

Study of East - West Rail Passenger Services: The 'Indian Pacific' and 'Trans Australian'

Report

The Government rail systems in Australia provide a number of intersystem rail passenger services which cater for intra- and interstate travellers. These services are potentially important sources of income for the rail systems concerned. This Report presents the results of a study of the profitability of the East-West rail passenger services specifically covering the Indian Pacific and Trans Australian trains.

Subject

Series

Date

A to Z

Search

Results

Print

Exit

BUREAU OF TRANSPORT ECONOMICS

A STUDY OF EAST-WEST RAIL PASSENGER SERVICES
THE 'INDIAN PACIFIC' AND 'TRANS AUSTRALIAN'

AUSTRALIAN GOVERNMENT PUBLISHING SERVICE
CANBERRA 1977

© Commonwealth of Australia 1977

Printed by Ambassador Press Pty. Ltd., Granville 2142

FOREWORD

The Government rail systems in Australia provide a number of intersystem rail passenger services which cater for intra- and interstate travellers. These services are potentially important sources of income for the rail systems concerned.

This report presents the results of a study of the profitability of the East-West rail passenger services specifically covering the Indian Pacific and Trans Australian trains.

The study adopts a different approach to previous studies undertaken by the railways. If the railways are to take full advantage of a more flexible pricing policy for long distance passenger services they may well consider activating further studies using the methodology of this report.

The research required for this study was undertaken by Messrs D.S. Short and D.J. Dennes and the report was prepared in the Transport Costs and Information Branch of the BTE. The econometric model used in the report was developed by Mr A.B. Smith of the Econometric Applications Section.

I would like to acknowledge the co-operation and assistance received from officers of the Public Transport Commission of New South Wales, the State Transport Authority of South Australia, the Australian National Railways Commission and Western Australian Government Railways.

G. K. R. REID
Acting Director

Bureau of Transport Economics
Canberra.
September 1977

CONTENTS

	<u>Page</u>
SUMMARY	vii
CHAPTER 1 INTRODUCTION	1
Terms of Reference	1
Scope of the Study	1
Outline of the Report	1
CHAPTER 2 OPERATION OF THE EAST-WEST PASSENGER SERVICES	3
Trans Australian Service	3
Indian Pacific Service	6
Typical Operation of an East-West Passenger Service	7
Financial Arrangements for the Operations of Intersystem Services	9
CHAPTER 3 INTERSYSTEM RAILWAY PASSENGER RATING PRACTICES	12
Railway Management	12
Passenger Fare Structures	13
Passenger Tariff Policy	15
CHAPTER 4 PREVIOUS STUDIES OF INTERSYSTEM PASSENGER SERVICES	20
ANZRC Study	20
ANRC Studies	22
Other Studies	23
General Discussion on Studies	25
CHAPTER 5 BTE APPROACH AND METHODOLOGY	27
Cost Concepts	27
Revenue	29
The 'Economic' Price	29
Methodology	31
Data Inputs	32

	<u>Page</u>
CHAPTER 6 FINANCIAL ANALYSES OF THE OPERATIONS OF THE INDIAN PACIFIC AND TRANS AUSTRALIAN RAIL PASSENGER SERVICES	34
Short Run Analyses	34
Longer Run Analysis	45
CHAPTER 7 POTENTIAL FOR FARE ADJUSTMENT ON THE INDIAN PACIFIC SERVICE	51
Elasticity Estimates and Interpretation	51
CHAPTER 8 CONCLUSIONS	54
ANNEX A ESTIMATED COSTS AND REVENUES FOR THE INDIAN PACIFIC/TRANS AUSTRALIAN RAIL PASSENGER SERVICES	56
ANNEX B INTERSYSTEM RAIL CONCESSIONS AND PASSES	83
ANNEX C SPECIFICATION OF EQUATIONS USED TO DERIVE DEMAND ELASTICITIES FOR INDIAN PACIFIC RAIL PASSENGER SERVICE	85

SUMMARY

This report is the result of a study of the East-West Rail Passenger Service which was requested by Railway Group of official advisers to the Australian Transport Advisory Council.

The scope of the study has been confined to the Indian Pacific and Trans Australian passenger services. The data inputs for the study were supplied, both on a trip basis and for the financial year 1975-76, by the railway systems providing these services.

An examination of intersystem fare structures revealed that the railways have developed a multi-tariff strategy consistent with an overall objective of equating total costs and total revenues.

The railways in the past have undertaken several studies which have indicated non-profitability of these passenger services. In these studies the general approach used was that of allocating to each service those costs which are common to the operations of the railway systems as a whole. The resulting cost estimates were inappropriate as a basis for managerial decisions relating to the operation of the services.

A recent study undertaken by Westrail examined a change in the scheduling arrangements for the trains. The approach used in that study is the same in principle as that used by the Bureau in this report. This in effect involves consideration of the variation in costs that would occur with a change in scheduling arrangements.

In the first instance, the BTE considered the short run viability of round trips during typical weeks of high and low demand for passenger travel. The results suggest that, in general, the individual services are economically viable particularly in periods of peak demand. This implies that it would cost the railways more to withdraw a service than to continue it. Developing the analysis to the longer term, covering the year 1975-76,

resulted in an estimated operating surplus of \$364,000 before allowing for capital charges. The financial results of the analyses do not provide justification for further investment.

As part of this study a model was developed to measure the price responsiveness of demand for travel on the Indian Pacific service.

It would appear that this demand is relatively inelastic with respect to price and sensitive to changes in air fares. This suggests that the railways should consider a more flexible fare setting policy and probably some upward adjustments. It is possible that a different pricing strategy would substantially improve the longer term financial outlook for this service.

The methodology used in this study could provide the railways with a basis for monitoring the profitability of long distance rail passenger services.

CHAPTER 1 - INTRODUCTION

TERMS OF REFERENCE

This study originated at a meeting of the Railway Group advisory committee to the Australian Transport Advisory Council. The Group comprises the Secretary of the Commonwealth Department of Transport and the various rail systems' Chairman/Commissioners. The minutes of the meeting of 26 August 1975 state that 'The question of the high cost of subsidising the East-West passenger service was ... raised and it was agreed that BTE would prepare a paper on the costs of running this service.'

SCOPE OF THE STUDY

The scope of this study was limited by the resources and the time available to undertake the task. It was impracticable to undertake a study of all rail passenger services operating between the east and west coasts of the nation. Consequently, this report is confined to an examination of the operations of the Indian Pacific and Trans Australian rail passenger services.

OUTLINE OF THE REPORT

The operational and financial background to the Indian Pacific and Trans-Australian services is discussed in Chapter 2.

Chapter 3 contains a general discussion relating to the rating practices applying on intersystem rail passenger services.

Studies relating to the Indian Pacific and Trans Australian services which have been undertaken by other organisations are reviewed in Chapter 4. There is also a discussion on the methodology used in these studies. The approach and methodology used by the BTE are outlined in Chapter 5, together with the sources of data used.

The results of the analysis undertaken in this study are presented in Chapters 6 and 7. Chapter 6 provides the results of financial analyses of the running of the Indian Pacific and Trans Australian services on both a trip and an annual basis. The potential for adjustments of passenger fares is considered in Chapter 7. Chapter 8 brings together the conclusions reached in the study.

CHAPTER 2 - OPERATION OF THE EAST-WEST PASSENGER SERVICES

This chapter briefly describes the development and operations of the two East-West passenger services currently being provided, namely, the Indian Pacific operating between Sydney and Perth and the Trans-Australian running between Port Pirie and Perth. Features of each train are considered along with a presentation of a typical schedule of operations for a journey from Sydney to Perth. Consideration is also given to the manner in which these operations are included in railway financial accounts.

The numbers of passengers carried on these two services between Port Pirie and Kalgoorlie in recent years are set out in Table 2.1. These figures show that about 125,000 passengers travel on the trains in both directions annually. It should be noted that the figures include those who go the whole distance as well as those travelling along only part of the route. Between capital cities the number of passengers travelling on these trains is believed to be less than the number travelling by air but more than the number travelling by road.⁽¹⁾

TRANS AUSTRALIAN SERVICE

The Trans Australian passenger service commenced in June 1969 when for the first time it was possible for standard gauge rolling stock to travel the whole distance from Port Pirie to Perth⁽²⁾. The Trans Australian replaced co-ordinated services for 'through' passengers, including the Trans Australian Express operated by the Commonwealth Railways⁽³⁾ between Port Pirie and

-
- (1) The Eyre Highway connecting Western Australia with the Eastern States was not completely sealed during the period under review. It is expected that improved road conditions will encourage more persons to travel across Australia by road than in the past.
 - (2) Following standardisation of the route between Kalgoorlie and Perth.
 - (3) Now the Australian National Railways Commission (ANRC).

TABLE 2.1 - ANNUAL RAIL PASSENGER MOVEMENTS ACROSS THE NULLARBOR
PLAIN

Year	Trans Australian		Indian Pacific		Total ^(a)
	Eastbound	Westbound	Eastbound	Westbound	
1972-73 ^(b)	36443	35616	16331	16366	104756
1973-74 ^(c)	45505	47077	20556	21125	134263
1974-75 ^(d)	43782	46522	18394	19403	128101
Four week period ending:					
9 Aug 1975	1977	2477	1222	1661	7337
6 Sept 1975	3379	4407	1785	2117	11688
4 Oct 1975	4301	4554	2098	2215	13168
1 Nov 1975	4293	3863	2191	2201	12548
29 Nov 1975	2910	2640	2009	1929	9488
27 Dec 1975	3175	3438	1752	1858	10223
24 Jan 1976	4577	4600	2032	2138	13347
21 Feb 1976	3052	3288	1560	1729	9629
20 March 1976	2254	2613	1192	1523	7582
17 April 1976	2178	2532	1396	1701	7807
15 May 1976	2349	2988	1549	1713	8599
12 June 1976	1882	1881	1444	1602	6809
10 July 1976	317 ^(e)	657 ^(e)	1732	1853	4559
1975-76	36644	39938	21962	24240	122784

(a) Excludes a small number of passengers travelling on other trains.

(b) Thirteen four week periods ending 14-7-73.

(c) Thirteen four week periods ending 13-7-74.

(d) Thirteen four week periods ending 12-7-75.

(e) The number of Trans Australian services was reduced in this period.

Source: ANRC passenger occupancy records for trains travelling between Port Pirie and Kalgoorlie.

Kalgoorlie (1435mm gauge) and the Westland Express operated by the Western Australian Government Railways between Kalgoorlie and Perth (1067mm gauge). Initially there were five scheduled Trans Australian services in each direction each week and this frequency was increased to a daily service in December 1973. From 31 May 1976, following a rationalisation of East-West services, the number of Trans Australian trains was reduced to three per week.⁽¹⁾

The normal Trans Australian consist⁽²⁾ comprises three first class cars (each having a capacity for 18 passengers), three economy cars (each with a capacity for 32 passengers), dining car, first class lounge car, economy class cafeteria club car, staff dormitory car, combined mail/brake van and power van. The total passenger capacity is 150.

The number of passengers travelling the complete distance from Port Pirie to Perth is limited to 144, determined by the capacity of the dining car which seats 48 persons at each of three sittings per meal. Light refreshments are provided in the cafeteria club car for the six economy passengers not able to use dining car facilities; these places are reserved for persons travelling only part of the way.

The Trans Australian consists are jointly operated by the ANRC and Westrail⁽³⁾. In the time frame of this study ANRC locomotives were used for the whole distance from Port Pirie to Perth with Westrail paying ANRC a hire charge for their use between Kalgoorlie and Perth.⁽⁴⁾

-
- (1) Daily services were reintroduced temporarily from 8 August 1976 to 29 January 1977.
 - (2) A term here used to include all items of rolling stock making up the train with the exception of the locomotive(s).
 - (3) The trading name for the Western Australian Government Railways.
 - (4) Since 1 April 1977, Westrail has used its own locomotives between Kalgoorlie and Perth.

Because of the necessity to comply with safe working rules, Westrail provides its own locomotive crews and guards to operate the services between Kalgoorlie and Perth. Each railway system provides its own on-train crews of catering staff, technicians and conductors for their respective segments of the route.

INDIAN PACIFIC SERVICE

The Indian Pacific was officially inaugurated in February 1970 when standard gauge operation became possible for the first time all the way from Sydney to Perth⁽¹⁾. Initially, two services were operated in each direction weekly and these were supplemented by the third and fourth weekly services in July 1973 and July 1975 respectively.

The normal Indian Pacific consist is made up of five first class and two economy class cars, supplemented by other cars similar to those that make up the Trans Australian consist. Altogether, the cars provide a capacity for 88 first class and 64 economy class patrons. Like the Trans Australian, the number of 'through' passengers is restricted to 144, this being all that the dining car can cater for. Similarly, the eight additional berths are used by persons travelling part of the distance and they have meals in the cafeteria car.

On some services in each week two carriages are attached to the Indian Pacific to carry intrasystem passengers between Sydney and Broken Hill. Similarly, the South Australian Railways (SAR)⁽²⁾ attaches carriages between Broken Hill and Peterborough to cater

-
- (1) Following standardisation of the line from Port Pirie to the NSW/SA border and the construction of a new standard gauge line from that point to Broken Hill.
 - (2) In 1975 the financial responsibility for the SAR, apart from the urban passenger system, was taken over by the Federal Government. However, the day to day operations of all services are currently conducted by the State Transport Authority. In this report this Authority is referred to as 'SAR'.

for persons travelling between Broken Hill and Adelaide⁽¹⁾. In the analysis of the operations of the Indian Pacific contained later in this Report the costs of operating these carriages and the revenues they earn have been excluded.

The Indian Pacific rolling stock is jointly operated by the PTCNSW, SAR, ANRC and Westrail. Each system is responsible for providing and operating locomotives within its system. However, at the time this study commenced Westrail used locomotives hired from ANRC.

Each system provides its own locomotive crews and guards to operate the service within its area of responsibility. Except for the section between Sydney and Port Pirie, the Indian Pacific is staffed by on-train personnel of the system over which the train travels; the PTCNSW and the SAR jointly staff the train between Sydney and Port Pirie. The PTCNSW on-train staff does not always travel as far as Port Pirie. On particular services, staff on the westbound train is scheduled to transfer to the eastbound train at Gladstone, east of Port Pirie. The westbound service is then manned by a skeleton SAR staff for the remaining short distance into Port Pirie.

TYPICAL OPERATION OF AN EAST-WEST PASSENGER SERVICE

In March 1976, 154 cars were being used to provide these rail passenger services, 102 for the Trans Australian and 52 for the Indian Pacific. Cars are interchanged between the two services on a hire basis, with most hirings being from the Trans Australian to the Indian Pacific.

Details of a typical operation of a Sydney to Perth service in March 1976 are shown in Table 2.2. The service described includes the operation of a double consist between Port Pirie and Perth

(1) It is understood that operating arrangements now allow for the PTCNSW cars to operate from Sydney to Peterborough.

TABLE 2.2 - SCHEDULE OF A TYPICAL EAST-WEST PASSENGER SERVICE,

MARCH 1976

(Involving the operation of a double consist between Port Pirie and Perth)

Station	Schedule	Remarks
Sydney 0 km	Mon, Wed, Thur, Sat, Dep. 1515	Indian Pacific consist hauled by two electric locomotives. Two carriages attached for local traffic to Broken Hill. Train staffed by joint PTCNSW/SAR crew.
Lithgow 156km	Dep. 1754	Two diesel-electric (D-E) locomotives replace electric locomotives.
Parkes 446km	Dep. 2334	One D-E locomotive detached leaving one D-E locomotive to haul train over easier gradients.
Broken Hill 1125km	Tue, Thur, Fri, Sun, Dep. 0930	SAR D-E locomotive replaces PTCNSW unit. 2 cars carrying intrasystem passengers from Sydney detached and replaced by SAR carriages for intrasystem traffic.
Peterborough 1408km	Dep. 1337	SAR carriages detached.
Gladstone 1474km	Dep. 1438	PTCNSW train staff leaves to join east-bound train crossing at this station. Skeleton SAR crew staffs the train into Port Pirie.
Port Pirie 1522km	Dep 1645	Trans Australian consist added ^(a) . SAR D-E locomotive replaced by one ANRC CL-class D-E locomotive (or two GM-class D-E locomotives). ANRC train staff takes over from SAR staff.
Kalgoorlie 3304km	Wed, Fri, Sat, Mon Dep. 2030	Westrail locomotive crew and train staff takes over from ANRC staff. ANRC locomotive(s) continue to Perth.
Perth 3961km	Thur, Sat, Sun, Tue Arr. 0700	Both trains cleared and checked for return trip to Sydney (Indian Pacific) and Port Pirie (Trans Australian) departing 2100 hours.

(a) A single mail/brake van serves both consists.

because at that time it was normal practice on the days when the Indian Pacific ran, for the Trans Australian consist to be coupled on to make up a combined train.⁽¹⁾

For the Trans Australian, ANRC provisions the train completely for the westbound journey and Westrail for the eastbound. For the Indian Pacific, the PTCNSW provisions the train at Sydney and Westrail at Perth, with ANRC replenishing supplies at Port Pirie as the train passes in each direction.

FINANCIAL ARRANGEMENTS FOR THE OPERATIONS OF INTERSYSTEM SERVICES

Due to the method of servicing and the composite operations of intersystem passenger carriages there is a set procedure for the allocation of costs and revenues among the railway systems. These financial arrangements apply to all intersystem passenger services and are explained here with reference to the Indian Pacific and Trans Australian services.

Cost Distribution

With the exception of locomotive costs, which are borne by the individual systems, the operating costs of the Indian Pacific and Trans Australian trains as assessed by each system are allocated according to the proportion of the total route that belongs to each system. The allocation of capital debt charges to systems is also made on a route kilometre basis. The proportional distribution of costs among systems for the two services is set out in Table 2.3.

Each system calculates its costs on a standardised four-weekly period basis. For instance, the PTCNSW after determining the costs incurred for a train will charge other systems their share of these costs according to the percentage distribution in the table, accepting 28.4162 per cent of the cost itself. The other systems follow the same procedure.

(1) It is understood that all services are now operated as single consists (May 1977).

TABLE 2.3 - EAST-WEST PASSENGER SERVICES: ALLOCATION OF OPERATING COSTS TO SYSTEMS

(Per Cent)

System	Indian Pacific	Trans Australian
PTCNSW	28.4162	-
SAR	10.0278	-
ANRC	45.0114	73.1227
Westrail	16.5446	26.8773
TOTAL	100.0000	100.0000

Revenue distribution

Income for the two services is derived from a number of sources; passenger fares, on-train sales from the lounge and club cafeteria cars, and parcels and mail carried under contract to the Australia Post. The method of distributing revenue from passenger fares among systems varies for the two elements constituting the cost of a ticket; the fare component and a compulsory ancillary charge for meals and sleeping berths.

For through journeys, between Sydney and Perth on the Indian Pacific and between Port Pirie and Perth on the Trans Australian, revenue from intersystem passenger fares is distributed among the systems on a route kilometre basis in the same way as for costs. For part journeys involving an intersystem passage, the fare component of passenger revenue is distributed generally on the basis of the length of travel over the systems involved⁽¹⁾. For intrasystem journeys on either service local fares apply and the revenue is retained by the system concerned. All meals and sleeping berth components of the passenger fare, irrespective of the length of the trip, and revenue from on-train sales, mail and parcels are distributed among all systems according to the proportions set out in Table 2.3.

(1) See method of calculating fares, Chapter 3, p. 12.

It is usual to distribute monies received from passenger fares among the systems in the next four weekly period following the costing period in which it is received. As it is possible to book a passage on the trains up to 13 months before departure date and pay fares in advance of travel, the revenue distributed among the systems in any costing period will not necessarily match the revenue from actual patronage during that period.

CHAPTER 3 - INTERSYSTEM RAILWAY PASSENGER RATING PRACTICES

This chapter provides an outline of the rating strategies applying on intersystem rail passenger services. To place this discussion in perspective it is necessary to recognise some underlying features of government railway management in Australia⁽¹⁾.

RAILWAY MANAGEMENT

Public railway systems in Australia are constituted under legislation enacted by the respective parliaments. Each system operates within the framework of parliamentary appropriation budget accounting. Funds to cover operating expenses are derived mainly from revenue obtained by charging for the services provided. Capital expenditure is financed either from loan funds, grants or operating surpluses. Where deficits occur finance is appropriated from consolidated revenue.

Management of the various public railway systems is vested by legislation in either a Railways Board or Railways Commission(er) which is responsible to a Minister of the Crown.

The respective Commissioners or Board have discretionary powers under the enabling acts to set fares, including certain concessional fares⁽²⁾, and prescribe the terms and conditions under which passengers are carried.

In some instances, this discretionary power is constrained by statutory obligations to grant particular concessional fares. In addition, there is a requirement for some systems, for example the

-
- (1) A more detailed description of railway management is provided in an earlier BTE report, A Study of Intersystem Railway Freight Rating Practices, Australian Government Publishing Service, Canberra, November 1976, Chapter 5.
 - (2) A list of the concessional fares available on the interstate passenger services is set out in Annex B.

PTCNSW and ANRC, to obtain Ministerial approval before a proposed increase in intersystem passenger fares can be implemented.

Railway operations are undertaken within a wide range of legislative and political constraints and it is difficult to generalise about the objectives that guide railway administrations. However it appears that the overall objective is aimed at equating total revenue and total costs in any financial year. In recent years this objective has not been achieved and based on current trends it appears unlikely that it will be in the immediate future.⁽¹⁾

In accounting for their financial position the railways identify various categories of costs as well as various items of revenue. This accounting procedure has not been set up in a way that facilitates the recognition of the costs for any particular service or groupings of services.

PASSENGER FARE STRUCTURES

In order to explain the manner in which passenger fares are set on the East-West route it is necessary to consider the fares that have been developed for intersystem journeys. The railways have developed a multi-tariff rating strategy for intersystem journeys and, depending on the origin and destination of the journey, the fare charged⁽²⁾ can be based on either the prescribed intersystem or intrasystem fares, or on a combination of the fares contained in both schedules.

-
- (1) The deficit of the PTCNSW (including losses on operations and the payment of capital debt charges) increased in four years from \$44.7m in 1971-72 to \$206.9m in 1975-76. Over the same period, the deficit incurred by Westrail declined from \$12.1m to \$3.0m. Source: Commonwealth Parliament Hansard, Senate, 25 February 1977, p. 503.
- (2) Exclusive of any ancillary charges for meals and sleeping berths.

All intersystem routes are considered as one or more stages, a 'stage' being either the route between two capital cities (e.g. Sydney and Melbourne) or between stations which border any sections within a system on the intersystem route, (e.g. Sydney and Broken Hill). A fare is set for travel over each stage and this applies for all intersystem travel between stage stations⁽¹⁾; this fare also applies for intersystem travel between stations located within 120km of the stage stations. Where an intersystem journey involves travel over more than one stage then the total fare is the addition of the fares for the separate stages.

When a journey extending over more than one stage either commences or terminates at a station that is located further than 120km from a stage station, a fare based on both intersystem and intrasystem schedules is charged. For a journey from Sydney to Ucolta⁽²⁾, the intersystem stage fare is charged from Sydney to Broken Hill and the SAR intrasystem fare from Broken Hill to Ucolta⁽³⁾.

There are a number of ways in which a traveller on an intersystem train can be charged fares which are based solely on intrasystem fare schedules. When an intersystem stage is located entirely within one system (e.g. Sydney to Broken Hill and Kalgoorlie to Perth), the fare charged for journeys over the entire stage are those based on the intrasystem fare schedules for the system concerned. Where a journey extends over two stages and neither commences nor terminates within 120km of a stage station, the total fare is the addition of the local fares applying on each system, e.g. a Parkes to Ucolta fare is the addition of the PTCNSW intrasystem fare from Parkes to Broken Hill and the SAR intrasystem fare from Broken Hill to Ucolta. Another variation occurs

-
- (1) Stage stations are located at the extremities of stages, as defined.
 - (2) Located 269km from Broken Hill and 128km from Port Pirie.
 - (3) If the stations bordering these stages are capital cities, then the total fare charged for such a journey must not exceed the fare between the capital cities.

on a single intercapital stage involving travel over two systems (e.g. Sydney to Melbourne) when a journey is made from a station that is more than 120km from a stage station. In this case the fare is calculated by aggregating the intrasystem fares, e.g. a Goulburn to Wangaratta fare is the addition of the PTCNSW fare from Goulburn to Albury and the VR fare from Albury to Wangaratta. The upper limit to any fares derived in this manner is the Sydney to Melbourne intersystem stage fare.

A visual presentation of the way in which various types of fares are set on the East-West route is shown in Figure 3.1.

The intersystem stage fares applying on the Sydney-Perth route in March 1976 are shown in Table 3.1. In terms of cents per kilometre it appears that the rate is constant for all stages⁽¹⁾. This is unlike both the intersystem and intrasystem freight rate schedules which taper with distance and is different from railway passenger fares set in the past⁽²⁾.

PASSENGER TARIFF POLICY

In this section consideration is given to the principle underlying the railways intersystem tariff policy. Towards this end a comparison is made of passenger fares on the various transport modes.

Passenger fares charged by rail, air and express bus services between Sydney and Perth in March 1976 are compared in Table 3.2. In addition, the intersystem rail fares applicable to the various stages of this journey are compared with the equivalent intrastate rail fares for travel on the same Indian Pacific service. Air fares between Sydney and Broken Hill and between Kalgoorlie and Perth are also shown.

-
- (1) The rate per kilometre is designed to facilitate alterations to fares.
 - (2) For previous practices refer to the Report of the Select Committee presented to ANRC, January 1974, Item 1, page 1.

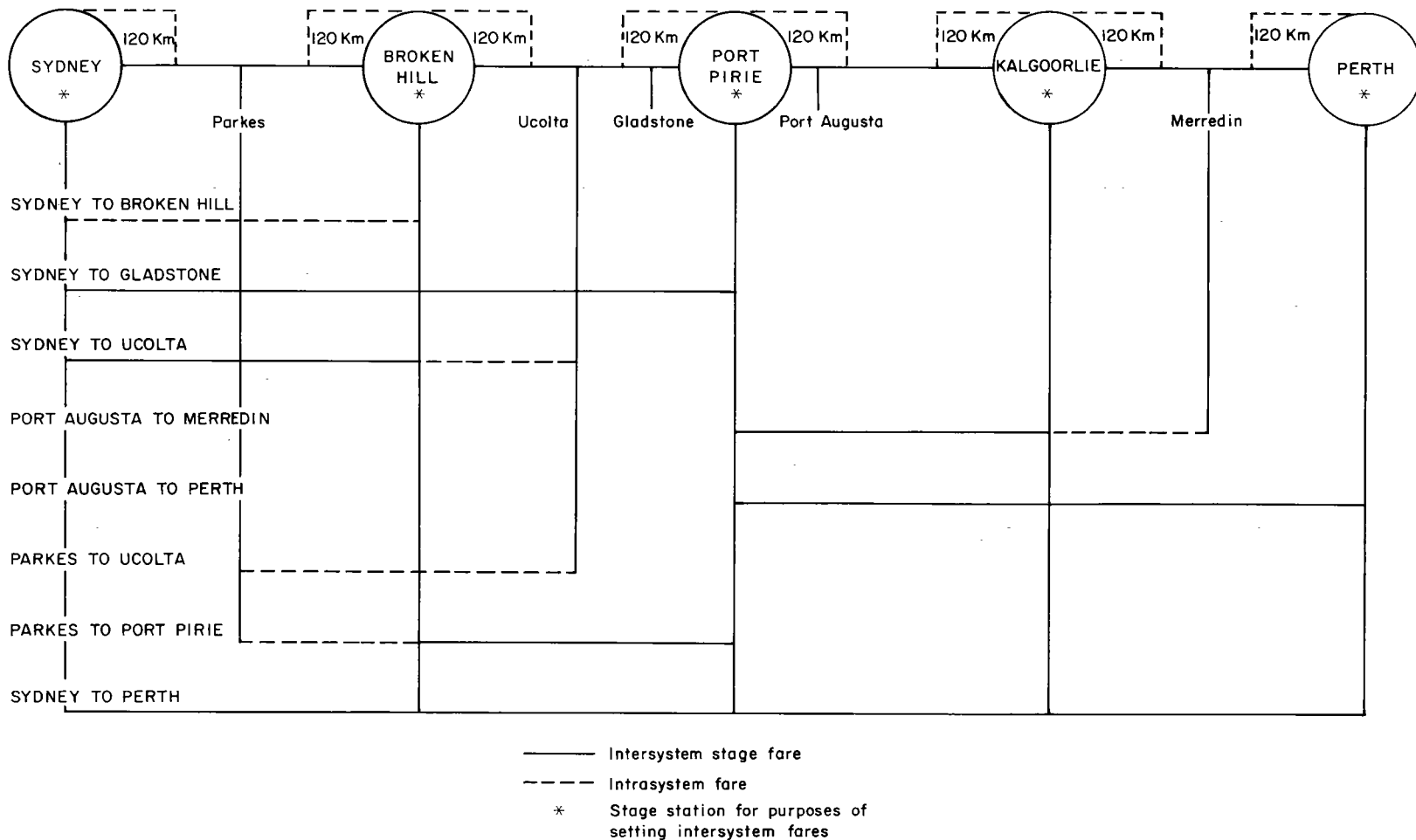


FIGURE 3-1
RAIL FARES APPLICABLE TO VARIOUS PASSENGER JOURNEYS
ALONG THE ROUTE FROM SYDNEY TO PERTH

TABLE 3.1 - INTERSYSTEM STAGE FARES APPLICABLE TO THE INDIAN
PACIFIC AND TRANS AUSTRALIAN SERVICES: MARCH 1976
(\\$)

Stage	Adult Single Fare ^(a)			
	First class		Economy class	
	Amount	Per km	Amount	Per km
Sydney-Broken Hill	44	0.039	29	0.026
Broken Hill-Pt Pirie	15	0.038	10	0.025
Pt Pirie-Kalgoorlie	68	0.038	45	0.025
Kalgoorlie-Perth	26	0.040	17	0.026
Total fare from Sydney to Perth	153	0.039	101	0.026

NOTE: Excludes compulsory ancillary charges for meals and sleeping berths.

(a) Return fares are double single fares and children's fares are half adult fares.

Source: ANR, Intersystem Fares and Proportions, effective 1 February 1976.

The comparison of intersystem and intrasystem rail fares indicates that for all stages of the route the intrasystem fares are substantially lower than the intersystem fares. Intersystem fares between Sydney and Perth are \$152 economy class and \$207 first class; an aggregation of the intrasystem fares applicable to the Indian Pacific Service that any passenger who breaks the journey at each stage station would pay shows that the comparable Sydney to Perth fares are \$130.80 economy class and \$169.85 first class.

The intrasystem rail economy fare between Sydney and Broken Hill is 47 per cent of the air fare. However, the first class intersystem stage fare between Sydney and Broken Hill (\$60) is only slightly less than the air fare (\$63.80).

The intersystem rail fares between Sydney and Perth fall within the range set by express bus and air services. The lower limit of this range, \$119.50 for express bus, excludes the costs of meals and consequently understates the total costs to the passenger.

TABLE 3.2 - INTERMODAL COMPARISON OF SINGLE ADULT FARES FOR STAGES OF JOURNEYS
 BETWEEN SYDNEY AND PERTH: MARCH 1976
 (\$)

Journey	Rail ^(a)				Air		Express ^(b) bus
	Intersystem ^(c)		Intrasystem		First class	Economy class	
	First class	Economy class	First class	Economy class			
Sydney to Broken Hill	60.00	44.00	38.35	29.90	-	63.80	-
Broken Hill to Port Pirie	19.50	14.50	12.50	10.90	-	-	-
Port Pirie to Kalgoorlie	92.50	68.50	92.50	68.50	-	-	-
Kalgoorlie to Perth	35.00	25.00	26.50	21.50	-	43.80	-
Complete journey Sydney to Perth	207.00	152.00	169.85	130.80	226.50	181.20 ^(d)	119.50

(a) Indian Pacific service. Fares shown include compulsory ancillary charges for meals and sleeping berths.

(b) Ansett Pioneer service excluding meals.

(c) Intersystem stage fares.

(d) Half of an off-peak economy return fare is \$154. This fare, which cannot be used for a single journey, is available only at certain times of the year and on particular flights.

The excess of the normal air fare over the rail fare ranges from \$19.50 (first class) to \$29.20 (economy). An amount equal to half of an air economy return off-peak fare⁽¹⁾ is only \$2 more than the economy rail fare and \$53 less than the corresponding first class rail fare.

One must be cautious in drawing definite conclusions from these comparisons of Sydney to Perth fares charged by the various modes because there is such a marked difference in the types of services provided, e.g. travel time, comfort, meals provided, etc. There is no data available on passenger characteristics over this particular route but it is likely that business travellers utilise the air mode and the rail and road modes cater for those people travelling either on holidays or for private reasons.

However, subject to these qualifications the comparison of the fares charged by the various modes suggests that the railways in structuring the Sydney to Perth fare have taken into account the fares charged by their major commercial competitors. Insofar as different prices apply to identical services on intersystem passenger trains, the railways appear to have exercised their discretionary powers within the constraints governing their operations relating to tariff policies by adopting a schedule of prices matched to market demand.

(1) This fare which cannot be used for a single journey, is only available on particular flights.

CHAPTER 4 - PREVIOUS STUDIES OF INTERSYSTEM PASSENGER SERVICES

Several studies have been undertaken in recent years on the operations of interstate passenger trains. These include studies of all intersystem passenger services carried out by a Committee of the Australian and New Zealand Railways Conferences (ANZRC)⁽¹⁾, and a specific study of the East-West passenger services undertaken by the ANRC⁽²⁾. A report assembled by a Committee of Railways of Australia (ROA) includes further information which updates the ANRC study referred to above as well as separate studies carried out by the PTCNSW and Westrail on the operation of these East-West passenger services on their own systems⁽³⁾.

This chapter assesses the conclusions of these studies in respect of East-West passenger services and outlines the methodologies that were used to reach these conclusions.

ANZRC STUDY

The ANZRC study consists of two volumes. The initial report, released in January 1974, presents the results of the financial analyses, in terms of annual cost and revenue information, for all intercapital passenger services. A supplementary report was

-
- (1) Australian and New Zealand Railways Conferences, Report of Select Committee, The Costing and Marketing of Intercapital Passenger Services, January 1974. Australian and New Zealand Railways Conferences, Supplementary Report of Select Committee, The Costing and Marketing of Intercapital Passenger Services, May 1974.
 - (2) Australian National Railways Commission, letter to Minister for Transport dated 30 September 1975 and 'Costs of Operating Passenger Services', unpublished discussion paper presented to meeting of ANRC, 30 January 1976.
 - (3) Swan T.A., 'Report on Interstate Passenger Trains', unpublished report, Railways of Australia Committee, August 1976.

released in May 1974. While the basic purpose of this latter volume was to present the methodology used in the study the results of additional analyses were also presented. The actual time frame considered by the Committee is not specified in either volume of the report but it is likely to cover the period immediately prior to publication.

The data for this study was supplied by the various systems providing the services. The Committee attempted to standardise this data in order to achieve consistent cost categories.

This Committee estimated that neither the Indian Pacific nor the Trans Australian services operated profitably, the annual loss on the former being \$2.83 million and on the latter \$3.44 million.

The supplementary report presented results of the operations of individual intercapital trips. While it is not specifically stated it is presumed that the results refer to one way trips rather than round trips. The conclusions reached were that losses on each trip on the Indian Pacific were \$608 and on the Trans Australian \$1538.

Although the Committee describes the basis for making cost estimations for annual operations and for individual trips, the philosophy underlying the methodology in each approach is not detailed. Neither the rationale of the particular approaches nor the differences between them are specified.

The method used to estimate the annual operating costs is described as that of the 'fully allocated cost approach'. In addition to including the variable costs of operations (such as crew costs), this approach involved allocating to each service portion of the costs which are common to the operations of the total railway network, e.g. the costs of way and works. The criteria used to allocate these common costs are not specified.

In estimating costs on a trip basis the stated aim was to establish the 'direct' costs of providing particular services. The methodology used to achieve this is described as the 'incremental cost approach'. However, a perusal of the cost categories considered in these analyses shows that in addition to the variable costs of operations the categories include the 'directly attributable proportion of way and works costs....'. Again the method of allocating these common costs of operating the total network is not specified.

As both methods of estimating costs include not only historical costs but also the apportionment of the common costs of operating a railway system, it is evident that the philosophy underlying the approaches used by the Committee has been based on the general principles of accounting. Consequently, the purported differences in the approaches is one of degree and not one of essence.

ANRC STUDIES

The Australian National Railways Commission has undertaken two studies of the financial operations of running passenger services over its own system from Port Pirie to Kalgoorlie. The first study was based on the four week costing period commencing 30 June 1975. The costs and revenues as defined by the ANRC for this period were used to impute the financial results of the Indian Pacific and Trans Australian services for the 13 costing periods which comprise the 1975-76 financial year. The ANRC concluded that the Indian Pacific would incur a deficit of \$1.42 million for the year and the Trans Australian service a deficit of \$2.79 million.

The second ANRC study also attempted to impute the financial results of the operations of the Indian Pacific and Trans Australian services for the financial year 1975-76. In this study eight four-weekly costing periods ending 7 February 1976 were used as the basis for estimating annual results. The findings of this study were that the Trans Australian would incur a deficit of

\$640,000 for the year but that the Indian Pacific would show an annual net revenue gain of \$84,000.

One reason for the extreme variation between the results of both studies is that no allowance is made for seasonal variation in demand. While the results of the second study would tend to overstate profitability because of the selection of a period of high demand, the results of the initial study would greatly understate profitability as July is typically a period of low patronage for both services. Further, either study may produce misleading results if in the periods covered particular services were cancelled and account was taken of the costs incurred ('downtime') without any allowance for the loss in revenue due to downtime.

The approach used in both ANRC studies to estimate costs is described as being based on the 'direct' costs of running the services. While such overhead costs as administrative services and the costs of way and works are excluded, the estimation of the 'direct' costs includes an arbitrary allocation of cost items common to the running of freight and passenger services over the ANRC rail system, such as the costs of train control and the provision of rest houses for train staff.

It is obvious that the estimation of 'direct' costs in the ANRC studies is different from that used in the ANZRC Committee studies. However, it is equally obvious that both the ANRC and ANZRC studies follow the same general principle of having a methodology based on allocation of indirect costs.

OTHER STUDIES

Three other studies related to the operations of either the Indian Pacific or both the Indian Pacific and Trans Australian services are summarised below. These studies were presented in the Railways of Australia Committee report of August 1976.

PTCNSW Study

The Public Transport Commission of New South Wales estimated the annual operating costs of the Indian Pacific between Sydney and Broken Hill for the 1973-74 financial year at \$3.4 million. No estimate of revenue was provided but it was concluded in the report that an average patronage of 154 for each consist (including the two carriages for intrastate travellers between these cities) would be necessary to cover operating costs. This was in fact 48 more than the 1973-74 average patronage.

In estimating operating costs general administrative overheads were excluded. However, the estimate is similar in principle to that described in the other studies as it included allocations of overall system costs, such as the general costs of track maintenance and of workshop overheads for locomotives.

ANRC Study

The Railways of Australia Committee presented the results of a later study undertaken by ANRC on the annual operations of the Indian Pacific and Trans Australian services. This work is simply an expanded version of the second ANRC study mentioned above. The time frame was extended from eight costing periods to twelve, ending on 29 May 1976. In this exercise the deficit for the Trans Australian in 1975-76 was estimated at \$825,712. For the Indian Pacific service it was estimated that there was a surplus of revenue over costs of \$6,113.

Westrail

Following a marked decline in patronage in the off-peak season during 1975-76 the Commissioners of the various rail systems were faced with the prospect of reducing the number of East-West passenger services operated.

A study was undertaken by Westrail involving their segment of the route, between Kalgoorlie and Perth, to estimate the effects on annual costs of reducing the number of services each week. The purpose of the study was to compare the costs for the financial year 1975-76 of operating seven single consists (that is, four Indian Pacific trains and three Trans Australian trains run separately) with the costs of operating four double consists each week. The estimated results were that annual costs would be \$1.7 million for seven single consists and \$2.3 million for the four double consists.

The methodology used in this study is specified by Westrail as the incremental cost approach. The intent of this analysis is in accord with the avoidable cost approach used by the Bureau in this report.

GENERAL DISCUSSION ON STUDIES

A comparison of the studies is difficult because they were undertaken for different time periods. Further, there is a lack of agreement among railway systems on the items to be used in estimating the relevant costs.

Insofar as the general philosophy of accounting procedure underlies the estimation of costs there is a consensus among most railways on the methodology to be used in studies. This approach involves the allocation of costs common to the operations of a railway system. However, this general procedure disregards the need for estimates of 'costs on a basis adequate for management decision making'⁽¹⁾, since the allocation of common costs

(1) Joy, S. et al, Tasmanian Railways, A report to the Hon P.J. Nixon, M.P., Minister for Transport, A.G.P.S., Canberra, 1977, p. 41.

to particular traffics results in a figure which is 'neither the costs which would be incurred if it were the only traffic, nor is it the costs that would be saved if that traffic were not carried.' (1).

The rationale of this latter philosophy is discussed in Chapter 5.

(1) Joy, S. et al, Tasmanian Railways, p. 41.

CHAPTER 5 - BTE APPROACH AND METHODOLOGY

It was stated in the previous chapter that the total outlays on the provision of all railway services should not necessarily form the basis of determining the costs of particular services. The reason for this is that not all costs of production can be unambiguously identified with the provision of individual services.

To overcome the problem of allocating the common costs of production the BTE has structured the analyses of the rail services in this study on economic rationale, as this provides an appropriate basis for managerial decisions relating to the operations of individual services. The basic aim in this chapter is to outline the philosophy underlying the methodology used to undertake the study. The explanation involves a discussion of the economic principles of pricing with reference to the short and long term operations of railways and the basic concepts of costs and revenue underlying these principles.

This is followed by an outline of the methodology used by the BTE in this report. In addition, notes on the sources of information and data inputs for the study are presented.

COST CONCEPTS⁽¹⁾

The appropriate costs for consideration by management will be significantly influenced by the temporal and technical aspects of the production process under review. The time profile for cost assessment will depend on whether the operations of existing facilities are being considered, whether an investment program is being contemplated or if some combination of these aspects of the supply of railway services is being evaluated. Consideration of

(1) For a more detailed exposition of cost concepts refer to Bureau of Transport Economics, A Study of Intersystem Railway Freight Rating Practices, Australian Government Publishing Service, Canberra, November 1976, Annex A, Appendix 2.

the unit of output may involve assessing the costs of carrying an additional passenger or the supply of an additional carriage or an additional service and so on. Consequently, there is no single cost formula that would be appropriate for the numerous possibilities that could confront management.

Each public railway system in Australia is a multi-product enterprise supplying a variety of both freight and passenger services. The costs of providing any or all of these services can be classified into the two broad categories of avoidable and non-avoidable costs.

Avoidable costs are defined as those which would not be incurred if the services were not provided. In the short term and assuming equipment is not to be discarded⁽¹⁾ these costs include such items as the cost of fuel, wages of drivers⁽²⁾, etc. Non-avoidable costs are those costs which do not vary with output, an example of which is the interest charge on capital. In the long term all costs are avoidable since replacement or investment expenditure need not be undertaken.

In the short run, depending on the technical aspects of production, the avoidable costs may also be directly assigned to particular traffics. For example, in the case of the Indian Pacific service, the wage cost for individual conductors can be directly attributed to each class of passenger traffic. On a broader scale, such as in the consideration of a service on a trip basis, the wage costs for the total train crew can be directly assigned to that trip.

-
- (1) If there is a market for excess equipment resulting from a reduction in services then the avoidable costs would include the opportunity costs of the realisation value of this equipment, A Study of Intersystem Railway Freight Rating Practices, p. 66.
 - (2) As government policy is one of non-retrenchment of railways labour, the inclusion of labour costs in the analyses assumes that the opportunity cost of labour equals the wage rate.

However, in this latter situation, there are elements of the avoidable trip costs which are common to the carriage of all passengers and therefore cannot be unambiguously assigned to each passenger classification, for example locomotive crew costs.

In general, in an existing railway system non-avoidable costs such as the costs of way and works are common to the provision of all services. Therefore these costs cannot be unambiguously attributed to any particular activity.

REVENUE

From the point of view of the railway enterprise it is necessary to know the total revenue from all services provided to determine, together with the total costs, the overall financial results of operations in any period of time.

However, assessing the viability of individual services necessitates estimation of the revenue that may be at risk by eliminating a service or group of services from the range presently being provided. It is possible that elimination of a scheduled trip from a timetable of services between a particular origin and destination may mean that all of the trip revenue may be foregone. Alternatively, only part of that trip revenue may be at risk if some passengers are prepared to travel on other trips within the rescheduled timetable of services. Whether the latter occurs will depend on consumer preferences for that mode of travel.

THE 'ECONOMIC' PRICE⁽¹⁾

The 'economic' price for an existing railway service is determined by demand, subject to the lower limit of the avoidable costs of providing the service. The actual price charged is set by managerial assessment of what the traffic will bear. This pricing

(1) Refer to BTE, A Study of Intersystem Railway Freight Rating Practices, Chapter 9, for a more detailed discussion.

policy provides the opportunity to maximise the contribution by each class of traffic carried to the common costs of production including non-avoidable costs.

Price set on this basis is structured to recoup the relevant costs of production of the service. As the actual price is related to the price elasticity of demand for the service, the market is the final arbiter in determining the allocation of all common costs of production among the various outputs.

When investment is contemplated avoidable costs, as the lower limit to price, include all costs associated with the investment. In the absence of other considerations, no extra outlays should be undertaken unless the prospective income justifies the additional investment.

However, if the prospective income which appeared to justify extra investment is not subsequently realised then management is confronted with a vastly different set of circumstances. All costs, compared with the situation before the investment was undertaken, will not then be avoidable, as not all assets employed in railway operations have a financially viable alternative use. This may require the implementation of a pricing policy which yields a low or zero rate of return on capital invested in those assets, even in the long run. In other words, the existence of excess capacity coupled with durable assets which have been 'sunk' in the enterprise requires a pricing policy which not only encourages a more efficient utilisation of existing assets, but also indicates whether replacement of renewable assets can be justified. The use of economic principles to determine the price of railway services implies the absence of any rule that all historical costs should necessarily be recouped from services provided in the short run.

METHODOLOGY

The analysis made in this report is divided into three segments. Firstly, the short term costs of the operations of the Indian Pacific and Trans Australian services on a trip basis were examined. Secondly, based on the results of these analyses, an examination was made of the longer term implications of whether sufficient income is being generated to cover the costs of providing the services. The reason for this approach is that in the longer term the indirect costs of providing all services such as capital charges, must also be covered by revenue to achieve overall viability. Finally, consideration was given to the effects of fare adjustments on the profitability of the services.

Short Run Analyses

The primary objective of this study was to consider the short run economic viability of specified round trips. This is in contrast to previous studies⁽¹⁾ of these services which were mostly conducted in terms of annual costs and revenue data. In this segment of the report the analysis is based on the premise that the services as a whole will not be discontinued.

In order to determine the net revenue earned by a particular service the avoidable costs are compared with the revenue which would be lost through its discontinuance. Hence, only those costs which can be directly attributed to each service, or which are common to both services when they are combined to form a double consist, are considered. Further, the analyses are conducted within the constraints governing railway operations, for example, account is taken of the policy of non-retrenchment of labour. Therefore, the analyses exclude costs which would not be saved in the short term if a particular service were discontinued, such as staff annual leave.

(1) Referred to in Chapter 4.

To account for the effects of seasonal variation in demand, selection was made of normal services in the peak and off-peak periods of the year. In addition, to allow for the variation in the costs of each service, arising through industrial award penalty payments, it was necessary to consider the services operating over a cycle of one week.

Longer Term Analyses

Estimates of the longer term financial operations of the services are based on the results of the short run analyses. However, allowance is made for additional items such as depreciation and major overhauls of rolling stock, and particular labour costs such as annual leave, none of which are avoidable in the short term. To allow for the effects of random events, such as downtime due to derailments and washaways, the longer term estimates are based on the arbitrary assumption that the services only operated for 48 weeks of the year.

DATA INPUTS

The basic statistical information sought by the BTE to undertake the study was supplied by the various railway systems involved in the operation of the services. These data included on-train trip costs⁽¹⁾ such as labour, fuel and providing and off-train costs, for example, car cleaning, depreciation and station staff.

Where possible, labour costs were derived from personnel time sheets relating to the particular services studied. Wages and salary rates used in the analyses were those in existence in March 1976. Estimates of other avoidable trip costs are, in general, made by averaging the costs of each system applying to one or more four week costing periods for the particular category being considered.

(1) For further details of the costs and revenues refer to Annex A.

Revenue information for each particular service considered was based on data relating to passengers, mail and parcels, hire charges and on-train sales. Some difficulty was experienced with the lack of readily accessible data relating to passengers carried on each service. Peak and off-peak periods were selected on the basis of passenger data supplied by the ANRC showing numbers carried in each accounting period of the financial year 1975-76⁽¹⁾ For the peak period, the services for the week commencing 3 January 1976 were selected. The off-peak period covers the services for the week commencing 6 March 1976. In selecting these weeks care was taken to ensure that all scheduled trains operated during the period; thus, no special allowance had then to be made for the costing of services that did not operate.

(1) These figures are shown in Table 2.1, p. 4.

CHAPTER 6 - FINANCIAL ANALYSES OF THE OPERATIONS OF THE INDIAN
PACIFIC AND TRANS AUSTRALIAN RAIL PASSENGER SERVICES

This chapter presents the results of a financial analysis of the short term operations of the two rail services. In addition, a longer term analysis on an annual basis is presented which has taken into account additional annual costs incurred by the railways which cannot be attributed to particular trips. For the purpose of estimating the annual financial results it was assumed that the scheduling arrangements which existed in January and March 1976 would continue.

The studies relating to the short term operations of the services are divided into two sections. The normal scheduled services are considered first and therefore cover the segments of the round trip between the east and west coasts of the nation where the two services constitute a double consist. Secondly, the operation of each service over its respective route is examined independently. The longer term implications of the financial results are developed from the round trip results for the combined Indian Pacific/Trans Australian services.

SHORT RUN ANALYSES

The aim of these analyses is firstly, to establish the avoidable costs of the individual services being considered, and secondly, to compare these results with the revenue at risk.

The costs under consideration include those which can be directly attributed to each service, for example catering crew costs⁽¹⁾, and those costs which, though they cannot be assigned to either

(1) For a detailed explanation of the composition of the various costs categories and the assumptions underlying the derivation of these costs refer to Annex A.

service, are common and directly attributable to both trains when the services are combined to form a double consist, for example, locomotive crew costs.

To account for the policy of non-retrenchment of labour, the costs of annual, long service and sick leave, superannuation as well as payroll tax⁽¹⁾ have been disregarded. These costs would still be incurred by each railway system if a particular service were cancelled.

An additional category of costs that has been excluded from the short run analyses are the costs of major overhauls to rolling stock where it has been possible to identify these costs⁽²⁾. These costs arise from operating the total services, and therefore there is no method of assigning the costs, other than by some arbitrary criterion, to particular services.

The East-West rail link is considered as having been built primarily for the movement of freight. Information available to the BTE suggests that the track is not always used to capacity by freight trains and that passenger services are not always given priority over freight trains for use of the track. Hence no congestion costs have been associated with the Indian Pacific and Trans Australian services.

In addition, no track maintenance costs are attributed to the services because the Bureau has been informed that the operations of passenger services cause no discernable damage to the track. The reasons for this are that speed restrictions are placed on the trains, and that the carriages are constructed with well sprung high speed bogies and have relatively small axle weight per carriage (12 tonnes per axle compared with 18-19 tonnes for freight wagons).

-
- (1) Strictly speaking the proportion of payroll tax attributable to penalty payments should be included.
 - (2) It has not been possible to extract the costs of major overhauls from Westrail and PTCNSW base data.

A problem arose with the allocation of revenue from hire charges to particular services. While these costs can be directly assigned to individual services, the revenue obtained by the systems hiring out the carriages cannot be unambiguously attributed to a particular consist. For this reason these revenues have been ignored in the analyses of the short term operations.

Peak Period Services

Table 6.1 presents the results of the financial analysis of the Indian Pacific and Trans Australian services during the peak period for the week commencing 3 January 1976. Total avoidable costs range from \$45,600 to \$48,800. The estimated revenue from the services ranged from \$74,300 to \$78,900. These latter estimates are a measure of the overall revenue at risk to the systems providing the services. The resulting estimated contributions to overhead costs from these services varied from \$27,800 to \$30,100.

Information relating to the costs of storing rolling stock resulting from the cancellation of individual services is not available to the BTE. Whether there are storage costs associated with the cancellation of particular services depends on the availability of storage facilities. Should space be available, whether a scheduled service is provided or not, the short term costs to the railway systems would be negligible. However, should the railways incur significant additional costs arising from the storage of carriages resulting from the cancellation of a particular service then the above estimates of net revenue that may be foregone if the services were cancelled would be understated.

No attempt has been made to estimate the excess of gross earnings over the avoidable costs for individual railway systems. The complex nature of the interstate fare structures⁽¹⁾ prohibits the

(1) Refer to Chapter 3.

TABLE 6.1 - ANALYSIS OF THE INDIAN PACIFIC/TRANS AUSTRALIAN^(a) RAIL PASSENGER SERVICES BY RAILWAY SYSTEM:
PEAK PERIOD SERVICES BETWEEN SYDNEY AND PERTH
(\$'000)

Railway system	Avoidable Costs per Round Trip				Revenue		Total	Estimated contribution to overhead costs
	Crew costs	Other on-train costs	Off-train costs	Total	Passenger (b)	Mails/Parcels		
Ex Sydney 3-1-76								
PTCNSW	5.6	2.4	3.7	11.7				
SAR	2.6	0.4	0.2	3.2				
ANRC	14.1	4.4	3.1	21.7				
Westrail	2.7	5.8	2.1	10.6				
Total	25.0	13.0	9.1	47.2	71.4	3.6	75.0	27.8
Ex Sydney 5-1-76								
PTCNSW	6.6	3.2	3.3	13.2				
SAR	2.2	0.7	0.1	2.9				
ANRC	15.0	4.3	3.1	22.4				
Westrail	2.7	5.7	1.9	10.3				
Total	26.4	13.9	8.5	48.8	75.3	3.6	78.9	30.1
Ex Sydney 7-1-76								
PTCNSW	5.4	3.5	2.9	11.7				
SAR	1.9	0.8	0.2	2.8				
ANRC	14.8	4.3	3.1	22.2				
Westrail	3.2	5.7	1.9	10.8				
Total	25.2	14.3	8.0	47.5	72.0	3.6	75.6	28.1
Ex Sydney 8-1-76								
PTCNSW	4.4	2.1	3.3	9.8				
SAR	1.9	0.3	0.2	2.4				
ANRC	14.0	4.4	3.1	21.5				
Westrail	3.3	5.8	2.8	11.9				
Total	23.7	12.6	9.4	45.6	70.7	3.6	74.3	28.7

(a) Estimation of costs actually incurred in providing these services with the operation of a double consist between Port Pirie and Perth.

(b) Includes passenger ticket revenue and on-train sales.

NOTE: Figures may not add to totals due to rounding.

use of any satisfactory criterion by which to assign revenues among the various systems. The use of different criteria would yield varying results.

In an endeavour to estimate the revenue contributions to overhead costs of all systems by the individual trains, the economic operations of the Indian Pacific and Trans Australian services were analysed separately.

The results of the analysis for the Indian Pacific are presented in Table 6.2. The estimated net contributions to overhead costs range from \$15,300 to \$15,600. For the Trans Australian service the comparable revenue ranges from \$7,400 to \$9,700 (Table 6.3).

The derivation of the avoidable costs for each service includes the costs which are common to both services when they are combined as a double consist, since by definition they cannot be allocated between the individual services. Consequently, the estimated avoidable costs for each service are overstated. For the same reason the results in Tables 6.2 and 6.3 do not sum directly to those in Table 6.1.

Information available to the BTE relating to patronage indicates that peak period services operate near capacity. If a scheduled peak period service were withdrawn it is reasonable to assume that there would not be sufficient capacity on the remaining services to cater for the patronage which could be diverted to other trips through the elimination of that service. Consequently, the conclusion to be drawn from the above analyses is that if any service in the peak periods were withdrawn, the railway systems would forego more in revenue than could be saved in costs.

Off-peak Period Services

The assumptions underlying the analyses in the previous section apply also to the review of the off-peak period services. The results of the analyses for the Indian Pacific and Trans

TABLE 6.2 - ANALYSIS OF THE INDIAN PACIFIC^(a) RAIL PASSENGER SERVICES BY RAILWAY SYSTEM: SYDNEY TO PERTH AND RETURN FOR

PEAK PERIOD SERVICES

(\$'000)

Railway system	Estimated Avoidable Costs per Round Trip				Passenger (b)	Revenue		Estimated contribution to overhead costs
	Crew costs	Other on-train costs	Off-train costs	Total		Mails/Parcels	Total	
Ex Sydney 3-1-76								
PTCNSW	5.6	2.4	3.7	11.7				
SAR	2.6	0.4	0.2	3.2				
ANRC	8.3	3.3	2.0	13.6				
Westrail	1.7	3.8	1.1	6.6				
Total	18.2	9.9	7.0	35.1	47.0	3.6	50.6	15.5
Ex Sydney 5-1-76								
PTCNSW	6.6	3.2	3.3	13.2				
SAR	2.2	0.7	0.1	2.9				
ANRC	8.6	3.3	2.0	13.9				
Westrail	1.7	3.8	0.8	6.3				
Total	19.1	11.0	6.2	36.3	48.3	3.6	51.9	15.6
Ex Sydney 7-1-76								
PTCNSW	5.4	3.5	2.9	11.7				
SAR	1.9	0.8	0.2	2.8				
ANRC	8.8	3.3	2.0	14.1				
Westrail	2.0	3.8	0.8	6.6				
Total	18.0	11.4	5.8	35.2	46.9	3.6	50.5	15.3
Ex Sydney 8-1-76								
PTCNSW	4.4	2.1	3.3	9.8				
SAR	1.9	0.3	0.2	2.4				
ANRC	8.3	3.3	2.0	13.6				
Westrail	2.1	3.8	1.9	7.8				
Total	16.8	9.5	7.3	33.6	45.4	3.6	49.0	15.4

(a) Estimated costs of operating a single consist; on these particular services the Indian Pacific and Trans Australian operated as a double consist between Port Pirie and Perth, and certain common costs are included in figures in this table, e.g. locomotive crew costs.

(b) Includes passenger ticket revenue and on-train sales.

NOTE: Figures may not add to totals due to rounding.

TABLE 6.3 - ANALYSIS OF THE TRANS AUSTRALIAN^(a) RAIL PASSENGER SERVICES BY RAILWAY SYSTEM:

PORT PIRIE TO PERTH AND RETURN FOR PEAK PERIOD SERVICES

(\$'000)

Railway system	Estimated Avoidable Costs per Round Trip				Passenger (b)	Revenue		Estimated contribution to overhead costs
	Crew costs	Other on-train costs	Off-train costs	Total		Mails/Parcels	Total	
Ex Port Pirie 4-1-76								
ANRC	7.8	2.3	3.1	13.2				
Westrail	1.6	3.8	1.0	6.4				
Total	9.3	6.1	4.2	19.6	24.4	2.7	27.1	7.5
Ex Port Pirie 6-1-76								
ANRC	8.4	2.2	3.1	13.7				
Westrail	1.5	3.7	1.2	6.4				
Total	9.9	5.9	4.3	20.1	27.1	2.7	29.8	9.7
Ex Port Pirie 8-1-76								
ANRC	8.1	2.2	3.1	13.4				
Westrail	1.8	3.7	1.3	6.8				
Total	10.0	5.9	4.4	20.3	25.0	2.7	27.7	7.4
Ex Port Pirie 9-1-76								
ANRC	7.7	2.3	3.1	13.1				
Westrail	2.0	3.6	1.6	7.2				
Total	9.6	5.9	4.8	20.3	25.3	2.7	28.0	7.7

(a) Estimated costs of operating a single consist; on these particular services the Indian Pacific and Trans Australian operated as a double consist between Port Pirie and Perth and certain common costs are included in figures in this table e.g. locomotive crew costs.

(b) Includes passenger ticket revenue and on-train sales.

NOTE: Figures may not add to totals due to rounding.

Australian services for the week commencing 6 March 1976 are illustrated in Table 6.4. The contribution to overheads by services during the off-peak period varied from \$2,300 to \$11,100⁽¹⁾.

Table 6.5 shows the results of a hypothesised round trip between Sydney and Perth by the Indian Pacific. On all services, with the exception of one, revenues marginally cover the costs that would have been saved had the services been cancelled.

Based on the information in the table, the services departing Sydney on 10 March 1976 would have incurred a shortfall of \$2,700 compared with the avoidable costs of the service. However, this result must be treated with caution. As indicated previously the estimated avoidable costs are overstated. In addition, for this particular service, revenue was understated because two conductors' sleeping car plans for first class carriages for the journey from Port Pirie to Sydney, were not available to the BTE⁽²⁾ and were omitted from the study. The maximum revenue that these sleeping cars could have earned was \$2844⁽³⁾. Consequently, taking account of the discrepancies in the base data it is obvious that the deficit is overstated.

The results of the analysis of the operations of the postulated Trans Australian off-peak services between Port Pirie and Perth are illustrated in Table 6.6. All services, with the exception of the one departing Port Pirie on 7 March 1976, would have generated revenue sufficient to cover the estimated avoidable costs. The service exhibiting a deficit had a relatively low patronage as indicated by the passenger revenue. As in the case of peak period

-
- (1) As in the case of avoidable costs for peak period services the off-peak cost estimates for the Trans Australian (See Table 6.6) and the Indian Pacific (Table 6.5) individually are overstated due to the inclusion in each of costs common to both trains and do not directly sum to the figures in Table 6.4.
 - (2) It is likely that passengers were carried because a conductor was sent from Sydney to Port Pirie to join one of these cars.
 - (3) The first class fare from Port Pirie to Sydney during this period was \$79. No more than 36 passengers could have travelled on these carriages.

TABLE 6.4 - ANALYSIS OF THE INDIAN PACIFIC/TRANS AUSTRALIAN^(a) RAIL PASSENGER SERVICES BY RAILWAY SYSTEM:

OFF-PEAK PERIOD SERVICES BETWEEN SYDNEY AND PERTH

(\$'000)

Railway system	Avoidable Costs per Round Trip				Revenue		Estimated contribution to overhead costs
	Crew costs	Other on-train costs	Off-train costs	Total	Passenger (b)	Mails/Parcels	
Ex Sydney 6-3-76							
PTCNSW	5.7	2.5	3.5	11.6			
SAR	2.9	0.5	0.2	3.6			
ANRC	13.6	3.8	3.1	20.5			
Westrail	2.1	3.6	2.0	7.7			
Total	24.3	10.4	8.8	43.5	45.6	4.0	6.1
Ex Sydney 8-3-76							
PTCNSW	6.2	2.8	3.3	12.4			
SAR	2.2	0.6	0.2	2.9			
ANRC	14.2	3.8	3.1	21.1			
Westrail	2.7	3.6	1.8	8.1			
Total	25.4	10.8	8.4	44.5	47.3	4.0	6.8
Ex Sydney 10-3-76							
PTCNSW	5.4	2.6	3.1	11.1			
SAR	1.9	0.5	0.1	2.5			
ANRC	14.0	3.8	3.1	20.9			
Westrail	2.8	3.6	2.1	8.5			
Total	24.1	10.5	8.4	43.0	41.3	4.0	2.3
Ex Sydney 11-3-76							
PTCNSW	5.1	2.1	2.9	10.1			
SAR	1.9	0.3	0.2	2.4			
ANRC	14.0	3.8	3.1	20.9			
Westrail	3.2	3.6	2.8	9.6			
Total	24.3	9.8	9.0	43.0	50.1	4.0	11.1

(a) Estimation of costs actually incurred in providing these services with the operation of a double consist between Port Pirie and Perth.

(b) Includes passenger ticket revenue and on-train sales.

NOTE: Figures may not add to totals due to rounding.

TABLE 6.5 - ANALYSIS OF THE INDIAN PACIFIC^(a) RAIL PASSENGER SERVICES BY RAILWAY SYSTEM:

SYDNEY TO PERTH AND RETURN FOR OFF-PEAK PERIOD SERVICES

(\$'000)

Railway system	Estimated Avoidable Costs per Round Trip				Revenue			Estimated contribution to overhead costs
	Crew costs	Other on-train costs	Off-train costs	Total	Passenger (b)	Mails/Parcels	Total	
Ex Sydney 6-3-76								
PTCNSW	5.7	2.5	3.5	11.6				
SAR	2.9	0.5	0.2	3.6				
ANRC	8.0	2.8	2.0	12.8				
Westrail	1.4	2.7	1.1	5.2				
Total	18.0	8.5	6.7	33.2	31.8	4.0	35.8	2.6
Ex Sydney 8-3-76								
PTCNSW	6.2	2.8	3.3	12.4				
SAR	2.2	0.6	0.2	2.9				
ANRC	8.4	2.8	2.0	13.2				
Westrail	1.7	2.7	0.8	5.2				
Total	18.6	8.9	6.3	33.7	31.8	4.0	35.8	2.1
Ex Sydney 10-3-76								
PTCNSW	5.4	2.6	3.1	11.1				
SAR	1.9	0.5	0.1	2.5				
ANRC	8.4	2.8	2.0	13.2				
Westrail	1.8	2.7	1.1	5.6				
Total	17.5	8.6	6.3	32.4	25.7	4.0	29.7	-2.7
Ex Sydney 11-3-76								
PTCNSW	5.1	2.1	2.9	10.1				
SAR	1.9	0.3	0.2	2.4				
ANRC	8.3	2.8	2.0	13.1				
Westrail	2.1	2.7	1.8	6.5				
Total	17.4	7.9	6.8	32.1	31.9	4.0	35.9	3.8

(a) Estimated costs of operating a single consist; on these particular services the Indian Pacific and Trans Australian operated as a double consist between Port Pirie and Perth and certain common costs are included in figures in this table, e.g. locomotive crew costs.

(b) Includes passenger ticket revenue and on-train sales.

NOTE: Figures may not add to totals due to rounding.

TABLE 6.6 - ANALYSIS OF THE TRANS AUSTRALIAN^(a) RAIL PASSENGER SERVICES BY RAILWAY SYSTEM:

PORT PIRIE TO PERTH AND RETURN FOR OFF-PEAK PERIOD SERVICES

(\$'000)

Railway system	Estimated Avoidable Costs per Round Trip				Passenger (b)	Revenue		Estimated contribution to overhead costs
	Crew costs	Other on-train costs	Off-train costs	Total		Mails/Parcels	Total	
Ex Pt Pirie 7-3-76								
ANRC	7.5	2.2	3.1	12.8				
Westrail	1.3	2.6	1.0	4.9				
Total	8.8	4.8	4.1	17.7	13.7	3.0	16.7	-1.0
Ex Pt Pirie 9-3-76								
ANRC	7.9	2.2	3.1	13.2				
Westrail	1.6	2.6	1.0	5.3				
Total	9.5	4.8	4.1	18.5	15.5	3.0	18.5	0.0
Ex Pt Pirie 11-3-76								
ANRC	7.8	2.2	3.1	13.2				
Westrail	1.7	2.6	1.2	5.5				
Total	9.5	4.8	4.3	18.7	15.7	3.0	18.7	0.0
Ex Pt Pirie 12-3-76								
ANRC	7.8	2.2	3.1	13.1				
Westrail	1.9	2.6	1.7	6.1				
Total	9.6	4.8	4.8	19.2	18.2	3.0	21.2	2.0

(a) Estimated costs of operating a single consist; on these particular services the Indian Pacific and Trans Australian operated as a double consist between Port Pirie and Perth and certain common costs are included in figures in the table, e.g. locomotive crew costs.

(b) Includes passenger ticket revenue and on-train sales.

NOTE: Figures may not add to totals due to rounding.

services, the Trans Australian contributed less than the Indian Pacific in off-peak periods to the overheads of the combined passenger services.

All revenue data for this latter service was not available to the BTE as no information was supplied regarding westbound patronage from Kalgoorlie to Perth. However, based on the revenue from patronage for this segment of the trip on other off-peak services, it would appear that the potential increase in revenue from this part of the journey would not have been sufficient to cover the deficit.

While the conclusion regarding the continuation of the services during the off-peak periods cannot be as positive as in the case for peak periods, the results suggest that, in general, the off-peak services generated just sufficient income to warrant their retention. However, because of the relatively low patronage during the off-peak period it may be advantageous to the railway systems to consider implementing a policy aimed at increasing overall net revenues of both the peak and off-peak services.

LONGER RUN ANALYSIS

The purpose of this analysis is to establish the extent to which total revenues from the services cover total costs during the period of a year. The longer term implications for the operations of the joint Indian Pacific/Trans Australian services are then considered.

The analysis is based on the estimated expenditures and revenues during 1975-76 for the operations of the Indian Pacific/Trans Australian services as a whole. The scheduling arrangements and facilities for the services applicable to the periods of January and March 1976 were taken as the basis for estimating the financial results on an annual basis. Therefore, expenditures and revenues for 1975-76 are estimated on the assumption that there

were four double-consist Indian Pacific/Trans Australian services and an additional three single-consist Trans Australian services being provided per week.

In arriving at the annual figures it was assumed that peak period weekly totals considered in the short run analyses would apply to 20 weeks of the year⁽¹⁾ and off-peak weekly totals to 28 weeks of the year, with the remaining four weeks representing an arbitrary estimate of downtime in which, for various reasons, the services would not operate.

The estimated annual costs cover only those that can be directly attributed to the services. That is, costs which are common to the operations of the railway system as a whole have been excluded from consideration, e.g. track costs and capital charges for maintenance depots.

The avoidable costs calculated on a trip basis have been expressed in annual terms and are shown in Table 6.7. For 1975-76 these costs were estimated to be \$11,414,800.

In addition, certain annual costs which are not assignable to particular trips but which are attributable to the annual operation of the services have been included. The additional annual costs totalled \$3,374,900 which raises the estimated annual avoidable cost figure from \$11,414,200 to \$14,789,700 (see Table 6.8).

The annual cost of downtime is difficult to estimate for several reasons. For example, if services are cancelled due to industrial action then the railway systems will not incur the costs of labour involved in the dispute. However, if downtime results from a derailment then the system on which the accident occurs bears the

(1) This figure represents the number of months per annum when patronage figures for the Nullarbor crossing supplied by ANRC indicated total train occupancy for both part and through journeys exceeded 90 per cent.

TABLE 6.7 - ANNUAL ESTIMATES OF SHORT RUN AVOIDABLE COSTS AND REVENUES FOR THE INDIAN PACIFIC AND TRANS AUSTRALIAN SERVICES

(\$'000)								
		Avoidable Costs			Revenue			
		Indian Pacific/ Trans Australian (a)	Trans Australian (b)	Total	Indian Pacific/ Trans Australian (a)	Trans Australian (b)	Total	
PEAK SERVICES -								
Ex Sydney	Ex Port Pirie							
3-1-76		47.2	-	47.2	75.0	-	75.0	
	3-1-76	-	20.1	20.1	-	28.2	28.2	
5-1-76		48.8	-	48.8	78.9	-	78.9	
	5-1-76	-	20.1	20.1	-	28.2	28.2	
7-1-76		47.5	-	47.5	75.6	-	75.6	
	7-1-76	-	20.1	20.1	-	28.2	28.2	
8-1-76		45.6	-	45.6	74.3	-	74.3	
Typical week		189.1	60.2	249.3	303.8	84.5	388.3	
1975-76 ^(c)		3782.0	1204.0	4986.0	6076.0	1689.0	7766.0	
OFF-PEAK SERVICES -								
Ex Sydney	Ex Port Pirie							
6-3-76		43.5	-	43.5	49.6	-	49.6	
	6-3-76	-	18.5	18.5	-	18.8	18.8	
8-3-76		44.5	-	44.5	51.3	-	51.3	
	8-3-76	-	18.5	18.5	-	18.8	18.8	
10-3-76		43.0	-	43.0	45.3	-	45.3	
	10-3-76	-	18.5	18.5	-	18.8	18.8	
11-3-76		43.0	-	43.0	54.1	-	54.1	
Typical week		174.0	55.6	229.6	200.3	56.3	256.6	
1975-76 ^(d)		4872.0	1556.8	6428.8	5608.4	1576.4	7184.8	
ALL SERVICES -								
1975-76 ^(e)		8654.0	2760.8	11414.8	11684.4	3265.4	14950.8	

(a) For derivation of figures for each trip refer to Table 6.1 (peak period) and Table 6.4 (off-peak period).

(b) The estimates for each trip are based on the average per trip derived from Table 6.3 (peak period) and Table 6.6 (off-peak period).

(c) Total of twenty weeks.

(d) Total of twenty eight weeks.

(e) Total of peak and off-peak estimates.

NOTE: Figures may not add to totals due to rounding.

**TABLE 6.8 - ESTIMATED ANNUAL FINANCIAL OPERATING RESULT FOR THE
INDIAN PACIFIC/TRANS AUSTRALIAN SERVICE: 1975-76**
(\$'000)

Cost/Revenue classification	Estimated annual costs	Estimated annual revenue	Estimated net revenue
Annual operation based on trip analyses (a)	11414.8	14950.8	3536.0
Additional annual items not taken into account in trip analyses -			
Net revenue from carriage hire	-	202.9	202.9
Downtime costs	548.6	-	-548.6
Wages and salaries for booking staff (b)	163.2	-	-163.2
Loading on wages and salaries of 25 per cent (c)	1694.7	-	-1694.7
Costs of major overhauls (d)	968.4	-	-968.4
ESTIMATES FOR ANNUAL OPERATIONS, 1975-76	14789.7	15153.7	364.0 ^(e)

- (a) Derived as indicated in Table 6.7.
(b) Based on data supplied by Westrail and PTCNSW.
(c) Loading is applied to wage costs included in annual avoidable costs estimated from trip analyses, plus booking staff wages.
(d) Based on data supplied by ANRC and SAR.
(e) If depreciation of rolling stock (\$650,000) and interest on capital (\$1,187,900) are taken into account as additional cost items the estimated annual deficit would be \$1,473,900.

costs of ensuring that patrons arrive at their destination. A crude estimate of downtime arising for reasons such as this has been made on the basis of a weighted average of peak and off-peak costs used in the short run analyses for all on-train staff and car cleaners. Labour costs for other off-train personnel were excluded since these costs are not likely to be affected by the cancellation of services. The resulting annual estimate of the cost of downtime was \$548,600.

The additional annual wages and salary cost of booking staff for the services was estimated at \$163,200. The cost of these staff were not included in the short run analyses since their employment would not be terminated if one service were to be cancelled.

The loading of 25 per cent on wages and salaries was estimated to cover the cost of annual leave, superannuation, workers' compensation insurance and payroll tax, and approximated the loading used by the various railway systems. The cost of this loading was estimated at \$1,694,700 and applies to the wage component of annual avoidable costs estimated from trip analyses, plus booking staff wages.

The labour component of annual avoidable costs excluding maintenance costs⁽¹⁾ was estimated at 69 per cent.

The cost of major overhauls estimated on an annual basis at \$968,400 makes allowance for expenditure on major overhauls which was not attributable to particular trips. Vehicle and locomotive maintenance which could be assigned on a trip basis was included in the short run avoidable cost analyses.

The annual revenue figures were estimated using the short run results on a trip basis which were then raised to cover 48 weeks in total made up of 20 peak periods and 28 off-peak periods. The

(1) These costs were excluded from the calculation of this estimate as it was not possible to separate the labour and parts components of the maintenance data supplied by all systems.

resulting estimate on an annual basis was \$14,950,800 (see Table 6.7).

In addition, annual net revenue from carriage hire amounted to \$202,900 (See Table 6.8). This revenue results from the interchange of carriages between the Indian Pacific and Trans Australian. Where a system hired carriages it partly owned, e.g. ANRC hiring Indian Pacific carriages for use on the Trans Australia, revenues have been offset against costs. The net costs involved have been included in the estimated annual costs based on trip analyses shown in Table 6.8.

After the addition of net hiring revenue estimated annual revenue increased from \$14,950,800 to \$15,153,700 (see Table 6.8).

The estimated annual operating result taking into account these additional avoidable costs and revenue was a surplus of \$364,000 (see Table 6.8).

If financial charges for depreciation of rolling stock, \$650,000 and interest on capital, \$1,187,900 were allowed for, the estimated annual operating surplus of \$364,000 became a deficit of \$1,473,900. This deficit was significantly lower than those calculated in the ANZRC report. Apart from the non-comparability of the time periods covered, the major reason for the difference was the inclusion in the ANZRC study of costs common to the railway systems as a whole.

A change in pricing strategy might well improve the railways' financial results. The feasibility of this particular option to railway administrators for the Indian Pacific service is considered in the following chapter.

CHAPTER 7 - POTENTIAL FOR FARE ADJUSTMENT ON THE INDIAN PACIFIC SERVICE

The analyses in this report have been framed within the existing operational and pricing policies of the railways. One question that should be asked is what would be the effect of varying these policies on net revenue from the Indian Pacific and Trans Australian passenger services.

A number of policy options are available to the railways that could significantly affect patronage and hence net revenues on these services, for example a promotional program of advertising, a change in quality of the services such as a reduction in the length of journey time or a change in fares. It has not been possible for the Bureau to evaluate all the options available to the railways due to the lack of appropriate data. However, in this chapter the effects of adjustment of fares on the Indian Pacific service is considered. The assessment of these effects is based on an estimation of the elasticity of demand for the Indian Pacific service.

ELASTICITY ESTIMATES AND INTERPRETATION

Due to the limitations of the data available to the Bureau and the time constraint to undertake the analysis it was possible only to establish crude estimates of both the direct price elasticity of demand for the Indian Pacific service and the cross price elasticity of demand for this service with respect to changes in the air fares for travel between Sydney and Perth.

The estimates of elasticities were derived from the use of multiple regression techniques based on a linear relationship between the dependent and the explanatory variables⁽¹⁾. Since data regarding

(1) Specification of the hypotheses are set out in Annex C.

the characteristics of rail travellers were not available, the analysis was carried out using trip data aggregated over four weekly periods. This allowed identification of peak effects and also avoided the effects on demand of calendar irregularities. Attention was focussed on the response of demand for the service to actual fare changes.

The direct and cross price elasticities were calculated at the average values of the variables. The results are presented in Table 7.1. It must be stressed that the estimates are based on a simplified analysis and should be treated with caution.⁽¹⁾

TABLE 7.1 - ESTIMATED COEFFICIENTS OF ELASTICITY FOR INDIAN
PACIFIC SERVICE

Dependent variable	$E_D^{(a)}$	$E_{RA}^{(b)}$
Total Trips ^(c)	-0.43	1.12
Total First Class Trips ^(d)	-0.67	1.56
Total Economy Class Trips ^(d)	-0.14	0.68
Total Trips Eastbound ^(e)	-0.51	1.29
Total Trips Westbound ^(e)	-0.27	0.91

(a) Price elasticity of demand for rail service.

(b) Cross price elasticity of demand for rail service with respect to air fares.

(c) Total east and westbound patronage.

(d) East and westbound patronage.

(e) Total first and economy class patronage.

The most important result is that, at prevailing prices, total rail demand is inelastic with respect to its own price. This implies that a general increase in Indian Pacific fares, if other influences on demand remained constant, would result in a reduction in patronage but an increase in total revenue for the railways.

(1) This is particularly true for the cross price elasticity which is higher than expected.

Consideration of the elasticity coefficients of demand by class of patronage indicates that, in general, first class passengers are more sensitive to increases in both rail and air fares than economy class patrons. This suggests that a higher relative increase in economy fares compared with first class fares could be desirable.

It also appears that westbound Indian Pacific travellers are less sensitive to changes in both rail and air fares than those travelling in the opposite direction. A possible explanation for this is that the characteristics of patrons travelling westbound, such as modal preference, are markedly different from those travelling eastbound.

Additional information on the characteristics of passenger travel would be needed before this hypothesis could be substantiated. However, the results indicate that there could be the opportunity to improve financial performance by implementing a multi-tariff pricing strategy, with higher prices for westbound travel.

An implicit assumption in the derivation of the coefficients of elasticity is that the effects of a price change are symmetrical. For example, a price increase or decrease of the same magnitude will result in an equal, but opposite, percentage change in the quantity demanded. This may not be a correct assumption. The results of the analyses presented in this chapter have in fact been based predominantly on fare increases and there is a distinct possibility that consumer responsiveness to fare decreases may be rather different.

However, the preceding results, though tentative, suggest that demand for the Indian Pacific service at prevailing prices is inelastic. While there is not sufficient information to determine the range of price adjustments that would maximise total revenue from this service, it does appear that the railways should consider an upward adjustment in fares.

CHAPTER 8 - CONCLUSIONS

This report presents the results of a financial study of the Indian Pacific and Trans Australian rail passenger services. The short run results are based on trip analyses and the longer run results on annual operations for 1975-76.

From the short run analyses it appears that the withdrawal of any particular service during the peak period would result in the railways foregoing considerably more in revenue than would be saved in costs. The analyses of off-peak services indicated that both trains were, in general, generating just sufficient income to cover avoidable costs.

The longer run analysis was prepared on the assumption that the scheduling arrangements and facilities available in the periods January and March 1976 were representative of operations for the whole of the financial year 1975-76. The result of the longer run analysis was an operating surplus of \$364,000. However, while this allows for some contribution to capital charges which totalled \$1,838,500 in 1975-76, the results indicate that neither investment in additional facilities nor in rolling stock replacement for the services are justified.

Of the estimated annual avoidable costs excluding maintenance charges, 69 per cent arose from the labour component of operating the services.

While it has not been possible for the BTE to evaluate all the policy and operational options available to the railways to improve the finances of the services, the evidence from a demand analysis of the Indian Pacific service suggests that an upward adjustment in fares for the service should be considered. The results of the study suggest the need for maximum utilisation of the equipment already available and a more flexible pricing policy aimed at an increase in revenue. The latter appears to be feasible

in view of the low price elasticity of rail passenger travel on the route considered although further analysis by the railways of the various segments of the market may be necessary on which to base actual changes in pricing policy.

The approach used in this report provides a means by which the railways could closely monitor the profitability of operating long distance rail passenger services.

ANNEX A
ESTIMATED COSTS AND REVENUES FOR THE
INDIAN PACIFIC/TRANS AUSTRALIAN RAIL
PASSENGER SERVICES

This annex provides details of the estimated costs and revenues used in the analyses of the operations of the Indian Pacific (IP) and Trans Australian (Trans) services on a trip basis.

COSTS

Tables A.1 to A.8 present the estimated avoidable trip costs for the scheduled IP and Trans services during the selected peak and off-peak periods examined in this report. The presentation cross classifies costs according to railway system and cost category. The cost classifications include crew costs, other on-train trip costs and off-train trip costs.

Crew costs are comprised of wages, excluding leave and pension loadings as well as payroll tax, for enginemen, guards, technicians, conductors and caterers. Other on-train costs range from the cost of energy to the costs of marshalling and shunting of the trains. Off-train trip costs include maintenance of rolling stock, car cleaning and booking and station staff wages that would be saved if a service were cancelled.

Wage rates used to calculate labour costs on both the peak and off-peak periods were the award rates applying on each railway system in March 1976.

The staffing arrangements for the services involve an interchange of crews at scheduled points on the east-west route. Consequently, no particular crew staffs either service for a complete trip. On occasions this change over involves relatively minor penalty payments, for example payment for barracks detention. As the aim in this report has been to ensure that cost estimates are not

understated, 50 per cent of these penalty payments were assigned to the trip under review.

CREW COSTS

Wages and penalty payments for on-train staff were calculated from personnel time sheets for each round trip under study.

In the case of Westrail it was not possible to ascertain the actual distribution of staff (i.e. conductors, stewardesses and train technicians) between the IP and Trans. The number of conductors assigned to each service was obtained by reference to conductors' sleeping car plans and train consist sheets. It was assumed that three stewardesses worked on each consist. One technician was assigned to each service.

Accommodation provided for ANRC staff at Kalgoorlie, while not part of wages, is also included in the analysis as a crew cost. The total expenses incurred by the IP and Trans for 48 weeks in 1975-76 was estimated from data supplied by ANRC at about \$170,000.

Allowing for four IP and seven Trans services each week for 48 weeks, the total number of on-train staff (technicians, conductors and caterers) requiring accommodation at Kalgoorlie for the year was calculated at 3840 for the IP and 6188 for the Trans.

Because of the scheduling arrangements of the trains, the Trans crews stay one night in Kalgoorlie, while the IP crews in effect stay for two nights. The arrival and departure times of the Trans mean that crews would have meals on the train, so it is assumed that ANRC would incur bed only expenses of \$10 per night for each crew member. For the IP crew members accommodation expenses would include meals and bed which are assumed to be \$14.50 per night or \$29 per round trip.

OTHER ON-TRAIN COSTS

Hire Charges

Locomotives

The ANRC charge to Westrail for the hire of ANRC locomotives is \$1.05 per kilometre for two GM class or one CL class. This charge includes fuel cost.

Carriages

The charges incurred on the IP service for the hire of Trans cars for a round trip are \$360 for mail vans and \$480 for all other cars. The comparable charges incurred on the Trans services for hiring IP cars are \$222 and \$296 respectively. The number of cars on hire on each consist for the services under review were obtained from the train consist sheets supplied by SAR, Westrail and PTCNSW.

Energy

PTCNSW

Energy costs include electricity for electric locomotives from Sydney to Lithgow and diesel fuel for diesel-electric locomotives from Lithgow to Broken Hill. Locomotive fuel costs were estimated using rates supplied by the PTCNSW of \$0.50 per thousand tonne kilometre for electric locomotives, and \$0.5194 per thousand trailing tonne kilometre for diesel-electric locomotives. Power van fuel costs were estimated at \$25 per trip by averaging the data for the four week costing periods ending 10 January 1976 for peak trips and 3 April 1976 for off-peak trips.

SAR

The fuel costs for SAR locomotives running between Broken Hill and Port Pirie were estimated using the SAR average costs of six cents per litre of fuel and average consumption per kilometre of 4.54 litres and 4.80 litres for the 600 and 700 class locomotives respectively.

ANRC

ANRC fuel costs were estimated at \$1141 per round trip for a double consist based on the total fuel costs for the services from 7 January 1976 to 15 January 1976.

Westrail

Westrail does not incur a separate charge for fuel as this cost is included in the charges for hiring ANRC locomotives.

Laundry

PTCNSW

Laundry costs for the IP were based on the information supplied by PTCNSW for trips from Port Pirie to Sydney during the months January and March 1976. The average costs per round trip used in this study were \$83 for January and \$57 for March.

ANRC

Laundry costs for the IP were estimated from the four week costing periods ending 15 November 1975 (peak) and 6 March 1976 (off-peak). The average costs per round trip were \$154 and \$186 respectively. As ANRC receives laundry from the IP in both directions, these costs were divided equally between east and westbound trips.

For the Trans, laundry costs were estimated from 12 four week costing period data (12 June 1975 to 12 May 1976) at \$179 per trip.

Westrail

Average laundry costs per consist for the months January and March 1976 were supplied by Westrail for the IP and Trans. These costs were \$192 for peak and \$169 for off-peak for the IP; and \$218 for peak and \$159 for off-peak for the Trans.

Providoring

PTCNSW

The PTCNSW supplies perishables for the IP for the journey from Sydney to Port Pirie and grocery items for this service for the trip from Sydney to Perth. Providoring costs were estimated on a trip basis from data supplied by PTCNSW for four week costing periods 15 December 1975 to 10 January 1976 (peak) and 8 March 1976 to 3 April 1976 (off-peak). These costs include the items food, drinks, other saleables and sundries. The cost estimates are \$884 for peak periods and \$854 for off-peak trips.

ANRC

ANRC stocks the IP with perishables from Port Pirie to Perth and Port Pirie to Sydney and supplements grocery items if necessary. Providoring costs for the IP were estimated from the four week costing periods ending 15 November 1975 (peak) and 6 March 1976 (off-peak) for the items food, saleables and consumables. For each journey mentioned above the estimates are \$992 and \$738 for peak and off-peak periods respectively.

The Trans is stocked by ANRC on westbound journeys and by Westrail on eastbound journeys. For ANRC these costs were averaged from 12 period four week costing data (12 June 1975 to 12 May 1975) at \$864.

Westrail

Providoring on this system includes perishables on both the IP and Trans for the journey from Perth to Port Pirie, and grocery items for the journey from Perth to Sydney for the IP and Perth to Port Pirie for the Trans. The trip costs were averaged from the total providoring costs for the months of January and March 1976. For peak period trips the providoring costs were estimated at \$1852 for the IP and \$1754 for the Trans. For off-peak trips these costs were \$770 and \$715 for the IP and Trans respectively.

Marshalling and Shunting

PTCNSW

Following discussions with PTCNSW staff, marshalling and shunting costs for a round trip were estimated at \$34 by extending engine crew time by four hours; that is an allowance of two hours at the commencement and completion of the trip.

Westrail

From information supplied by Westrail, marshalling costs were \$51 per round trip. These costs include hire charges for the ANRC locomotive, crew costs for this locomotive and the costs associated with the shunting locomotive used to marshall the cars.

ANRC

ANRC stated that it was not possible to isolate marshalling and shunting costs for the Trans at Port Pirie. Therefore no charge was used in the analysis.

Miscellaneous

PTCNSW

The miscellaneous cost item is for garbage clearances at Broken Hill. The cost of \$10 for each trip is the average for 12 four week costing periods from 26 July 1975 to 29 May 1976.

SAR

The cost of supplying newspapers is the only miscellaneous item included. This cost was estimated from 1975-76 data supplied by SAR at \$17 per round trip.

Westrail

Based on information supplied by Westrail the cost per round trip for miscellaneous items was averaged as follows: stationery costs, \$20; telex, teleprinter and telephone costs, \$72; and agencies commission, \$196 (peak period) or \$222 (off-peak period).

OFF-TRAIN TRIP COSTS

Maintenance

PTCNSW

Locomotives: The PTCNSW allocates all locomotive maintenance to the train that the particular locomotive was hauling at the time maintenance falls due. In the absence of a PTCNSW average charge for locomotive maintenance, and given the similar horsepower ratings of PTCNSW and ANRC locomotives, the cost per kilometre of maintaining ANRC locomotives (54.9 cents per km) was used as a proxy for PTCNSW costs.

Carriages: Wages for maintenance crews were calculated from trip data supplied by PTCNSW. The costs of parts used in repairs and

renewals were isolated from data for the four week costing periods ending 10 January 1976 and 3 April 1976 by removing the wage component. These charges include some items that cannot be allocated to a specific trip and therefore are overstated on a trip basis. Total carriage maintenance costs for each trip ranged from \$951 to \$1117.

SAR

Locomotives: Maintenance costs were estimated for SAR locomotives by using the SAR average service and repair costs per kilometre. For round trips maintenance costs ranged between \$116 to \$184 depending on the class of locomotive used.

Carriages: All carriage maintenance carried out by SAR is for major overhauls and is not included in the round trip analyses. The major overhaul cost for 1975-76 was \$71,448.

ANRC

Locomotives: Maintenance for locomotives was estimated by aggregating maintenance, examination and lubrication costs assigned to the IP and Trans by ANRC. For the IP maintenance, examination and lubrication costs were averaged from the four week costing periods ending 15 November 1975 and 6 April 1976. The Trans figure was estimated from 12 four week costing period data extending from 29 June 1975 to 29 May 1976. The resulting figure of \$2608 per round trip was reduced by 25 per cent to allow for the mark up for overheads by ANRC. The estimate used in the analysis was \$1956 per round trip.

Carriages: ANRC maintenance on IP cars is mainly for major overhauls. Each system is allocated a number of cars each year for this task. Some running repairs may be carried out at Port Pirie but these costs cannot be specifically allocated to the IP as such work is part of the staff weekly roster.

Maintenance cost information supplied by ANRC included the costs of major overhauls. It was not possible to disaggregate the data to exclude these costs. The use of these data as a basis to derive trip costs would have resulted in a grossly exaggerated estimate. Consequently, it was decided to construct an estimate using the average maintenance cost per kilometre of 12.45 cents based on PTCNSW and Westrail data.

Westrail

Carriages: Maintenance costs for carriages by Westrail were estimated from a costing exercise done by Westrail in 1973. These costs were adjusted using an index based on subsequent variations in a fitter's rate of pay to give estimates on a round trip basis of \$502 for the IP and \$452 for the Trans.

Car Cleaning

PTCNSW

Specific trip cleaning costs were unavailable for the services arriving in Sydney on 11 January 1976 to 14 January 1976. However, PTCNSW, was able to supply representative data for the preceeding week which was used to represent the peak trips studied. The estimates used in the analyses range from \$600 to \$1393. For the off-peak period, the costs for cleaning the specific trains under study were available, and varied from \$704 to \$1190.

ANRC

While some cleaning is undertaken on the IP at Port Pirie this forms only a minor part of the weekly staff roster and cannot be isolated on a trip basis. Hence no costs for these services were included in the analyses.

The Trans cleaning costs were estimated using 12 four week costing period data extending from 29 June 1975 to 29 May 1976. The cost per round trip was averaged at \$556.

Westrail

Cleaning costs for the IP and Trans at Perth were provided by Westrail as an average cost per consist for the months of January and March 1976. These estimates are \$522 (peak) and \$490 (off-peak) for the IP and \$499 (peak) and \$449 (off-peak) for the Trans.

Booking and Station Personnel

The estimates for the costs of these personnel relate to the costs that would be saved if a particular service was discontinued. From the information supplied by Westrail, the estimated savings in the costs of these personnel range from \$92 to \$168 per trip.

These savings arise either from the redeployment of staff or from a reduction in penalty payments for week-end work. Information from other systems was not available.

REVENUES

The revenue earned on the IP and Trans is made up of passenger ticket revenue, earnings from on-train sales, and mail and parcel revenue. Tables A.9 and A.10 show the estimated total revenue earned on peak and off-peak round trips for the IP and Trans respectively. In Tables A.11 and A.12 the revenue by class of passenger on through journeys for the IP and Trans respectively is given. Tables A.13 and A.14 provide this class breakdown for part journeys.

Passenger ticket revenue was calculated from the actual patronage of each train obtained from conductors' sleeping car plans. This patronage by class of passenger is shown in Tables A.15 and A.16

for the IP and Trans respectively. The fares applying in March 1976 were used in the analyses. As the Federal Government reimburses the railways for pensioner concessions, these tickets were taken as full adult fares.

On Train Sales

Revenue from on train sales includes items sold in the lounge car, club car and club car cafeteria.

PTCNSW

These earnings were calculated from actual trip data supplied by PTCNSW between Sydney and Port Pirie.

ANRC

Data was unavailable so ANRC revenue was assumed to be the same as PTCNSW revenue as the times of travel on each system are similar.

Westrail

As Westrail was only able to supply data for the westbound services, the revenues for the four peak and four off-peak period eastbound trips were averaged to provide estimates for the westbound trips.

Revenue from Parcels and Mails

Parcels

Only Westrail was able to supply these particular data for January (peak services) and March (off-peak services) 1976 relating to the Westrail portion of parcel revenue. Estimates for the total revenue were made by converting this data to a kilometre basis and multiplying by the distance of the route owned by each system. Revenue from the section from Sydney to Port Pirie was adjusted to allow for four round trips each week compared with seven between

Port Pirie and Perth. It was assumed that, as the IP and Trans have a common mail van, ANRC and Westrail would receive the same revenue from a double consist of the IP and Trans as from a single Trans consist. Parcel revenue was estimated at \$1648 for peak round trips and \$2048 for off-peak round trips.

Mail

Westrail figures for mail revenue were supplied in the form of a monthly average for the year ended December 1976. The round trip revenue was estimated, using the same method as for parcels, at \$1979 for peak and off-peak services.

TABLE A.1 - THE AVOIDABLE COSTS OF OPERATING THE INDIAN PACIFIC/TRANS AUSTRALIAN RAIL PASSENGER SERVICES BY RAILWAY SYSTEM:

PEAK PERIOD SERVICE - JANUARY 1976

(\$)

Railway system	Crew Costs					Other On-train Trip Costs						Off-train Trip Costs					System total
	Engine-men	Guards	Technicians	Conductors	Caterers	Hire charges	Energy	Laundry	Providing	Marshalling	Miscellaneous	Maintenance Car	Loco cleaning	Booking staff	Station staff		
WESTBOUND CROSSING - Indian-Pacific leaving Sydney 3-1-76; Trans-Australian leaving Port Pirie 4-1-76																	
PTCNSW	517	256	-	1181	1406	273	420	-	884	17	10	1117	618	-	-	-	6699
SAR	183	101	346	452	499	96	111	-	-	-	-	-	75	-	-	-	1863
ANRC (a)	833	393	-	-	-	-	570	-	-	-	-	-	1956	-	-	-	3752
IP	-	-	200	1176	1942	-	-	77	992	-	-	-	-	-	-	-	4387
Trans	-	-	189	955	1919	83	-	-	864	-	-	607	-	-	-	-	4617
Westrail (a)	178	76	-	-	-	693	-	-	-	-	144	-	-	-	46	-	1137
IP	-	-	66	454	100	-	-	192	-	-	-	-	522	-	-	-	1334
Trans	-	-	65	390	99	49	-	218	-	-	-	-	499	-	-	-	1320
Sub-total Westbound	1711	826	866	4608	5965	1194	1101	487	2740	17	154	1724	2649	1021	46	-	25109
EASTBOUND CROSSING - Indian-Pacific and Trans-Australian leaving Perth 6-1-76																	
Westrail (a)	193	77	-	-	-	693	-	-	-	51	144	-	-	-	46	-	1204
IP	-	-	52	391	94	-	-	-	1852	-	-	502	-	-	-	-	2891
Trans	-	-	52	336	92	49	-	-	1754	-	-	452	-	-	-	-	2735
ANRC (a)	527	288	-	-	-	-	571	-	-	-	-	-	-	-	-	-	1386
IP	-	-	199	1062	1714	-	-	77	992	-	-	-	-	-	-	-	4044
Trans	-	-	189	855	1626	83	-	179	-	-	-	-	556	-	-	-	3488
SAR	116	33	256	200	440	96	111	-	-	-	17	-	75	-	-	-	1344
PTCNSW	332	170	-	788	905	273	420	83	-	17	10	-	618	1393	-	-	5009
Sub-total Eastbound	1168	568	748	3632	4871	1194	1102	339	4598	68	171	954	693	1949	46	-	22101
TOTAL WESTBOUND AND EASTBOUND CROSSINGS																	
TOTAL	2879	1394	1614	8240	10836	2388	2203	826	7338	85	325	2678	3342	2970	92	-	47210

(a) Costs in this row are those common to the Indian Pacific and Trans Australian.

TABLE A.2 - THE AVOIDABLE COSTS OF OPERATING THE INDIAN PACIFIC/TRANS AUSTRALIAN RAIL PASSENGER SERVICES BY RAILWAY SYSTEM:

PEAK PERIOD SERVICE - JANUARY 1976

(\$)

Railway system	Crew Costs					Other On-train Trip Costs						Off-train Trip Costs					System total
	Engine-men	Guards	Technicians	Conductors	Caterers	Hire charges	Energy	Laundry	Providing	Marshalling	Miscellaneous	Maintenance Car	Loco cleaning	Book- ing staff	Station staff		
WESTBOUND CROSSING - Indian-Pacific leaving Sydney 5-1-76; Trans-Australian leaving Port Pirie 6-1-76																	
PTCNSW	465	166	282	708	898	597	478	-	884	17	10	1045	618	-	-	-	6168
SAR	139	48	28	374	553	211	114	-	-	-	-	-	58	-	-	-	1525
ANRC (a)	661	342	-	-	-	-	570	-	-	-	-	-	1956	-	-	-	3529
IP	-	-	120	1197	1795	-	-	77	992	-	-	-	-	-	-	-	4181
Trans	-	-	109	1089	1992	-	-	-	864	-	-	607	-	-	-	-	4661
Westrail (a)	191	71	-	-	-	693	-	-	-	-	144	-	-	-	46	-	1145
IP	-	-	83	366	113	-	-	192	-	-	-	-	-	522	-	-	1276
Trans	-	-	83	314	110	-	-	218	-	-	-	-	-	499	-	-	1224
Sub-total Westbound	1456	627	705	4048	5461	1501	1162	487	2740	17	154	1652	2632	1021	46	-	23709
EASTBOUND CROSSING - Indian-Pacific and Trans-Australian leaving Perth 8-1-76																	
Westrail (a)	208	72	-	-	-	693	-	-	-	51	144	-	-	-	46	-	1214
IP	-	-	53	411	87	-	-	-	1852	-	-	194	-	-	-	-	2597
Trans	-	-	52	353	84	-	-	-	1754	-	-	566	-	-	-	-	2809
ANRC (a)	678	347	-	-	-	-	571	-	-	-	-	-	-	-	-	-	1596
IP	-	-	111	1262	2085	-	-	77	992	-	-	-	-	-	-	-	4527
Trans	-	-	101	1032	2002	-	-	179	-	-	-	-	-	556	-	-	3870
SAR	163	83	-	244	518	211	114	-	-	-	17	-	58	-	-	-	1408
PTCNSW	430	255	462	1374	1609	597	478	83	-	17	10	-	618	1063	-	-	6996
Sub-total Eastbound	1479	757	779	4676	6385	1501	1163	339	4598	68	171	760	676	1619	46	-	25017
TOTAL WESTBOUND AND EASTBOUND CROSSINGS																	
TOTAL	2935	1384	1484	8724	11846	3002	2325	826	7338	85	325	2412	3308	2640	92	-	48726

(a) Costs in this row are those common to the Indian Pacific and Trans Australian.

TABLE A.3 - THE AVOIDABLE COSTS OF OPERATING THE INDIAN PACIFIC/TRANS AUSTRALIAN RAIL PASSENGER SERVICES BY RAILWAY SYSTEM:
PEAK PERIOD SERVICE - JANUARY 1976

(\\$)

Railway system	Crew Costs					Other On-train Trip Costs						Off-train Trip Costs					System total
	Engine-men	Guards	Technicians	Conductors	Caterers	Hire charges	Energy	Laundry	Providing	Marshalling	Miscellaneous	Maintenance Car	Loco cleaning	Booking staff	Station staff		
WESTBOUND CROSSING - Indian-Pacific leaving Sydney 7-1-76; Trans-Australian leaving Port Pirie 8-1-76																	
PTCNSW	334	153	480	706	780	801	420	-	884	17	10	1060	618	-	-	-	6263
SAR	164	111	18	346	438	283	111	-	-	-	-	-	75	-	-	-	1546
ANRC ^(a)	614	302	-	-	-	-	570	-	-	-	-	-	1956	-	-	-	3442
IP	-	-	181	1044	1731	-	-	77	992	-	-	-	-	-	-	-	4025
Trans	-	-	170	840	1697	-	-	-	864	-	-	607	-	-	-	-	4178
Westrail ^(a)	233	96	-	-	-	693	-	-	-	-	144	-	-	-	46	-	1212
IP	-	-	68	463	86	-	-	192	-	-	-	-	522	-	-	-	1331
Trans	-	-	67	373	85	-	-	218	-	-	-	-	499	-	-	-	1242
Sub-total Westbound	1345	662	984	3772	4817	1777	1101	487	2740	17	154	1667	2649	1021	46	-	23239
EASTBOUND CROSSING - Indian-Pacific and Trans-Australian leaving Perth 10-1-76																	
Westrail ^(a)	276	102	-	-	-	693	-	-	-	51	144	-	-	-	46	132	1444
IP	-	-	75	505	112	-	-	-	1852	-	-	42	-	-	-	-	2586
Trans	-	-	74	432	111	-	-	-	1754	-	-	566	-	-	-	-	2937
ANRC ^(a)	858	370	-	-	-	-	571	-	-	-	-	-	-	-	-	-	1799
IP	-	-	243	1306	2163	-	-	77	992	-	-	-	-	-	-	-	4781
Trans	-	-	232	1065	1986	-	-	179	-	-	-	-	556	-	-	-	3923
SAR	124	54	-	186	442	283	111	-	-	-	17	-	75	-	-	-	1292
PTCNSW	324	214	523	795	1041	801	420	83	-	17	10	-	618	600	-	-	5446
Sub-total Eastbound	1582	740	1147	4289	5855	1777	1102	339	4598	68	171	608	693	1156	46	132	24303
TOTAL WESTBOUND AND EASTBOUND CROSSINGS																	
TOTAL	2927	1402	2131	8061	10672	3554	2203	826	7338	85	325	2275	3342	2177	92	132	47542

(a) Costs in this row are those common to the Indian Pacific and Trans Australian.

TABLE A.4 - THE AVOIDABLE COSTS OF OPERATING THE INDIAN PACIFIC/TRANS AUSTRALIAN RAIL PASSENGER SERVICES BY RAILWAY SYSTEM:

PEAK PERIOD SERVICE - JANUARY 1976

(\$)

Railway system	Crew Costs					Other On-train Trip Costs						Off-train Trip Costs				System total
	Engine-men	Guards	Technicians	Conductors	Caterers	Hire charges	Energy	Laundry	Providing	Marshalling	Miscellaneous	Maintenance Car	Loco cleaning	Booking staff	Station staff	
WESTBOUND CROSSING - Indian-Pacific leaving Sydney 8-1-76; Trans-Australian leaving Port Pirie 9-1-76																
PTCNSW	310	187	309	817	735	68	478	-	884	17	10	1060	618	-	-	5493
SAR	109	43	-	320	426	24	108	-	-	-	-	-	92	-	-	1122
ANRC (a)	715	375	-	-	-	-	570	-	-	-	-	-	1956	-	-	3616
IP	-	-	102	1192	1909	-	-	77	992	-	-	-	-	-	-	4272
Trans	-	-	91	972	1919	41	-	-	864	-	-	607	-	-	-	4494
Westrail (a)	293	134	-	-	-	693	-	-	-	-	144	-	-	-	84	53
TP	-	-	99	512	103	-	-	192	-	-	-	-	522	-	-	1428
Trans	-	-	99	439	100	16	-	218	-	-	-	-	499	-	-	1371
Sub-total Westbound	1427	739	700	4252	5192	842	1156	487	2740	17	154	1667	2666	1021	84	53
EASTBOUND CROSSING - Indian-Pacific and Trans-Australian leaving Perth 11-1-76																
Westrail (a)	225	86	-	-	-	693	-	-	-	51	144	-	-	-	84	461
IP	-	-	66	472	124	-	-	-	1852	-	-	656	-	-	-	3170
Trans	-	-	66	405	110	16	-	-	1754	-	-	452	-	-	-	2813
ANRC (a)	586	353	-	-	-	-	571	-	-	-	-	-	-	-	-	1510
IP	-	-	199	1073	1790	-	-	77	992	-	-	-	-	-	-	4131
Trans	-	-	189	859	1687	41	-	179	-	-	-	-	556	-	-	3514
SAR	128	86	18	210	585	24	108	-	-	-	17	-	92	-	-	1268
PTCNSW	343	158	223	599	752	68	478	83	-	17	10	-	618	966	-	4315
Sub-total Eastbound	1282	683	761	3618	5058	842	1157	339	4598	68	171	1108	710	1522	84	461
TOTAL WESTBOUND AND EASTBOUND CROSSINGS																
TOTAL	2709	1422	1461	7870	10250	1684	2313	826	7338	85	325	2775	3376	2543	168	514

(a) Costs in this row are those common to the Indian Pacific and Trans Australian.

TABLE A.5 - THE AVOIDABLE COSTS OF OPERATING THE INDIAN PACIFIC/TRANS AUSTRALIAN RAIL PASSENGER SERVICES BY RAILWAY SYSTEM:
OFF-PEAK SERVICE - MARCH 1976

(\\$)

Railway system	Crew Costs					Other On-train Trip Costs						Off-train Trip Costs				System total	
	Engine-men	Guards	Technicians	Conductors	Caterers	Hire charges	Energy	Laundry	Providing	Marshalling	Miscellaneous	Maintenance Car	Loco cleaning	Book- ing staff	Station staff		
WESTBOUND CROSSING - Indian-Pacific leaving Sydney 6-3-76; Trans-Australian leaving Port Pirie 7-3-76																	
PTCNSW	453	213	-	1370	1516	341	420	-	854	17	10	1051	618	-	-	-	6863
SAR	217	128	386	418	486	120	108	-	-	-	-	-	92	-	-	-	1955
ANRC (a)	772	282	-	-	-	-	570	-	-	-	-	-	1956	-	-	-	3580
IP	-	-	217	1275	2088	-	-	93	738	-	-	-	-	-	-	-	4411
Trans	-	-	206	880	2142	-	-	-	864	-	-	607	-	-	-	-	4699
Westrail (a)	207	84	-	-	-	693	-	-	-	-	157	-	-	-	46	-	1187
IP	-	-	70	385	75	-	-	169	-	-	-	-	-	490	-	-	1189
Trans	-	-	69	193	74	-	-	159	-	-	-	-	-	449	-	-	944
Sub-total Westbound	1649	707	948	4521	6381	1154	1098	421	2456	17	167	1658	2666	939	46	-	24828
EASTBOUND CROSSING - Indian-Pacific and Trans-Australian leaving Perth 9-3-76																	
Westrail (a)	192	72	-	-	-	693	-	-	-	51	157	-	-	-	46	-	1211
IP	-	-	53	219	89	-	-	-	770	-	-	468	-	-	-	-	1599
Trans	-	-	53	218	89	-	-	-	715	-	-	479	-	-	-	-	1554
ANRC (a)	609	282	-	-	-	-	571	-	-	-	-	-	-	-	-	-	1462
IP	-	-	176	605	1728	-	-	93	738	-	-	-	-	-	-	-	3390
Trans	-	-	165	570	1603	-	-	179	-	-	-	-	-	556	-	-	3073
SAR	134	70	264	217	615	120	108	-	-	-	17	-	92	-	-	-	1637
PTCNSW	409	169	-	537	988	341	392	57	-	17	10	-	618	1190	-	-	4728
Sub-total Eastbound	1344	593	711	2416	5112	1154	1071	329	2223	68	184	947	710	1746	46	-	18654
TOTAL WESTBOUND AND EASTBOUND CROSSINGS																	
TOTAL	2993	1300	1659	6937	11493	2308	2169	750	4679	85	351	2605	3376	2685	92	-	43482

(a) Costs in this row are those common to the Indian Pacific and Trans Australian.

TABLE A.6 - THE AVOIDABLE COSTS OF OPERATING THE INDIAN PACIFIC/TRANS AUSTRALIAN RAIL PASSENGER SERVICES BY RAILWAY SYSTEM:

OFF-PEAK SERVICE - MARCH 1976

(\$)

Railway system	Crew Costs					Other On-train Trip Costs						Off-train Trip Costs					System total
	Engine-men	Guards	Technicians	Conductors	Caterers	Hire charges	Energy	Laundry	Providing	Marshalling Shunting	Miscellaneous	Maintenance Car	Loco cleaning	Booking staff	Station staff		
WESTBOUND CROSSING - Indian-Pacific leaving Sydney 8-3-76; Trans-Australian leaving Port Pirie 9-3-76																	
PTCNSW	334	155	233	505	758	460	449	-	854	17	10	1018	618	-	-	-	5411
SAR	114	62	-	339	442	163	111	-	-	-	-	-	75	-	-	-	1306
ANRC (a)	661	343	-	-	-	-	570	-	-	-	-	-	1956	-	-	-	3530
IP	-	-	204	1083	1956	-	-	93	738	-	-	-	-	-	-	-	4074
Trans	-	-	193	839	1959	-	-	-	864	-	-	607	-	-	-	-	4460
Westrail (a)	221	96	-	-	-	693	-	-	-	-	157	-	-	-	46	-	1213
IP	-	-	85	413	125	-	-	169	-	-	-	-	-	490	-	-	1282
Trans	-	-	84	409	124	-	-	159	-	-	-	-	-	449	-	-	1225
Sub-total Westbound	1330	656	799	3588	5364	1316	1130	421	2456	17	167	1625	2649	939	46	-	22503
EASTBOUND CROSSING - Indian-Pacific and Trans-Australian leaving Perth 11-3-76																	
Westrail (a)	197	83	-	-	-	693	-	-	-	51	157	-	-	-	46	-	1227
IP	-	-	53	333	91	-	-	-	770	-	-	242	-	-	-	-	1489
Trans	-	-	53	278	88	-	-	-	715	-	-	486	-	-	-	-	1620
ANRC (a)	694	350	-	-	-	-	571	-	-	-	-	-	-	-	-	-	1615
IP	-	-	218	922	1960	-	-	93	738	-	-	-	-	-	-	-	3931
Trans	-	-	207	712	1902	-	-	179	-	-	-	-	-	556	-	-	3556
SAR	188	88	-	353	626	163	111	-	-	-	17	-	75	-	-	-	1621
PTCNSW	589	250	327	1185	1904	460	478	57	-	17	10	-	618	1085	-	-	6980
Sub-total Eastbound	1668	771	858	3783	6571	1316	1160	329	2223	68	184	728	693	1641	46	-	22039
TOTAL WESTBOUND AND EASTBOUND CROSSINGS																	
TOTAL	2998	1427	1657	7371	11935	2632	2290	750	4679	85	351	2353	3342	2580	92	-	44542

(a) Costs in this row are those common to the Indian Pacific and Trans Australian.

TABLE A.7 - THE AVOIDABLE COSTS OF OPERATING THE INDIAN PACIFIC/TRANS AUSTRALIAN RAIL PASSENGER SERVICES BY RAILWAY SYSTEM:

OFF-PEAK SERVICE - MARCH 1976

(\$)

Railway system	Crew Costs					Other On-train Trip Costs					Off-train Trip Costs					System total	
	Engine-men	Guards	Technicians	Conductors	Caterers	Hire charges	Energy	Laundry	Providing	Marshalling Shunting	Miscellaneous	Maintenance Car	Loco cleaning	Booking staff	Station staff		
WESTBOUND CROSSING - Indian-Pacific leaving Sydney 10-3-76; Trans-Australian leaving Port Pirie 11-3-76																	
PTCNSW	309	156	461	513	767	392	392	-	854	17	10	951	618	-	-	-	5440
SAR	146	99	18	184	466	139	114	-	-	-	-	-	58	-	-	-	1224
ANRC (a)	561	292	-	-	-	-	570	-	-	-	-	-	1956	-	-	-	3379
IP	-	-	183	848	1816	-	-	93	738	-	-	-	-	-	-	-	3678
Trans	-	-	173	760	1787	-	-	-	864	-	-	607	-	-	-	-	4191
Westrail (a)	199	100	-	-	-	693	-	-	-	-	157	-	-	-	46	-	1195
IP	-	-	80	371	87	-	-	169	-	-	-	-	-	490	-	-	1197
Trans	-	-	79	308	85	-	-	159	-	-	-	-	-	449	-	-	1080
Sub-total Westbound	1215	647	994	2984	5008	1224	1076	421	2456	17	16	1558	2632	939	46	-	21384
EASTBOUND CROSSING - Indian-Pacific and Trans-Australian leaving Perth 13-3-76																	
Westrail (a)	269	146	-	-	-	693	-	-	-	51	157	-	-	-	46	132	1494
IP	-	-	76	398	101	-	-	-	770	-	-	400	-	-	-	-	1745
Trans	-	-	75	320	101	-	-	-	715	-	-	490	-	-	-	-	1701
ANRC (a)	864	429	-	-	-	-	571	-	-	-	-	-	-	-	-	-	1864
IP	-	-	248	973	2152	-	-	93	738	-	-	-	-	-	-	-	4204
Trans	-	-	237	711	2014	-	-	179	-	-	-	-	-	556	-	-	3697
SAR	156	59	-	217	562	139	114	-	-	-	17	-	58	-	-	-	1322
PTCNSW	322	192	593	919	1215	392	420	57	-	17	10	-	618	940	-	-	5695
Sub-total Eastbound	1611	826	1229	3538	6145	1224	1105	329	2223	68	184	890	676	1496	46	132	21722
TOTAL WESTBOUND AND EASTBOUND CROSSINGS																	
TOTAL	2826	1473	2223	6522	11153	2448	2181	750	4679	85	351	2448	3308	2435	92	132	43106

(a) Costs in this row are those common to the Indian Pacific and Trans Australian.

TABLE A.8 - THE AVOIDABLE COSTS OF OPERATING THE INDIAN PACIFIC/TRANS AUSTRALIAN RAIL PASSENGER SERVICES BY RAILWAY SYSTEM:

OFF-PEAK SERVICE - MARCH 1976

(\$)

Railway system	Crew Costs					Other On-train Trip Costs						Off-train Trip Costs				System total	
	Engine-men	Guards	Technicians	Conductors	Caterers	Hire charges	Energy	Laundry	Providing	Marshalling	Miscellaneous	Maintenance Car	Loco cleaning	Book- ing staff	Station staff		
WESTBOUND CROSSING - Indian-Pacific leaving Sydney 11-3-76; Trans-Australian leaving Port Pirie 12-3-76																	
PTCNSW	374	193	289	679	1156	68	478	-	854	17	10	976	618	-	-	-	5712
SAR	146	96	-	329	469	24	108	-	-	-	-	-	92	-	-	-	1264
ANRC (a)	658	380	-	-	-	-	570	-	-	-	-	-	1956	-	-	-	3564
IP	-	-	198	1182	1954	-	-	93	738	-	-	-	-	-	-	-	4165
Trans	-	-	187	834	1983	-	-	-	864	-	-	607	-	-	-	-	4475
Westrail (a)	292	113	-	-	-	693	-	-	-	-	157	-	-	-	84	53	1392
IP	-	-	97	516	99	-	-	169	-	-	-	-	490	-	-	-	1371
Trans	-	-	96	443	96	-	-	159	-	-	-	-	449	-	-	-	1243
Sub-total Westbound	1470	782	867	3983	5757	785	1156	421	2456	17	167	1583	2666	939	84	53	23186
EASTBOUND CROSSING - Indian-Pacific and Trans-Australian leaving Perth 14-3-76																	
Westrail (a)	232	113	-	-	-	693	-	-	-	51	157	-	-	-	84	461	1791
IP	-	-	71	408	119	-	-	-	770	-	-	614	-	-	-	-	1982
Trans	-	-	70	292	119	-	-	-	715	-	-	520	-	-	-	-	1716
ANRC (a)	763	337	-	-	-	-	571	-	-	-	-	-	-	-	-	-	1671
IP	-	-	203	864	1771	-	-	93	738	-	-	-	-	-	-	-	3769
Trans	-	-	192	793	1712	-	-	179	-	-	-	-	556	-	-	-	3432
SAR	133	86	19	203	445	24	108	-	-	-	17	-	92	-	-	-	1127
PTCNSW	333	198	244	655	1014	68	478	57	-	17	10	-	618	704	-	-	4396
Sub-total Eastbound	1461	734	799	3315	5180	785	1157	329	2223	68	184	1134	710	1260	84	461	19884
TOTAL WESTBOUND AND EASTBOUND CROSSINGS																	
TOTAL	2931	1516	1666	7298	10937	1570	2313	750	4679	85	351	2717	3376	2199	168	514	43070

(a) Costs in this row are those common to the Indian Pacific and Trans Australian.

TABLE A.9 - TOTAL REVENUE EARNED BY INDIAN PACIFIC: PER TRIP

(\$)

Train		Passenger revenue	On-train sales				Mail ^(a) revenue	Total revenue
			PTCNSW ^(b)	Westrail	ANRC ^(c)	Total		
PEAK TRIPS								
Ex Sydney	3-1-76	20912	322	114 ^(d)				
Ex Perth	6-1-76	24597	312	117				
Total		45509	634	231	634	1499	3627	50635
Ex Sydney	5-1-76	23096	485	114 ^(d)				
Ex Perth	8-1-76	23375	306	100				
Total		46471	791	214	791	1796	3627	51894
Ex Sydney	7-1-76	21238	323	114 ^(d)				
Ex Perth	10-1-76	23980	413	129				
Total		45218	736	243	736	1715	3627	50560
Ex Sydney	8-1-76	21034	339	114 ^(d)				
Ex Perth	11-1-76	22804	342	108				
Total		43838	681	222	681	1584	3627	49049
OFF-PEAK TRIPS								
Ex Sydney	6-3-76	20501	399	72 ^(d)				
Ex Perth	9-3-76	10026	160	109				
Total		30527	559	181	559	1299	4027	35853
Ex Sydney	8-3-76	17995	329	72 ^(d)				
Ex Perth	11-3-76	12428	259	67				
Total		30423	588	139	588	1315	4027	35765
Ex Sydney	10-3-76	13638	224	72 ^(d)				
Ex Perth	13-3-76	11094	169	70				
Total		24732	393	142	393	928	4027	29687
Ex Sydney	11-3-76	18546	399	72 ^(d)				
Ex Perth	14-3-76	12071	190	41				
Total		30617	589	113	589	1291	4027	35935

(a) Includes Westrail-ANR revenue common to IP and Trans.

(b) Excludes revenue from non ticket meals which is included with 'Passenger revenue'.

(c) Figure assumed to equal PTCNSW revenue.

(d) Estimated by averaging four Eastbound trips.

TABLE A.10 - TOTAL REVENUE EARNED BY TRANS AUSTRALIAN: PER TRIP
(\$)

Train		Passenger revenue	On-train sales			Mail revenue	Total revenue
			Westrail	ANRC ^(a)	Total		
PEAK TRIPS							
Ex Pt Pirie	4-1-76	11312	109 ^(b)				
Ex Perth	6-1-76	12253	117				
Total		23565	226	634	860	2670	27095
Ex Pt Pirie	6-1-76	12962	109 ^(b)				
Ex Perth	8-1-76	13087	115				
Total		26049	224	791	1015	2670	29734
Ex Pt Pirie	8-1-76	12601	109 ^(b)				
Ex Perth	10-1-76	11493	100				
Total		24094	209	736	945	2670	27709
Ex Pt Pirie	9-1-76	12087	109 ^(b)				
Ex Perth	11-1-76	12312	104				
Total		24399	213	681	894	2670	27963
OFF-PEAK TRIPS							
Ex Pt Pirie	7-3-76	7832	69 ^(b)				
Ex Perth	9-3-76	5209	59				
Total		13041	128	559	687	2966	16694
Ex Pt Pirie	9-3-76	8479	69 ^(b)				
Ex Perth	11-3-76	6312	72				
Total		14791	141	588	729	2966	18486
Ex Pt Pirie	11-3-76	9715	69 ^(b)				
Ex Perth	13-3-76	5414	61				
Total		15129	130	393	523	2966	18618
Ex Pt Pirie	12-3-76	9301	69 ^(b)				
Ex Perth	14-3-76	8167	84				
Total		17468	153	589	732	2966	21176

(a) Figure assumed to equal IP revenue.

(b) Estimated by averaging four eastbound trips.

TABLE A.11 - PASSENGER TICKET REVENUE EARNED BY INDIAN PACIFIC: PER THROUGH JOURNEY

(\$)

Train	First Class				Economy Class				Total revenue	
	Adult	Child	Pass	Sub Total	Adult	Child	Pass	Sub Total		
PEAK TRIPS										
Ex Sydney 3-1-76	10175	2466	-	12641	4560	1117	-	5677	18318	
Ex Perth 6-1-76	12627	798	30	13455	4788	1523	-	6311	19766	
Total	22802	3264	30	26096	9348	2640	-	11988	38084	
Ex Sydney 5-1-76	8726	959	216	10117	4256	1218	-	5474	15591	
Ex Perth 8-1-76	11799	1918	111	13828	5624	1218	-	6842	20670	
Total	20525	2877	327	23945	9880	2436	-	12316	36261	
Ex Sydney 7-1-76	10143	2055	54	12252	5168	1117	-	6285	18537	
Ex Perth 10-1-76	14076	1209	30	15315	4864	1117	-	5981	21296	
Total	24219	3264	84	27567	10032	2234	-	12266	39833	
Ex Sydney 8-1-76	9865	1888	324	12077	5320	1218	-	6538	18615	
Ex Perth 11-1-76	10764	411	222	11397	4408	1117	-	5525	16922	
Total	20629	2299	546	23474	9728	2335	-	12063	35537	
OFF-PEAK TRIPS										
Ex Sydney 6-3-76	13694	274	270	14238	3344	203	204	3751	17989	
Ex Perth 9-3-76	4347	-	216	4563	2888	-	306	3194	7757	
Total	18041	274	486	18801	6232	203	510	6945	25746	
Ex Sydney 8-3-76	6417	387	302	7106	5320	-	-	5320	12426	
Ex Perth 11-3-76	4761	-	216	4977	2888	102	102	3092	8069	
Total	11178	387	518	12083	8208	102	102	8412	20495	
Ex Sydney 10-3-76	10329	-	108	10437	1216	-	306	1522	11959	
Ex Perth 13-3-76	5382	137	216	5735	3516	305	102	2383	9658	
Total	15711	137	324	16172	4732	305	408	3905	21617	
Ex Sydney 11-3-76	11571	411	162	12144	3800	102	204	4106	16250	
Ex Perth 14-3-76	3105	137	108	3350	2280	-	153	2433	5783	
Total	14676	548	270	15494	6080	102	357	6539	22033	

TABLE A.12 - PASSENGER TICKET REVENUE EARNED BY TRANS AUSTRALIAN: PER THROUGH JOURNEY
(\$)

Train	First Class				Economy Class				Total revenue
	Adult	Child	Pass	Sub Total	Adult	Child	Pass	Sub Total	
PEAK TRIPS									
Ex Pt Pirie 4-1-76	4096	81	340	4517	4230	1512	224	5966	10483
Ex Perth 6-1-76	4352	81	34	4467	4418	1576	64	6058	10525
Total	8448	162	374	8984	8648	3088	288	12024	21008
Ex Pt Pirie 6-1-76	4096	891	-	4987	4202	1120	-	5322	10309
Ex Perth 8-1-76	3584	405	-	3989	5443	1323	-	6766	10755
Total	7680	1296	-	8976	9465	2443	-	12088	21064
Ex Pt Pirie 8-1-76	4096	486	68	4650	4982	1435	-	6417	11067
Ex Perth 10-1-76	3328	243	-	3571	4418	1120	-	5538	9109
Total	7424	729	68	8221	9400	2555	-	11955	20176
Ex Pt Pirie 9-1-76	2688	810	136	3634	5170	1638	128	6936	10570
Ex Perth 11-1-76	2816	648	238	3702	5264	728	-	5992	9694
Total	5504	1458	374	7336	10434	2366	128	12928	20264
OFF-PEAK TRIPS									
Ex Pt Pirie 7-3-76	3328	162	204	3694	2256	-	102	2358	6052
Ex Perth 9-3-76	1408	-	272	1680	1598	-	192	1790	3470
Total	4736	162	476	5374	3854	-	294	4148	9522
Ex Pt Pirie 9-3-76	2048	243	408	2699	3666	189	288	4143	6842
Ex Perth 11-3-76	2944	-	238	3182	1974	63	-	2037	5219
Total	4992	243	646	5881	5640	252	288	6180	12061
Ex Pt Pirie 11-3-76	4224	-	204	4428	3478	63	288	3829	8257
Ex Perth 13-3-76	2944	227	408	3579	940	-	-	940	4519
Total	7168	227	612	8007	4418	63	288	4769	12776
Ex Pt Pirie 12-3-76	4531	-	120	4651	1880	315	224	2419	7070
Ex Perth 14-3-76	2560	-	170	2730	2068	63	96	2227	4957
Total	7091	-	290	7381	3948	378	320	4646	12027

TABLE A.13 - PASSENGER TICKET REVENUE EARNED BY INDIAN PACIFIC: PER PART JOURNEY

(\$)

Train	First Class				Economy Class				Total revenue
	Adult	Child	Pass	Sub Total	Adult	Child	Pass	Sub Total	
PEAK TRIPS									
Ex Sydney 3-1-76	210	-	-	210	1860	524	-	2384	2594
Ex Perth 6-1-76	2488	81	192	2761	1907	95	33	2070	4831
Total	2698	81	192	2971	3767	619	33	4454	7425
Ex Sydney 5-1-76	4821	635	-	5456	1787	262	-	2049	7505
Ex Perth 8-1-76	1938	-	-	1938	667	100	-	767	2705
Total	6759	635	-	7394	2454	362	-	2816	10210
Ex Sydney 7-1-76	581	-	116	697	1693	219	92	2004	2701
Ex Perth 10-1-76	1390	85	18	1493	832	359	-	1191	2684
Total	1971	85	134	2190	2525	578	92	3195	5385
Ex Sydney 8-1-76	1152	-	60	1212	1056	151	-	1207	2419
Ex Perth 11-1-76	3598	166	119	3883	1832	167	-	1999	5882
Total	4750	166	179	5095	2888	318	-	3206	8301
OFF-PEAK TRIPS									
Ex Sydney 6-3-76	1479	-	-	1479	1019	-	14	1033	2512
Ex Perth 9-3-76	1327	-	198	1525	653	91	-	744	2269
Total	2806	-	198	3004	1672	91	14	1777	4781
Ex Sydney 8-3-76	4480	-	24	4504	1013	16	26	1065	5569
Ex Perth 11-3-76	1681	-	120	1801	2425	95	38	2558	4359
Total	6161	-	144	6305	3438	111	64	3623	9928
Ex Sydney 10-3-76	456	-	265	721	790	128	40	958	1679
Ex Perth 13-3-76	607	-	-	607	829	-	-	829	1436
Total	1063	-	265	1328	1619	128	40	1787	3115
Ex Sydney 11-3-76	1351	-	-	1351	848	-	97	945	2296
Ex Perth 14-3-76	4984	-	93	5077	933	139	139	1211	6288
Total	6335	-	93	6428	1781	139	236	2156	8584

TABLE A.14 - PASSENGER TICKET REVENUE EARNED BY TRANS AUSTRALIAN: PER PART JOURNEY

(\$)

Train	First Class				Economy Class				Total revenue	
	Adult	Child	Pass	Sub Total	Adult	Child	Pass	Sub Total		
PEAK TRIPS										
Ex Pt Pirie 4-1-76	104	-	51	155	674	-	-	674	829	
Ex Perth 6-1-76	889	22	38	949	720	59	-	779	1728	
Total	993	22	89	1104	1394	59	-	1453	2557	
Ex Pt Pirie 6-1-76	464	43	26	533	1965	155	-	2120	2653	
Ex Perth 8-1-76	1348	198	38	1584	662	79	7	748	2332	
Total	1812	241	64	2117	2627	234	7	2868	4985	
Ex Pt Pirie 8-1-76	582	-	43	625	859	-	50	909	1534	
Ex Perth 10-1-76	604	57	99	760	1307	310	7	1624	2384	
Total	1186	57	142	1385	2166	310	57	2533	3918	
Ex Pt Pirie 9-1-76	598	325	77	1000	469	48	-	517	1517	
Ex Perth 11-1-76	858	22	103	983	1430	197	8	1635	2618	
Total	1456	347	180	1983	1899	245	8	2152	4135	
OFF-PEAK TRIPS										
Ex Pt Pirie 7-3-76	748	-	89	837	826	40	77	943	1780	
Ex Perth 9-3-76	990	80	-	1070	634	-	35	669	1739	
Total	1738	80	89	1907	1460	40	112	1612	3519	
Ex Pt Pirie 9-3-76	581	-	71	652	903	59	23	985	1637	
Ex Perth 11-3-76	240	-	179	419	626	48	-	674	1093	
Total	821	-	250	1071	1529	107	23	1659	2730	
Ex Pt Pirie 11-3-76	662	-	51	713	726	-	19	745	1458	
Ex Perth 13-3-76	197	-	26	223	599	16	57	672	895	
Total	859	-	77	936	1325	16	76	1417	2353	
Ex Pt Pirie 12-3-76	1189	52	86	1327	649	32	223	904	2231	
Ex Perth 14-3-76	1364	-	156	1520	1628	47	15	1690	3210	
Total	2553	52	242	2847	2277	79	238	2594	5441	

TABLE A.15 - INDIAN PACIFIC PATRONAGE: PEAK AND OFF-PEAK ROUND TRIPS

Train	Through Journeys								Part Journeys											Total Part	Total for Trip
	First Class				Economy Class				Total Through	First Class				Economy Class							
	Adult	Child	Pass	Total	Adult	Child	Pass	Total		Adult	Child	Pass	Total	Adult	Child	Pass	Total				
PEAK TRIPS																					
Ex Sydney 3-1-74	49	18	-	67	30	11	-	41	108	3	-	-	3	25	9	-	34	37	145		
Ex Perth 6-1-76	61	6	1	68	32	15	-	47	115	20	1	3	24	19	2	1	22	46	161		
Total	110	24	1	135	62	26	-	88	223	23	1	3	27	44	11	1	56	83	306		
Ex Sydney 5-1-76	42	7	4	53	28	12	-	40	93	40	9	1	50	25	7	-	32	82	175		
Ex Perth 8-1-76	57	14	2	73	37	12	-	49	122	24	1	-	25	12	3	1	16	41	163		
Total	99	21	6	126	65	24	-	89	215	64	10	1	75	37	10	1	48	123	338		
Ex Sydney 7-1-76	49	15	1	65	34	11	-	45	110	7	-	6	13	19	5	5	29	42	152		
Ex Perth 10-1-76	68	9	1	78	32	11	-	43	121	10	1	1	12	9	4	-	13	25	146		
Total	117	24	2	143	66	22	-	88	231	17	1	7	25	28	9	5	42	67	298		
Ex Sydney 8-1-76	48	14	6	68	35	12	-	37	105	10	1	2	13	15	4	2	21	34	139		
Ex Perth 11-1-76	52	3	4	59	29	11	-	40	99	41	1	7	49	26	2	-	28	77	176		
Total	100	17	10	127	64	23	-	77	204	51	2	9	62	41	6	2	49	111	315		
Total for week commencing 3-1-76	426	86	19	531	257	95	-	342	873	155	14	20	189	150	36	9	195	384	1257		
OFF-PEAK TRIPS																					
Ex Sydney 6-3-76	66	2	5	73	22	2	4	28	101	14	-	-	14	13	-	2	15	29	130		
Ex Perth 9-3-76	21	-	4	25	19	-	6	25	50	14	-	2	16	12	2	-	14	30	80		
Total	87	2	9	98	41	2	10	53	151	28	-	2	30	25	2	2	29	59	210		
Ex Sydney 8-3-76	31	3	5	39	35	-	2	35	74	32	-	2	34	23	1	3	27	61	135		
Ex Perth 11-3-76	23	-	4	27	19	1	2	22	49	12	-	6	18	37	3	7	47	65	114		
Total	54	3	9	66	54	1	2	57	123	44	-	8	52	60	4	10	74	126	249		
Ex Sydney 10-3-76	53	-	2	55	8	-	6	14	69	6	-	8	14	18	3	2	23	37	106		
Ex Perth 13-3-76	26	1	4	31	23	3	2	18	49	5	-	-	5	16	-	-	16	21	70		
Total	79	1	6	86	31	3	8	32	118	11	-	8	19	34	3	2	39	58	176		
Ex Sydney 11-3-76	57	3	3	63	25	1	4	30	93	14	-	-	14	12	-	2	14	28	121		
Ex Perth 14-3-76	16	1	2	19	15	-	3	18	37	41	-	4	45	20	4	4	28	73	110		
Total	73	4	5	82	40	1	7	48	130	55	-	4	59	32	4	6	42	101	231		
Total for week commencing 6-3-76	293	10	29	332	166	7	27	190	522	138	-	22	160	151	13	20	184	344	866		

TABLE A.16 - TRANS AUSTRALIAN PATRONAGE: PEAK AND OFF-PEAK ROUND TRIPS

Train	Through Journeys								Part Journeys										Total Part for Trip
	First Class				Economy Class				Total Through	First Class				Economy Class				Total	
	Adult	Child	Pass	Total	Adult	Child	Pass	Total		Adult	Child	Pass	Total	Adult	Child	Pass	Total		
PEAK TRIPS																			
Ex Pt Pirie 4-1-76	32	1	10	43	45	24	7	76	119	3	-	2	5	13	-	-	13	18	137
Ex Perth 6-1-76	34	1	1	35	47	26	2	75	111	14	1	4	19	14	1	-	15	34	145
Total	66	2	11	79	92	50	9	151	230	17	1	6	24	27	1	-	28	52	282
Ex Pt Pirie 6-1-76	32	11	-	43	45	18	-	63	106	7	2	2	11	31	4	-	35	46	152
Ex Perth 8-1-76	28	5	-	33	58	21	-	79	112	17	5	2	24	16	3	1	20	44	156
Total	60	16	-	76	103	39	-	142	218	24	7	4	35	47	7	1	55	90	308
Ex Pt Pirie 8-1-76	32	6	2	40	53	23	-	76	116	7	-	4	11	24	-	7	31	42	158
Ex Perth 10-1-76	26	3	-	29	47	18	-	65	94	10	-	9	19	27	8	1	36	55	149
Total	58	9	2	69	100	41	-	141	210	17	-	13	30	51	8	8	67	97	307
Ex Pt Pirie 9-1-76	21	10	4	35	55	26	4	85	120	10	4	6	20	8	3	-	11	31	151
Ex Perth 11-1-76	22	8	7	37	56	12	-	68	105	12	1	6	19	27	4	1	32	51	156
Total	43	18	11	72	111	38	4	153	225	22	5	12	39	35	7	1	43	82	307
Total for week commencing 4-1-76	227	45	24	296	406	168	13	587	883	80	13	35	128	160	23	10	193	321	1204
OFF-PEAK TRIPS																			
Ex Pt Pirie 7-3-76	26	2	6	34	24	-	3	27	61	8	-	5	13	11	1	4	16	29	90
Ex Perth 9-3-76	11	-	8	19	17	-	6	23	42	17	2	-	19	12	-	5	17	36	78
Total	37	2	14	53	41	-	9	50	103	25	2	5	32	23	1	9	33	65	168
Ex Pt Pirie 9-3-76	16	3	12	31	39	3	9	51	82	10	-	5	15	14	1	3	18	33	115
Ex Perth 11-3-76	23	-	7	30	21	1	-	22	52	6	-	10	16	11	3	-	14	30	82
Total	39	3	19	61	60	4	9	73	134	16	-	15	31	25	4	3	32	63	197
Ex Pt Pirie 11-3-76	33	-	6	39	37	1	9	47	86	14	-	5	19	17	-	3	20	39	125
Ex Perth 13-3-76	23	3	12	38	10	-	-	10	48	4	-	1	5	12	1	5	18	23	71
Total	56	3	18	77	47	1	9	57	134	18	-	6	24	29	1	8	38	62	196
Ex Pt Pirie 12-3-76	36	-	4	40	20	5	7	32	72	19	1	5	25	19	2	5	26	51	123
Ex Perth 14-3-76	20	-	5	25	22	1	3	26	51	19	-	8	27	35	1	2	38	65	116
Total	56	-	9	65	42	6	10	58	123	38	1	13	52	54	3	7	64	116	239
Total for week commencing 7-3-76	188	8	60	256	190	11	37	238	494	97	3	39	139	131	9	27	167	306	800

ANNEX B
INTERSYSTEM RAIL CONCESSIONS AND PASSES

The following types of concessions and passes are available to passengers travelling on the IP and Trans. The number of free passes issued on the round trips under study are shown in Tables A.15 and A.16 in the columns labelled 'pass'.

Student Concessions. Students 16 years of age and over pay the same rate as children. That is, half adult fare but the full rate for meals and berths.

Pensioner Concessions. Age and repatriation pensioners are entitled to travel at half the adult fare component of the ticket. The difference between the adult and concessional fares is reimbursed to the railways by the Government.

Austrail Passes. These passes are available only to overseas visitors for periods of 14 days, 21 days, 1 month, 2 months and 3 months at costs of \$110, \$160, \$200, \$300 and \$350 respectively.

The holders of these passes are entitled to rail travel on any Government intercity rail passenger service in Australia. However, the passholders must pay for ancillary charges of meals and sleeping berths. Austrail pass revenue is distributed among rail systems irrespective of whether the passholder travels on the system. The distributions for each state are NSW 36.33 per cent, Victoria 26.13 per cent, ANRC 11.63 per cent, Queensland 10.35 per cent, Western Australia 8.73 per cent, South Australia 6.40 per cent, and Tasmania 0.43 per cent.

Group Concession. A 10 per cent fare reduction is given for group travel.

Free Passes. Free passes apply to a variety of passengers with the cost incurred depending on status of the holder. Gold passes are issued to Members of Parliament and senior railway officials

and red leather passes to MP's wives. These passes entitle the holders to free fare and sleeping berths. Meals are the only cost incurred. Blue linen passes are issued to railway employees for travel to take up duties. Again meals are the only cost incurred.

Passes for which only ancillary charges are paid by the passenger include Intersystem Paper Passes which are issued to railway employees (and families) on annual leave, medical passes and retired employees passes. Blind persons with an attendant together pay one fare.

ANNEX C
SPECIFICATION OF EQUATIONS USED TO DERIVE
DEMAND ELASTICITIES FOR INDIAN PACIFIC RAIL
PASSENGER SERVICE

In this annex the regression equations used by the BTE to estimate the coefficients of price elasticity of demand for travel on the Indian Pacific service and the cross price elasticity of demand for this service with respect to air fares for travel between Sydney and Perth are presented.

HYPOTHESIS

Basing demand on trip data aggregated over four weekly periods, the basic hypothesis investigated was that the variation in demand is a function of the rail fares, time of travel, interruptions to normal services and air fares. The number of trips are expected to vary inversely with the level of rail fares and directly with the level of air fares. A linear relationship between trips and fares was assumed. The use of four-weekly data is preferable to quarterly data for the purpose of investigating peak effects.

In specifying the basic hypothesis an attempt was made to see whether the price elasticity of demand varied between the peak and off-peak seasons. An extra variable, obtained by multiplying the peak factor by rail fares, was included as an explanatory variable. The effect of fares in the peak is then found by taking the algebraic sum of the coefficients on the fares variable and the extra variable.

Data base

Trip data comprised statistics of the number of first and economy class passengers on each east and westbound service between Port Pirie and Kalgoorlie for the period July 1972 to August 1976. It was assumed that the patronage statistics were representative of

the number of passengers travelling on the Indian Pacific service between Sydney and Perth. The explanatory variables used in the equations included economy and first class rail fares, economy air fares and dummy variables to allow for disruptions in normal services and seasonal factors. A time trend variable was initially included in the analyses in an attempt to account for trends in various other factors having an influence on demand such as the general price level, car costs, income and population, all of which have tended to change steadily over time. However, it was found that this variable was not significant in the explanation of the variation in demand and was subsequently discarded from the analyses.

ESTIMATION

Specification of the equations to test the basic hypothesis is set out in Table C.1.

Given the random fluctuations expected in monthly data and the absence of a strong general trend the equations provide a reasonable explanation of the variation in demand. The coefficient for rail and air fares and for the dummy variable in each equation have the expected signs and are highly significant. The coefficient for air fares in the equations, however, is surprisingly high. In each equation multicollinearity exists between the remaining two independent variables i.e. the peak dummy and the fares/peak variable. This prevented satisfactory identification of their separate effects. When either variable was omitted the other became highly significant.

Calculation of Elasticity Coefficients

The method of calculating the elasticity coefficients, E, from each regression equation is as follows:

$$E = \frac{\Delta T}{X} \cdot \frac{\bar{X}}{\bar{T}}$$

Where $\frac{\Delta T}{X}$ = coefficient of the independent variable in the regression equation

$\bar{X}$ = mean of the independent variable

$\bar{T}$ = mean of the dependent variable.

Elasticities were also calculated at different points in time. Although there was some variation between the estimates, there was no discernable trend in elasticity over time.

FURTHER ANALYSIS

A number of other hypotheses were tested by experimenting with the total trips equation. The equation was re-estimated after taking the logs of the trips and fares variables. The definition of the peak period was changed. The number of train trips per period was included as a variable representing service frequency. Its coefficient was positive and significant and implied a service elasticity of between 0.3 and 0.4. These changes did not have important effects on the rail and air fare elasticities.

It is common for people intending to travel on the Indian Pacific to book well in advance. The fare they pay for the trip is the fare at the time of purchase of the ticket. It was therefore decided to investigate the effect on demand of fares in earlier periods. This was done by including lagged rail fares in the regression equation and using the Almon estimation technique. Equations were also run with separate lags for peak and off-peak travel and for air fares.

The results of this work showed that fares in earlier months had some effect but the impact fell away rapidly and was negligible beyond 3 or 4 months. The lag associated with peak travel was slightly longer than off-peak travel. The lag on air fares seemed to be somewhat less. Both these effects are in accord with expectations. The differences between the long run elasticities from the lagged equations and the elasticities obtained from the

equation for total trips in table C.1 were not substantial. The rail fare elasticity is increased to between -0.5 and -0.6.

In addition to the above, an analysis was carried out with the data aggregated into quarterly time periods. The hypothesis examined was based on the relationship between demand for rail services, real prices⁽¹⁾ and population. An income variable was also included but the results were unsatisfactory. Therefore this variable was omitted from the analysis. The coefficients for rail and air fares and population in the basic equation all had the correct sign. However, while the measures of fare elasticity obtained from this analysis were in the same order of magnitude as those based on monthly data, the coefficient estimates were much less significant from a statistical viewpoint.

(1) Air and rail fares were deflated by using the consumer price index.

TABLE C.1 - SPECIFICATION OF REGRESSION EQUATIONS

TT	=	784.80	-	10.68F	+	22.38AF	-	2456D ₂	+	2.52FT.PE _W	+	215.7PE _W
		(1.62)		(-3.01)		(4.42)		(-7.24)		(0.80)		(0.55)
		with R ² = 0.70 and										
		d = 1.701										
TF	=	139.0	-	9.22FF	+	18.68AF	-	1473D ₂	+	30.12PE _W	+	2FF.PE _W
		(0.37)		(-3.23)		(4.25)		(-5.98)		(0.10)		(0.96)
		with R ² = 0.62 and										
		d = 2.049										
TE	=	522.90	-	1.76EF	+	5.46AF	-	1009D ₂	+	161.5PE _W	+	0.316FF.PE _W
		(2.68)		(-1.83)		(3.52)		(-6.90)		(1.05)		(0.29)
		with R ² = 0.66 and										
		d = 1.339										
TTE	=	269.90	-	6.35F	+	12.86AF	-	1269D ₂	-	0.45F.PE _C	+	344.10PE _C
		(1.02)		(-3.54)		(4.53)		(-6.74)		(-0.22)		(1.28)
		with R ² = 0.64 and										
		d = 1.941										
TTW	=	496.80	-	3.33F	+	9.08AF	-	1222D ₂	+	1.94F.PE _W	+	43.49PE _W
		(1.50)		(-1.37)		(2.62)		(-5.26)		(0.90)		(0.16)
		with R ² = 0.57										
		d = 1.579										

where TT = total number of trips (total patronage in both directions).

F = index of rail fares with fixed weights (60% of first class fare plus 40% of economy class fare).

AF = Sydney-Perth economy air fare.

FT = index of rail fares weighted by actual passenger numbers.

PE_W = peak factor westbound services (dummy variable equal to 1 in the peak and 0 in the off-peak)

D₂ = major disruption to eastbound services (dummy variable given a value of 1 when major disruption to eastbound service in any four week period, otherwise value = 0).

TF = total first class trips (eastbound plus westbound).

FF = first class rail fare.

TE = total economy class trips (eastbound plus westbound).

EF = economy rail fare.

TTE = total number of trips eastbound.

E_C = peak factor eastbound.

TTW = total number of trips westbound.