings and conclusions which demonstrated certain key principles which were followed in developing the recommendations. These key principles for strategy development were –

water transport services have a fundamental role to play in the future development of the Bay for residential or tourism purposes;

fast water transport services have the potential to :
- make feasible, regular commuting for island residents;
- increase the share of recreational trips (generated by the metropolitan area) attracted to the islands; and
- serve and encourage increased island development;

the existing privately supplied system of water transport services is efficient, responsive to the requirements of the travelling public and has a good safety record;

experience with other modes of transport indicates that unnecessary regulation stifles competition, limits the choice of available services and increases the cost of service provision. Given the performance and safety record of scheduled water transport services and the existing technical standards for vessels and personnel, there appears to be no reason for government to consider further regulation of the industry at present;

there is extensive interest by both existing operators and other groups in operating new and improved transport services provided a favourable investment climate is present;

the uncertainty surrounding the timing or otherwise of the development of a bridge to North Stradbroke Island will postpone investment in new craft, services and terminal facilities unless remedial action is taken;

Toondah Harbour and Dunwich are the optimum terminal locations for services to North Stradbroke Island as are the existing terminals for islands in the Russell group;

the ability to commence operating services from a particular terminal location depends on who controls use of it;

the introduction of modern high speed passenger craft and car ferries on routes to North Stradbroke Island and islands in the Russell group are operationally and commercially viable at present;

the highly variable nature of travel demand to North Stradbroke Island suggests the need for further application of pricing policies along the lines already adopted by Riverside - at times of peak holiday travel demand charge full fare while at other times use selected promotional programmes in conjunction with discount ticketing;

if certain land and water transport services are considered to be socially desirable and would not otherwise be provided, they could be operated under contracts to State or Local Government or by application of selected subsidies, preferably provided to the target users;

tourist services of the 'leisure' cruise type are fundamentally different from scheduled services. Since they are catering for travellers without a critical time constraint, and who are interested in sight seeing and on-board entertainment, speed is not usually important. These services should desirably operate out of the Brisbane River in locations convenient to the Central Business District and associated hotels;

any major new resorts that are developed in the Bay Islands are expected to develop their own transport connections;

a major constraint on development of tourist and other services is the lack of destinations in the Bay that have appropriate public amenities Increased development of the island including new resorts and small boat harbours with amenities is required to realise the Bay's tourism potential;

a further constraint on development is the lack of up-to-date information on the Bay, its islands and water transport services;

improved co-ordination of existing land public and water transport services is required;

land transport services on North Stradbroke Island need to be upgraded.

A recommended strategy was developed from these guidelines and is presented in Pak-Poy and Kneebone et al (1987)

CONCLUSION

Analysis of the performance of the existing Moreton Bay Water Transport industry showed it to be competitive efficient and responsive to the requirements of the travelling public. The performance of the industry would be the envy of many groups involved in the regulation of urban public transport in Australia. Some areas of the industry are in need of improvement, for example, the condition of facilities at terminals and ease of obtaining new landing areas. The demand modelling and evaluation results showed that modern fast and comfortable new services have the potential to generate substantial demands and to be commercially viable. However, uncertainty regarding the possibility of a bridge to North Stradbroke Island being constructed in future is delaying the necessary investment in craft and facilities. The key elements of the strategy are aimed at selected improvements to terminals increased coordination of decisions on land use in the vicinity of important terminal areas, maintaining the industry as a private sector operation and creating a favourable investment climate for existing and new operators. Strategy details did not deal with the precise details of craft which should be operated in future since these details are best left to individual operators when operating in a competitive environment.

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