The role of the transport system in destination development

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Abstract

Although the transport industry provides the link between tourism generating and destination regions the industry’s role as an agent in destination development has been largely overlooked. If the ability of tourists to travel to preferred destinations is inhibited by inefficiencies in the transport system there is some likelihood that they will seek alternative destinations. This paper outlines a transport cost model that identifies the significance of transport as a factor in destination development as well as in the selection of destinations by intending tourists. The model demonstrates the dynamic relationship between categories of holiday expenditure and tourists’ point of origin. Increased distance generally leads to increased transport access costs and represents a significant factor in total holiday cost. The model is tested by analyzing the role of transport in the development of Cairns as a destination by examining the effect of distance, transport access costs and competing destinations. © 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Transport; Destination growth; Cairns; Holiday budget; Resorts; Destination

1. Introduction — area of research

The aim of this paper is to identify the significance of the transport system as a factor in the development of destinations. The role of transport has not been investigated in any detail, although its importance has been acknowledged (Chew, 1987; Gilbert, 1939; Gunn, 1994; Hall, 1991; Inskeep, 1991; Martin & Witt, 1988; Page, 1994,1999; Picard, 1993; Robinson, 1976; Rose, 1991). In this study analysis of the role of transport is approached from an economic perspective in contrast to previous studies of destination development that have generally adopted a spatial or geographic perspective (Burton, 1994; Gilbert, 1939; Miossec, 1976; Robinson, 1976; Smith, 1992; Thurot, 1980). To illustrate the role of transport in destination development, this paper will outline a destination transport cost model and test it by examining the role of transport in the development of Cairns, one of Australia’s newest international destinations.

2. The role of transport

History records that the transport system has exerted a profound effect on the development of travel from ancient times (Kaul, 1985). For example, in Roman Times, Pompeii and Herculaneum were popular retreats for the citizens of Rome escaping the capital’s summer heat (Theobald, 1994). The movement of these early travellers from origin to destination was made possible by well engineered road systems, organised road transport based on horse and cart teams, organised sea travel in the Mediterranean and a hospitality sector. In more recent times the development of the steam train followed later by the car and the plane have added to humanities’ ability to undertake travel to even the remotest corner of the globe.

Each new breakthrough in transport technology, from the development of roads by the Romans to the construction of wide-bodied passenger jets, has enabled the traveller to go further, at greater speed, for a cheaper price, and in greater comfort and safety. Beginning with rail in the 19th Century and the private automobile and commercial air services in the 20th Century, the transport system has provided the foundation for the development of both domestic and international tourism in its present form. In the 19th Century, railways were largely responsible for the growth of seaside resorts in the United Kingdom (Gilbert, 1939; Robinson, 1976) because travel from origin markets was convenient, comparatively fast and economical (Kaiser & Helber, 1978). Likewise, in the 20th Century, the private car and public bus industry opened up continental landmasses such as Europe and
North America for mass tourism. In Canada for example, Nelson and Wall (1986) found that the development of mass tourism on Vancouver Island was initiated by growth in private automobile ownership.

In the air, aviation developments such as the jet engine and wide body passenger jets created the opportunities for long-haul travel (Prideaux, 1993; Thurot, 1980). Air transport has made a significant contribution to the growth of tourism in many parts of the world including destinations in Asia, Spain, Africa and the Pacific Islands. In the holiday islands of the Caribbean, airlines are the primary means of transport for long-haul travelers from the United States and Europe (Wheatcroft, 1994). In Australia, the Commonwealth Department of Tourism (1992) stated that development of the nation’s relatively decentralised tourism industry relied on the provision of transport infrastructure. In other studies, the role of transport has been largely ignored.

In many tourism studies, the relationship between transport and tourism is defined in terms of accessibility; that is, transport is seen as a link between tourist generating regions and tourism destination regions. Some authors have examined the history of tourism from the perspective of the development of various transport modes (Dickman, 1994), while others (Mill & Morrison, 1985) have taken an interdisciplinary perspective, viewing transport as only one of many components which together constitute the tourism system. In other studies, the role of transport has been largely ignored.

The economic significance of transport as a factor in tourism demand has been acknowledged by a number of researchers (Martin & Witt, 1988; Taplin, 1980; Witt, 1980). In a study of the demand elasticities of short- and long-haul tourists Crouch (1994) found that there was evidence to suggest that the sensitivity of demand for long-haul travel was significantly different from that of short-haul tourists due to the sensitivity of long-haul tourists to transport costs. Martin and Witt (1988) noted that the cost of travel to substitute destinations could be expected to be a factor in destination selection. Other studies have focused on the value of travel time (Ankomah & Crompton, 1992; Chevs, Stoll & Sellars, 1989; Walsh, Sanders & McKean, 1990), mode characteristics (Barff, Mackay & Olshavsky, 1982), and the opportunity cost of various modes of transport (Morrison & Winston, 1985). The consensus appears to be that there is a direct relationship between the value of time spent travelling and estimates of consumer surplus (Walsh, Sanders & McKean, 1990). Pursuit of this line of inquiry could throw more light on the travel patterns of tourists and assist in planning of transport networks and associated tourism facilities. While the measurement of travel characteristics including time, cost and choice of mode and their impact on travel decisions has been a fertile area of research in the transport and engineering literature (Coto-Millan, Pino & Inglanda, 1997; Hensher, 1993; Mayeres, Ochelen & Proost, 1996) the issue has not been pursued to a great extent in the tourism literature.

One area that has received little attention is the link between transport and destination development. In many tourism markets, the role of transport is crucial as demonstrated by Australia’s almost total dependence on air transport for inbound tourism. Although the relationship between long-haul transport, such as aviation, and tourism is well understood, the relationship at destination level is less clear. As a consequence, the relationships involved have not been investigated in any detail. Although a number of researchers (Barrett, 1958; Barbaza, 1970; Butler, 1980; Lavery, 1974; Smith, 1992; Soane, 1993; Young, 1983) have suggested models to explain the development of tourism resorts and destinations, they have not identified transport as a major factor in the growth process. In previous studies, transport was often viewed from a geographic perspective and analysed...
in terms of tourist flows occurring between metropolitan destinations and peripheral urban and rural destinations (Lundgren, 1982). Transport’s economic role as the bridge between buyer (tourist) and seller (the suppliers of tourism services) has not been assessed in a meaningful way.

4. Transport and destination development

The role of transport as a significant variable in destination development, when acknowledged, is usually relegated to a minor place behind more specific geographic concepts including spatial separation and interaction, traffic flows and transit zones (Barrett, 1958; Leiper, 1990; Pearce, 1987). In one of the few attempts to quantify the relationship between tourism development and transport, Miossec (1976) developed a resort model which illustrated the role of transport as a means of increasing links between resorts and between resorts and tourism generating regions. Although noting that the transport system was an essential part of the development process, Miossec (1976) failed to develop a model that was capable of being operationalised. In an analysis of the relationship between resort growth and the growth of crime, Prideaux (1996) noted the link between resort growth and the development of resort transport systems and other infrastructure. The model, the Tourism Crime Cycle, outlined a series of resort stages, each of which is typified by specific infrastructure development such as transport and hotel types. In later studies Prideaux (1998, 1999) postulated a model incorporating four phases of resort development and one post growth phase of decline or rejuvenation based on a range of supply side factors including transport. The model, called the Resort Development Spectrum (RDS), argues that as resorts and destinations grow and move into more intense phases of development, the provision of transport becomes critical. The RDS identified the role of transport, among other variables including attractions and activities, market sectors, and accommodation, as a major factor in resort and destination development.

Leiper (1990) developed the notion of a transit route region through which departing and returning travellers pass during the course of their travel. Leiper’s model illustrates the function of transport as the conduit through which flows of tourists move from their homes to holiday locations and back to their homes again but does not comment on the ability of the transport system to influence the behaviour of travelers. Impediments to the satisfactory operation of the transit route region may, for example, inhibit the flow of travelers. Unfortunately, Leiper’s model fails to consider travel within the tourist destination region typified by travel from accommodation to places of interest as well as travel within the generating region required to move tourists from home to the point of departure.

Kaul (1985, p. 496) recognised the role of transport system as an essential component of successful tourism development and stated that “transport plays an important role in the successful creation and development of new attractions as well as the healthy growth of existing ones. Provision of suitable transport has transformed dead centres of tourist interest into active and prosperous places attracting multitudes of people”. Kaul (1985) summarized the role of transport in tourism development in a number of postulates outlined in Table 1. Together, these postulates outline in a concise manner the relationship between transport and tourism. However, the postulates overlook the role of price as a determinate of travel demand, an issue of some importance for developing destinations attempting to compete in the global market place.

Not withstanding Kaul’s postulates, the issue of transport and its effect on tourism demand can be viewed from a cost perspective. Page (1994), for example, implied that

Table 1

<table>
<thead>
<tr>
<th>Postulates in the role of transport in tourism development</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>One:</strong> The evolution of tourism is greatly influenced by and is a function of the development of the means of transport.</td>
</tr>
<tr>
<td><strong>Two:</strong> Tourism is a mass phenomenon as well as an individual activity, which needs and calls for transport and other facilities suitable for each category.</td>
</tr>
<tr>
<td><strong>Three:</strong> Transport facilities are an initial and integral need for tourism and operate both as an expanding as well as a limiting factor for traffic flows; the quality of transport services offered also influences the type of tourist flow.</td>
</tr>
<tr>
<td><strong>Four:</strong> The planned development, maintenance and operation of transport infrastructure under a well-conceived overall transport policy, to meet the present and future technology and demand requirements, is the key to the success of the transport system contributing to the growth of tourism.</td>
</tr>
<tr>
<td><strong>Five:</strong> Transport prices influence elasticity of demand for traffic and diversification of price structure and competition has encouraged price reduction and qualitative improvements amongst modes of transport much to the benefit of tourism.</td>
</tr>
<tr>
<td><strong>Six:</strong> The integration of domestic and international transport systems and parallel co-ordination with other countries, contributes to the ease of tourism flow and growth of domestic and international tourism.</td>
</tr>
<tr>
<td><strong>Seven:</strong> Transport technological developments would exercise a deep influence on the means and patterns of transportation in both developing and developed societies, with the result that a more efficient, faster and safer transport system, beneficial to the growth and expansion of tourism would emerge and evolve.</td>
</tr>
<tr>
<td><strong>Eight:</strong> Accommodation, as an essential ingredient of tourism development and success, must maintain comparative growth to meet the increasing and diverse demands of tourism and transport expansion.</td>
</tr>
<tr>
<td><strong>Nine:</strong> The satisfactory development and equipping of terminal and en-route facilities the systematic improvement in infrastructure, the absorption and adoption of new technology and appropriate mass marketing techniques in transport would have a pervasive impact in the continued growth of future world tourism.</td>
</tr>
</tbody>
</table>

*Source: Kaul, 1985.*
an increase in the cost of travel would have repercussions for other components in the tourism system. From the foregoing discussion it is apparent that the role of transport is acknowledged in the literature but to date, detailed study of the impact that changes in the transport system can have on the operation of the tourism industry in general and the development of destinations in particular is lacking. For the potential of specific destinations to be realized, transport infrastructure development and enhancement must keep pace with growth in tourism demand. If the ability of tourists to travel to preferred destinations is inhibited by inefficiencies in the transport system such as uncompetitive prices or lengthy journey times, there is a likelihood that they will seek alternative destinations.

4.1. Defining transport

For the purpose of this paper, the tourism transport system is defined as the operation of, and interaction between, transport modes, ways and terminals that support tourism resorts in terms of passenger and freight flows into and out of destinations, the provision of transport services within the destination, and the provision of connecting transport modes in the tourism generating region. For the tourism industry, transport is the key factor in enabling tourists to travel from their place of residence to the place where they wish to holiday. The study of transport networks usually entails consideration of linkages and flows, location and places connected by linkages, and a system of catchments and relationships between places within a transport network (Page, 1994). To these factors should be added the cost of transport, safety concerns, time factors and the level of comfort required by various groups of travellers.

4.2. Transport system

The transport industry can be studied from a systems perspective rather than treating transport as a group of separate modes that service the tourism industry. The advantage of a systems approach (Prideaux, 1993; van Doorn, 1986) is that change is not treated as an isolated event relevant to one specific mode but rather viewed in the light of its system wide impact. Thus, the opening of new air services to a destination should not be viewed solely as a change in the number of passenger arrivals by air but instead, framed in the context of the impact on other modes such as road and rail and the overall potential to increase the number of tourists flowing into the destination.

It is possible to identify four basic elements of a transport system (Benson & Whitehead, 1985):

- **Modes**: Modes refer to the specific class of transport vehicle that undertakes freight and passenger tasks.

- **Transport**: The term ‘way’ refers to the type of track along which the various classes of transport vehicles travel. Ways includes seaways, roadways, airways and railways. Efficient ways reduce travel times, as well as the cost of travel.

- **Terminals**: In essence, terminals are points of interchange from one mode to another. Air terminals are examples of interchange points between air and road and in some cases, rail and occasionally sea. In larger destinations, particularly those servicing an international market, airports are an important component of the destination’s transport system. Congestion at terminals may inhibit the ability of a destination to reach its full potential.

- **Technology**: Technological change determines modal competitiveness, price structures, speed and comfort levels, as well as safety. The post world war two growth in intercontinental tourism has only been possible because of the ability of large jet passenger aircraft such as the Boeing 707 and 747 to safely carry large numbers of passengers over long distances at high speed, in comfort and at low cost.

In summary, the transport system is responsible for connecting tourism generating regions or origin points to tourism destination regions. The transport system also has several other tasks that should not be ignored. These include:

- providing transport from the tourist’s home to the terminal where the journey to the tourism destination commences,
- providing services that are safe, comfortable, competitively priced and fast,
- providing transport within the tourism destination, and
- providing freight services into the tourism destination.

5. Transport cost model

The cost structure of travel to a destination has two principal elements, supply side costs and demand side...
costs. Supply side costs refer to those costs incurred when establishing and maintaining a destination and range from the cost of building hotels to the construction and operation of an airport. These costs are relatively fixed and incorporated in the general destination price structure. Demand side costs refer to those costs directly incurred by the tourist and must be paid for from the tourist’s personal holiday budget. From the tourist’s perspective, holiday travel entails a range of personal costs that may be grouped together into three broad categories; accommodation costs, discretionary spending and transport access costs. Accommodation generally includes expenditure on lodgings and meals (where the accommodation provider supplies them). Discretionary spending includes pre-travel costs such as visa payments, purchase of new clothing and other travel accessories, as well as a range of destinational expenses such as entertainment, dining, tours and souvenir purchase. Tourists have some control over the allocation of spending on these items by being able to substitute within groups of expenses. Thus a tourist may substitute an expensive restaurant meal for a take-away or one form of entertainment for another. Transport access costs refer to a range of costs associated with the transport component of travel from the point of origin to the destination. Transport costs within the destination can be classified as discretionary expenditure because these costs are separate from the cost of travel to the destination.

Transport access costs comprise three broad categories, actual fares paid for travel (this will include payment for use of the destination’s transport infrastructure), a value on the time taken for the journey and the cost of the comfort of travel required. Although not discussed in detail in this paper time is a significant cost and is an area requiring additional research. With respect to the value of time, transport modes offer a range of travel times, thus rail travel is slow and time consuming while air travel is, by comparison, fast. If a tourist has limited time available, the time cost may be of more importance than the actual monetary cost of travel. The issue of time is significant because its finite nature (Feldman & Hornik, 1981) may force tourists to make choices between modes according to their perceived time utility. The comfort of travel is also a significant transport cost variable. While some tourists are prepared to pay a cost premium for first class travel, others place a lower value on comfort and are satisfied with lower price economy travel.

The theoretical relationship between demand for travel (expressed as transport access cost to a destination) and the components of transport cost can be expressed in general terms as:

$$TAC_i = f(PF_i, TJ_i, CT_i, TIC_i),$$

where $i$ is the unique destination, $TAC_i$ the transport access cost to destination $i$, $PF_i$ the price of fares to destination $i$, $TJ_i$ the time of journey to destination $i$, $CT_i$ the comfort of travel to destination $i$, $TIC_i$ the transport infrastructure costs at destination $i$ and $f$ denotes some function.

Similarly, the theoretical demand function for transport can be expressed as a relationship between total holiday expenditure and the various categories of expenditure, and can be expressed in general terms as:

$$THC_i = f(DS_i, AC_i, TAC_i),$$

where $THC$ is the total holiday expenditure, $i$ the unique destination, $DS_i$ the discretionary spending at destination $i$, $AC_i$ the accommodation costs at destination $i$, $TAC_i$ the transport access costs to destination $i$ and $f$ denotes some function.

Fig. 1 illustrates the relationship between the three categories of holiday costs and the selection of a holiday destination based on a personal holiday budget and transport access cost for a number destination types. The model assumes that tourists have a personal holiday spending budget and will make destination choices based on the amount of money they wish to spend for a holiday experience, the time available and the level of satisfaction that they will derive from choices made in respect to accommodation, discretionary expenditure and transport access cost.

In Fig. 1 the y-axis represents holiday costs by category while the x-axis represents distance from the tourist’s origin point A. In the model, the proportion of total holiday expenditure incurred on accommodation and discretionary expenditure is assumed to be fixed. In reality, tourists often trade lower accommodation standards and hence costs for higher discretionary spending on tours, entertainment and dining. Backpacking is a classic example of the trade-off between cheap accommodation and additional expenditure on other holiday activities. For the purposes of this discussion the premium paid for the comfort of travel will not be discussed in detail. Accordingly, the components of transport access cost

![Fig. 1. Transport cost model.](image-url)
considered are the actual monetary value of fares paid for the transport mode used and the time component of the journey.

Assuming that tourists usually have a fixed holiday expenditure budget and that expenditure on accommodation and discretionary spending is predetermined by the tourist’s accommodation preferences and destination cost levels, the transport access cost will have some effect on the selection of a destination. In Fig. 1, A represents the tourists’ origin point, B represents a nearby domestic destination, G represents a more distant domestic destination while F represents a foreign destination. Lines ET and ET_1 represent two transport cost scenarios, with ET being the higher cost scenario. The transport cost scenarios might represent two competing modes. If the cost of travel from the origin point is E_3 C_1, at transport cost level of ET_1, the tourist may select the foreign destination F as it falls within the predetermined holiday budget (represented by line CC_1). If however, the transport access cost for travel to the foreign destination F rises to E_3 F_1, the total holiday cost will exceed the tourist’s holiday budget and the tourist will be forced to seek an alternative holiday destination such as domestic destinations B or G, unless the tourist is prepared to forego some other component of holiday expenditure. For foreign destination F to regain its previous market at origin A, total destination costs must be reduced to a level equal to the tourist’s maximum holiday budget. This may be achieved in a number of ways including: reducing the destination’s infrastructure costs, introducing new technology that will reduce transport fares or through packaging of holidays. In recent decades holiday packaging has stimulated the development of mass travel particularly to foreign destinations by reducing overall costs including transport.

The impact of transport access costs on competing domestic destinations may also be illustrated in a similar manner. If domestic destinations B and G are competing for the same origin market A, the size of the transport element of the total holiday cost may influence destination selection. Again, assume that tourists have a fixed maximum holiday budget (represented by line CC_1), anticipated expenditure on accommodation and discretionary spending is the same at destinations B and G, and transport access cost is ET. Both destinations are competitive based on these assumptions. However, destination B has lower transport access costs compared to G producing a potential surplus between line ET (representing transport access cost to the resort) and line CC_1. This surplus will now be available for non-holiday expenditure or for increasing the level of discretionary and accommodation spending at destination B. Examples may include a higher standard of accommodation or increased spending on other holiday activities such as an increase in the length of stay. As a result of the differences in transport access costs destination B is more competitive than destination G based on price, however factors other than price may effect final the destination selection.

The model can also be used to illustrate how transport access costs are effected by substituting one mode for another. As the distance between the origin and destination increases the relative costs of modes change. For example, over short distances travel by car may be cheaper than travel by air but as distance and the time of travel increases air tends to become cheaper than car travel. This will be demonstrated in Fig. 3.

The importance of transport access cost as a factor in determining the tourist’s selection of a destination will largely depend on the percentage of the total holiday budget consumed by the transport component. Thus the distance of the destination from the tourist’s point of origin is a significant variable because it includes both the actual fare cost and a time element. If other categories of holiday expenditure are higher, the importance of transport access costs as a determinate of destination selection is substantially reduced.

The significance of the transport access component of destination selection has generally been overlooked in past tourism research. The model demonstrates, in a simplistic manner, the dynamic relationship between the three major categories of holiday expenditure and tourist’s point of origin. Increased distance generally leads to increased transport access costs and represents a significant factor in total holiday cost. The following discussion will demonstrate the effect of distance and travel access costs on the recent development of Cairns as a tourism destination.

### 6. Application of the model — a case study

The model can be used to illustrate the impact of transport on destination development by classifying tourists into distance based categories such as intrastate, interstate and international and examining how transport access costs impact on each category of tourist. Assessment of the impact of transport access cost to a specific destination will also require the identification of:

- specific origin markets or generating regions,
- competing destinations, and
- transport modes connecting the origin with the destination.

The impact of transport on destination development can be demonstrated by using the transport cost model to examine the growth of Cairns between 1982 and 1997. Using Sydney as an example of an origin market that Cairns is competing in and the Gold Coast (situated between Sydney and Cairns) as an example of a domestic competitor, the transport cost model is used to:
demonstrate that distance and fare prices influence the choice of mode to a particular destination, and

illustrate how destination growth is at least partly dependent on the structure of the transport system servicing the destination.

Located in the far north of the state of Queensland, Cairns has undergone rapid tourism development since the early 1980s. The city’s tourism industry is based on three markets; intrastate (residents of Queensland), interstate (residents of other Australian states) and international. Changes in the composition of each market sector during the period 1982/83 to 1996/97 are illustrated in Fig. 2. The rapid increase in international visitors can be attributed to a combination of demand and supply side factors. On the supply side, domestic and foreign investors developed a range of international standard facilities including hotels, shopping complexes and golf courses during the 1980s and early 1990s. In addition, a number of transport infrastructure projects were undertaken including the opening of an international air terminal in 1985, upgrading of the domestic airport, and the construction of cruise boat and long distance coach terminals. Enhanced access to nearby World Heritage listed coral reefs and rainforests provided additional attractions for tourists and opportunities for investors. On the demand side, Tourism Queensland (formally the Queensland Tourism and Travel Corporation [QTTC]), in conjunction with the private sector, local tourism promotion bodies and the Australian Tourist Commission commenced promotional campaigns in overseas markets concentrating initially on Japan and North America. Successful promotion combined with competitive international airfares and a reduction in domestic airfares as a consequence of airline deregulation in 1990 created a competitive cost structure and enhanced the ability of Cairns to rapidly expand both its domestic and international markets.

The contribution of the transport sector to the development of Cairns as a destination becomes apparent when the mode of travel to Cairns is analysed. During the period 1982/83 to 1995/96, the use of air travel rose rapidly as a result of growth in demand from interstate and international markets (Fig. 3). By 1995/96 air travel accounted for 55.5 per cent of all travel to Cairns (QTTC, 1997a). During the same period (1982/83 to 1995/96) travel by motor vehicle (including rental vehicles) fell from 39.8 to 29.8 per cent, rail travel fell from 2.9 to 2.3 per cent and coach travel declined from 15.3 to 5.7 per cent (QTTC 1984, 1997a,b).

Table 2 illustrates the cost of various modes connecting Sydney to the Gold Coast and Cairns based on time, published fares, service frequency and estimated additional costs above published fares. Travel by rail, coach and road is comparatively slow and tourists utilising these means of transport incur a range of additional costs that air travellers do not face. Additional costs include food, reading matter and in the case of travel by private car, the cost of fuel, accommodation and a contribution to vehicle maintenance costs. For tourists using private vehicles the total cost is not readily apparent because many of costs incurred in operating a private vehicle are hidden. These costs include depreciation, maintenance, repairs and tyres. Based on the data outlined in Table 2 the cheapest mode of travel from Sydney to Cairns is economy air, while the most expensive form of travel is the private car.

6.1. Travel by mode

The relationship between transport costs and the ability of a destination to market itself in a specific generating region is illustrated in Fig. 4 and based on data in Table 2. Sydney is represented by origin point A, Cairns is represented by G and the Gold Coast is represented by B. Line ET represents the cost of travel by car while line ET1 represents the cost of air travel. As the distance from Sydney increases, the comparative cost of modes change. These changes are reflected in the shape of lines ET and ET1. The cost of a return journey from Sydney to the Gold Coast by road is estimated to be $690 compared to $249 by air. When the journey is extended to Cairns the cost of air increases to $519 while the cost of travel by car
Table 2
Comparison of fare prices and other costs from Sydney to Gold Coast and Cairns in 1999

<table>
<thead>
<tr>
<th>Transport from Sydney by Mode to Gold Coast and Cairns (% of travellers in 1997) (1)</th>
<th>Cost of return economy ticket</th>
<th>Travel time (one way)</th>
<th>Services per week (2)</th>
<th>Additional costs incurred on journey (3)</th>
<th>Total estimated cost (economy)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rail</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gold Coast (2.8%)</td>
<td>$190</td>
<td>16 h</td>
<td>14</td>
<td>$70</td>
<td>$260</td>
</tr>
<tr>
<td>Cairns (0%)</td>
<td>$448</td>
<td>48 h plus transfer times</td>
<td>3</td>
<td>$190</td>
<td>$638</td>
</tr>
<tr>
<td><strong>Road (private vehicle) (4)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gold Coast (37.4%)</td>
<td>$630</td>
<td>Minimum 12 h</td>
<td></td>
<td>$60</td>
<td>$690</td>
</tr>
<tr>
<td>Cairns (6.5%)</td>
<td>$1909</td>
<td>Minimum 3.5 days</td>
<td></td>
<td>$600 (5)</td>
<td>$2509</td>
</tr>
<tr>
<td><strong>Coach</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gold Coast (3.1%)</td>
<td>$135</td>
<td>14 h</td>
<td>70</td>
<td>$70</td>
<td>$205</td>
</tr>
<tr>
<td>Cairns (1.3%)</td>
<td>$409</td>
<td>39 h</td>
<td>63</td>
<td>$190</td>
<td>$599</td>
</tr>
<tr>
<td><strong>Air (6)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gold Coast (56.3%)</td>
<td>$249</td>
<td>1 h</td>
<td>84</td>
<td>Nil</td>
<td>$249</td>
</tr>
<tr>
<td>Cairns (88.3%)</td>
<td>$519</td>
<td>35 h</td>
<td>96</td>
<td>Nil</td>
<td>$519</td>
</tr>
</tbody>
</table>

*Source: Travel by mode from BTR (1998), other data compiled from carriers (Ansett Australia, 1999).*

*Notes: 1. In 1996/97 Sydney generated 179,000 trips to the Gold Coast and 77,000 trips to Cairns.
2. Travel by rail requires a break of journey in Brisbane.
3. Estimated cost for a single person on a return trip based on the number of meals consumed at an average cost of $15 per meal and the purchase of reading material valued at $20 (for rail and coach).
4. Vehicle costs are estimated at $0.35/km including fuel, depreciation and maintenance, based on a new standard 6 cylinder sedan. The total one way distance by road from Sydney to Cairns is 2727 km while the distance from Sydney to the Gold Coast is 900 km. Assume one vehicle occupant. Additional occupants will reduce motor vehicle and accommodation costs but not the cost of food.
5. Accommodation costs are based on staying at an average priced motel at $50 per night.
6. Based on advanced purchase fares at the lowest rate.*

![Fig. 4. Transport cost model for Cairns competing in the Sydney market.](image)

increases by a much larger percentage to $2509. The additional cost incurred by car travel is largely comprised of additional expenditure on meals and accommodation. Thus for Sydney tourists preferring to travel by car, the Gold Coast has a distinct cost advantage over Cairns. However, for tourists who prefer air travel the cost of flying to Cairns is only marginally higher than flying to the Gold Coast (when accommodation costs and discretionary spending are included). Thus investment of promotional funds into attracting Sydney residents who prefer to fly should yield more tourists than expenditure of similar funds on Sydney residents who prefer car travel. Data collected by the Bureau of Tourism Research (1998) indicates that travel by plane is the most popular mode of travel by Sydney residents to both the Gold Coast (56.3 per cent) and Cairns (88.3 per cent). These findings illustrate the significance of air transport in the development of Cairns as both an international destination and a major interstate destination.

### 6.2. Impact of transport on destination growth

The model also illustrates the impact of transport on the development of destinations according to markets based on a distance classifications (intrastate, interstate and international). The distance between tourist generating regions and tourist destination regions and the cost of that travel, expressed as a monetary value and the time require for the journey, have a significant bearing of the type of transport used. Intrastate tourists are more likely to travel by car while interstate tourists have a higher propensity to travel by plane. The time of travel for interstate tourists is such that a point is reached where the tourist has insufficient holiday time available to travel by road and is therefore forced to use another
mode such as air in spite of apparently higher costs. This pattern is illustrated by the propensity of travellers to substitute travel by car during intrastate journeys for air travel on interstate journeys. In 1995/96, 73.4 per cent of Cairns’ intrastate visitors travelled by car while 11.8 per cent travelled by air transport. Conversely, 61.8 per cent of interstate visitors used air compared to 28.1 per cent who travelled by car (QTTC, 1997a,b). Distance and fare costs are therefore tradable and as the time of travel increases distance factors may determine the mode used rather than fare costs.

The relationship between origin and destinations points based on transport access price indicates that transport is a significant factor in both destination development and the type of markets that destinations compete in. Prior to the opening of the Cairns International airport in 1985 Cairns had a very small international market and inbound visitors had to travel through intermediate gateways such as Brisbane or Sydney. Opening of the international airport reduced transport costs giving Cairns the ability to compete internationally. The impact of the opening of Cairns to direct international flights is illustrated in Fig. 3. After the commencement of international flights the number of international visitors grew rapidly. The airport was also a significant factor in the development of the interstate market which exhibits a higher propensity to travel by plane than to travel by car. This is illustrated by the travel patterns of interstate visitors. Sydney visitors for example, are more likely to fly than drive even for relatively short journeys to destinations such as the Gold Coast (Table 2).

7. Discussion

Martin and Witt (1988) noted that travel costs to substitute destinations may be a factor in destination selection. This has been illustrated in Fig. 4. The model demonstrates in broad terms the impact of transport access cost on the ability of a destination to attract tourists from a specified origin market. In its current form the model does not attempt to quantify the relationship between transport access costs and destination selection. One method of quantifying the relationship may be to estimate price elasticity of demand between destinations competing in the same origin market based on transport modes. The simplest elasticity equation would test changes in consumption brought about by changes in price (Beaman, Hegmann & DuWors, 1991). However, the existence of numerous exogenous factors including individual preferences for transport modes, seasonally, and destination attractions require construction of an elasticity equation that incorporates a wide range of factors (see Rolle (1997) for a discussion on computation of transport elasticities and Crouch (1994) for a discussion on demand elasticities for short haul and long haul tourists). Development of an equation incorporating a range of transport factors is beyond the scope of this paper.

Analysis of these trends illustrates the type of transport infrastructure required to attract different tourist markets based on distance. Destinations with an international focus such as Cairns are heavily reliant on air transport for both domestic and overseas tourists. Conversely, if a destination is close to a tourist generating region (Cairns’ intrastate market), there is a high probability that road transport will be used in preference to air transport as the distance is shorter. From these observations it is apparent that:

- destinations without airport facilities are largely restricted to markets that are accessible by car. This observation is limited to destinations that are not serviced by rail or sea.
- air travel is the key element in developing new markets beyond the reasonable reach of travel by car. These markets may be interstate and international.

8. Conclusion

The foregoing discussion illustrates the importance of transport in destination development. Any future discussion of destination development must include consideration of transport factors. Major transport elements of destination development include:

- the distance from origin to destination will influence the mode of transport used to travel to the destination. Intrastate visitors are more likely to travel by car. Conversely, interstate and international visitors exhibit a strong preference for air travel.
- in determining the importance of transport access costs in destination selection decisions the major factors are fare costs, travel time and the distance travelled.
- as distance increases the transport element of holiday cost increases and assumes greater importance.
- travelling has a number of hidden costs that are not always apparent to tourists. Identification of these may alter transport choices as one mode is substituted for another.
- access to international airports is a vital component in the development of international markets, particularly where there are sea gaps or lengthy surface travel is required.
- until the development of an international airport, Cairns was not successful in developing a significant international market because of the inconvenience of flying through intermediate airports. This also indicates the impact of non-transport factors such as promotion and development of destination infrastructure and tourism services.
• destinations wishing to grow must identify and invest in appropriate transport infrastructure. Expansion into interstate markets may require an upgraded airport while international markets will require access to a nearby international airport.

The value of the transport cost model lies in its ability to relate a range of destination cost variables to the holiday travel budgets and travel preferences of individual tourists. In its present stage of development the model is largely descriptive, illustrating the relationship between a range of interrelated variables. Placing monetary values on variables and determining the demand function for specific groups of tourists, perhaps classified according to point of origin, and preferences for specific holiday experiences based on accommodation requirements, activities and mode of travel will give the model an operational capability which in its current state of development is not possible. Future research could also concentrate on identifying and quantifying the relationship between holiday budgets, destination selection and mode of travel.

References


