National Highways Linking Hobart, Launceston and Burnie: Appraisal of Penguin to Burnie Section, 1978

Report

The main issue relating to the section of the National Highway linking Hobart, Launceston and Burnie between Penguin and Burnie is whether to retain the coastal alignment for the National Highway or to adopt an alternative inland route. This appraisal covers both options and provides a recommendation for the future.

BUREAU
OF
TRANSPORT
ECONOMICS

National Highway Linking Hobart, Launceston and Burnie: Appraisal of Penguin to Burnie Section, 1978

BUREAU OF TRANSPORT ECONOMICS

NATIONAL HIGHWAY LINKING HOBART, LAUNCESTON AND BURNIE
APPRAISAL OF PENGUIN TO BURNIE SECTION, 1978

AUSTRALIAN GOVERNMENT PUBLISHING SERVICE
CANBERRA 1978

Printed by Watson Ferguson and Co., Brisbane

FOREWORD

The Bureau of Roads in its Report on Roads in Australia, 1973, recommended that the Commonwealth Government legislate to declare a system of National Highways throughout Australia and to provide grants of financial assistance to the states for construction and maintenance of these highways. The Commonwealth Government accepted this recommendation and the National Roads Act, 1974, was introduced in September, 1974. A system of National Highways was declared under that Act and continued under the States Grants (Roads) Act, 1977.

As part of the National Highway System the Bureau of Roads nominated the Bass Highway between Launceston and Burnie as part of the National Highway linking Hobart, Launceston and Burnie. However, in its 1975 Report on Roads in Australia, the Bureau of Roads recommended that a corridor study be carried out for the Penguin to Burnie section as settlement along the coast was seen as slowing travel on the existing Bass Highway. An inland route was proposed as an alternative.

This report presents an appraisal of the alternatives. The investigation was lead by A.J. McKenzie of the Transport Planning Branch. Other members of the study team were A. Sinclair, A. Kerle and R. Nelson.

The Bureau would like to express its appreciation to the Tasmanian Department of Main Roads, Wynyard, Burnie and Penguin Councils, the North West Master Planning Authority and other authorities which contributed to the study.

G.K.R. Reid
Acting Director

Bureau of Transport Economics
CANBERRA
June, 1978

CONTENTS

FIGURES

TABLES

SUMMARY AND CONCLUSIONS

The main issue relating to the section of the National Highway linking Hobart, Launceston and Burnie between Penguin and Burnie, and that addressed in this report, is whether to retain the coastal alignment for the National Highway or to adopt an alternative inland route.

It is not feasible to upgrade the coastal route between Penguin and Burnie, the Bass Highway, to full National Highway design standards: the maximum feasible standard for the section is well below the National Highway Design Standards. However, the Bureau is satisfied that the Highway can be upgraded sufficiently to cater adequately for expected traffic growth. There are no social or environmental problems associated with the coastal route which would prevent it continuing to function as the National Highway.

In this appraisal an inland route designed to full National Highway standards along an alignment proposed by the Tasmanian Department of Main Roads was compared with the Bass Highway as it currently exists. The cost of constructing the inland route, about $32 million in 1976 prices, far outweighs the likely benefits to road users. The discounted cost of construction was $27 million and discounted benefits were $2.3 million (1976 prices, discounted to 1977 at 10% per annum).

On the basis of this appraisal the construction of an inland route is not economically warranted at this time. Further, the construction costs outweigh the benefits to the extent that construction for at least the next 30 years is unlikely to be justified on economic grounds. Any improvements made to the coast route will further reduce the viability of an inland route.

It is therefore concluded that the National Highway should continue to be along the general alignment of the Bass Highway for the foreseeable future.

If it is accepted that the Bass Highway will remain the National Highway there are certain decisions that need to be made by the Department of Main Roads.

Firstly, it will be necessary to develop detailed plans for upgrading the coast route between Penguin and Burnie and to determine priorities for these projects in relation to projects for the remainder of the National Highways System in Tasmania. Before planning can proceed far beyond this appraisal it will be necessary to obtain detailed and comprehensive traffic data for the area. This exercise will require careful consideration because of the complications resulting from the combination of long distance through traffic, Burnie destination traffic and local traffic generated within the section.

Although it would need to be confirmed in a detailed study this appraisal has indicated two sections of road which appear to be problem areas. The section from the Emu River to the Tioxide plant carried significantly more traffic than the remainder of the section and duplication may be warranted. At Penguin the intersection of the Bass Highway with Main Street may require modification and consideration could be given to improving cross town access to reduce the effects of severence created by the location of the Bass Highway.

Secondly, it will be necessary to decide whether there is any case for reserving an alignment for an inland route to be constructed at some future time. This appraisal indicates that any upgrading of the coastal route will significantly diminish the viability of constructing an inland route. In such an event construction of an inland route would not be likely to be justified for many years beyond the 30 year period considered in this appraisal. Thus the costs of making a planning reservation now may make such an action unjustifiable.

CHAPTER 1 - INTRODUCTION

In its 1975 Report on Roads in Australia the Bureau of Roads recommended that a corridor study be carried out for the Penguin to Burnie section of the Hobart to Burnie National Highway. The growth of settlement along the coast was seen as slowing travel on the existing Bass Highway and an inland route was proposed as a possible alternative.

The Bureau of Roads saw such a corridor study as including consideration of:

(a) alternative locations for the National Highway in the corridor including standards, staging and costs of alternatives;

(b) the need for improvements to roads connecting to each alternative;

(c) likely future developments in the corridor and the relationship of such development to highway location;

(d) the impacts of the alternatives and associated growth patterns on the bio-physical environment;

(e) likely social implications of the alternatives;

(f) the road user effects of the alternatives; and

(g) the comparative advantages and disadvantages of each alternative.

Following a request from the Tasmanian Minister for Main Roads that the Bureau of Transport Economics undertake the corridor study the Minister for Transport, Mr. Nixon, advised that the Bureau would undertake a study of short duration and would consider whether to retain the present National Highway route or adopt an alternative inland route. The more detailed study required to determine the precise location and form of the final route adopted would be undertaken by the State road authority at a later date.

This report presents an appraisal of the alternatives following an investigation by the Bureau.

CHAPTER 2 - THE STUDY AREA

This Chapter defines the area considered in this appraisal and describes significant physical characteristics, population trends and existing transport systems.

Definition of the Study Area

The area considered in detail in this study extends from east of Penguin to Wynyard in the west and south from the coast to include the townships of Ridgley, Natone and Riana (see Figure 2.1). This includes the section of the National Highway under consideration, and the area that would be directly affected by the construction of an alternative inland route.

There are issues which relate to a broader area. These include consideration of activities west of Wynyard through to Smithton, south along the Waratah Highway and east to the Ulverstone and Devonport area which influence traffic in the study area. This broader area is that considered by the North West Master Planning Authority (see Fig. 2.2).

Physical Characteristics

The landform of the study area is composed of two distinct units. First, there is a narrow coastal plain. This rises sharply by about 80 to 100 metres to the second, a plateau of rolling hills. The plateau gradually rises with distance from the coast, culminating in the central highlands south of the study area.

Both the coastal plain and the plateau have been extensively modified by several rivers flowing north through the study area into Bass Strait. They are fast flowing rivers with small catchments which have carved deep, steep sided valleys and gorges through the plateau. The waterways of note in the study area are the Cam, Emu and Blythe Rivers and Sulphur and Penguin Creeks. Although rainfall can be high, particularly in winter, flooding is not a problem.

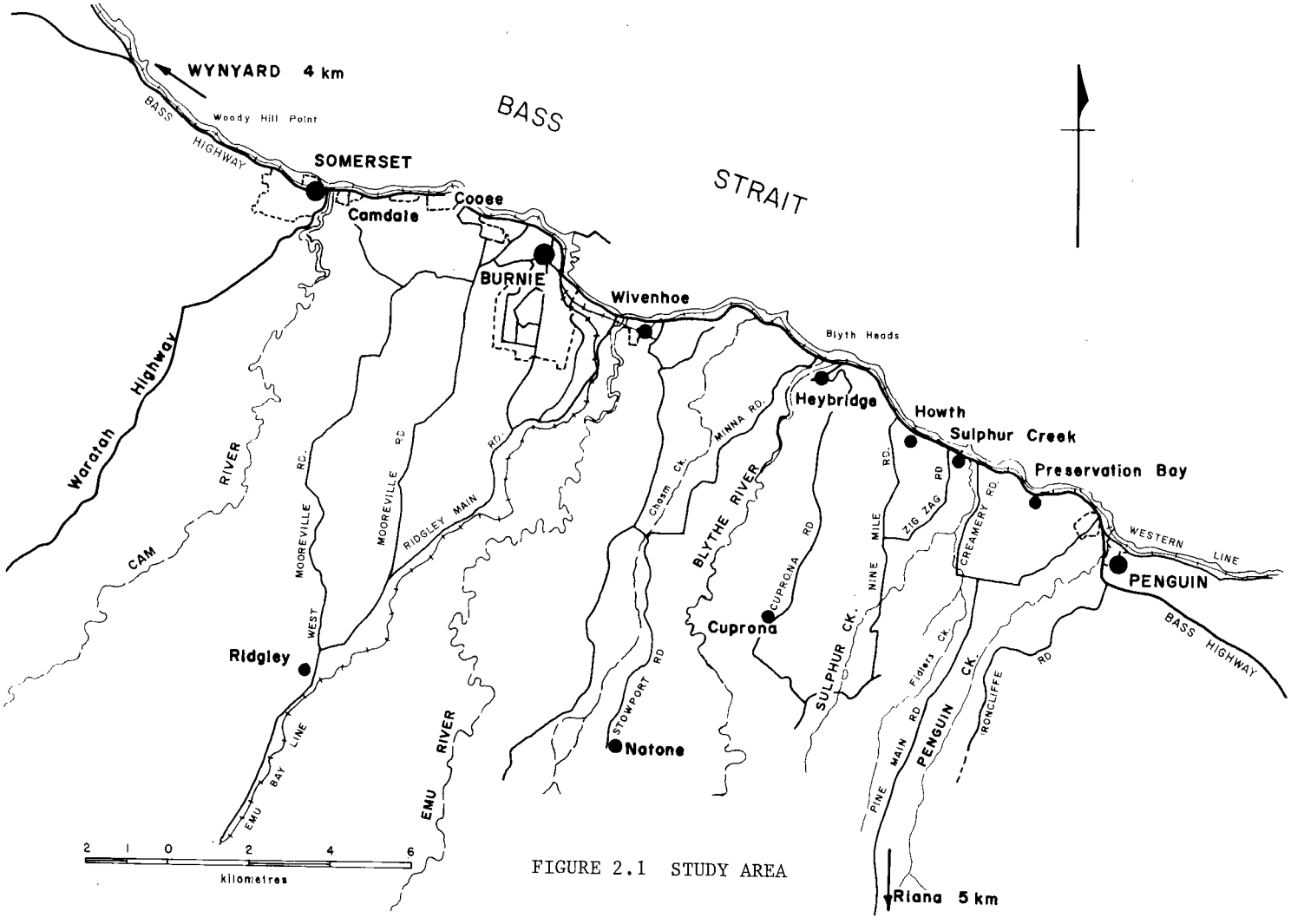

FIGURE 2.1 STUDY AREA

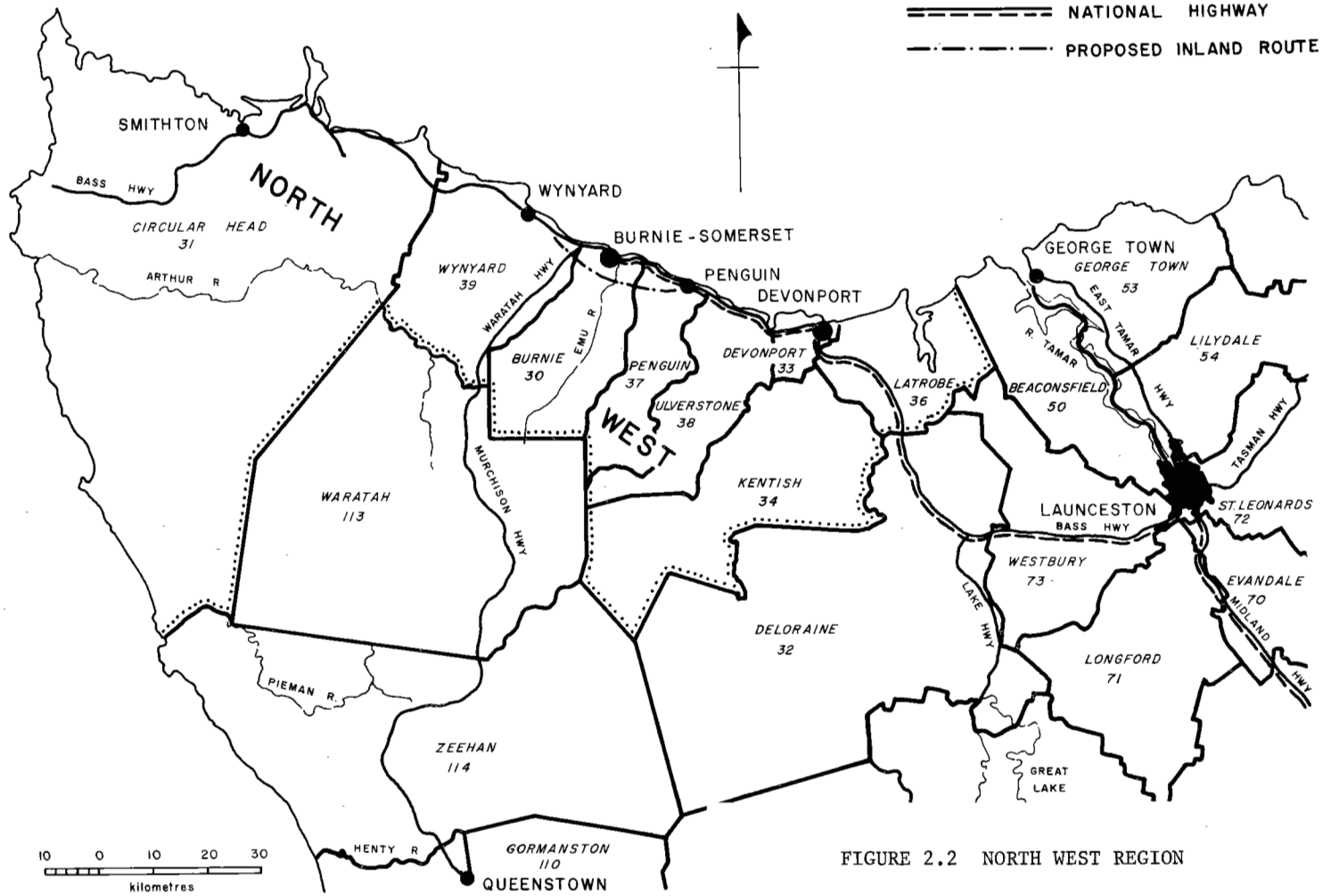

FIGURE 2.2 NORTH WEST REGION

The region has a temperate maritime climate. Close to the coast the rainfall ranges from about 750 to 1000 mm per annum and this increases with distance inland. Mean temperatures on the coast range from around 20°C in mid summer to around 11°C in mid winter. These temperatures decrease with distance from the coast by up to 5°C reflecting the influence of the sea. Frosts occur from late March to late September.

In areas with basalt parent rock the predominant soil type is a highly fertile, deep, well drained clay. As a consequence, the majority of the land in the study area has been cleared for grazing and cash crop production. Patches of less fertile clay soils occur throughout the study area particularly in the south. These support commercially important timber stands. On the steep hillsides the clay soils are prone to slipping when saturated. In some places this has been aggravated by clearing and removal of top soil.

Most of the study area has been cleared for agricultural purposes but there are some patches of native vegetation remaining, particularly along the watercourses and close to the coastline where the cliffs are steep and rugged. Dry sclerophyll forest is the principal type of vegetation in such places but where rainfall is above 1000 mm wet sclerophyll forests occur. Further south, patches of temperate rainforest occur and gradually become the dominant vegetation as the rainfall increases above 1500 mm.

The sclerophyll forests are the richest in native fauna in terms of both diversity and numbers of individuals. They are well frequented by a wide range of birds and nocturnal mammals. The forest is rapidly being cleared for other landuses and there is a need to reserve parts of this habitat.

Landuse and Economic Activity

Because of the soil types, climate and natural resources of the north west region the area is suited to agriculture and forestry and the region is economically dependent on the growing and the processing of agricultural and forestry products. The economy is oriented to external markets.

Primary Industry

The agricultural development of the region began in the 1820's when the Van Diemen's Land Company established a large but unsuccessful sheep grazing venture around Burnie to supply wool to England. Then during the gold boom on the mainland a strong export base was established in potatoes, palings and posts for Melbourne and Adelaide. Dairying was introduced in the 1890's to overcome a decline in the timber trade and potato yield,with butter becoming a major export in the early 1900's.

As a consequence of this historical development, the most distinctive feature of the agricultural industry is its mixed nature which now includes grains, cash crops such as vegetables and poppies for medicinal purposes, beef and racehorse studs. The region is still dependent on external markets.

Because of the highly fertile soils the farms are mostly small and intensively worked, providing high yields. The farm size is, on the average, less than half the size of the average Tasmanian farm. However, during the 1960's there was a decrease in the number of holdings and a slight increase in farm size.

The north west region dominates the production of vegetables for human consumption in Tasmania. Of the State's produce 94% of beans, 69% of peas, 87% of potatoes and 59% of turnips are grown in the region. Vegetable processing is an important manufacturing industry in the larger towns, as is the processing of dairy products.

The forestry industry began by supplying the mainland with palings and posts and is now an extremely important part of the local economy. The sclerophyll forests found within the study area provide eucalypts for sawn timber. The rainforests well to the south are basically exploited for pulp, paper and woodchip production. Large tracts of land south of the study area have been planted with pine, principally to supply raw materials for the pulp and paper mills.

Most timber is felled and prepared outside the study area but the transportation of timber and manufacturing of timber products has a highly significant influence within the study area. Logs are transported by both road and rail with a large percentage of the timber being taken to the Australian Pulp and Paper Mills in Burnie and Wesley Vale (east of the study area) as well as several small timber businesses.

A large amount of timber is also exported and provides significant income for the area.

Manufacturing Industry

The manufacturing industry in the study area is mostly based on the processing of local raw materials, especially timber and farm products. However, some industries have also been attracted there by state assistance such as reduced electricity costs.

Except for the food processing industries manufacturing is mostly concentrated around Burnie and Devonport and all are dependent upon mainland and overseas markets. As a consequence there is considerable concern in the area about rising shipping costs and irregular or inadequate services and these problems may be inhibiting the expansion of manufacturing in the study area.

Trends during the late 1960's and early 1970's indicated that Burnie will continue to have the largest share of manufacturing industry in the region although growth has slowed recently. Its numerical and percentage increases in the numbers of factories, people and value added all exceed that for Devonport. In the late 1960's Burnie Municipality provided over 50% of factory employment in the North West Region and of the value added by manufacturing.

The Burnie Municipality contains most of the heavy industries of the region as well as some processing plants and engineering works. The town is dominated by the APPM mills which comprises 2 paper mills, a hardboard mill and 2 sawmills. Around 3500 workers are employed there. APPM recently announced a $30 million expansion and pollution mitigation program for the existing plant. There are small timber manufacturers in the study area but most of these are suffering as a result of the slump in the building industry.

Titanium Dioxide is manufactured by Australian Titan Products Pty. Ltd. at Heybridge, east of Burnie. The ilmenite for the titanium is imported from Western Australia and the large quantity of sulphuric acid required is produced at Wivenhoe. The North West Acid plant at Wivenhoe was established in 1970 and exports 75% of its output. The acid is manufactured from iron pyrites transported from Rosebery by the Emu Bay Railway.

Of the local agricultural output meat and dairy products are processed in the study area. Butter, butter oils, casein, cheese and milk powder are produced mainly for export with Japan providing a growing market.

Manufacturing industries are being actively encouraged to establish in the area, particularly by Burnie Council and to a lesser extent by Wynyard Council. A large part of the Camdale/Somerset area has been zoned for industrial use. A small steelworks, a plywood manufacturer and wholesale vegetable outlets have already established there. Land values in Burnie range from $60-70,000 per hectare within 5 kilometres of the city centre to $30-35,000 per hectare from 5 to 8 kilometres out. Prices of land in Wynyard are considerably less than in Burnie. Somerset, which is in Wynyard Municipality, is closely associated with development in Burnie.

Tourism

Tourism is an important component of the Tasmanian economy and is likely to become a dominant industry. The north-west coast has a wide variety of possible activities and environments for tourism but these are mostly undeveloped.

In general, local authorities feel that the area is inadequately promoted by the State Department of Tourism and that airline promotion unfairly favours Launceston ahead of Wynyard and Devonport. The area is frequently omitted from the itineraries of coach tours and, if not, the average stay is only 1 or 2 days.

Burnie Council has made a considerable effort to stimulate tourism in the area by promoting the city as a conference and convention centre. They have constructed a large conference centre and a Pioneer Museum. Accommodation is slowly increasing in Burnie and currently it has 720 beds, compared with 500 in Devonport. Last year 35,000 people passed through the Pioneer Museum, perhaps indicating an increased interest in the area.

The policy of Penguin Municipality is to actively discourage industry and develop the area as a residential and recreational centre. The main thrust of their effort has been in planning the development of 10,000 hectares in the Dial Range south of Penguin, for recreational purposes. Most of this area will consist of walking tracks and horse or motor bike trails, but close to Penguin, extensive facilities are being developed. These include an indoor stadium, hockey fields, golf course, woodchopping stadium, lawn bowls, netball, motorcycle scramble track and mini-bike circuit.

The development has already benefited the Municipality. Many visitors have attended recent events such as motor racing, woodchopping and motorcycle scrambles and there has been an increase in land sales.

To the west of Wynyard are Boat Harbour, Sisters Beach and Rocky Cape all of which are very popular holiday spots but have limited capacity. Wynyard Council does not actively promote these areas, or tourism in general, but patronage of such areas is increasing.

Population and Workforce

The Region

Within the region the natural features of the land have influenced landuse, economic activity and settlement patterns. The landform has limited settlement to the coastal strip and in some of the ridges between valleys. Inland road links are mostly restricted to a north-south pattern with the major east-west links along the coastal plain.

The population growth rate in the region has generally declined over the last few intercensal periods (see Tables 2.1 and 2.2). In particular a large percentage of the 15 to 20 age group has been migrating from the region to search for better job opportunities. The rural population is declining but urban populations are increasing. Future growth is most likely to continue in the larger urban areas and in neighbouring towns which are dormitory suburbs to Burnie and Devonport.

TABLE 2.1 - PROJECTED POPULATION OF NORTH WEST COAST, 1987-2002, BY LOCAL GOVERNMENT AREA

LGA	1976	1987	1992	2002
Wynyard	11,684	13,390	14,415	15,805
Burnie	19,619	20,450	20,960	21,375
Penguin	5,015	5,290	5,440	5,640
Ulverstone	12,193	14,190	15,280	16,760
Devonport	21,551	24,560	26,320	28,370

Source: Sewerage Strategy Study. Draft Report. Commissioned by Tasmanian Department of Planning and Development.

The workforce is a lower proportion of the population than for the rest of Tasmania or Australia. This is partially a reflection of the high proportion of the population in the 0 to 14 age group. The proportion of the workforce employed in manufacturing is around the Australian average but is higher than for Tasmania in general. In the mid 1960's unemployment in the region was lower than both the Tasmanian and Australian averages. The region now has one of the highest unemployment levels in the state.

TABLE 2.2 - AVERAGE ANNUAL GROWTH RATES ON NORTH WEST COAST BY LOCAL GOVERNMENT AREA, 1954-2002, POPULATION

	Actual Percentages				Projected Percentages		
	1954-61	1961-66	1966-71	1971-76	1976-87	1987-92	1992-2002
Wynyard	2.8	1.7	2.2	1.9	1.2	1.5	1.0
Burnie	3.1	2.2	1.4	-0.3	0.4	0.5	0.2
Penguin	2.9	0.0	0.4	0.9	0.5	0.6	0.4
Ulverstone	2.3	1.7	1.8	1.9	1.4	1.5	1.0
Devonport	3.0	3.5	3.6	1.6	1.2	1.4	0.8

Source: Sewerage Strategy Study. Draft Report. Commissioned by Tasmanian Department of Planning and Development.

Most services are provided in the larger towns and centres. Trends in shopping patterns and in the retail industry indicate that the larger centres will continue to expand at the expense of the small towns and villages. Retail and service industries have concentrated in Devonport, Burnie, Ulverstone and Wynyard.

Burnie Municipality

Over the past two decades, and particularly in the 1960's, population growth in Burnie declined. In the last couple of years this trend has changed. For example residential development in 1977 was double that for 1976. This is occurring mainly to the south and west of Burnie.

Population growth in Burnie itself is slow but it is becoming the centre for employment, commerce and services for the surrounding area. For example, most applications for recently advertised Council jobs have come from surrounding municipalities. In addition to industrial development a number of Australian Government offices and north-west regional offices of State Departments are located in Burnie. Despite this Burnie has the highest percentage unemployment in Tasmania.

Wynyard Municipality

Although Wynyard Council would like to attract industry to Wynyard and Somerset the municipality is essentially developing as a dormitory suburb to Burnie. Annual growth rates for the last 10 years have been higher than for the region at around 2%. The total population of the municipality is 11,000 with 4,900 at Wynyard and 2,900 at Somerset. In addition the numbers of permanent residents in the holiday resorts of Boat Harbour and Sisters Beach are increasing.

In Wynyard itself most employment is provided by the council (80 people), cheese factory and hospital. Most residents travel east to jobs in Somerset or Burnie, with a few working for Titan at Heybridge, or west to the Iron Ore plant at Port Latta. In Somerset, both TAS Engineering Services and Tasmanian Plywood Mills employ approximately 80 people each. It is likely that most industries interested in locating in Wynyard Municipality in the future will choose Somerset because of its proximity to Burnie.

Students doing matriculation travel to Burnie High and the Marist College.

The Tasmanian Housing Department has constructed houses in the area, particularly in Somerset. Little has been done recently because of a lack of suitable land, but it is thought that this may be because the department wishes to encourage private development. The department proposes to develop 156 lots in West Wynyard. All construction will be carried out under contract rather than by day labour. About 40% of these lots will be for private sale and usually such lots are sold quite quickly.

The future of the municipality appears to be as a dormitory area for Burnie, and as a local commercial and retail centre. Burnie will continue to be the centre for employment and specialist services for the people in the Wynyard Municipality.

Penguin Municipality

The Penguin Municipality has a population of about 5,000 with about 3,000 in the township of Penguin. The current growth rate is just under 1% and about 80 to 100 houses have been constructed per annum over the last few years. Since the reconstruction of the Bass Highway through the north west of Penguin most building and subdivision has occurred to the east and south east of the town centre although a subdivision south of the Highway and Lester Road has recently been approved.

In essence, Penguin is a dormitory town with about 70% of its workforce travelling west to either professional or trade positions around Burnie. The remainder travel east to Ulverstone and even Devonport except for a small percentage which provides the services in Penguin itself. Penguin Council actively fosters this development as a dormitory town. They do not encourage the establishment of any industry but aim to provide a pleasant residential environment with good facilities available.

As a result of this role as a dormitory town the Bass Highway is a very important link for most Penguin residents. They not only use it for daily work trips but also to make use of the services in Burnie.

The Existing Transport System

Road

The most important road in the study area is the Bass Highway. It functions as a highway for the major long distance traffic with origins and destinations in North-West and Western Tasmania and also as an arterial road for commuters to and from Burnie and the surrounding areas.

The Bass Highway from Launceston to Burnie has been declared as part of the National Highway linking Hobart and Burnie under the National Roads Act. It terminates at the intersection of North Terrace and Alexander Street Burnie.

Within the study area the Bass Highway is a two lane road with 7.4 metre pavement and 12 metre formation width. Shoulders are unsealed. The horizontal alignment is generally to 80 kph standard.

At Penguin there is a set of traffic lights at Main Street which can result in some inconvenience. Between Burnie and Penguin there are areas with speed restrictions where residential areas front onto the highway.

From the Emu River to Burnie the road is being reconstructed to four lanes and the first stage of the Burnie Expressway links this work with Alexander Street. From Alexander Street west to the Cam River the highway is a narrow congested two lane road with abutting commercial and residential development. The Waratah Highway to the west coast diverges from the Bass Highway at the Cam River. Beyond the Cam River the road is a two lane road with 7.4 metre pavement and 12 metre formation width on a slightly better horizontal alignment than the section east of Burnie.

The inland settlements such as Natone, Ridgley, Camena, Riana are connected to the coast by roads running south from the Bass Highway. They are generally sealed but narrow and on poor alignments due to the terrain. There are no existing inland roads in the study area parallel to the coast due to steepsided north-south valleys.

Rail

The main north-west rail line from Western Junction (Launceston) to Wiltshire Junction (near Smithton) parallels the Bass Highway, between the road and the sea, within the study area. It is generally in poor condition and suffers erosion problems due to its proximity to the sea. It is well used, particularly as far as Burnie, and is an important transport link.

The Emu Bay Railway runs south from Burnie to Rosebery and is used to transport iron pyrites to the North West acid plant at Wivenhoe.

Ports

Burnie is a major port for the North West coast. Devonport is also a major port. There are limited facilities at Circular Head (Stanley) and iron ore is shipped in bulk from Port Latta west of Wynyard.

Most exports from the port of Burnie, particularly bulk goods, originate in Burnie and the surrounding district. Similarly most imports are destined for the immediate vicinity. The port also services the area west and south west of Burnie.

Road Travel Characteristics

Information on the existing road traffic is available from the Department of Main Roads traffic counts and from an origin/destination survey done in Burnie at the time of opening of the first stage of the Burnie expressway in May 1977. The road traffic counts are shown in Figure 2.3, together with the month and year of the count.

The interview forms for the origin/destination survey were reanalysed for the purposes of this appraisal. Zones used are shown in Figure 2.4. Vehicle types were amalgamated into two categories: cars, including station wagons, utilities and light commercial vehicles, and trucks. Results are shown below in Table 2.3.

TABLE 2.3 - DAILY VEHICLE TRIPS PASSING BURNIE 1977 (vehicles per day)

Between	Burnie		Sulphur Ck.		East	
	cars	trucks	cars	trucks	cars	trucks
Burnie	5400	480	340	20	2200	220
Somerset	1900	90	130	20	730	80
West[1]	1900	200	140	4	1800	250

(1) Includes Waratah Highway traffic.

As the origin/destination survey was carried out at the centre of Burnie the trip matrix does not include traffic which does not pass through the centre of Burnie. Traffic from east of Penguin with destinations in the East Burnie/Wivenhoe area and traffic from west of Somerset with destinations in the West Burnie/Cooee area as well as local traffic on the Bass Highway is not included in the trip matrix.

The difference between the traffic count data and estimates from the origin/destination survey indicate that a significant proportion of trips on the Bass Highway do not pass through the centre of Burnie (see Figure 2.3). However, only a small number of trips not passing through Burnie would be likely to benefit from using an inland route. The origin/destination data includes most trips which would use an inland route if constructed and the origin/destination matrix has been used to estimate traffic on the inland route for this appraisal. This is considered in more detail in Chapter 5.

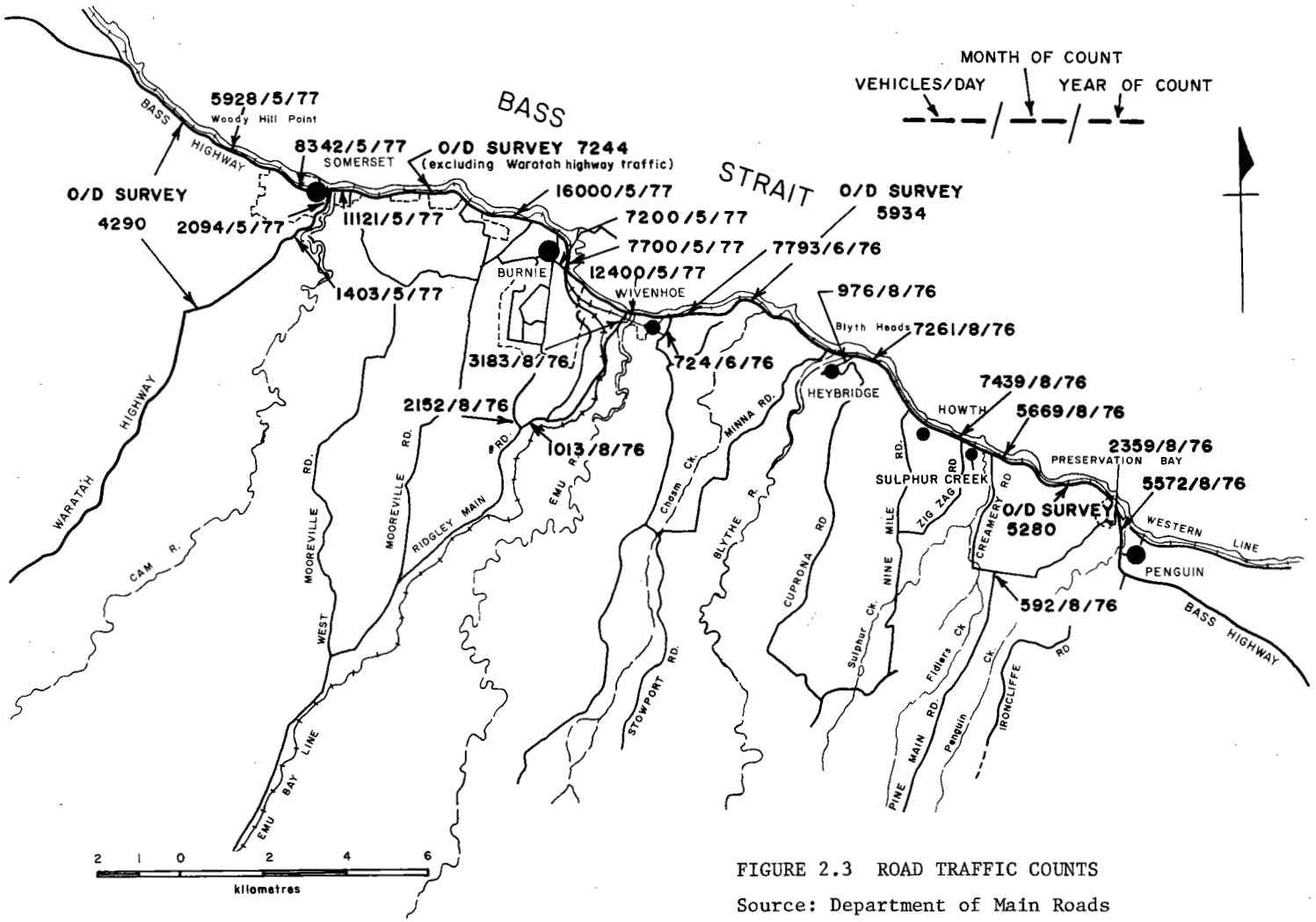

FIGURE 2.3 ROAD TRAFFIC COUNTS

Source: Department of Main Roads

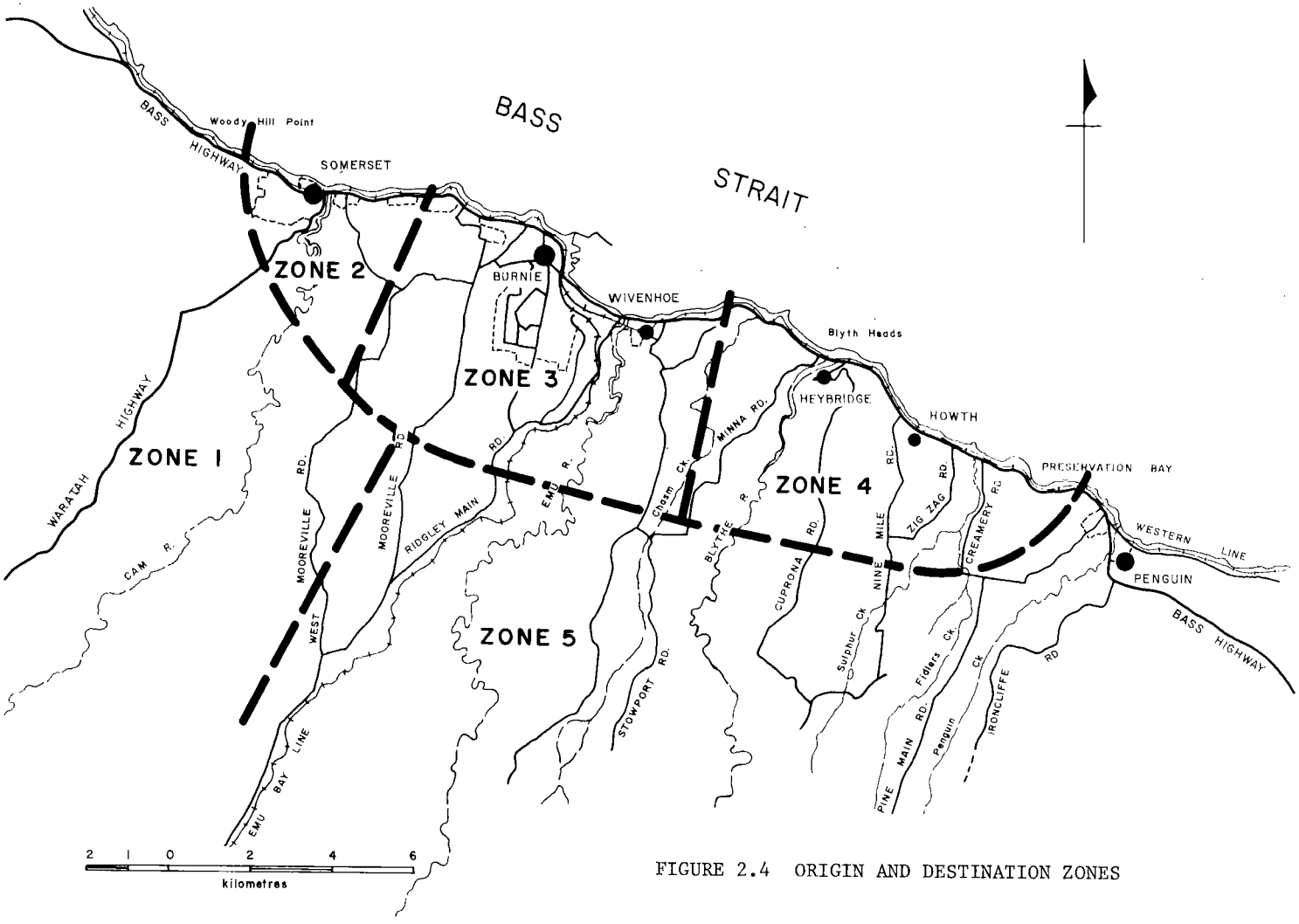

FIGURE 2.4 ORIGIN AND DESTINATION ZONES

The Department of Main Roads encountered problems during the origin/destination survey which resulted in what is suspected to be a biased sample. This limitation, and other inadequacies, were accepted by the Bureau for this appraisal, however, it is recognised that additional and more reliable origin/destination data will be required before road planning can progress far beyond this appraisal.

CHAPTER 3 - OPTIONS FOR THE NATIONAL HIGHWAY

The existing National Highway between Penguin and Burnie, the Bass Highway, runs along the narrow coastal plain and its standard is lower than the recommended National Highway standard. Because of restrictions imposed by the topography and urban development there are only two real options available for the National Highway route. These are:

(i) the existing route;

or

(ii) a completely new route running inland along the plateau.

The Coastal Route

Should the coastal route continue to function as the National Highway or not it is likely to need upgrading to increase capacity at some time in the future. This section considers the options for upgrading the coast route.

The National Highway Design Standards[1] for this section of the highway specify a four-lane divided road with each carriageway having 7.4 metre pavement width and 3 metre shoulders on the left and 1.2 metres on the right. The general minimum median width should be 15 metres, the general maximum grade should not exceed 5%, the minimum radius for horizontal curves should be 1000 metres and the general design speed should be 130 km/h. However, where economic considerations suggest a lowering of these standards the median width should not be less than 3 metres, the absolute maximum grade should not exceed 7%, horizontal curves should have a minimum radius of at least 500 metres and the design speed should be no less than 100 km/h. In addition, in situations where economic, environmental or other considerations suggest a variation in these design standards the State may propose alternative (lower) standards.

---

(1) Design Standards for National Highway between Hobart and Burnie; Document NH DS9, 1976, Department of Transport.

Although technically it is possible to upgrade to National Highway standard the problems associated with this mean it is not feasible. Upgrading the coast route to National Highway standard would require the acquisition of a large number of houses, relocation of the railway in some places and would cause stability problems with earthworks on steep slopes. Because of these factors an upgrading was examined which, although well below the National Highway standard, would adequately serve the likely traffic and would avoid most of the problems of higher standard options.

The DMR has developed preliminary plans for a four lane road with a narrow median and no more than 250m radius curves. In the late 1960's when extensive improvements were last made to the road, further upgrading to four lanes was considered and the road reserve was widened in anticipation where this was possible. The upgrading plan, described below, utilizes these widened areas and takes account of DMR's preliminary plans. It represents the maximum possible upgrading that could be considered feasible for the coast route.

At "Borthwick's slip" between Penguin and Preservation Bay (See Figure 3.1), the road reserve was widened sufficiently to accommodate a four lane road with narrow median. The DMR propose a deviation from the present highway at Cameron's corner around the south of Preservation Bay rejoining the highway just east of Elphinstone's Corner. One house and some sheds would have to be acquired.

Increasing the width of the road is particularly difficult at Sulphur Creek where the houses are quite close on one side and the railway and shoreline close on the other. It would be possible to provide a dual carriageway if the railway were relocated further offshore and depending on the extent of the relocation it may be possible to accommodate a service road.

Widening would also be difficult, in the vicinity of Howth, but would be possible if the railway were relocated northwards. The cuts along the section between Howth and Blythe Heads (Ling's, McKenna's and Johnson's Corners) have already been widened for four lanes and a narrow median could be provided.

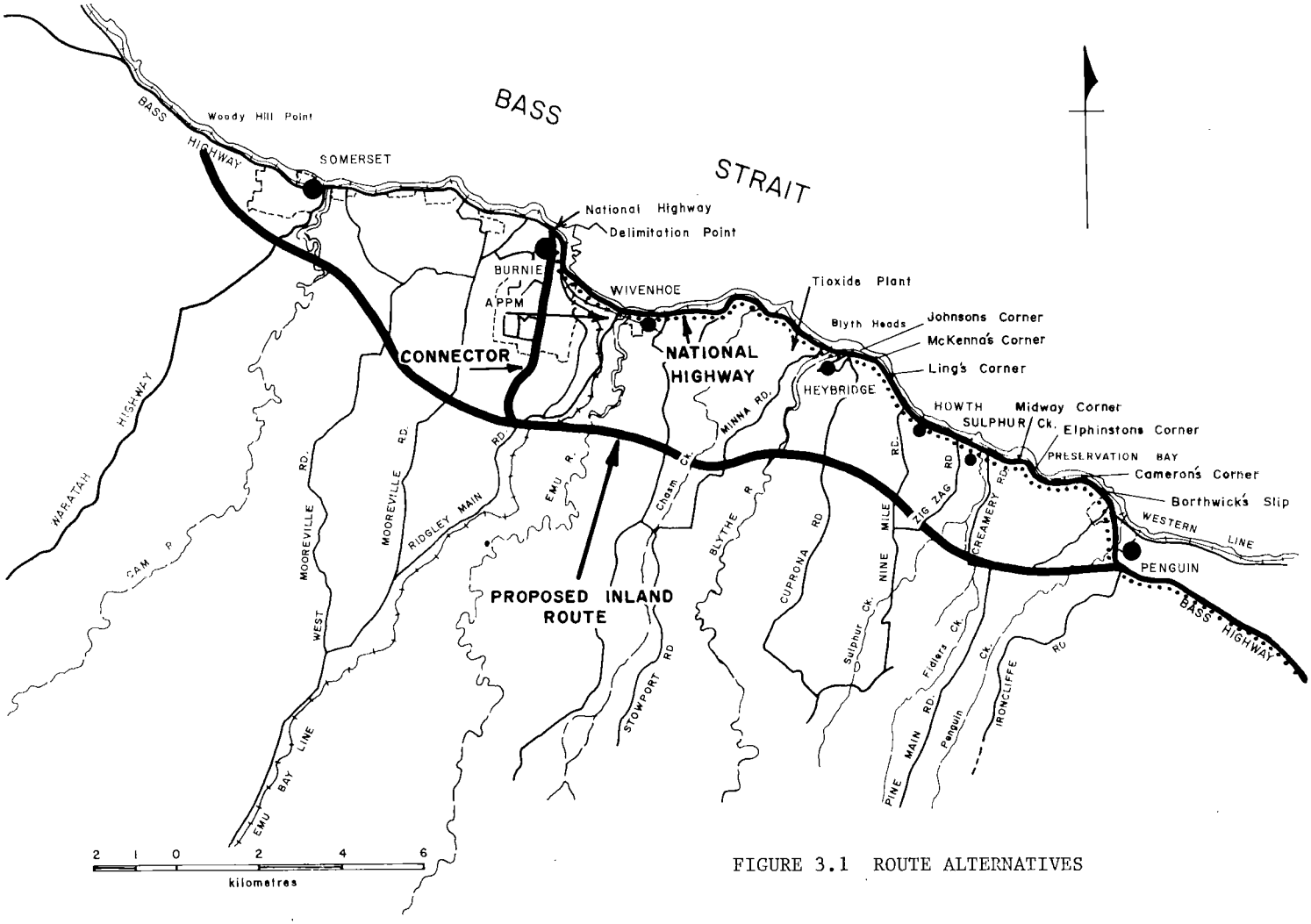

FIGURE 3.1 ROUTE ALTERNATIVES

At Heybridge the highway was relocated to run parallel to the railway line and coast. To upgrade the road further it would be necessary to duplicate the bridge over the Blythe River between the one now in use and the railway bridge.

Through Chasm Creek the railway and dwellings restrict widening as at Sulphur Creek. Widening would require the acquisition and use of land close to the front yards of existing dwellings. The railway would have to be relocated further towards the sea to provide for four lanes and depending on the extent of relocation a service road may be possible.

Widening the section from Chasm Creek to Wivenhoe does not pose any particular difficulties. Duplication of the bridge over the Emu River would link with the extension of the four lane section currently under construction.

Since it is not feasible to upgrade the coast route to National Highway design standards, lower standards have to be accepted if the existing Bass Highway is to remain the National Highway. A four lane highway can be provided as described above and this would represent the highest feasible standard along the route. It would be expensive to achieve, particularly where railway relocation is required.

An alternative is to provide four lanes where this can be achieved without major disruption to existing residents, railway line and land formation but not to attempt this for sections such as through Sulphur Creek and Chasm Creek. This would provide increased opportunities for passing heavy vehicles, reduce congestion and provide high benefits for relatively low cost. It may be economically and environmentally the best solution for meeting future traffic needs even though the resultant road standard would be lower than National Highway Design Standards and it should be investigated as an alternative to the four lane highway option. The possibility of providing two lanes with a service lane should also be considered through sections where ribbon development exists.

The Inland Route

The inland route (See Figure 3.1), as proposed by the Department of Main Roads, traverses land varying from gently rolling hills to very deep and steep creek and river valleys. Except for these valleys most of this land has been cleared for agricultural purposes. The route avoids the narrow coastal plain and the existing ribbon development, but the creek and river valleys pose significant problems. Grades considerably in excess of 7% would be required at such valleys unless very large and expensive structures are provided.

The indicated alignment leaves the existing Bass Highway in a south westerly direction, just west of the Ironcliffe Road overpass at Penguin. The alignment in this section was developed following a submission by Penguin Council. It requires the acquisition of three houses on the northern side of Lester Road but does not interfere with land proposed for subdivision, schools and the sports complex.

The first steep valley is at Penguin Creek, west of Penguin, where there would be problems achieving grades below 7%. The route is then east-west along Pine Main Road to the junction with Creamery Road. From there it continues across Fiddlers and Sulphur Creeks, Zig Zag Road, Nine Mile Road and Cuprona Road to the Blythe River. At the Blythe River the rugged, thickly vegetated terrain will be difficult to cross without very expensive structures or accepting grades well over 7%.

West of Blythe River the route crosses Minna Road and veers south west and crosses Stowport Road and the Emu River where a substantial structure would be required. Then the route intersects with Ridgley Main Road near its junction with Old Surrey Road. Ridgley Main Road would form the connector to Burnie, and both Mount Street (Ridgley Main Road) and Reeve Street would be upgraded for this purpose.

From the Burnie Connector the inland route veers north-west and crosses Mooreville Road and West Mooreville Road before descending into the Cam River valley. The route crosses the Cam River and then intersects with the Waratah Highway north of Somerset. It joins the Bass Highway just west of Woody Hill Point. Acquisition of one house will be required near this junction. One other house may possibly be required along the route.

The proposed inland route would be designed to meet National Highway Standard with regard to horizontal alignment, pavement width, etc. However, it is unlikely to be feasible to achieve grades complying with the National Highway standards throughout the length.

CHAPTER 4 - ISSUES RAISED IN RELATION TO THE NATIONAL HIGHWAY

Discussions were held with the North West Master Planning Authority and Penguin, Wynyard and Burnie Councils as well as the Department of Main Roads. Also, a sample of residents in the Preservation Bay, Sulphur Creek areas were interviewed as were proprietors of a sample of businesses in the area. This chapter reports the issues raised in these discussions.

The North-West Master Planning Authority

The NWMPA has considered the future development of the region and most future industrial development will continue to be in the major centres of Devonport and Burnie. The NWMPA believes that an inland route could be developed to encourage the opening up of farming land in the south of the region and to provide for tourist trips. A route suggested in a draft outline development plan is about 20 kilometres inland through Hampshire where there are some east west roads at present. It is proposed that these could be upgraded and with the addition of missing sections could perform the function of a development and tourist road running parallel to the coast from Deloraine west.

The NWMPA considers that there is great tourist potential in the region but expects that tourists would continue to be attracted to the coast, even with an inland route, because tourist accommodation and facilities would be better along the coast.

The inland route suggested by the NWMPA does not meet the objectives of the National Highways System and is not an alternative to the existing Highway. It is not considered further in this appraisal.

Burnie Council

Burnie is the major commercial, service, industrial and employment centre for the region. Burnie Council thinks that any route that bypasses Burnie would not satisfy the demand for access to Burnie. The council considers that the existing coastal route serves Burnie's needs adequately but could be improved by upgrading to a four lane facility, in particular the section between Burnie and the Tioxide plant and duplication of the Emu River Bridge. The council does not consider it necessary or desirable to upgrade the Bass Highway to full National Highway Standards.

It is the council's opinion that the difficult terrain and associated high costs and steep grades would make the inland route infeasible. However, the council considers that an inland route may be needed at some time well into the future.

The council considers that many of the problems associated with through traffic would be overcome if the National Highway was extended to the Waratah Highway and funds made available for upgrading this section.

Wynyard Council

It is the council's view that Wynyard municipality will continue to be a service centre and dormitory suburb for Burnie which will remain the major centre for employment, specialist services and shopping. As most Wynyard traffic is to and from Burnie the council sees only limited advantages for the inland route.

The council considers that the declared National Highway should be extended to the Airport at Wynyard. They argue that this is the logical termination point of the National Highway as Wynyard Airport serves Burnie. National Highway funds could then be used for the Burnie-Camdale section of the Bass Highway which the council considers to be the worst section of the road between Burnie and Wynyard.

Penguin Council

The council is not happy with the existing location of the Bass Highway. Before the realignment in the late 1960's the highway followed the coast parallel to the railway. The council and citizen groups were in favour of a complete bypass of the town but the road as constructed bisects the town and disrupts cross-town movements. Most residents live on the opposite side of the highway to the schools.

Penguin council's major concern is the maintenance and improvement of the residential quality of the area. The council does not wish to attract industry because the council sees Penguin's future as a dormitory suburb for Burnie and as a high quality residential area. The council is developing a 10,000 hectare recreational centre which will attract visitors from throughout the region.

As well as being an important link for Penguin residents travelling to other towns for employment and to use services unavailable in Penguin, the Bass Highway facilitates travel to the recreation centre at Penguin. The council's main concerns are to improve the standard of the highway and those problems associated with the current location of the Bass Highway.

Although an inland route would overcome many of the problems if it succeeded in diverting traffic from the Bass Highway at Penguin, the problems could be overcome more simply. A major problem area is the Main Street intersection and the council have been pressing for this to be grade separated for some time. If the cross town links could be improved and the at grade intersection eliminated the existing alignment of the Bass Highway would be satisfactory.

The council considers that because of steep grades an inland route would be unlikely to attract heavy vehicle traffic and would not divert traffic from the coast route. Upgrading of the coast route would be of more benefit to Penguin by improving access between coastal settlements, that is, allowing for increased traffic speeds.

Residents

Ribbon development has taken place along the Bass Highway and, although it is now being restricted, there are a number of houses located close to the highway at Preservation Bay, Sulphur Creek and Chasm Creek. Residents of some of these houses were interviewed and a number of issues were raised.

Noise was an issue to some residents and some had arranged their houses so that they slept and lived in rooms away from the highway. Residents claim to have noticed an increase in traffic, particularly heavy vehicles, over the last few years. Although most residents have accepted or adapted to the noise levels, noise is an issue which would need to be carefully considered in any upgrading proposals for the highway which would bring traffic closer to the dwellings.

Access to properties is a major issue with many residents. Entry to and exit from driveways is a problem, particularly near curves and bends in the road. Some residents complained that cars overtake as they slow down to turn. Access to some properties was adversely affected when the road level was altered during upgrading of the highway. These problems would be alleviated if the road was widened and shoulders sealed through these settlements or if a service road could be provided.

Dust problems due to the wide unsealed shoulders are a major source of annoyance to many residents.

Some residents have a poor image of the Department of Main Roads following the resumption of land which occurred during the late 1960's. Communication appears to have been the problem. Some residents assumed that land was required for additional traffic lanes and are unhappy with the unsealed shoulders. Others consider that they had to apply pressure to obtain compensation and prevent what they considered to be unnecessary removal of trees. If further land resumption is required for upgrading in the future it would need to be very carefully handled and residents should be involved at an early stage in planning because of this attitude of residents.

Although access to the beach is difficult at times and the safety of children is a consideration, it appears that beach access is not a major issue. The view was a more important reason for home location for most residents interviewed. However, the beaches are used for walking and swimming and access may become a more important issue with increased traffic.

Some residents were concerned about what they perceive as an increasing number of heavy trucks and the high speeds they travel at. They are concerned generally about safety and thought many problems would be solved by reducing the speed limit. Safety is an issue with a minority of residents.

Businesses

There are a number of light industrial, commercial and retail businesses located along the Bass Highway between Penguin and Burnie. Generally, the location of the National Highway is not an issue for most businesses as they do not rely on passing trade. Relocation of the highway would not benefit these businesses except by diverting traffic from the coast route and reducing congestion.

There are several service station/general stores between Burnie and Penguin. Proprietors were worried that a relocation of the National Highway would be detrimental but were unsure of the extent to which their trade relied on long distance traffic which may use an inland route. The Bureau considers that it is unlikely to be significant and the bulk of their trade is likely to be local. Although local residents do their main shopping in the larger towns a few items are regularly purchased locally.

CHAPTER 5 - ASSESSMENT OF ALTERNATIVES

DETAILS OF ALTERNATIVES

Alternatives to be Evaluated

The base case used to assess alternative National Highway development strategies between Penguin and Burnie is the existing highway with the upgrading work currently underway between Burnie and the Emu River Bridge eventually being extended east to the Tioxide plant. This eventual further upgrading of the coastal route is taken to be common to all other alternatives because of expected growth in local commuter traffic associated with employment in the Burnie-Wivenhoe area.

Further upgrading of the coastal route along the lines canvassed in Chapter 3 would need to be the subject of evaluation against this base case. Such an evaluation is outside the scope of the terms of reference for this study.

The development of an inland route to full National Highway standard is evaluated against the base case in this report. Development of this route was described in Chapter 3.

Projected Travel Speeds

Traffic counts available to the Bureau are summarized in Table 5.1. Although these data provides only a limited data base, they do indicate that there has not been significant traffic growth in the area over the last few years. Given this limited data base, it has been assumed that the determinants of traffic levels are similar to those for traffic on the Midland Highway and reported by the Bureau of Roads.(1) That is, it is assumed that traffic will grow in proportion to the motor vehicle population. Traffic is therefore projected to grow at a rate of 2.1% per annum to 1991 and thereafter at 0.4% per annum.

---

(1) Commonwealth Bureau of Roads - National Highways Linking Hobart, Launceston and Burnie - Approaches to Hobart, 1977. Paragraphs 6.8 to 6.13 in particular.

TABLE 5.1 - TRAFFIC COUNTS

	ARS[1]		DMR[2]	
	1973	1974	1976	1977
Penguin		6210	5572	
Sulphur Ck.		7410	7439	
Heybridge		7351	7261	
Wivenhoe	8508		7793	
Emu River	11944			12400

(1) Figures provided for 1975 Update of Australian Roads Survey

(2) Date provided by DMR

East of Wivenhoe traffic currently does not exceed 8,000 vehicles per day (vpd). This is expected to grow to around 11,000 vpd by the year 2000. With 10% of the traffic expected to be heavy trucks, the average speed of traffic at peak hours would be 60 kph for both cars and trucks. Near Penguin traffic is expected to grow from about 5,500 vpd to around 8,000 vpd and would travel at 70 kph. For comparison with the inland route it is assumed that speeds on the coast route average 60 kph for both cars and trucks.

On the inland route, cars would be expected to travel at an average speed of 90 kph and trucks at an average of 70 kph. The difference reflects the influence of steep grades on this route.

Travel time estimates for alternative routes are shown on Figure 5.1 and in Table 5.2.

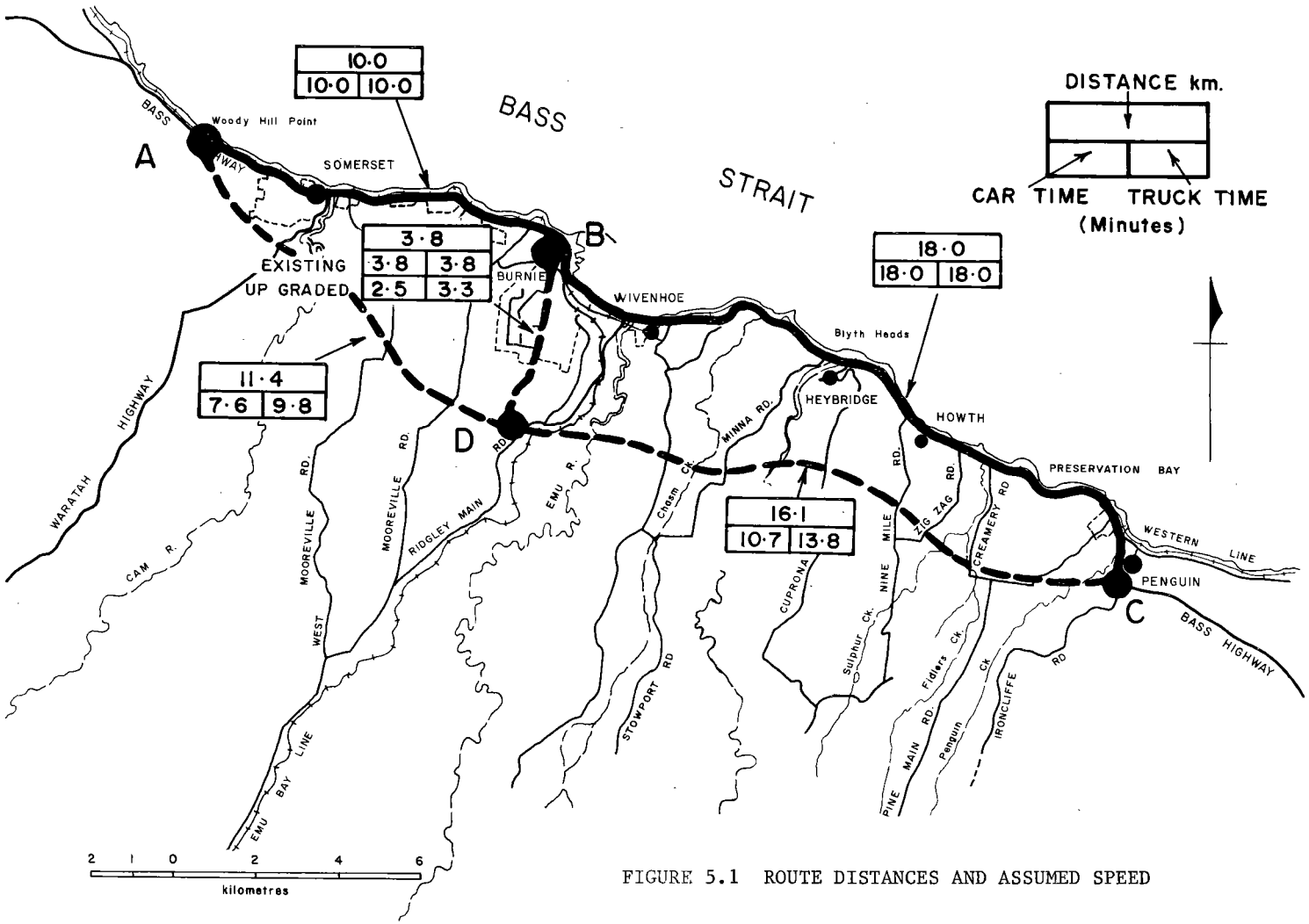

FIGURE 5.1 ROUTE DISTANCES AND ASSUMED SPEED

TABLE 5.2 - TRAVEL TIMES BY ALTERNATIVE ROUTES

(minutes)

	Route Section[1]		
	A to B	B to C	A to C
coastal route			
cars	10.0[2]	18.0	28.1
trucks	10.0	18.0	28.1
inland route			
cars	10.1	13.2	18.3
trucks	13.1	17.1	23.6

(1) See Figure 5.1 for section definitions

(2) The fastest times are underlined

Projected Traffic Patterns

Using the O/D data in Table 5.3 and assuming that traffic would use the fastest route available, Table 5.4 shows the traffic that would currently use an inland route in preference to the coast route.

TABLE 5.3 - DAILY VEHICLE TRIPS PASSING BURNIE 1977[1]

(Vehicles per day)

Between	Burnie		Sulphur Ck.		East	
	cars	trucks	cars	trucks	cars	trucks
Burnie	5400	480	340	20	2200	220
Somerset	1900	90	130	20	730	80
West[2]	1900	200	140	4	1800	250

(1) O/D survey data.

(2) Includes Waratah Highway traffic.

TABLE 5.4 - 1977 TRAFFIC DIVERTED TO INLAND ROUTE

Section[1]	Cars	Trucks
A - D	1800	250
B - D[2]	5930	300
D - C	4730	550

(1) See Figure 5.1 for section definitions.

(2) Includes 3,000 cars on Ridgley Main Rd./Old Survey Road. This figure derived from traffic count data.

If such a diversion were to occur, the traffic count data indicates that traffic on the coast route at Sulphur Creek would be reduced from about 7440 to 2160 vpd. At the Bass and Waratah Highway intersection, Somerset, traffic would be reduced from 11,120 to around 9,100 vpd.

Road User Benefits

Road user benefits associated with the alternatives are calculated using the assumptions outlined in Chapter 6 and Appendix 2 of the Bureau of Roads report National Highways Linking Hobart, Launceston and Burnie: Approaches to Hobart, 1977. That is traffic growth, vehicle occupancy, vehicle ownership levels, traffic mix, vehicle operating costs and passenger time cost are taken to be the same as for the Approaches to Hobart study. Road user benefit calculations employing this information are set out in Table 5.5.

Table 5.5 shows that there is a net cost to road users who use the inland route from Penguin to Burnie. This arises because there is a net increase in vehicle operating costs which outweighs the passenger time savings. Because the time saving for trucks is low and the net cost high, it is likely that trucks would continue to use the coast route in spite of the estimated time saving. There would be no time saving for trucks if the average speed on the coast route were 63 kph instead of the 60 kph assumed.

TABLE 5.5 - CALCULATION OF ROAD USER BENEFITS

	route segment(1)				
	A - C		B - C		B - D
	cars	trucks	cars	trucks	cars
Affected Traffic (vpd)	1800	250	2930	300	3000
Unit Operating Cost (c/vehicle)					
coast	126.0	490.0	81.0	315.0	17.1
inland	140.3	497.8	101.5	360.2	19.4
difference	-14.3	-7.8	-20.5	-45.2	-2.3
Unit Time Cost (c/vehicle)					
coast	112.9	232.4	72.6	149.4	15.3
inland	73.8	195.9	53.2	141.9	10.1
difference	39.1	36.5	19.4	7.5	5.2
Total Unit Benefit (c/vehicle	24.8	28.7	-1.1	-37.7	2.9
Total Benefit ($/day)	446	72	-32	-113	87

(1) See Figure 5.1 for segment definitions.

Note: 1977 traffic levels, June 1976 prices.

Accident Costs

Accident costs were calculated using the method employed in the Approaches to Hobart study (see Appendix 2 of that report). A reduction of a maximum of 8 accidents per year could be expected to result if a new inland route was to be constructed. This would be due to a combination of reduced traffic levels on the existing roads and the higher standard of the new road. The annual benefit of this cost saving would be of the order of $34,000.

Minor improvements to the coast route would be expected to result in a greater reduction in the number of accidents than would construction of the inland route. For example, increasing the pavement width to 15m, undivided, could reduce accidents by 21 per year.

Total Benefits

Total road user benefits are summarized in Table 5.6.

TABLE 5.6 - TOTAL ROAD USER BENEFITS OF INLAND ROUTE

	Benefits $,000 per annum[1], 1977
Time Benefits	
cars	521
trucks	42
Operating Cost Benefits	
cars	-338
trucks	-57
Accident Cost Savings	34
TOTAL	202

(1) June 1976 prices. 1977 traffic levels.

Construction Costs

Cost estimates prepared in 1973 indicated that the inland route would cost not less than $20 million[1] ($32 million in 1976 prices). These costs have been adopted for this appraisal.

ECONOMIC EVALUATION OF ALTERNATIVES

To estimate the total road user benefits to be gained from construction of the inland route the following set of assumptions was employed:

(a) construction of the route commences in 1978;
(b) construction proceeds at a constant yearly rate of expenditure until completion in 1982;
(c) traffic uses the route from 1983 onwards;
(d) evaluation is over a 30 year period from 1978;

(1) North West Tasmania - Outline Development Plan. Prepared by UDPA Planners, Melbourne.

(e) road user benefits increase in line with traffic growth and at 2% per annum in real terms reflecting the increase in benefits caused by rises of 3% per annum in the real value of passengers time;

(f) traffic will grow at 2.1% up to 1991 and 0.4% thereafter; and

(g) a discount rate of 10% and a discount year of 1978.

The results are summarized in Table 5.7.

TABLE 5.7 - ECONOMIC ASSESSMENT OF INLAND ROUTE

	$ million[1]
discounted construction cost	27
discounted road user benefits	2.3
BCR	0.09

(1) 1976 prices, discounted to 1978 at 10% per annum.

To test the sensitivity of the economic assessment, traffic growth was increased to 4% per annum throughout the period of analysis. This is double that considered to be the most likely case.

Under this assumption traffic on the coast road would travel at an average speed of 50 kph by 1990 and congestion would be high in the areas near Burnie.

Discounted road use benefits for the inland route would increase to $11 million and the benefit cost ratio would be 0.41. Even under the assumption of high traffic growth, construction of the inland route would not be warranted for another 20 to 30 years.

It should also be pointed out that any improvements made to the coast route which reduce travel time or prevent travel times increasing in the future will further reduce the viability of the inland route.

SOCIAL AND ENVIRONMENTAL ASSESSMENT OF ALTERNATIVES

The Inland Route

The construction of the inland route would not be greatly constrained by social and environmental factors but there are some aspects which would require consideration. The greatest problems along this route would be posed by the need to cross the Blythe and Emu Rivers and the ascent from the existing Bass Highway at Penguin.

The design of the road and, in particular, the structures required to cross Penguin Creek and the Blythe and Emu Rivers would have to be carefully considered to preserve the peaceful rural setting of the route and to minimise interference to natural vegetation along the river valleys. The few remaining areas of the type of dry sclerophyll forest found along these rivers are important because of the diversity of fauna they contain. The vegetation is also important in maintaining the stability of the valley sides.

Housing acquisition may be necessary where the route joins the Bass Highway. Some houses would be affected by the proximity of the highway. The severance of some farms would reduce their viability.

A social problem arises because of the uncertainty associated with the location of the National Highway. This has had some effect on the subdivision and development plans of Penguin and Burnie Councils. It would be desirable for a final decision to be taken as early as possible on whether to reserve an alignment for an inland route and if so to determine the route location so that councils can formulate definitive development plans.

Although provision of an inland route could reduce traffic levels on the coast route significantly in some areas, it may not relieve problems associated with heavy vehicle movements. Most of this traffic would continue to use the coast route particularly if congestion on the coast route were reduced as a result of cars using the inland route.

Access to inland settlements will not be greatly improved because only a limited number of intersections would be provided on the limited access inland route. The coastal route will still provide for the bulk of the existing local traffic and it is likely that upgrading of the coast route would be required, particularly close to Burnie, even if the inland route were constructed.

The Coastal Route

Overall, an upgrading of the coastal route to four lanes on the existing alignment would not create significant environmental problems nor would it greatly exacerbate the problems of pollution and aesthetic degradation already existing along the route. Environmental considerations would become significant if massive upgrading involving extensive blasting and relocation of large sections of the railway line onto the beachfront was to be carried out. If this occurred blasting could cause significant slips on unstable slopes and reduce the local scenic amenity. Relocation of the railway onto the beachfront could cause an alteration to the sedimentation patterns of that part of the coast.

As the coastal settlements are dormitory centres for Burnie, most local authorities and residents consider that the maintenance of high standard access along the coast is the highest priority. If residents and local councils were satisfied with existing conditions along the coast route there may be more local support for an inland route.

The problems associated with the present Bass Highway are perceived from two viewpoints. The first is the problem of congestion and restriction of traffic flow and the second is concerned with noise, difficulties of crossing the highway and ease of access to or from private driveways. Central to these problems is the amount of heavy traffic using the road. Although only a relatively low proportion of traffic is, in fact, heavy trucks (10%), the perceived disruption is significant.

Upgrading of the full length of this section of the coast road to a four lane facility would adequately solve any traffic congestion problems but, in some sections, could worsen the problems perceived by the residents. In particular, further acquisition of land from residents in Preservation Bay, Sulphur Creek and Chasm Creek would place them closer to the highway, exacerbating noise and access problems.

In order to avoid further encroachment of the road onto private land in these settlements, the road could be partially upgraded to four lanes, leaving the sections through the townships as two lanes. This would provide adequate overtaking opportunities for cars without further impinging on these residential areas. It may be possible to provide for two lanes and a service road through the townships.

When the road was upgraded in the late 1960's some provision was made for the later construction of a four lane road. Some cuttings were widened to accommodate this but without a median as required for National Highway standards, and the road reserve was widened in other sections. An adequate solution to the problems perceived on the existing Bass Highway could be to upgrade the road making use of these widened sections.

Consideration should be given to the problems caused by the present location of the Bass Highway at Penguin. To this end, any upgrading proposal could include grade separation of the Main Street intersection and improved access across the highway for local traffic.

From discussions with local residents in the Preservation Bay, Sulphur Creek and Chasm Creek areas, it is apparent that consultation with residents and compensation for compulsory acquisition may have been inadequate in the past. If the coast route is to be upgraded again, particular care should be exercised to ensure that the residents are adequately consulted and compensated if necessary.

CONCLUSION

The construction of an inland route from Penguin to Somerset is not economically warranted at this time. The expected growth in traffic will not alter this situation and it is unlikely that an inland route will be economically warranted in the foreseeable future. In addition any improvements made to the coast route will further reduce the viability of the inland route.

There are no social or environmental problems associated with the coast route between Burnie and Penguin which would prevent it continuing to function as the National Highway. Nor are there any major problems associated with limited upgrading of the coast route to provide adequately for expected traffic growth.

It is therefore concluded that the National Highway should continue to be along the alignment of the Bass Highway.

Although the evaluation of alternative upgrading options and their timing for this route is outside the terms of reference for this study and it is recognised that considerable work needs to be carried out to enable detailed planning to proceed a number of considerations impinging on these matters have arisen during the study.

Firstly, upgrading of the coast route to meet National Highway Design Standards is not feasible. However, the Bureau is satisfied that the coast route can be upgraded to adequately cater for expected traffic growth.

Secondly, there are two sections of road which appear to be problem areas. The section from the Emu River Bridge to the Tioxide plant carried significantly more traffic than the remainder of the route and duplication may be warranted. At Penguin the intersection of the Bass Highway with Main Street may require modification and consideration could be given to improving cross town access to reduce the effects of severance caused by the location of the Bass Highway.